T.A 35

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2002

Mr. John Young, Corrective Action Project Leader
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SUBJECT: SUBMITTAL OF SAMPLING AND ANALYSIS PLAN (SAP) FOR THE MIDDLE MORTANDAD/TEN SITE AGGREGATE, LOS ALAMOS NATIONAL LABORATORY (LANL)

Dear Mr. Young:

Enclosed are two copies of the SAP for the Middle Mortandad/Ten Site Aggregate [originally called the Technical Area (TA) 35 Integrated SAP in LANL's March 30, 2001 submittal of the Installation Work Plan annual schedule]. The TA-35 Integrated SAP High Performing Team developed this document.

If you have any questions, please call Gabriela Lopez Escobedo at (505) 665-7352 or David Gregory at (505) 667-5808.

Sincerely,

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ENVIRONMENTAL RESTORATION PROJECT

A Department of Energy
Environmental Cleanup Program

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Sampling and Analysis Plan for the Middle Mortandad/Ten Site Aggregate

Los Alamos
NATIONAL LABORATORY

Los Alamos NM 87545

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Produced by the Remedial Actions Focus Area

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1.0 INTRODUCTION

This aggregate sampling and analysis plan (SAP) describes the characterization activities that will be conducted to complete the Resource Conservation and Recovery Act (RCRA) facility investigation (RFI) for an aggregate of potential release sites (PRSs) in Technical Area 35 (TA-35) at Los Alamos National Laboratory (the Laboratory or LANL) (Figure 1.0-1). The TA-35 PRSs addressed in this integrated investigation lie within, and comprise a large portion of, the Middle Mortandad/Ten Site Aggregate of the Mortandad Watershed. Figure 1.0-2 identifies the aggregates within the Mortandad Watershed. Although the PRSs have been sampled previously, more data are needed to support a no further action (NFA) decision or to justify corrective action.

The TA-35 PRSs addressed in this SAP occupy a narrow mesa and adjacent slopes between Mortandad and Ten Site Canyons as well as the floor of a small tributary canyon to Ten Site Canyon (informally named Pratt Canyon). Industrial Laboratory operations at TA-35 date back to the early 1950s and continue to the present day. It is due to the industrial nature of TA-35 that previous RFI work at this site has failed to completely characterize the nature and extent of chemical contamination, as low levels of industrial contaminants are found almost everywhere on the mesa top. These ubiquitous organic chemicals, inorganic chemicals, and radionuclides are found at levels just above background (or detected) concentrations. The pervasive chemicals and radionuclides found at TA-35 include zinc, nickel, copper, cadmium, polyaromatic hydrocarbons (PAHs), and plutonium-239. By characterizing this industrial area (Mortandad/Ten Site Slope Aggregate) as a whole, an overall assessment of environmental and human-health risks can be performed more accurately. Because there are several industrial sites with ubiquitous contamination across the Laboratory, the issue of performing large-scale assessments which could rank the risk contributed by individual or aggregates of PRSs to the overall watershed risk had to be addressed. This document is the Environmental Restoration (ER) Project's pilot aggregate sampling plan for a watershed aggregate in an industrial area.

The ER Project has evaluated existing data, assessed potential impacts, and defined additional data needs for all the PRSs at TA-35. Where a potential release to the environment may have occurred, assessment of existing data has focused on defining data gaps. Implementation of this aggregate SAP will close the data gaps, allowing for a more complete assessment of the risk ranking for the aggregate.

This aggregate SAP was developed with the participation of the Department of Energy/National Nuclear Security Administration (DOE/NNSA) Office of Los Alamos Site Operations (OLASO) and the New Mexico Environment Department Hazardous Waste Bureau (NMED-HWB). This pilot document incorporates a watershed approach to the RCRA corrective action process—an approach that uses watershed boundaries to delineate discrete systems. The ER Project Installation Work Plan (IWP) (LANL 2000, 66802) is now the framework for conducting ER Project activities at the Laboratory. The IWP directs project managers to take a systems-oriented approach to their activities, using the natural watersheds within the Laboratory to delineate discrete systems (watersheds) or portions of systems (aggregates within watersheds) within which multiple PRSs will be investigated, assessed, and (if necessary) remediated together. The Laboratory is committed to assessing the potential contribution of individual PRSs to effects that take place on a much larger spatial scale and to transport processes that result in accumulation of contaminants over time in remote locations or in different environmental media. These issues, referred to as *cumulative risk,* share common data-collection requirements because they require considering spatial scales that are considerably larger than a PRS boundary.

Only a subset of the PRSs within the Middle Mortandad/Ten Site Aggregate are included in this aggregate SAP because tools and techniques for conducting assessments on this larger scale (aggregate/watershed) are being developed and tested with this pilot document and subsequent assessments. The data set associated with this group of TA-35 PRSs and the neighboring canyon reaches is very large and the data assessment efforts are extremely laborious. Figure 1.0-3 and Figure 1.0-4 show the Middle Mortandad/Ten Site Aggregate (eastern and western areas, respectively), the canyons sampling reaches, and the location of TA-35 within the Mortandad Watershed.

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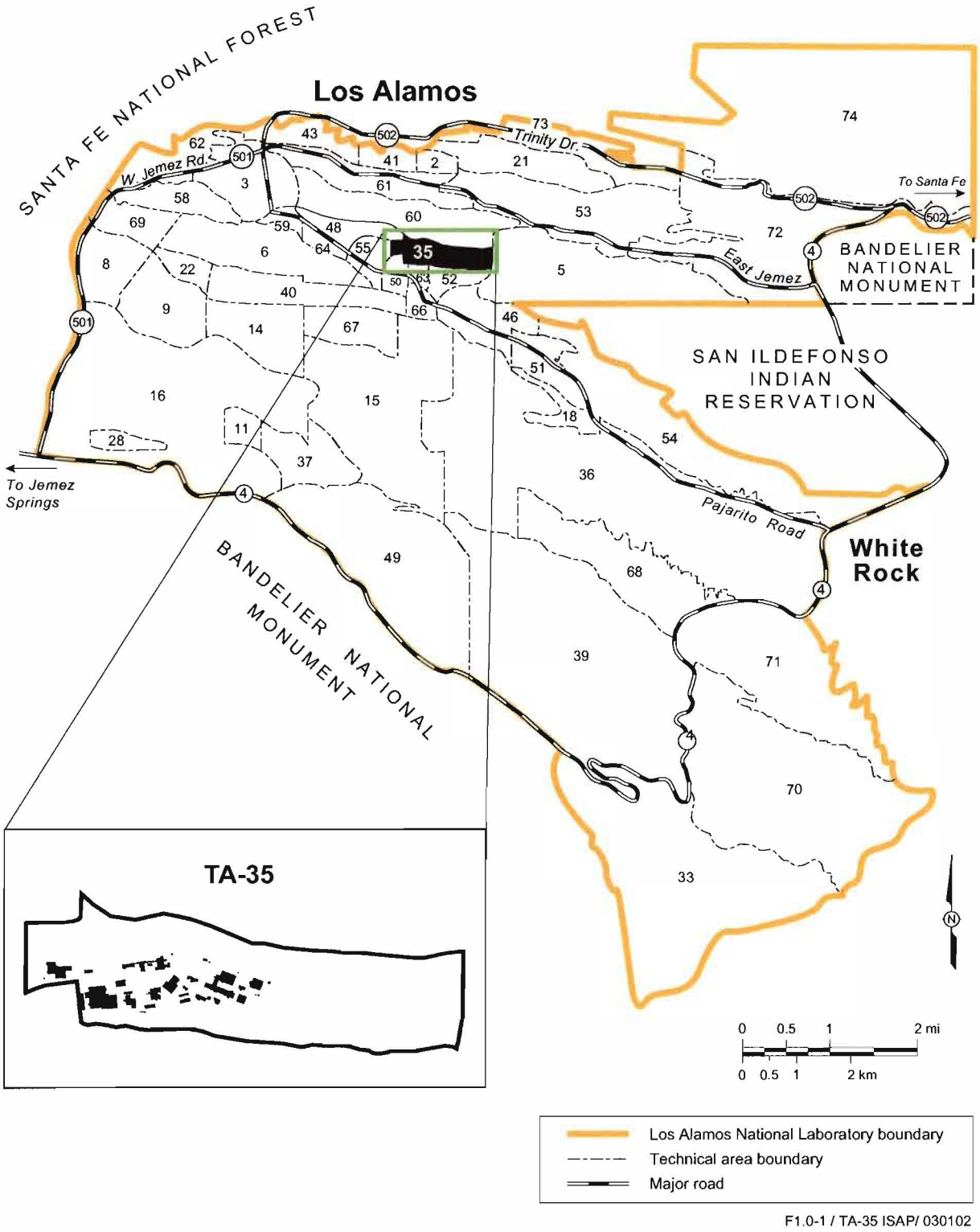
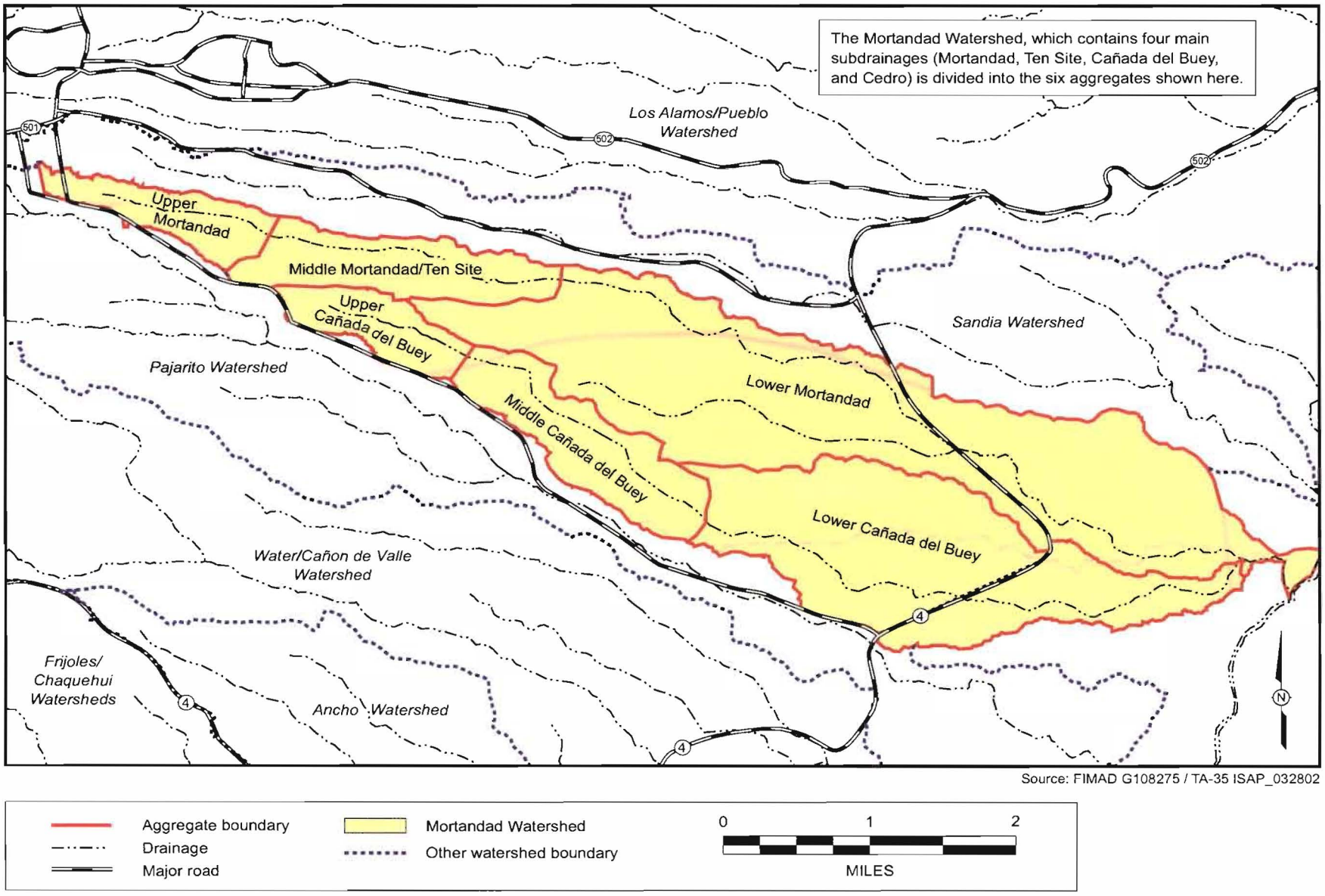


Figure 1.0-1. Location of TA-35 with respect to Laboratory technical areas and surrounding land-holdings



Source: FIMAD G108275 / TA-35 ISAP_032802

Aggregate boundary
Drainage
Major road
Mortandad Watershed
Other watershed boundary
0 1 2
MILES

Figure 1.0-2. Mortandad Watershed and its aggregates

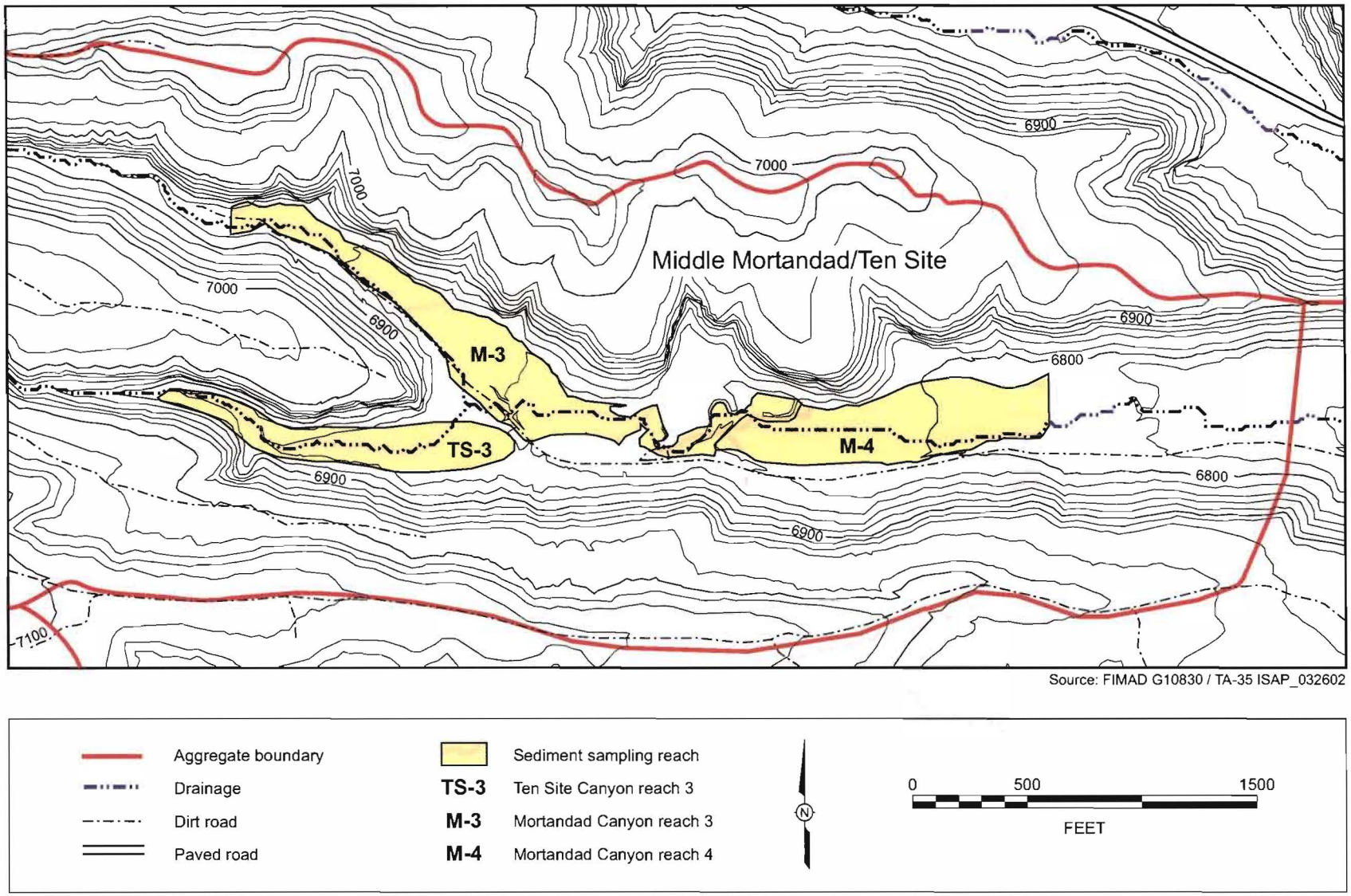


Figure 1.0-3. Eastern portion of Middle Mortandad/Ten Site Aggregate, with canyons sampling reaches

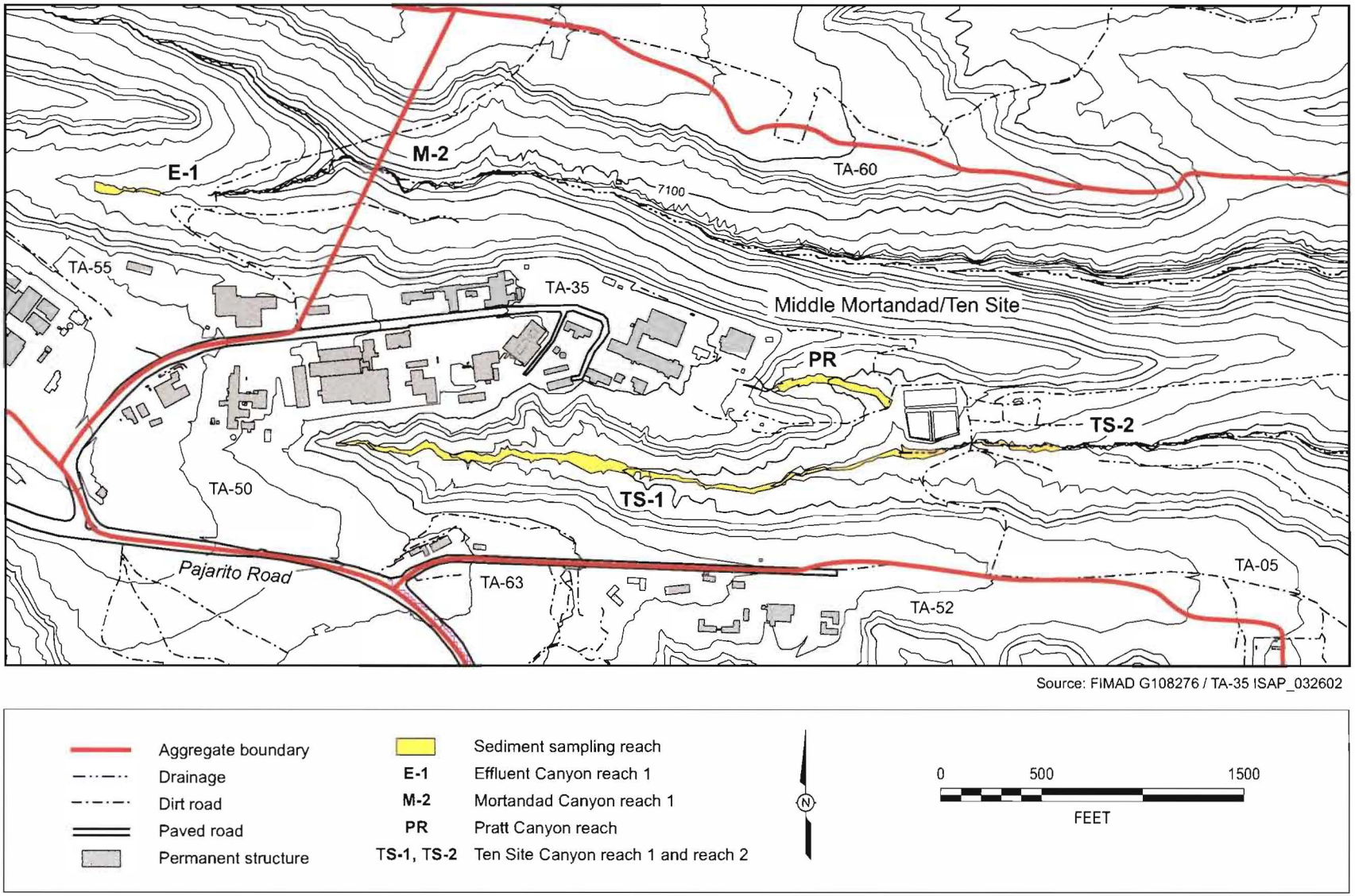


Figure 1.0-4. Western portion of Middle Mortandad/Ten Site Aggregate, with canyons sampling reaches

This SAP for the Middle Mortandad/Ten Site Aggregate presents an evaluation of relevant existing data, a description and conceptual model of spatial distribution and fate and transport of contaminants, a determination of existing data gaps, and the characterization approach to address the data gaps.

This document is organized as follows:

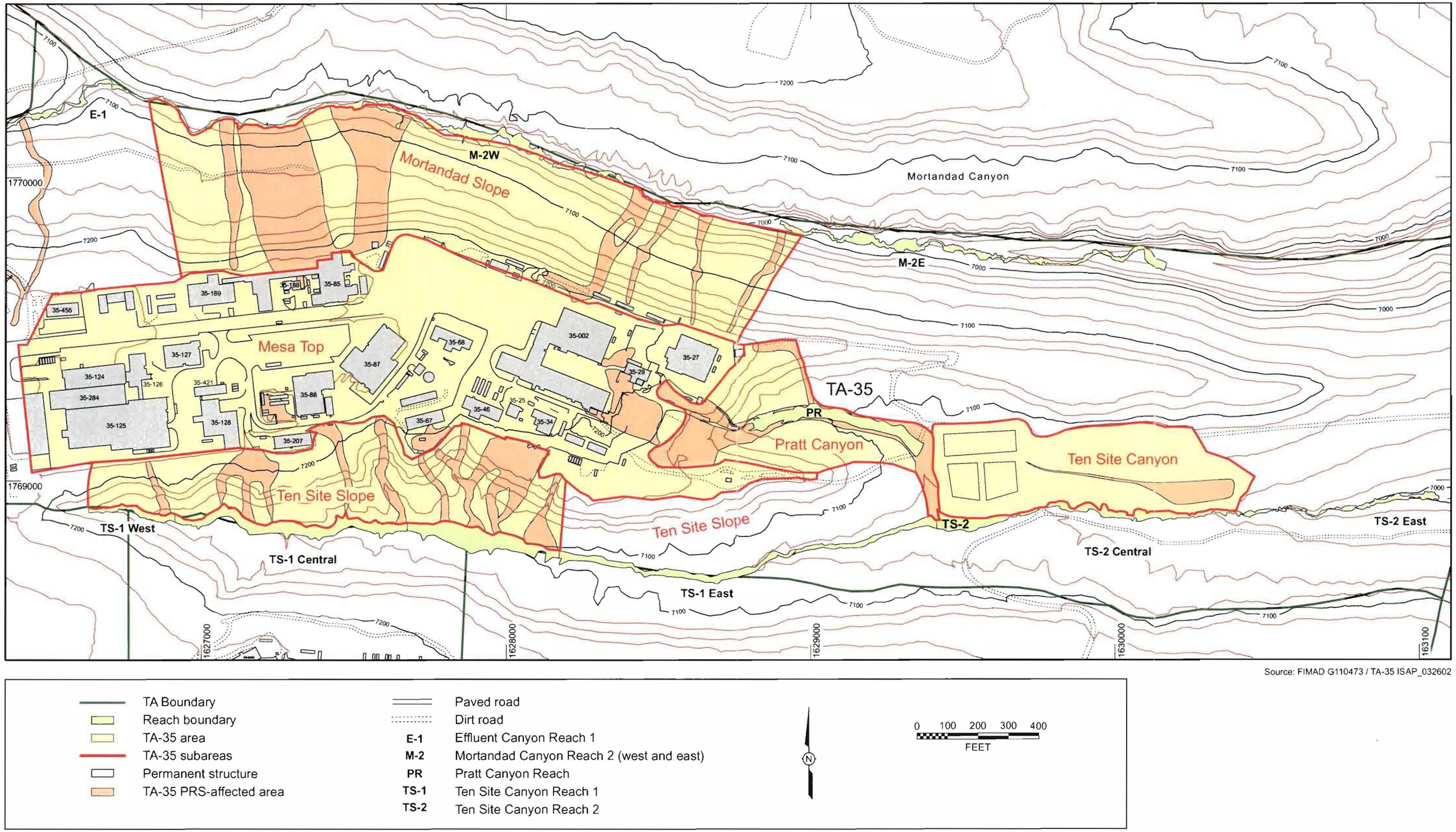
- Sections 1 and 1.1 describe the scope of this document and provide information about what PRSs are included, as well as the objective and purpose of this document. Section 1.2 contains the regulatory framework for the RFI work and corrective actions at TA-35.
- TA-35 PRSs have been organized into five subareas, each of which is discussed individually within sections 2 and 3.
- Section 2 presents the subarea descriptions and history, previous data collected, and conceptual model for the TA-35 portion of the Middle Mortandad/Ten Site Aggregate based on the current understanding of the existing data and data gaps.
- Section 3 presents the investigatory approach for each of the five subareas and includes the data quality objectives.
- Section 4 reviews the sampling and analysis procedures to be used to collect the required data.
- Section 5 describes project management.
- Section 6 contains the references.

This investigation organizes the TA-35 PRSs into five subareas: Mesa Top, Ten Site Slope, Mortandad Slope, Pratt Canyon, and Ten Site Canyon, as illustrated in Figure 1.0-5. The subareas were established by considering one or more of the following criteria:

- Potentially different land use and exposure scenarios for risk: mesa top and adjacent upper portion of the slopes = industrial, middle and lower slopes and canyons = recreational;
- Different ecological habitat: slopes/canyons vs. mesa top;
- Different contaminant release scenarios: mesa top = subsurface or surface liquid releases that would predominantly percolate to the subsurface, slopes/canyons = surface releases;
- Different contaminant transport mechanisms: mesa top = infiltration, mesa top/slopes = runoff, slopes/canyons = runoff and sorbed to sediment; and,
- Which adjacent slope or canyon each PRS potentially affects.

Within TA-35 proper, there were originally 102 PRSs. Fifty-four PRSs were solid waste management units (SWMUs) and 48 were areas of concern (AOCs). SWMUs are PRSs listed in the Hazardous and Solid Waste Amendments (HSWA) module of the Laboratory's Hazardous Waste Facility Permit. For SWMUs, the administrative authority (AA) is NMED; for AOCs, the administrative authority is DOE. Of the 102 PRSs, 32 have been recommended and approved for an NFA decision by either NMED or DOE, leaving 70 TA-35 PRSs to investigate. Five of the seventy TA-35 PRSs will not be investigated as part of this aggregate SAP because they are either outside of the watershed aggregate boundary or reside within active buildings and have been deferred until after decontamination and decommissioning (D&D) of the building. These PRSs are 35-013(a), 35-013(b), 35-013(c), 35-016(g) and 35-016(h).

Any PRSs within the Middle Mortandad/Ten Site Aggregate that come from other TAs not contained in this aggregate SAP will be addressed in an addendum to this SAP.



Source: FIMAD G110473 / TA-35 ISAP_032602

Figure 1.0-5. TA-35 subareas with PRS-affected areas

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In 1999, PRSs boundaries were re-examined and consolidated according to geographical proximity, similar contaminants, and similar fate and transport mechanisms. The physical boundaries of the consolidated units either grew to reflect the larger unit size or remained the same. Because the PRSs were consolidated, the number of PRSs to be investigated decreased, from 65 individual PRSs to 23 individual PRSs and 11 consolidated units (which were previously 42 individual PRSs) for a total of 34 PRSs. The consolidated unit number will be used in this document; however, to clarify previous sampling collected for an individual PRS, the individual PRS number will also be shown.

Table 1.0-1 has several columns to describe the disposition of each PRSs in the Middle Mortandad/Ten Site Aggregate that still require investigation. The first column indicates whether the PRS is consolidated and the new consolidation unit number, the last two columns indicate if the PRS is included in this SAP and to which subarea each has been assigned.

Table 1.0-1
PRSs in the Middle Mortandad/Ten Site Aggregate

Consolidation Unit[a]	PRS Number	PRS Description	HSWA SWMU[b]?	PRS in This SAP?	Subarea Designation or Current Standing
	00-001	Sediment traps in Mortandad	Yes	No	Canyons Focus Area investigation
04-001-99	04-001	Firing site	Yes	No	Future addendum[c]
	04-002	Surface disposal	Yes	No	Future addendum
	04-003(b)	Outfall	Yes	No	Future addendum
05-001(a)-99	05-001(a)	Former firing site	Yes	No	Future addendum
	05-001(b)	Former firing site	Yes	No	Future addendum
	05-001(c)	Former firing site	No	No	Future addendum
05-001(a)-99	05-002	Canyon side disposal	Yes	No	Future addendum
05-005(a)-00	05-005(a)	Former French drain	Yes	No	Future addendum
	05-006(b)	Soil contamination	Yes	No	Future addendum
	05-006(e)	Soil contamination	Yes	No	Future addendum
05-001(a)-99	05-006(h)	Soil contamination	Yes	No	Future addendum
	35-002	Material disposal area (MDA X)	Yes	Yes	Mesa Top
35-003(a)-99	35-003(a)	Waste water treatment facility	Yes	Yes	Mesa Top
	35-003(b)	Waste water treatment facility	Yes	Yes	Mesa Top
	35-003(c)	Waste water treatment facility	Yes	Yes	Mesa Top
35-003(d)-00	35-003(d)[d]	Waste water treatment facility	Yes	Yes	Pratt Canyon
35-003(a)-99	35-003(e)[d]	Waste water treatment facility	Yes	Yes	Pratt Canyon
	35-003(f)	Waste water treatment facility	Yes	Yes	Mesa Top
	35-003(g)	Waste water treatment facility	Yes	Yes	Mesa Top
	35-003(h)	Waste water treatment facility	Yes	Yes	Mesa Top
35-003(j)-99	35-003(j)	Waste water treatment facility	Yes	Yes	Mesa Top
	35-003(k)	Waste water treatment facility	Yes	Yes	Mesa Top
35-003(d)-00	35-003(l)[d]	Waste water treatment facility	Yes	Yes	Pratt Canyon
35-003(a)-99	35-003(m)	Waste water treatment facility	Yes	Yes	Mesa Top
	35-003(misc)	Industrial waste lines	No	Yes	Mesa Top
	35-003(n)	Waste water treatment facility	Yes	Yes	Mesa Top
	35-003(o)	Waste water treatment facility	Yes	Yes	Mesa Top
	35-003(p)	Waste water treatment facility	Yes	Yes	Mesa Top
35-003(d)-00	35-003(q)[d]	Waste water treatment facility	Yes	Yes	Pratt Canyon
	35-003(r)[d]	Outfall	No	Yes	Pratt Canyon

Table 1.0-1
PRSs in the Middle Mortandad/Ten Site Aggregate (continued)

Consolidation Unit[a]	PRS Number	PRS Description	HSWA SWMU[b]?	PRS in This SAP?	Subarea Designation or Current Standing
	35-004(a)	Storage areas	Yes	Yes	Mesa Top
	35-004(b)	Storage areas	Yes	Yes	Mortandad Slope
35-004(g)-00	35-004(g)	Container storage area	Yes	Yes	Ten Site Slope
	35-004(h)	Container storage area	Yes	Yes	Mesa Top
35-014(g)-00	35-004(m)	Container storage area	No	Yes	Ten Site Slope
35-008-00	35-008	Surface disposal and landfill	Yes	Yes	Mortandad Slope
	35-009(a)	Septic system	Yes	Yes	Ten Site Slope, Mesa Top
35-004(g)-00	35-009(b)	Septic system	Yes	Yes	Ten Site Slope, Ten Site Canyon
	35-009(c)	Septic system	Yes	Yes	Mortandad Slope
	35-009(d)	Septic system	Yes	Yes	Pratt Canyon
	35-009(e)	Septic system	Yes	Yes	Ten Site Slope
35-010(a)-99	35-010(a)	Sanitary lagoon	Yes	Yes	Ten Site Canyon
	35-010(b)	Sanitary lagoon	Yes	Yes	Ten Site Canyon
	35-010(c)	Sanitary lagoon	Yes	Yes	Ten Site Canyon
	35-010(d)	Sand filters	Yes	Yes	Ten Site Canyon
	35-010(e)	Release from sand filter	No	Yes	Ten Site Canyon
	35-011(d)	Underground storage tank	No	Yes	Mesa Top
	35-013(a)	Sump	Yes	No	Deferred to D&D
	35-013(b)	Sump	Yes	No	Deferred to D&D
	35-013(c)	Sump	Yes	No	Deferred to D&D
	35-014(a)	Operational release	Yes	Yes	Mesa Top
35-003(j)-99	35-014(b)	Leaking drum	Yes	Yes	Mesa Top
	35-014(d)	Operational release	No	Yes	Mesa Top
35-008-00	35-014(e)	Oil spill	Yes	Yes	Mortandad Slope
35-016(i)-00	35-014(e2)	Oil spill	No	Yes	Mortandad Slope
	35-014(f)	Soil contamination	No	Yes	Mesa Top
35-014(g)-00	35-014(g)	Soil contamination	Yes	Yes	Ten Site Slope
	35-014(g2)	Soil contamination	No	Yes	Ten Site Slope
	35-014(g3)	Soil contamination	No	Yes	Ten Site Slope
	35-015(a)	Soil contamination	Yes	Yes	Mesa Top
35-003(j)-99	35-015(b)	Waste oil treatment	Yes	Yes	Mesa Top
35-016(a)-00	35-016(a)	Drains and outfalls	Yes	Yes	Ten Site Slope
	35-016(b)	Outfall	No	Yes	Ten Site Slope
35-016(c)-00	35-016(c)	Outfall	Yes	Yes	Ten Site Slope
	35-016(d)	Outfall	Yes	Yes	Ten Site Slope
	35-016(e)	Outfall	No	Yes	Mortandad Slope
	35-016(f)	Storm drain	No	Yes	Mortandad Slope
	35-016(g)	Outfall	No	No	Future addendum
	35-016(h)	Storm drain	No	No	Future addendum
35-016(i)-00	35-016(i)	Drains and outfalls	Yes	Yes	Mortandad Slope
	35-016(j)	Storm drain	No	Yes	Ten Site Slope

Table 1.0-1
PRSs in the Middle Mortandad/Ten Site Aggregate (continued)

Consolidation Unit[a]	PRS Number	PRS Description	HSWA SWMU[b]?	PRS in This SAP?	Subarea Designation or Current Standing
35-016(k)-00	35-016(k)	Drains and outfalls	Yes	Yes	Pratt Canyon
	35-016(l)	Storm drain	No	Yes	Pratt Canyon
	35-016(m)	Drains and outfalls	Yes	Yes	Pratt Canyon
35-014(g)-00	35-016(n)	Storm drain	No	Yes	Ten Site Slope
	35-016(o)	Drains and outfalls	Yes	Yes	Mortandad Slope
	35-016(p)	Outfall	Yes	Yes	Mortandad Slope
35-016(a)-00	35-016(q)	Drains and outfalls	Yes	Yes	Ten Site Slope
	35-017	Steam blow-off outfall from reactor	No	Yes	Ten Site Slope
	35-018(a)	Transformer	No	Yes	Mesa Top
	50-001(a)	Waste treatment facility—RCRA	Yes	No	MDAs Focus Area investigation
	50-001(b)	Waste lines and manholes	No	No	MDAs Focus Area investigation
	50-002(a)	Underground tanks	Yes	No	MDAs Focus Area investigation
	50-002(b)	Underground tank	Yes	No	MDAs Focus Area investigation
	50-002(c)	Underground tank	Yes	No	MDAs Focus Area investigation
	50-002(d)	Underground tank	No	No	MDAs Focus Area investigation
	50-003(a)	Storage area	No	No	MDAs Focus Area investigation
	50-004(a)	Waste lines	Yes	No	MDAs Focus Area investigation
	50-004(b)	Underground tanks	Yes	No	MDAs Focus Area investigation
	50-004(c)	Waste lines	Yes	No	MDAs Focus Area investigation
	50-006(a)	Operational release	Yes	No	MDAs Focus Area investigation
	50-006(c)	Operational release	Yes	No	MDAs Focus Area investigation
	50-006(d)	Effluent discharge	Yes	No	MDAs Focus Area investigation
	50-007	Incinerator	No	No	MDAs Focus Area investigation
	50-008	Reduction site	No	No	MDAs Focus Area investigation
	50-009	Material disposal area (MDA C)	Yes	No	MDAs Focus Area investigation
	50-010	Decontamination facility	No	No	MDAs Focus Area investigation
	50-011(a)	Septic system	Yes	No	MDAs Focus Area investigation
	50-011(b)	Septic system	No	No	MDAs Focus Area investigation
	52-002(a)	Septic system	Yes	No	Future addendum
	52-003(a)	Waste treatment facility	No	No	Future addendum
	52-003(b)	Industrial wasteline	No	No	Future addendum
	60-004(c)	Storage area	No	No	Future addendum
	60-004(e)	Storage area	No	No	Future addendum
	60-005(a)	Surface impoundment	Yes	No	Future addendum
	63-001(a)	Septic system	Yes	No	Future addendum
	63-001(b)	Septic system	Yes	No	Future addendum
	C-35-007	Soil contamination	No	Yes	Ten Site Canyon

[a] The shaded cells in this column indicate that the PRS in that row has not been consolidated.

[b] SWMU = solid waste management unit.

[c] Future addendum; these PRSs are not included in this SAP but will be included in a future Industrial Sites SAP addendum.

[d] These PRSs are consolidated with mesa-top PRSs but also have a canyon component.

Table 1.0-2 lists the PRSs that have been approved for NFA or are pending approval for NFA by the pertinent administrative authority. Therefore, any future work to be done within the boundaries of the PRSs listed below would not be addressed by ER.

Table 1.0-2
TA-35 PRSs That Have NFA Decisions

	PRS Number	HSWA SWMU	NFA Approval from AA?	ER ID Number of Request or Approval Document
1	35-001	No	Yes	56752
2	35-003(i)	Yes	Yes	63042
3	35-004(c)	No	Yes	56752
4	35-004(d)	No	Yes	56752
5	35-004(e)	Yes	Yes	70010
6	35-004(f)	No	Yes	56752
7	35-004(i)	No	Yes	56752
8	35-004(j)	No	Yes	56752
9	35-004(k)	No	Yes	56752
10	35-004(l)	No	Yes	56752
11	35-004(n)	No	Yes	56752
12	35-004(o)	No	Yes	56752
13	35-005(a)	No	Pending	65899
14	35-005(b)	No	Pending	38808
15	35-006	Yes	Yes	70010
16	35-007	No	Yes	56752
17	35-011(a)	Yes	Yes	70010
18	35-011(b)	No	Yes	64370
19	35-011(c)	No	Yes	56752
20	35-012(a)	No	Pending	65899
21	35-012(b)	No	Yes	56752
22	35-013(d)	Yes	Yes	70010
23	35-014(c)	No	Yes	58824
24	35-014(e3)	No	Yes	59689
25	35-018(b)	No	Yes	56752
26	C-35-001	No	Yes	56752
27	C-35-002	No	Yes	56752
28	C-35-003	No	Yes	56752
29	C-35-004	No	Yes	64370
30	C-35-005	No	Yes	64370
31	C-35-006	No	Yes	64011
32	C-35-008	No	Yes	56752

1.1 Objective and Purpose

The ER Project uses an integrated technical strategy to identify a process for making remedial decisions that coordinate human health, ecological, and extent-of-contamination endpoints, as well as supporting the assessment of long-term Laboratory effects on a watershed scale (LANL 2000, 66802). The objectives for data use described in this SAP have been identified with the participation of key ER Project, DOE/NNSA-OLASO, and NMED-HWB personnel and are consistent with the integrated technical strategy. This SAP presents historic data evaluations and the rationale for collecting additional data at particular locations.

The purpose for collecting the data proposed in this SAP is that it will close gaps (data gaps) in the understanding of the current conceptual model for the area. The data set that results from implementation of this SAP, when combined with the existing data set, will be adequate to

- determine nature and extent of contamination for these five subareas in the Middle Mortandad/Ten Site Aggregate and to evaluate historical and present-day fate and transport of contaminants by incorporating all relevant data and affected media within the watershed;
- assess potential human health and ecological risks on a spatial scale consistent with appropriate exposure models;
- establish the relative contribution of residual contamination at PRS-affected areas to potential human and ecological risk and to support the ranking of affected areas based on risk;
- calculate inventory for key risk-driver contaminants where the contaminant inventory has relevance to the overall watershed assessment;
- provide data required to assess this portion of the Middle Mortandad/Ten Site Aggregate when the entire Mortandad Watershed is evaluated; and,
- ensure that the Middle Mortandad/Ten Site Aggregate sites requiring long-term monitoring are turned over to the appropriate Laboratory facilities or organizations (LANL 2000, 66802, section 1.2.2.1).

Relevant information from the Mortandad Watershed, in many cases from outside the Middle Mortandad/Ten Site Aggregate (e.g., surface water data and canyon-bottom sediment data), was incorporated and evaluated in the design of this investigation and will be incorporated into the evaluation leading to final recommendations and decisions. Decisions to remediate or recommendations to monitor specific media can then be made in the context of relevant portions of the entire watershed.

Following the implementation of this SAP, the combined data set from this TA-35 investigation and future investigations for remaining Middle Mortandad/Ten Site Aggregate PRSs (TA-4, -5, -50, -52, -55, and -63) will be used to evaluate risk at the aggregate scale, and make recommendations for future actions. In addition, the data from the Middle Mortandad/Ten Site Aggregate will be integrated with data from other aggregates within the Mortandad Watershed to evaluate cumulative risk and determine final actions for the entire Mortandad Watershed.

Details of the data quality objectives are presented in section 3.0 of this SAP.

1.2 Regulatory Framework

The investigation is driven by Module VIII of the Laboratory's RCRA Hazardous Waste Facility Permit (HWFP) #NM089010515 (LANL 1989, 12547). The NMEID (now NMED) issued the HWFP in 1989. The U.S. Environmental Protection Agency (EPA) issued Module VIII, the Hazardous and Solid Waste Amendments (HSWA) Module of the permit, in 1990 (EPA 1990, 1585) and modified it on May 19, 1994. NMEID received base authorization in 1996.

As stated above, this SAP investigates both PRSs listed on the HSWA Permit (SWMUs), for which the AA is NMED, and PRSs not listed on the HSWA Permit (AOCs), for which the AA is DOE.

DOE has implementation authority under DOE Order 5400.5, "Radiation Protection of the Public and the Environment," and Order 435.1, "Radioactive Waste Management." In 1993, DOE order 5400.5 was issued as a Proposed Rule (proposed 10CFR834) in the Federal Register. It covers, among other topics, establishment of dose limits to the public from radiation and radionuclides associated with DOE operations. Although radionuclides are regulated by the DOE and are not regulated under RCRA, it is more efficient and cost-effective to investigate all types of potential contamination during a single site characterization. Therefore, radiochemical concerns are addressed as part of this SAP.

1.3 Previous Investigations

In May of 1992, an RFI work plan (LANL 1992, 07666) was submitted to the regulatory authority: the EPA. The OU 1129 work plan and subsequent addendum (Pratt 1994, 39932) identified PRSs to be investigated at TA-35 and at other TAs in the surrounding area. Site-characterization investigations occurred at TA-35 from 1994 through 1998. Results of the investigations have been detailed in various RFI reports and SAPs. Table 1.3-1 summarizes the documents that have been submitted to the regulatory authorities and reflects the history of significant RFI activities at this TA.

Table 1.3-1
History of Significant Activities at TA-35

Date	ER ID Number	From/To	Synopsis of Correspondence
Work Plans			
5/18/92	12259.4	LANL to EPA	"Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Work Plan for Operable Unit (OU) 1129" (cover letter) (attachment referenced, LA-UR-92-800, is located in Reference Library, 328 pages)
7/1/93	28637	EPA to LANL	OU 1129 notice of deficiency (NOD)
8/20/93	38666	LANL to EPA	Final response to NODs regarding RFI work plan for OU 1129
11/3/93	49667	EPA to LANL	EPA approval of RFI work plan for OU 1129 with modification to Appendix E, aggregate J of OU 1129 work plan, NM0890010515
6/13/94	40252	LANL to DOE/EPA	Addendum to the RFI work plan for OU 1129
1/23/95	52910.203	EPA to LANL	NOD for addendum to the RFI work plan for OU 1129
3/29/95	46036	LANL to EPA	Response to NOD for addendum to the RFI work plan for OU 1129 (TA-35, -4, -48, -5, -55)
5/22/95	52910.193	EPA to LANL	Approval of addendum to the RFI work plan for OU 1129, Los Alamos National Laboratory (NM0890010515)
RFI Reports and NODs and Responses			
5/2/96	54373	DOE & LANL to NMED	"RFI Report for Potential Release Sties (PRSs) in TA-35 [for PRSs 35-003(h, j, and k), 35-004(b), 35-008, 35-009(a through d) 35-014(a,b,d,e1,e2, and f), 35-015(b), 35-016(e, f, and i)"; "Alpha" - RCRA Constituents Only
3/11/97	56954.5	NMED to DOE & LANL	NOD for RFI report for PRSs in TA-35, LANL, NM0890010515 [PRSs 35-003(h,j,k), 35-004(b), 35-008, 35-009(a–d) 35-014(a,b,d,e1,e2,f), 35-015(b), 35-016(e,f, i); Alpha" - RCRA Constituents Only
4/18/97	55640.1	DOE & LANL to NMED	Response to NOD for RFI report for PRSs in TA-35 (former OU 1129), PRSs 35-003(h, j, k), 35-004(b), 35-008, 35-009(a–d) 35-014(a,b,d,e1,e2,f), 35-015(b), 35-016(e,f, i); Alpha" - RCRA Constituents Only
11/3/97	55640	DOE & LANL to NMED	Request for supplemental information (RSI) for RFI report for PRSs 35-003(h,j, k), 35-004(b), 35-008, 35-009(a–d) 35-014(a,b,d,e1,e2, f), 35-015(b), 35-016(e, f, i); Alpha" - RCRA Constituents Only
12/5/97	56954.3	DOE & LANL to NMED	Response to NOD (second) TA-35 RFI report, PRSs 35-003(j,k), 35-004(b), 35-008, 35-009(a,b,d,e1,e2,f), 35-015(b), and 35-016(e,f,g,h,1)
7/1/96	54763.4	DOE & LANL to NMED	RFI report for PRSs 35-004(a,g, h,m), 35-009(e), 35-014(g1,g2), 35-016(b,j,n,q) (located in former OU 1129), Field Unit 4, July 1996, LA-UR-96-2082; "Charlie" - RCRA Constituents Only

Table 1.3-1
History of Significant Activities at TA-35 (continued)

Date	ER ID Number	From/To	Synopsis of Correspondence
9/23/97	56672.1	NMED to LANL	RSI for RFI report for TA-35, PRSs 35-004(a,g,h) 35-009(e), 35-014(g1,g2), 35-016(b,j,n,q), dated July 1996, LANL NM 0890010515 [NOD for RFI report for PRSs 35-004(a,g,h,m), 35-009(e), 35-014(g1,g2), 35-016(b, j,n,q); "Charlie" - RCRA Constituents Only
10/30/97	56856	DOE & LANL to NMED	Response to RSI for RFI report for TA-35, PRSs 35-004(a,g,h) 35-009(e) 35-014(g1,g2), 35-016(b,j,n,q); "Charlie" - RCRA Constituents Only
9/29/97	56820	DOE & LANL to NMED	Addendum to the RFI report for PRSs at TA-35 (former OU 1129) (cover letter), Field Unit 4, September 1997, LA-UR-97-3567; "Foxtrot" - Addendum Reporting Radiological Sampling Results
5/1/96	54459	DOE & LANL to NMED	Voluntary Corrective Action (VCA) plan for PRSs 35-003(a), 35-003(b), 35-003(c), and 35-003(n), phase separator pit and underground storage tanks, Field Unit 4, ERP dated March 1996.
9/11/98	59674	LANL to DOE	RFI report for TA-35, PRSs 35-003(a,b,c,n) (former OU 1129, Field Unit 4) to fulfill performance measure for functional area A.1 (cover letter with enclosures)
9/30/98	62225	DOE & LANL to NMED	RFI report for PRSs 35-003(a,b,c,n)
6/24/99	63460	DOE & LANL to NMED	Response to RSI for RFI report for PRSs 35-003(a,b,c,n)
6/1/96	57129.1	LANL to DOE	RFI report for PRSs 35-003(d,e,f,g,l,m,o,q,r), 35-016(g,h) (located in former OU 1129), Field Unit 4, June 1996, LA-UR-96-1605; "Bravo" - not approved by DOE, not submitted to AA
9/1/96	55075.1	LANL to DOE	RFI report for PRSs 35-016(a,c,d,m,p), C-35-007 (located in former OU 1129), Field Unit 4, September 1996, LA-UR-96-2828; "Delta"- not approved by DOE, not submitted to AA
VCAs and Interim Actions (IAs)			
3/25/96	54341.1	LANL to DOE	VCA completion report for Activities at TA-35 for PRSs 35-009(b,c,d) (enclosure is ER ID # 54762.1) (not approved by DOE, not submitted to AA)
5/1/96	53800.1	LANL to DOE	VCA plan for TA-35 PRS 35-009(a) (cover letter)
6/3/96	547541	LANL to DOE	VCA plan for PRS 35-018(a), electrical transformer substation, Field Unit 4, June 1996, LA-UR-96-1992
9/1/96	55063.1	LANL to DOE	VCA completion report for PRS 35-018(a), electrical transformer substation, Field Unit 4, September 1996, LA-UR-96-3271
9/27/96	55246.1	LANL to DOE	VCA plan for TA-35, PRS 35-014(f); VCA completion report for PRSs 35-009(a) 35-014(f) and 35-018(a); and interim action report for TA-35 PRSs 35-003(d,l,q) Activities, w/o enclosures (VCA report 35-009(a); not approved by DOE, not submitted to AA)
RCRA Closures			
11/1/89	8999	LANL to NMED	Interim closure plan: Technical Area 35-TSL-85, surface impoundment, Los Alamos National Laboratory, Los Alamos, New Mexico Pkg # 469
6/21/1993	22611.2	NMED TO DOE	TA-35 TSL-85 surface impoundment: denial of clean closure equivalency demonstration and disapproval of closure plan
2/4/98	65899.1	NMED TO LANL	Approval of the amended closure certification report for the Technical Area 35, Ten Site Laboratory 85 surface impoundment dated September 1996 EPA I.D. No. NM 0890010515

Table 1.3-1
History of Significant Activities at TA-35 (continued)

Date	ER ID Number	From/To	Synopsis of Correspondence
11/1/89	9000	LANL TO NMED	Interim status closure and post-closure care plan: Technical Area 35-TSL-125, surface impoundment, Los Alamos National Laboratory, Los Alamos, New Mexico
07/07/92	42389.10	NMED to LANL	TA-35 TSL-125 surface impoundment: denial of clean closure equivalency demonstration and disapproval of closure plan
10/26/92	11804.2	LANL TO DOE	Response to NMED request for clarification of the activities associated with RCRA closure of surface impoundment in TA-35 TSL-125 and explain discrepancies between the closure report and the NOD response letter dated March 16, 1992
09/17/93	30190.0	LANL to EPA	Transmittal of response to concerns regarding closure of the TA-35 TSL-125 surface impoundment
09/29/92	38808.0	NMED TO LANL	Approval of closure plan TA-35 TSL 125 surface impoundment NM0890010515

Note: *Alpha, Bravo, Charlie,* and *Delta* were designations created by the technical writing staff to differentiate the TA-35 PRS RFI reports.

2.0 TA-35 SUBAREA AGGREGATE DESCRIPTIONS

2.1 TA-35 Characterization, Setting, and Operational History

Ten Site Mesa, which lies at elevations between 6950 ft and 7250 ft (LANL 1992, 07666), is bounded by Mortandad Canyon to the north, Pratt Canyon to the east, and Ten Site Canyon to the south. Most structures associated with TA-35 are located on Ten Site Mesa. The mesa top is highly developed and most of the land surface is paved; a few small, unpaved areas are currently present on the mesa.

2.1.1 Mesa Top Subarea Site Description and Operational History

The original Ten Site Laboratory building (TA-35-2) was constructed in 1951. Through the 1970s, the principal activities at TA-35 were associated with development of radioactive lanthanum sources for weapons testing and research involving various radionuclides, particularly plutonium and tritium (LANL 1992, 07666). Wastewater associated with these activities was processed at the TA-35 wastewater treatment facility until 1963, at which time TA-35 industrial wastewater was piped to the Laboratory's centralized wastewater facility at TA-50. In the 1970s, research activities at TA-35 shifted to laser technology, optics, and nuclear safeguards. The latter activities continue at TA-35 to the present day. Documented discharges of contamination to the environment are associated with the industrial operational activities listed above, and with drainlines and outfalls that handled wastewater, stormwater, and cooling water; tanks and structures used to store dielectric oils for the laser facilities; sanitary septic systems; container storage areas; and areas on the mesa top used for debris disposal.

The PRSs in this subarea include components of the former wastewater treatment plant (WWTP), former container storage areas, an area of surface deposition from stack emissions, oil spills, septic tanks, and former oil-handling facilities. Figure 2.1-1 outlines the eastern and western portions of the Mesa Top Subarea. Figure 2.1-2 and Figure 2.1-3 show the PRSs and PRS-affected areas in which, according to the conceptual model (see section 2.3), residual contamination is expected to be present. The current land use designation for the Mesa Top Subarea is industrial and is expected to remain so for the next 30 years or more (LANL 1998, 57224). Table 2.1-1 lists the subarea PRSs with brief descriptions and current availability of residual contaminants remaining at the site. Detailed descriptions of the subarea PRSs are presented in Appendix B; historic ER Project RFI data from the subarea PRSs are presented in section 2.2.1 and in Appendix C, with corresponding sample locations shown on Figure 2.1-2 and Figure 2.1-3.

Operational histories suggest that the Mesa Top Subarea may contain a variety of inorganic, organic, and radiological contaminants as a result of past Laboratory operations. The former TA-35 WWTP is a potential source of residual subsurface contamination, especially radionuclides, at the eastern end of the mesa top. Oil spills may have contributed a number of organic chemicals, including PAHs, phthalates, polychlorinated biphenyls (PCBs), and total petroleum hydrocarbon (TPH). Portions of the mesa top may have received radionuclide contamination, including tritium and plutonium, from stack emissions at building TA-35-2 between 1954 and 1979.

All of the Mesa Top Subarea PRS sites have been cleaned up to some extent and no longer present a source term for contaminant migration. The existing data gaps within the Mesa Top Subarea lie primarily at the mesa-top edges, as will be discussed in section 2.4. This additional information will provide extent of residual contamination. The ongoing industrial nature of TA-35 eliminates the possibility of an overall cleanup until decommissioning some time in the future. Therefore, it is anticipated that most LANL active industrial sites with residual contamination, which do not pose a current day human health or ecological risk, will be turned over to the facilities for long-term stewardship, as outlined in the IWP (LANL 2000, 66802, section 1.2.2.1).

2.1.1.1 Neighboring Influences to the Mesa Top Subarea

TA-55 was established in 1973 for the plutonium-processing laboratory. Operations include fabrication of plutonium metal components, processing of plutonium, and basic research on transuranic materials.

PRS 55-007 is made up of two thermal treatment units located in building TA-55-4. Discharge data for 1978 through 1988 indicate that tritium, plutonium-238,239, and plutonium-240 were released to the atmosphere (LANL 1992, 07666). Any or all portions of the TA-35 subareas may have received radionuclide contamination from stack emissions at building TA-55-4, although it is expected that much of those emissions were deposited on the mesa top proximally to TA-55.

Table 2.1-1
Mesa Top Subarea PRSs and Their Current Status

	PRS	PRS Description	Current Ground Cover	Description of Source Term Removal	ER Project Confirmatory Sampling Performed?	Comments
	35-002	Former material disposal area (MDA) X (LAPRE-I, -II Reactor, associated structures, components, contaminated soil)	> 3 ft of clean soil over PRS	1991 D&D removed 430 gal. mixed waste (rad and lead) to TA-54 Area L, removed 533 m^3 LLW to TA-54 Area G, completed action 01/23/92; 1996 D&D removed portions of 2 underground storage tanks (USTs) from LAPRE-I (Roberson 1991, 21577)	No	No areas of concern exist based on ALARA[a] and the Radiological Site Assessment Program independently assessed by ORAU[b]; 15 Environment, Safety & Health (ESH) composite samples for rad, 1 composite sample for toxicity characteristic leaching procedure (TCLP) waste
35-003(a)-99	35-003(a)	Former TA-35-4, WWTP holding tank	> 20 ft of clean soil over PRS	1996 D&D (in concert with ER Project verification sampling) removed tanks; actual volume of low-level solid waste removed from north and south sides of TA-35-2, including soil below phase separator pit and holding tanks, was approximately 2265 yd^3, plus 20 ft^3 mixed waste; bottom of excavations was 20–30 ft below surface grade and backfilled with clean soil (LANL 1997, 58737)	Yes, see table of samples collected (section 2.2)	No ecological or human health risks present, considering depth of remaining contamination
	35-003(b)	Former TA-35-5, WWTP holding tank				
	35-003(c)	Former TA-35-6, WWTP holding tank				
	35-003(e)	Discussed in Pratt Canyon Subarea description, section 2.1.4				
	35-003(f)	Former TA-35-37, WWTP flocculator tank	> 3 ft of clean soil over PRS	1980 D&D; tank removed to prepare for D&D of WWTP's underground liquid waste lines (Cox 1985, 780)	No	No ecological or human health risks present, considering depth of remaining contamination; for ER Project RFI data, see table of samples collected (section 2.2)
	35-003(g)	Former TA-35-38, WWTP regenerant tank	> 3 ft of clean soil over PRS	1980 D&D; regenerant tank removed to prepare for D&D of WWTP's underground liquid waste lines (Cox 1985, 780)	No	No ecological or human health risks present, considering depth of remaining contamination; for ER Project RFI data, see table of samples collected (section 2.2)
	35-003(h)	Former TA-35-31, WWTP retention tank	> 3 ft of clean soil over PRS	1985 RLWLR[c] project; tank was connected to buildings TA-35-41 and TA-35-10 by stainless-steel underground pipes 4 in. in diameter; removed in 1985	No	Minor detected tritium at depth; however, no ecological or human health risks present, considering depth of remaining contamination; for ER Project RFI data, see table of samples collected (section 2.2)
	35-003(m)	Former TA-35-22, WWTP underground sludge tank	> 10 ft of clean soil over PRS	1981 RLWLR project; concrete tank excavated and removed in one load to TA-54; contaminated soil was left 10 ft deep in solid tuff in this excavation	No	No ecological or human health risks present, considering depth of remaining contamination; for ER Project RFI data, see table of samples collected (section 2.2)

Table 2.1-1
Mesa Top Subarea PRSs and Their Current Status (continued)

PRS		PRS Description	Current Ground Cover	Description of Source Term Removal	ER Project Confirmatory Sampling Performed?	Comments
35-003(a)-99	35-003 (misc.)	Former WWTP waste lines 68-114	> 3 ft of clean soil over PRS	1981–1985 RLWLR D&D; underground lines connecting various structures of the TA-35 WWTP removed; most of the piping constructed from stainless, black, or galvanized steel with screwed or welded joints; 1996 D&D (with ER Project verification sampling) removed remaining lines (LANL 1997, 58737)	Yes, see table of samples collected (section 2.2)	No ecological or human health risks present, considering depth of remaining contamination
	35-003(n)	Former TA-35-03, WWTP phase separator pit	> 3 ft of clean soil over PRS	See 35-003(a–c)	Yes, see table of samples collected (section 2.2)	See 35-003(a–c)
	35-003(o)	Former TA-35-12, WWTP manhole	> 3 ft of clean soil over PRS	1985 RLWLR project; manhole, subsurface line 90A, and 86 yd^3 contaminated soil adjacent to east wall of Air Filter Building (TA-35-7) excavated and removed in 1985	No	Further excavation may have compromised integrity of excavation walls; area was backfilled and paved; for ER Project RFI data, see table of samples collected (section 2.2)
	35-003(p)	Former TA-35-07, WWTP air filter building	> 2 ft of clean soil over PRS	1996 D&D (with ER Project verification sampling) removed building; approximate volume of low-level solid waste removed from below TA-35-07 after its demolition was 535 yd^3 and backfilled with clean soil; excavated 2–9 ft of soil from building footprint (LANL 1997, 58737)	Yes, see table of samples collected (section 2.2)	No ecological or human health risks present, considering depth of remaining contamination; for ER Project RFI data, see table of samples collected (section 2.2)
35-003(j)-99	35-003(j)	Former TA-35-96, aboveground oil storage tanks	Asphalt	Storage tank removed in 1976; residual contamination cleaned up as PRS 35-014(d) (LANL 1996, 54402)	No	Although TPH contamination exists, no current exposure risks exist due to lack of migration pathways; for ER Project RFI data, see table of samples collected (section 2.2)
	35-003(k)	Former TA-35-97, aboveground oil storage tanks				
	35-014(b)	Former leaking drum, outside of TA-35-2	Drum removed	Drum removed and site cleaned by Laboratory group Health, Safety, and Environment (HSE)-7 in 1985 (LANL 1996, 54402)	No	For ER Project RFI data, see table of samples collected (section 2.2)
	35-014(d)	Oil spill–stained soil, near former TA-35-29	Asphalt	Site backfilled in 1988 or 1989 with clean soil material and covered with asphalt to create a parking area (LANL 1996, 54402)	No	No ecological or human health risks viable below asphalt; for ER Project RFI data, see table of samples collected (section 2.2)
	35-015(b)	Former oil-handling facility, west of TA-35-29	Soil and asphalt	Tanks removed after 1988 (Shafer 1998, 41150; LANL 1996, 54402)	No	Reduced human health and ecological potential exposure; for ER Project RFI data, see table of samples collected (section 2.2)
35-004(a)		Former outdoor container storage area TA-35-25	Asphalt/ soil	Cleaned up after 1990 (LANL 1992, 07666)	No	No documentation located; for ER Project RFI data, see table of samples collected (section 2.2)

Table 2.1-1
Mesa Top Subarea PRSs and Their Current Status (continued)

PRS	PRS Description	Current Ground Cover	Description of Source Term Removal	ER Project Confirmatory Sampling Performed?	Comments
35-004(h)	Former outdoor container storage area TA-35-7	Covered with 8 ft of clean soil	1985 D&D removed up to 8 ft contaminated soil from the storage area (LANL 1997, 58737)	No	Removed contaminated surface soil; worker exposure risk reduced; for ER Project RFI data, see table of samples collected (section 2.2)
35-009(a)	Discussed in Ten Site Slope Subarea description (section 2.1.2)				
35-011(d)	Two 6000-gal. former USTs, southeast of TA-35-188	Asphalt	Tanks removed in accordance with NMED UST regulations summer of 1991; same location as 35-014(f)	No	Tanks were inspected, found to be in good condition with no evidence of leaks (Carmichael 1991, 14618)
35-014(a)	Contaminated soil from former TA-35-7 stack emissions	Asphalt/ soil	None; concentrations too low to represent significant health hazard to the public	No	No remediation initiated; for ER Project RFI data, see table of samples collected (section 2.2)
35-014(f)	Former oil spill–stained soil, east side of TA-35-188	Asphalt	Site cleaned up during 1996 ER Project VCA; 45 yd^3 of TPH-contaminated waste removed (LANL 1996, 53783)	Yes, see table of samples collected (section 2.2)	Removed all visible and odor-emitting oil-contaminated soil and contaminant migration potential
35-015(a)	Former waste oil–treatment facility, west side of TA-35-86	Asphalt	Tank farm and treatment facility decommissioned and removed late 1988/1989 (Roberson 1991, 21576)	No	Surface migration pathway removed by remediation; for ER Project RFI data, see table of samples collected (section 2.2)
35-018(a)	Former transformers leaking PCB-contaminated oil, near TA-35-29	Asphalt	Site cleaned up during a 1996 ER Project VCA; 9 yd^3 of PCB-contaminated waste removed (LANL 1996, 55063)	Yes, see table of samples collected (section 2.2)	Eliminated potential for migration of PCB-containing surface soils

[a] ALARA = as low as reasonably achievable, a DOE target level.

[b] ORAU = Oak Ridge Associated Universities.

[c] RLWLR = radioactive liquid waste line removal (see Elder et al. 1986, 06666, for project details).

Source: FIMAD G110299 / TA-35 ISAP_031102

Figure 2.1-1. Index map of Mesa Top Subarea

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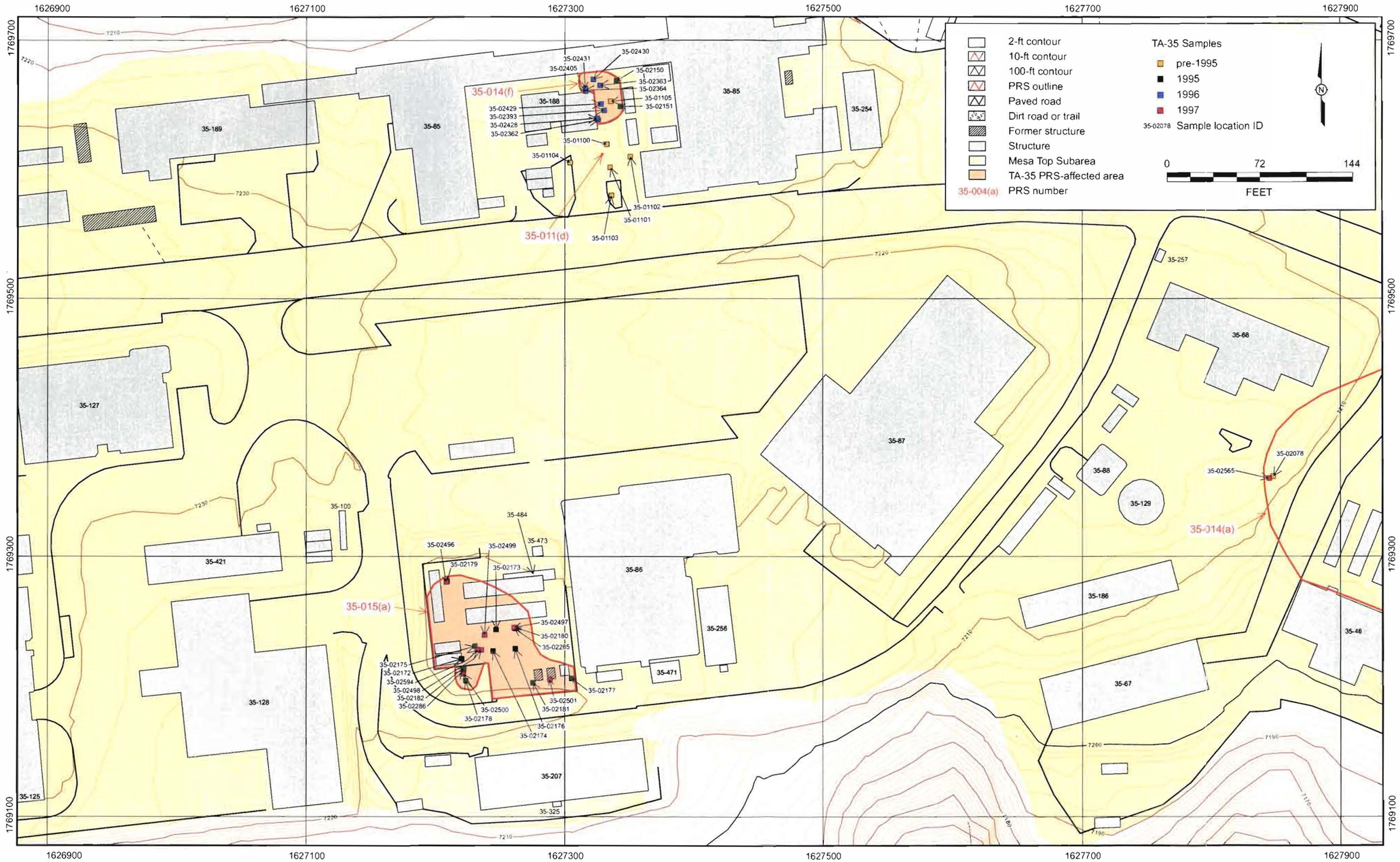

Source: FIMAD G110295 / TA-35 ISAP_031902

Figure 2.1-2. Existing sample locations in western portion of Mesa Top Subarea

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Source: FIMAD G110297 / TA-35 ISAP_031202

Figure 2.1-3. Existing sample locations in eastern Mesa Top Subarea

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2.1.2 Ten Site Slope Subarea Site Description and Operational History

Ten Site Slope is the south-facing slope of Ten Site Canyon. The difference in elevation from the mesa top to the bottom of Ten Site Canyon in this area is about 100–120 ft. The slope has a very steep middle section with flatter bench sections above and below, and it is marked by several distinct drainage channels. Figure 2.1-4 outlines the eastern and western portions of the Ten Site Slope Subarea. Figure 2.1-5 and Figure 2.1-6 show the PRSs and PRS-affected areas in which, according to the conceptual model (section 2.3), residual contamination is expected to be present.

The Ten Site Slope Subarea is comprised of 16 PRSs which include outfalls, former container storage areas, abandoned septic systems, and areas of stained asphalt/oil spills. The PRSs are related to operations and incidental activities or processes primarily at buildings TA-35-86 (carbon dioxide laser building), TA-35-125 (Antares carbon dioxide laser building), TA-35-25 (sodium building), TA-35-67 (warehouse), and TA-35-2 (laboratory and office building). The PRSs are either located on, or adjacent to, the north slope of Ten Site Canyon or are outfalls that discharge onto that slope.

The current land use designation of the north slope of Ten Site Canyon is industrial and is expected to remain so for the next 30 years or more (LANL 1998, 57224). Site access is uncontrolled, but the steep topography of the slope makes recreational or other use by the public unlikely. Table 2.1-2 lists the Ten Site Slope Subarea PRSs with brief descriptions and current availability of residual contaminants remaining at the site. Detailed descriptions of the Ten Site Slope Subarea PRSs are presented in Appendix B; historic ER Project RFI data from the subarea PRSs are presented in section 2.2.2 and in Appendix C, with corresponding sample locations presented on Figure 2.1-5 and Figure 2.1-6.

Operational histories suggest that the Ten Site Slope Subarea may contain a variety of inorganic, organic, and radiological contaminants as a result of Laboratory operations. Oil spills may have contributed a number of organic chemicals, including PAHs, phthalates, PCBs, and TPH. Septic systems are likely to have received both inorganic and organic chemicals from laboratory buildings and, in some cases, may have received radionuclides as well. Outfalls connected to drains inside buildings possibly received undocumented discharges of chemicals in all three categories. Stormwater outfalls may discharge water containing chemicals derived from parking lots and roadways, such as PAHs and metals contained in gasoline, motor oil, other automotive fluids, and asphalt. Any or all portions of the Ten Site Slope Subarea have probably received radionuclide contamination, including tritium and plutonium, from stack emissions at building TA-35-2 between 1954 and 1979, and including uranium from 1950s power reactor discharges.

From 1951 until 1975, two sanitary septic systems at TA-35 discharged to Ten Site Slope (LANL 1992, 07666). These septic systems were investigated as PRSs 35-009(a,b). In 1996, VCAs were completed at each of the septic systems (LANL 1996, 55071; LANL 1996, 54967); they no longer present a source term for contaminant release and migration.

The existing data gaps within the Ten Site Slope Subarea lie within established outfall channels, mostly within the alluvial fans, as discussed in section 2.4. It is anticipated that most TA-35 industrial sites with residual contamination that do not pose a potential current-day or anticipated future human-health or ecological risk will either be turned over to the facilities for long-term stewardship [as outlined in the IWP, section 1.2.2.1 (ERP-OP 0003)], or be proposed for no further ER Project action.

2.1.2.1 Neighboring Influences to the Ten Site Slope Subarea

2.1.2.1.1 TA-50

Before 1975, outfalls at TA-50 [other than the Radioactive Liquid Waste Treatment Facility (RLWTF) outfall to Effluent Canyon] discharged into the head of Ten Site Canyon via drainlines 55 and 67, which originated in buildings TA-50-1 and TA-50-2, respectively. In 1974, two unplanned discharges of untreated wastes occurred due to overflow of a sump in TA-50-2. The radionuclide activities released are unknown. Drainline 67 was sealed with a flexible plug in February 1975.

Table 2.1-2
Ten Site Slope Subarea PRSs and Their Current Status

PRS		PRS Description	Current Ground Cover	Description of Source Term Removal	ER Project Confirmatory Sampling Performed?	Comments
35-004(g)-00	35-004 (g)	Former container storage area, south of TA-35-67	Asphalt to soil	None	No	For ER Project RFI data, see table of samples collected (section 2.2)
	35-004(m)	Former container storage area, south of TA-35-86	Asphalt to soil	None	No	For ER Project RFI data, see table of samples collected (section 2.2)
	35-009(b)	Abandoned, inactive sanitary septic system, south of TA-35-67	> 3 ft of clean soil over PRS	Site cleaned up during 1996 ER Project VCA; 1350 gal. liquid/sludge removed; septic tank, dosing chamber, manhole, and distribution box filled with concrete (LANL 1996, 55071)	Yes, see table of samples collected in section 2.2	Properly abandoned inactive septic system and eliminated potential for leaks or contaminant migration
35-009(a)		Abandoned, inactive septic system, southwest of TA-35-34	> 3 ft of clean soil over PRS	Site cleaned up during 1996 ER Project VCA; 3 yd^3 solid waste and 1800 gal. liquid/sludge removed; septic tank and dosing chamber filled with concrete, cleanout structure and distribution box removed (LANL 1996, 55071)	Yes, see table of samples collected in section 2.2	Properly abandoned inactive septic system and eliminated potential for leaks or contaminant migration
35-009(e)		Inactive floor drainline inside building TA-35-25	Daylights to slope	None	No	For ER Project RFI data, see table of samples collected (section 2.2)
35-014(g)-00	35-016(n)	Active stormwater outfall and daylight channel, south of TA-35-86	Outfall to soil/tuff	None	No	For ER Project RFI data, see table of samples collected (section 2.2)
	35-014(g_1)	Former oil-stained asphalt, south of TA-35-207 at outfall PRS 35-016(n)	Asphalt to soil	Area partially cleaned up in 1988/1989 (LANL 1996, 54763)	No	Removed stained soil and asphalt; for ER Project RFI data, see table of samples collected (section 2.2) [as PRS 35-016(n)]
	35-014(g_2)	Former oil-stained asphalt area within PRS 35-004(m) at TA-35-86	Asphalt to soil	Area partially cleaned up in 1988/1989 (LANL 1996, 54763)	No	Removed stained soil and asphalt; for ER Project RFI data, see table of samples collected (section 2.2) [as PRS 35-004(m)]
35-014(g_3)		Site of former dielectric oil spill at PRS 35-015(a), west of TA-35-86	Asphalt to soil	Area partially cleaned up in 1988/1989 (Roberson 1991, 21576)	No	For ER Project RFI data, see table of samples collected (section 2.2)

Table 2.1-2
Ten Site Slope Subarea PRSs and Their Current Status (continued)

PRS		PRS Description	Current Ground Cover	Description of Source Term Removal	ER Project Confirmatory Sampling Performed?	Comments
35-016(a)-00	35-016(a)	Inactive outfall 04A-089, non-contact cooling water from TA-35-34 to canyon	Outfall to soil/tuff	None	No	For ER Project RFI data, see table of samples collected (section 2.2)
	35-016(q)	Inactive stormwater outfall and associated trench, east of TA-35-34	Outfall to soil/tuff	None	No	For ER Project RFI data, see table of samples collected (section 2.2)
35-016(b)		Inactive outfall 06A-132; up to 3000 gal. per day; photographic waste effluent from TA-35-87 to canyon	Outfall to soil/tuff	None	No	For ER Project RFI data, see table of samples collected (section 2.2)
35-016(c)-00	35-016(c)	Inactive outfalls 04A-088 and 04A-012; noncontact cooling water from TA-35-67 to canyon	Outfall to soil/tuff	None	No	For ER Project RFI data, see table of samples collected (section 2.2)
	35-016(d)	Inactive outfall 04A-087, non-contact cooling water from TA-35-46 to canyon	Outfall to soil/tuff	None	No	For ER Project RFI data, see table of samples collected (section 2.2)
35-016(j)		Active outfall that discharges stormwater runoff (roof drains) and fire protection water from TA-35-125	Outfall to soil/tuff	None	No	For ER Project RFI data, see table of samples collected (section 2.2)
35-017		Abandoned steam line outfall from Los Alamos power reactors, ~300 ft south of TA-35-2	Daylights to slope	Partial removal during 1996 WWTP phase separator pit D&D (LANL 1996, 59379)	No	Sampled by D&D; no contamination in pipe detected

Both drainlines were completely removed in 1981. Contaminants encountered during the removal were primarily cesium-137, plutonium-239, ruthenium-106, strontium-89, strontium-90, and yttrium-90. Soil samples collected near the outfalls in 1976 contained up to 50,000 pCi/g gross-alpha activity. However, early 1990s sampling in Ten Site Canyon found only 1 of 27 samples contained gross-alpha activity greater than 20 pCi/g. When the area was partially decontaminated in 1981, approximately 70 m^3 of soil was removed from the outfall locations. After decontamination, the maximum soil activities observed near the outfall were 400 pCi/g gross-alpha and 40 pCi/g gross-beta (Elder et al. 1986, 3089).

An RFI was performed for PRS 50-006(a), the former Ten Site Canyon outfall. In 1993, soil samples were collected near the outfalls of the two former drainlines, on both banks of the drainage channel and in the canyon drainage channel at regular intervals to about 1300 ft downstream from the TA-50 boundary. After background and screening action level (SAL) comparisons and multiple chemical risk evaluation, contaminants identified as chemicals of potential concern (COPCs) were Aroclor-1254 and Aroclor-1260, the PAHs benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, and the radionuclides americium-241, cobalt-60, cesium-137, potassium-40, plutonium-238/239/240, radium-226, strontium-90, and thorium-232. The PAHs were eliminated from the COPC list because they probably originated from runoff from asphalt surfaces in areas adjacent to Ten Site Canyon (LANL 1995, 49925).

A small hummock of soil located on the south side of the drainage channel about 325 ft downstream from the outfalls contained concentrations of cesium-137, plutonium-238/239/240, and strontium-90 above soil SALs. Supplemental soil samples collected from around the hummock did not contain contaminants above SALs (LANL 1995, 49925). This small area of soil contamination was the subject of an interim corrective measure in 1996. According to Field Unit 5 personnel, several cubic yards of material were removed and placed in 55-gal. drums for disposal.

2.1.2.1.2 TA-55

Information about potential contaminants from TA-55 as a neighboring influence can be found above in section 2.1.1.

2.1.3 Mortandad Slope Subarea Site Description and Operational History

Mortandad Slope is the north-facing slope of Mortandad Canyon. The slope is steepest near the mesa edge and gently tapers in the lower section to the canyon floor. The slope is characterized by less prominent channel incision, increased soil abundance and thickness, and is more heavily vegetated than the Ten Site Slope. Figure 2.1-7 outlines the eastern and western portions of the Mortandad Slope Subarea. Figure 2.1-8 and Figure 2.1-9 show the PRSs and PRS-affected areas in which, according to the conceptual model (see section 2.3), residual contamination is expected to be present. The Mortandad Slope Subarea is made up of 10 PRSs which include outfalls, former container storage areas, an abandoned septic system, a canyon side disposal area, and oil spills.

In general, the PRSs progress in age from east to west as TA-35 facility operations expanded from the eastern end of Ten Site Mesa. PRSs located in the eastern portion of the subarea were established in 1951 and 1961 and are associated with the Ten Site Laboratory, building TA-35-2, and a transportable office building, TA-35-253. Subsequent PRSs to the west were established in the mid- to late-1970s as operations were expanded to the Chemical Laser Facility, building TA-35-85, and the Target Fabrication Building, building TA-35-213. The current land use designation for the north slope of Mortandad Canyon is industrial and is expected to remain so for the next 30 years or more (LANL 1998, 57224). Access to Mortandad Canyon on Laboratory property is currently administratively controlled; however, in the past, Laboratory employees and possibly the public have used access roads in the canyon as hiking and biking trails.

FIMAD Plot ID: G110244 / TA-35 ISAP_031202

Figure 2.1-4. Index map of Ten Site Slope Subarea

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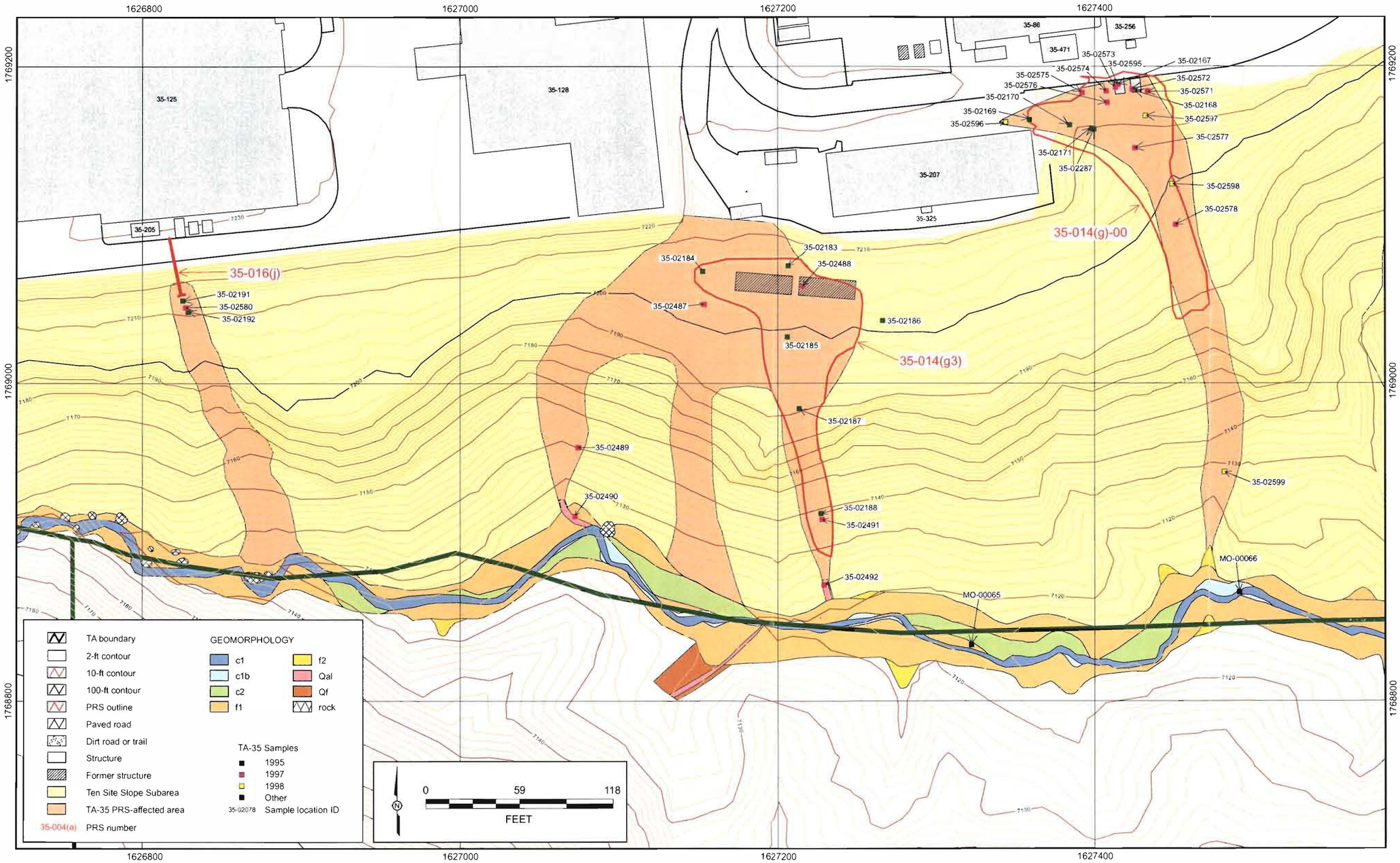

FIMAD Plot ID: G110242 / TA-35 ISAP_031202

Figure 2.1-5. Existing sample locations in western portion of Ten Site Slope Subarea

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Figure 2.1-6. Existing sample locations in eastern portion of Ten Site Slope Subarea

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Table 2.1-3 lists the Mortandad Slope Subarea PRSs with brief descriptions and current availability of residual contaminants remaining at the site. Detailed descriptions of the Mortandad Slope Subarea PRSs are presented in Appendix B; historic ER Project RFI data from the subarea PRSs are presented in section 2.2.3 and in Appendix C, with corresponding sample locations shown on Figure 2.1-8 and Figure 2.1-9.

Table 2.1-3

Mortandad Slope Subarea PRSs and Their Current Status

PRS		PRS Description	Current Ground Cover	Description of Source Term Removal	ER Project Confirmatory Sampling Performed?	Comments
35-004(b)		Former chemical storage area outside TA-35-85	Asphalt to soil	None	No	Not applicable; for ER Project RFI data, see table of samples collected (section 2.2)
35-008-00	35-008	Former canyonside disposal area, north of TA-35-85	Outfall to soil/tuff	None	No	Not applicable; for ER Project RFI data, see table of samples collected (section 2.2)
	35-014(e1)	Former dielectric oil spill bulldozed off mesa top, north side of TA-35-85	Exposed soil/tuff	None	No	For ER Project RFI data, see table of samples collected (section 2.2)
35-009(c)		Abandoned, inactive septic system, north of TA-35-2	> 3 ft of clean soil over PRS	Site cleaned up during 1996 ER Project VCA; 700 gal. liquid/sludge removed; septic tank, dosing chamber, manhole, and distribution box filled with concrete (LANL 1996, 54967)	Yes, see table of samples collected in section 2.2	Properly abandoned inactive septic system and eliminated potential for leaks or migration of contaminants
35-016(e)		Former outfall that discharged noncontact cooling water from TA-35-85	Outfall to soil/tuff	None	No	For ER Project RFI data, see table of samples collected (section 2.2)
35-016(f)		Active stormwater drain, north of TA-35-85	Outfall to soil/tuff	None	No	For ER Project RFI data, see table of samples collected (section 2.2)
35-016(i)-00	35-014(e2)	One-time oil spill in impoundment area, northeast of TA-35-85	Exposed soil/tuff	None	No	For ER Project RFI data, see table of samples collected (section 2.2)
	35-016(i)	Active stormwater discharge channel from parking lot near TA-35-85	Outfall to soil/tuff	None	No	For ER Project RFI data, see table of samples collected (section 2.2)
35-016(o)		Active stormwater drains, north of TA-35-261	Outfall to soil/tuff	None	No	For ER Project RFI data, see table of samples collected (section 2.2)
35-016(p)		Cooling water outfall, north of TA-35-27	Outfall to soil/tuff	None	No	For ER Project RFI data, see table of samples collected (section 2.2)

Operational histories suggest that the Mortandad Slope Subarea may contain a variety of inorganic, organic, and radiological contaminants as a result of Laboratory operations. Oil spills may have contributed a number of organic chemicals, including PAHs, phthalates, PCBs, and TPHs. A septic system is likely to have received both inorganic and organic chemicals from Laboratory buildings and may have received radionuclides as well. Outfalls connected to drains inside Laboratory buildings have possibly received undocumented discharges of chemicals in all three categories. Stormwater outfalls may discharge water containing chemicals derived from parking lots and roadways, such as PAHs and metals contained in gasoline, motor oil, other automotive fluids, and asphalt. Any or all portions of the Mortandad Slope Subarea may have received radionuclide contamination, including tritium and plutonium, from stack emissions at building TA-35-2 between 1954 and 1979 due to prevailing wind direction and from TA-55 stack emissions.

The septic system within the Mortandad Slope Subarea has been removed, and no longer presents a source term for contaminant release and migration. The existing data gaps within the Mortandad Slope Subarea lie within established outfall channels, mostly within the alluvial fans, as discussed in section 2.4. Filling the data gaps will provide extent of residual contamination, which is needed for risk calculations. It is anticipated that most LANL industrial sites with residual contamination which do not pose a potential current-day human health or ecological risk will either be turned over to the facilities for long-term stewardship [as outlined in the IWP, section 1.2.2.1 (ERP-OP 0003)] or be proposed for no further ER Project action.

2.1.3.1 Neighboring Influences to the Mortandad Slope Subarea

2.1.3.1.1 TA-42

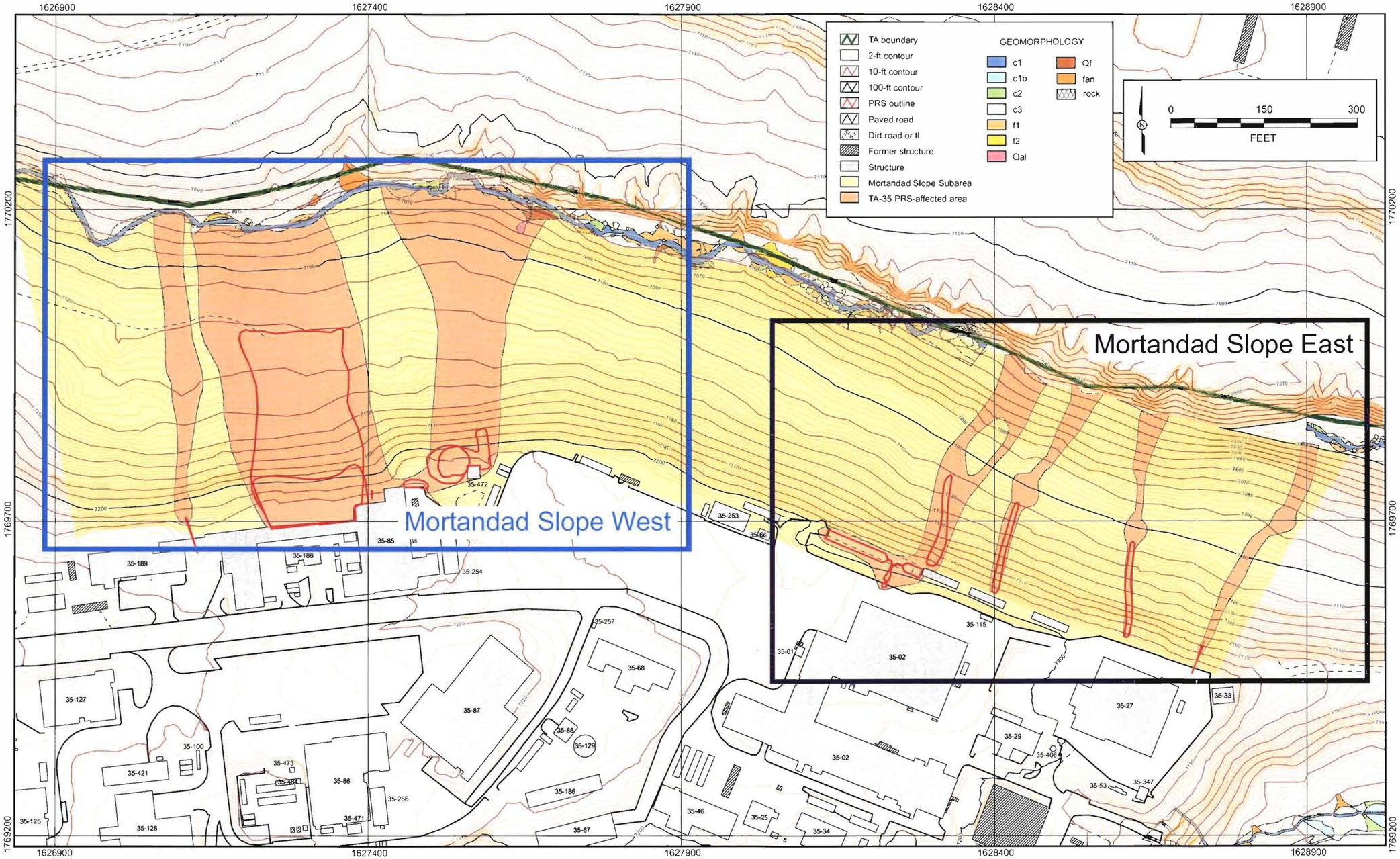
Former TA-42, the Incinerator Site, was located at the north side of what is now TA-55, on the south edge of Effluent Canyon. The incinerator [PRSs 42-001(a–c)] was designed to burn radionuclide-contaminated wastes generated at the Laboratory. The incinerator was completed in 1951 and operated for a short time in 1951 and 1952. Because of poor performance and operational problems, very little waste was actually incinerated (Harper and Garde 1981, 6286).

From 1957 until 1969 the incinerator site was used to store and decontaminate equipment (e.g., dry boxes and vehicles). The decontamination process was designated as PRSs 42-002(a,b). In 1969, an unsuccessful attempt was made to reactivate the incinerator to burn uncontaminated classified wastes, but by 1970 all operations had been discontinued and all combustibles were removed from the incinerator building (Harper and Garde 1981, 6286; DOE 1987, 8663). In 1978, the incinerator, including all structures, debris, and contaminated soils, was removed and disposed of at TA-54, Area G.

In 1993, an RFI was conducted for the TA-42 PRSs and the results were reported in a subsequent RFI report (Pratt et al. 1994, 41204; LANL 1995, 50056). Contaminant concentrations did not exceed SALs; however, many of the sample analyses for metals and radionuclides were performed in mobile laboratories whose higher-than-fixed-laboratory detection limits were later deemed unacceptable.

2.1.3.1.2 TA-50

A prominent neighboring influence to the Mortandad Slope Subarea is the TA-50 RLWTF which discharges to Effluent Canyon, a tributary of Mortandad Canyon. The RLWTF has operated since 1963 when operations ceased at the TA-35 WWTP. Radioactive liquid wastes from Laboratory operations have been collected and treated at the RLWTF at TA-50 using classical but effective chemical and physical treatment technology (LANL 1996, 55688). The TA-50 RLWTF has operated continually with periodic upgrades being made to the treatment process. The discharge has been regulated as National Pollutant Discharge Elimination System (NPDES) outfall 051 since 1990 and typically contains low levels of radionuclides and other chemicals. The discharge flows a short distance downstream in Mortandad Canyon and infiltrates the alluvium.



FIMAD Plot ID: G110325 / TA-35 ISAP_031202

Figure 2.1-7. Index map of Mortandad Slope Subarea

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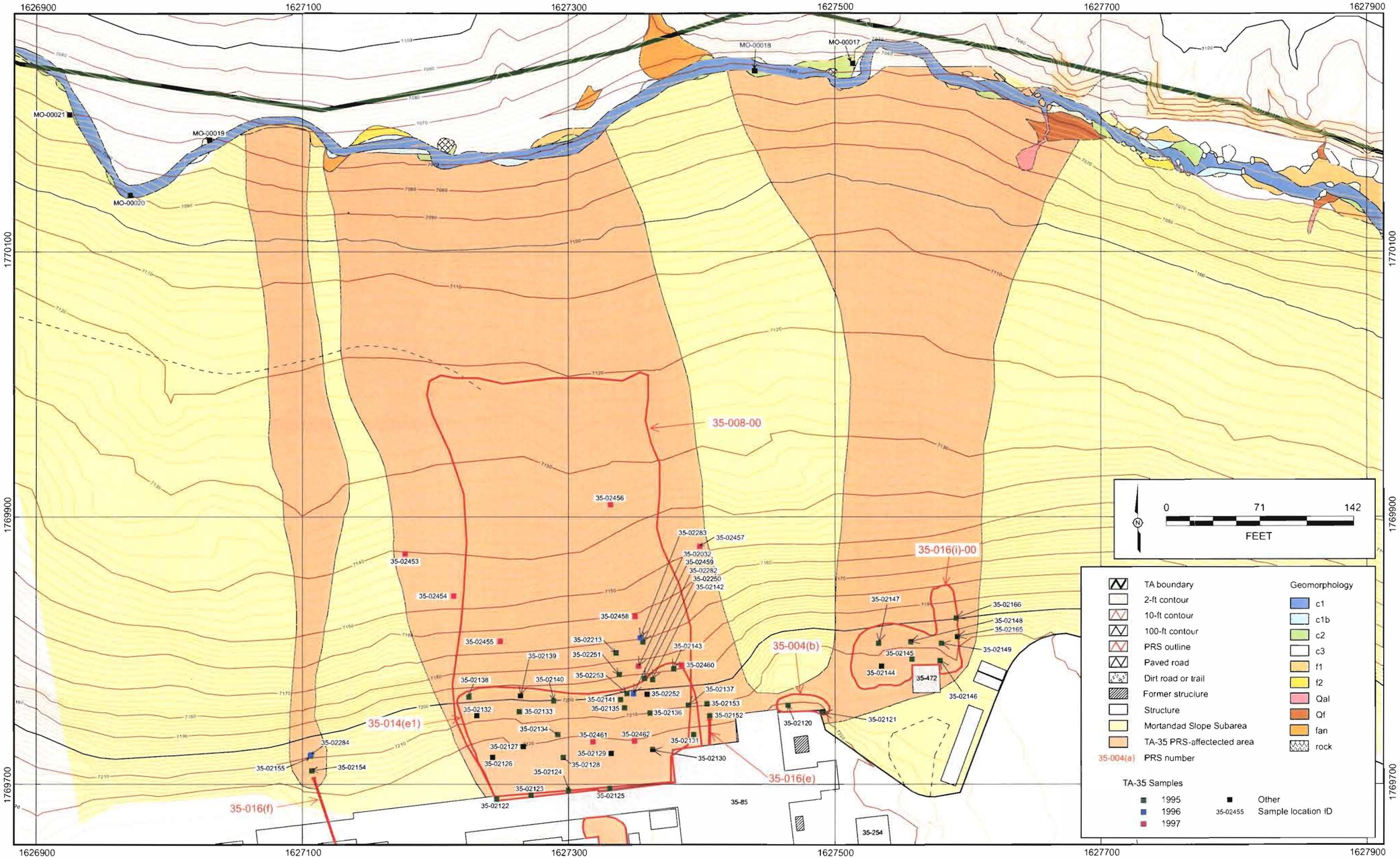

FIMAD Plot ID: G110321 / TA-35 ISAP_032002

Figure 2.1-8. Existing sample locations in western portion of Mortandad Slope Subarea

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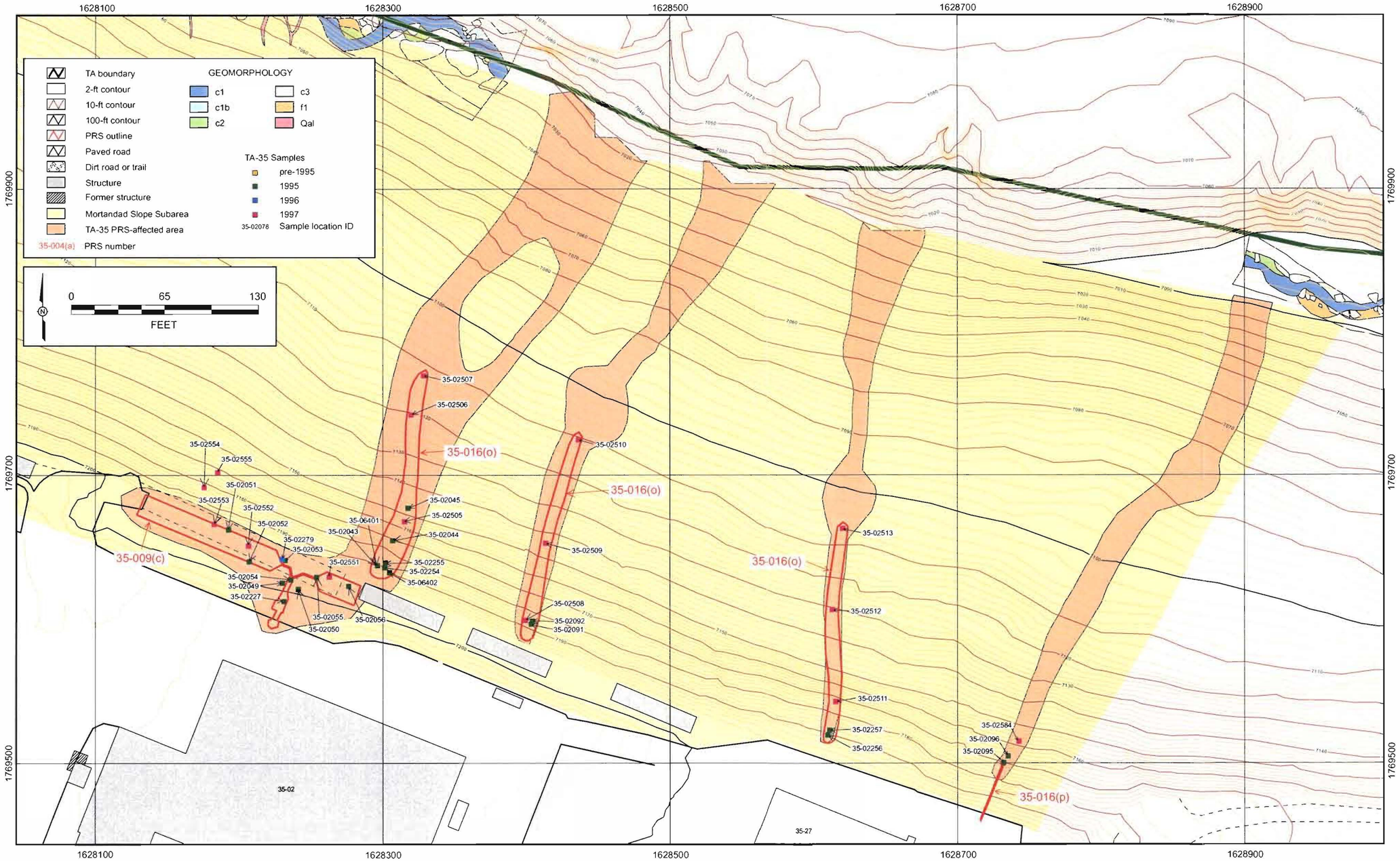

Source: FIMAD G110323 / TA-35 ISAP_031902

Figure 2.1-9. Existing sample locations in eastern portion of Mortandad Slope Subarea

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The Laboratory has installed numerous wells in the canyon alluvium and the hydrogeologic unit immediately below it and routinely monitors the groundwater and sediment in the canyon. Monitoring data are reported annually in environmental surveillance reports (e.g., LANL 1998, 59904). Evaluation of the monitoring data has shown that most of the radionuclides (fission products and actinides) discharged are adsorbed to the sediments; to date, the inventory of transuranic radionuclides (about 400 mCi) discharged to the canyon has been shown to be largely contained within Laboratory boundaries (Stoker et al. 1991, 7530).

Because most of the radionuclides are associated with the sediments, three sediment traps were constructed about 2 mi downstream from the TA-50 RLWTF outfall in middle Mortandad Canyon, east of the TA-35 boundary. The sediment traps dissipate the energy of major runoff events and capture transported sediments, thus eliminating or reducing radionuclide transport downstream. Two sediment traps were constructed in 1976, and a third was constructed in 1980. The sediment traps are maintained with visual inspections and periodic reconfiguration.

An RFI was performed on the current TA-50 RLWTF outfall into Effluent Canyon [PRS 50-006(d)] according to the "RFI Work Plan for Operable Unit 1147" (LANL 1992, 7672). Soil samples were collected in nine transect lines perpendicular to the drainage channel beginning about 20 ft downstream from the outfall and extending for a distance of approximately 900 ft downstream, at intervals of approximately 100 ft. Because PRS 50-006(d) is located within Mortandad Canyon, additional investigation of this PRS was deferred until the Mortandad Canyon investigation and is included as part of the work plan for Mortandad Canyon (LANL 1997, 56835).

2.1.3.1.3 TA-55

TA-55 is a neighboring influence to the Mortandad Slope Subarea; information about potential contaminants from TA-55 can be found above in section 2.1.1. In addition, four other stormwater PRSs contribute discharges to Effluent Canyon from TA-55-4, the Plutonium Building. The four are PRS 55-011(a), which discharges stormwater collected from the northwest side of TA-55-4, and PRSs 55-011(b,c,e) which discharge stormwater from the northeast side of TA-55-4.

2.1.4 Pratt Canyon Subarea Site Description and Operational History

Pratt Canyon is a tributary of Ten Site Canyon and is located at the east end of Ten Site Mesa. Pratt Canyon heads at the east end of the mesa at the location of the former TA-35 WWTP, several components of which were located within the upper portion of the canyon. Figure 2.1-10 shows the PRSs and PRS-affected areas in which, according to the conceptual model (see section 2.3), residual contamination is expected to be present. The Pratt Canyon Subarea is made up of eight PRSs which include outfalls, former wastewater WWTP components, an abandoned septic system, and Pratt Canyon itself, which received planned and unplanned discharges from the WWTP that operated from 1951 to 1963.

The Pratt Canyon Subarea PRSs are primarily related to the operation of the TA-35 WWTP. Additional contributors include an abandoned septic system leach field, a cooling water outfall, and two stormwater outfalls. Several WWTP structures [PRSs 35-003(d,e,l,q)] located at the head of Pratt Canyon were removed during the early to mid-1980s. During this effort, backfill was placed at the head of the canyon to fill the excavations and to "cap" contamination potentially present as a result of WWTP discharges. Subsequent runoff events incised the backfill and threatened to re-expose the potentially contaminated horizon. In 1996, the ER Project conducted an IA at the location of PRSs 35-003(d,e,l,q) and in Pratt Canyon. The IA activities included replacement of fill into the incised channel, stabilization of the slope using compaction and vegetative matting, and installation of a berm that diverts runoff to a riprap-lined drainage located north of the site and common to inactive outfall PRS 35-016(k) and daylight drainage channel PRS 35-016(l) (LANL 1996, 55809). The action was designed to remove the potential for mobilization of residual contamination by insulating the source from surface water exposure.

The current land use designation for Pratt Canyon is industrial and is expected to remain so for the next 30 years or more (LANL 1998, 57224). Site access is uncontrolled; an unpaved road located along the south edge of Pratt Canyon provides access from the TA-35 mesa top to an unpaved road in Ten Site Canyon. In addition to providing facility access, these roads are used by Laboratory employees as hiking and biking trails. Table 2.1-4 lists the Pratt Canyon Subarea PRSs with brief descriptions and current availability of residual contaminants remaining at the site. Detailed descriptions of the Pratt Canyon Subarea PRSs are presented in Appendix B; historic ER Project RFI data from the subarea PRSs are presented in section 2.2.4 and in Appendix C, with corresponding sample locations presented on Figure 2.1-10.

Table 2.1-4

Pratt Canyon Subarea PRSs and Their Current Status

	PRS	PRS Description	Current Ground Cover	Description of Source Term Removal	ER Project Confirmatory Sampling Performed?	Comments
35-003(a)-99	35-003(e)	Former WWTP's surge tank TA-35-36	> 3 ft of clean soil over PRS	1981–1985 RLWLR[a] project; completely removed tank in one load to TA-54	No	For ER Project RFI data, see table of samples collected (section 2.2)
35-003(d)-00	35-003(d)	Former WWTP's holding tank building TA-35-10	> 18 ft of clean soil over PRS	1985 RLWLR project; removed 340 m^3 of soil to 18–20 ft below grade; backfilled with clean soil	No	Met 1985 ALARA objectives; for ER Project RFI data, see table of samples collected (section 2.2)
	35-003(l)	Former WWTP's pump pit TA-35-08	> 3 ft of clean soil over PRS	1981–1985 RLWLR project; completely removed pump pit in one 30-ton load to TA-54	No	For ER Project RFI data, see table of samples collected (section 2.2)
	35-003(q)	Former WWTP's pipe trench TA-35-09	> 3 ft of clean soil over PRS	1981–1985 RLWLR project; completely removed pipe trench in three loads of 20-, 10-, and 18-ton sections to TA-54	No	For ER Project RFI data, see table of samples collected (section 2.2)
	35-003(r)	Former WWTP's canyon disposal area for liquid sludge	Exposed soil/tuff	None	No	For ER Project RFI data, see table of samples collected (section 2.2)
35-009(d)		Abandoned septic system	> 3 ft of clean soil over PRS	Site cleaned up during 1996 ER Project VCA; 550 gal. liquid/sludge removed; septic tank, dosing chamber, manhole, and distribution box filled with concrete (LANL 1996, 54967)	Yes, see table of samples collected in section 2.2	Properly abandoned inactive septic system and eliminated potential for leaks or migration

Table 2.1-4
Pratt Canyon Subarea PRSs and Their Current Status (continued)

PRS		PRS Description	Current Ground Cover	Description of Source Term Removal	ER Project Confirmatory Sampling Performed?	Comments
35-016(k)-00	35-016(k)	Inactive outfall that handled cooling water from TA-35-29	Outfall to soil/ tuff	None	No	For ER Project RFI data, see table of samples collected (section 2.2)
	35-016(l)	Active, open-air, surface, stormwater discharge channel and sterilized water from TA-35-29	Outfall to soil/ tuff	None	No	For ER Project RFI data, see table of samples collected (section 2.2)
35-016(m)		Inactive cooling tower outfall, north of TA-35-33	Outfall to soil/ tuff	None	No	For ER Project RFI data, see table of samples collected (section 2.2)

[a] RLWLR = radioactive liquid waste line removal (see Elder et al. 1986, 06666, for project details).

Because most of the discharges into Pratt Canyon are related to the former WWTP, the list of potential contaminants expected in the Pratt Canyon Subarea is derived from the operational histories of that facility. Potential radionuclide contaminants include isotopes of plutonium and uranium, barium-140, lanthanum-140, strontium-89, strontium-90, cesium-137, and tritium. Metals and semivolatile organic compounds (SVOCs) are also potential contaminants.

During the first 4 years of operation, neither the volumes treated and discharged nor the radionuclide contents were routinely recorded in daily operation logs for the treatment plant; these parameters are listed as unknown in Table 2.1-5. Information about the discharges during 1951 and 1952 was obtained from Aeby (1954, 742). Discharge data for 1955 through 1963 were obtained from the daily operation logs referenced in Table 2.1-5.

Table 2.1-5
Total Annual Discharges from the TA-35 Wastewater Treatment Plant to Pratt Canyon[a]

Year	Number of Runs	Volume of Wastewater Treated (gal.)			Gross Beta Activity[b] to Canyon (Ci)	Total Strontium Activity[b] to Canyon (Ci)	Strontium-90 Activity[b] to Canyon (Ci)	Strontium-89 Activity[b] to Canyon (Ci)
		Treated	Discharged	Recirculated				
1951	1	Unknown	Unknown	Unknown	0.00500	0.00020	0.00003	0.00017
1952	3	Unknown	52,500	Unknown	1.92200	0.07680	0.01160	0.06540
1953	3	Unknown	~300,000	Unknown	0.16700	0.00670	0.00100	0.00570
1954	1	Unknown	~300,000	Unknown	0.16000	0.00640	0.00097	0.00542
1955	10	52,890	46,850	9,040	0.15142	0.04902	0.00738	0.04164
1956	59	410,900	193,970	238,130	7.36369	0.83700	0.15400	0.68300
1957	16	480,550	446,380	34,440	1.76401	0.22487	0.03373	0.19114
1958	9	370,755	367,485	3,270	1.39311	0.11383	0.01707	0.09675
1959	10	560,234	560,234	0	3.64135	0.02803	0.00420	0.02383
1960	11	572,220	308,635	263,585	1.72937	0.03729	0.00559	0.03170
1961	3	342,497	342,497	0	1.39997	0.01097	0.00165	0.00932
1962	3	318,582	318,582	0	0.90934	0.01643	0.00246	0.01397

Table 2.1-5

Total Annual Discharges from the TA-35 Wastewater Treatment Plant to Pratt Canyon[a] (continued)

Year	Number of Runs	Volume of Wastewater Treated (gal.)			Gross Beta Activity[b] to Canyon (Ci)	Total Strontium Activity[b] to Canyon (Ci)	Strontium-90 Activity[b] to Canyon (Ci)	Strontium-89 Activity[b] to Canyon (Ci)
		Treated	Discharged	Recirculated				
1963	1	105,532	105,532	0	0.10802	0.00227	0.00034	0.00193
Total	130	3,214,160	2,690,165	548,465	20.71428	1.40981	0.24002	1.16997

[a] Release data were obtained from the Ten Site Treatment Plant Daily Operation Logs (Emelity 1958, 794; Aeby 1954, 742; Christenson 1956, 775).

[b] Activities are not corrected for radioactive decay.

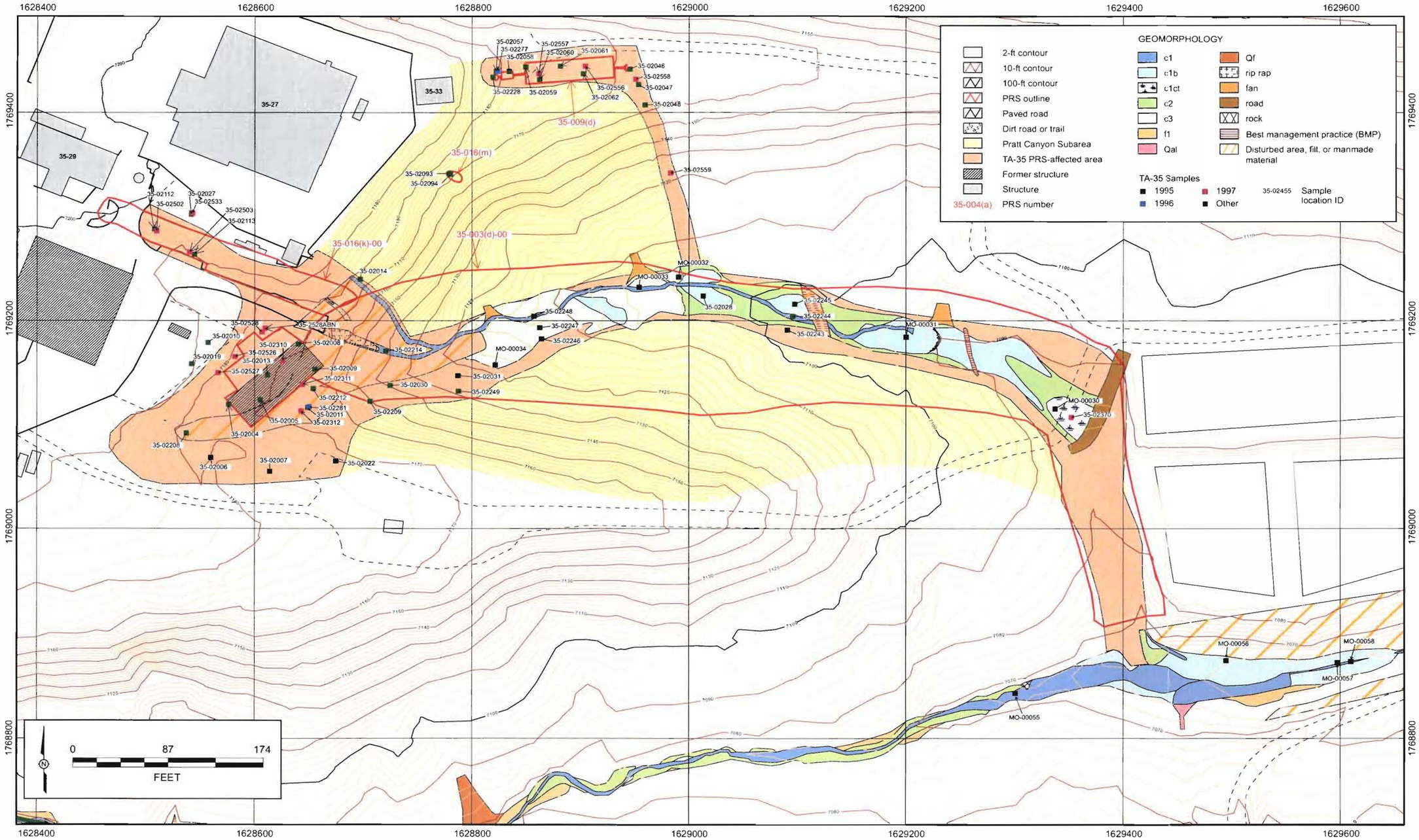
Reports indicate two unplanned releases in which the gross-beta activity exceeded 1 Ci. The first discharge occurred on September 6, 1952, when wastewater containing 1.8 Ci gross-beta activity and approximately 70 mCi of strontium-89 and strontium-90 was released because of a malfunctioning solenoid valve (Aeby 1952, 741; Aeby 1954, 742). Another unplanned discharge occurred during the weekend of February 11 and 12, 1956. In this case a leaking pipe caused 21,200 gal. (80.2 m^3) of water (and a quantity of sludge) to be pumped into the canyon. Based on activities measured earlier that week, it was estimated that approximately 7 Ci gross-beta activity and 0.7 Ci of strontium-89 and strontium-90 were released.

The total gross-beta activity and strontium concentrations discharged in wastewater in 1953 were estimated in documentation by Matthews (1954, 55686) based on the total volume of wastewater, ~300,000 gal. (an average of 1150 gal./working day), and two samples collected from the concrete holding tanks in February and April of 1954. Keenan (1975, 845) projected that the estimate of discharges for 1953 might also be used to estimate the discharges for 1954.

As of 1997, all components of the original TA-35 WWTP have been removed and no longer present a source term for contaminant migration. The existing data gaps within the Pratt Canyon Subarea mostly lie within the outfall channels alluvial fans, as will be discussed in section 2.4. This information will provide extent of residual contamination. It is anticipated that most LANL industrial sites with residual contamination which do not pose a potential current-day human health or ecological risk will either be turned over to the facilities for long-term stewardship [as outlined in the IWP, section 1.2.2.1 (ERP-OP 0003)] and/or be proposed for no further ER Project action.

2.1.5 Ten Site Canyon Subarea and Operational History

The Ten Site Canyon Subarea comprises the canyon floor west of Ten Site Canyon and extends east of the confluence with Pratt Canyon. Figure 2.1-11 outlines the eastern and western portions of the Ten Site Canyon Subarea. Figure 2.1-12 and Figure 2.1-13 show the PRSs and PRS-affected areas in which, according to the conceptual model (see section 2.3), residual contamination is expected to be present. The Ten Site Canyon Subarea is made up of one consolidated unit [35-010(a)-99, associated with an inactive sanitary wastewater treatment facility and including three lagoons, a sand filter treatment unit, and an effluent outfall that collectively operated from 1975 to 1992] and one AOC (C-35-007) related to the sanitary wastewater treatment facility.



Source: EIMAD G110304 / TA-35 ISAP 031402

Figure 2.1-10. Existing sample locations in Pratt Canyon Subarea

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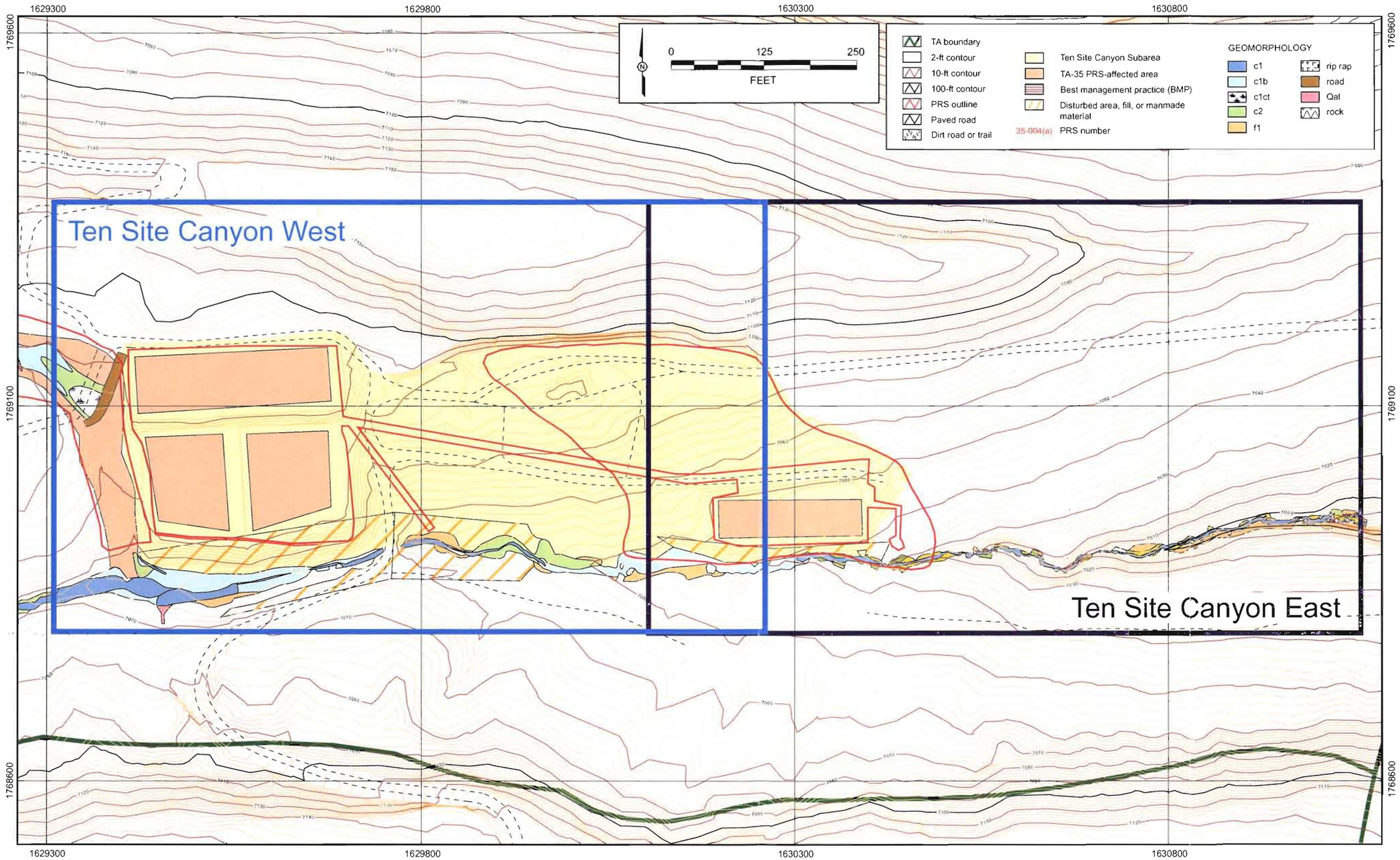

FIMAD Plot ID: G110338 / TA-35 ISAP_032702

Figure 2.1-11. Index map of Ten Site Canyon Subarea

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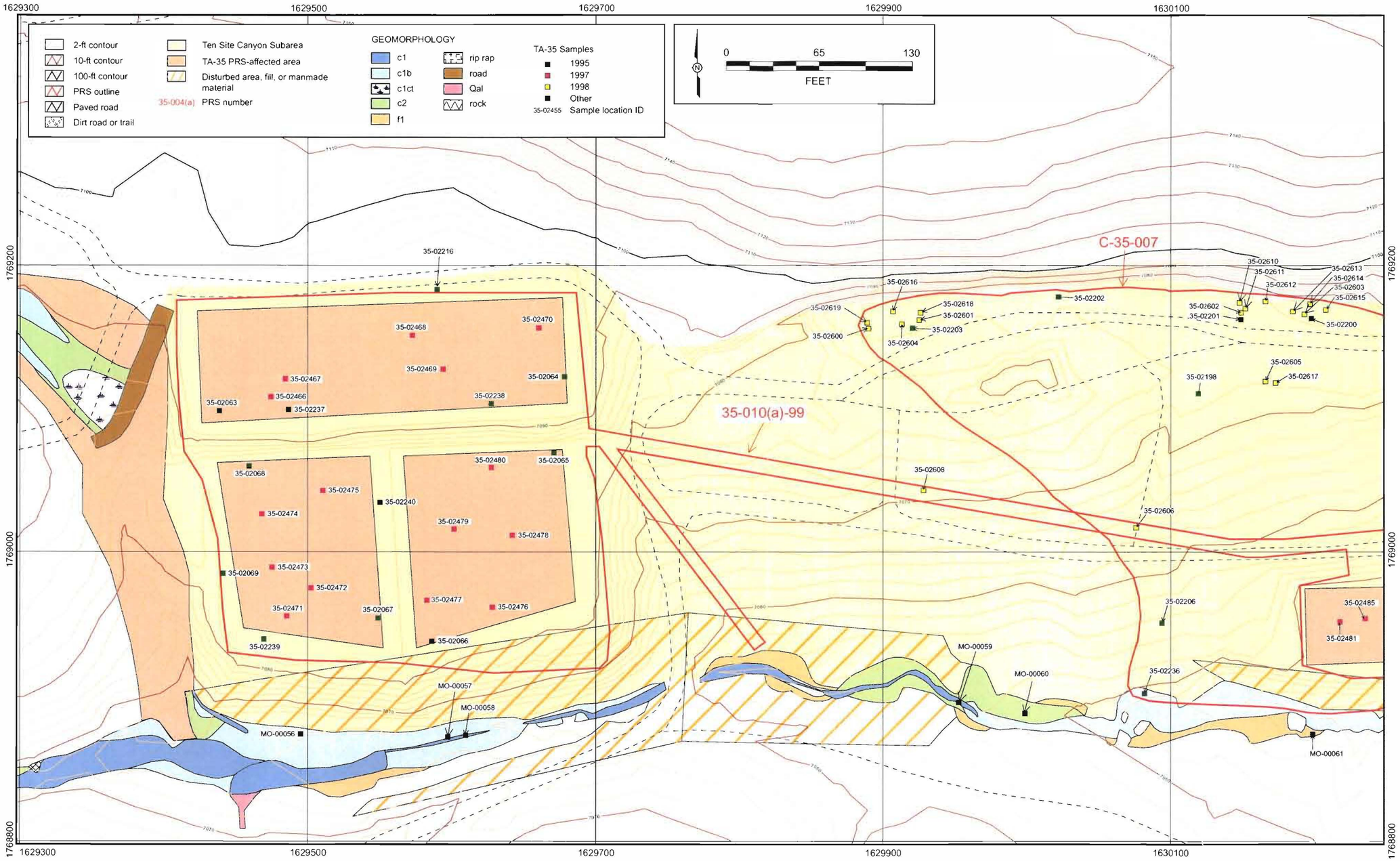

FIMAD Plot ID: G110334 / TA-35 ISAP_032702

Figure 2.1-12. Existing sample locations in western portion of Ten Site Canyon Subarea

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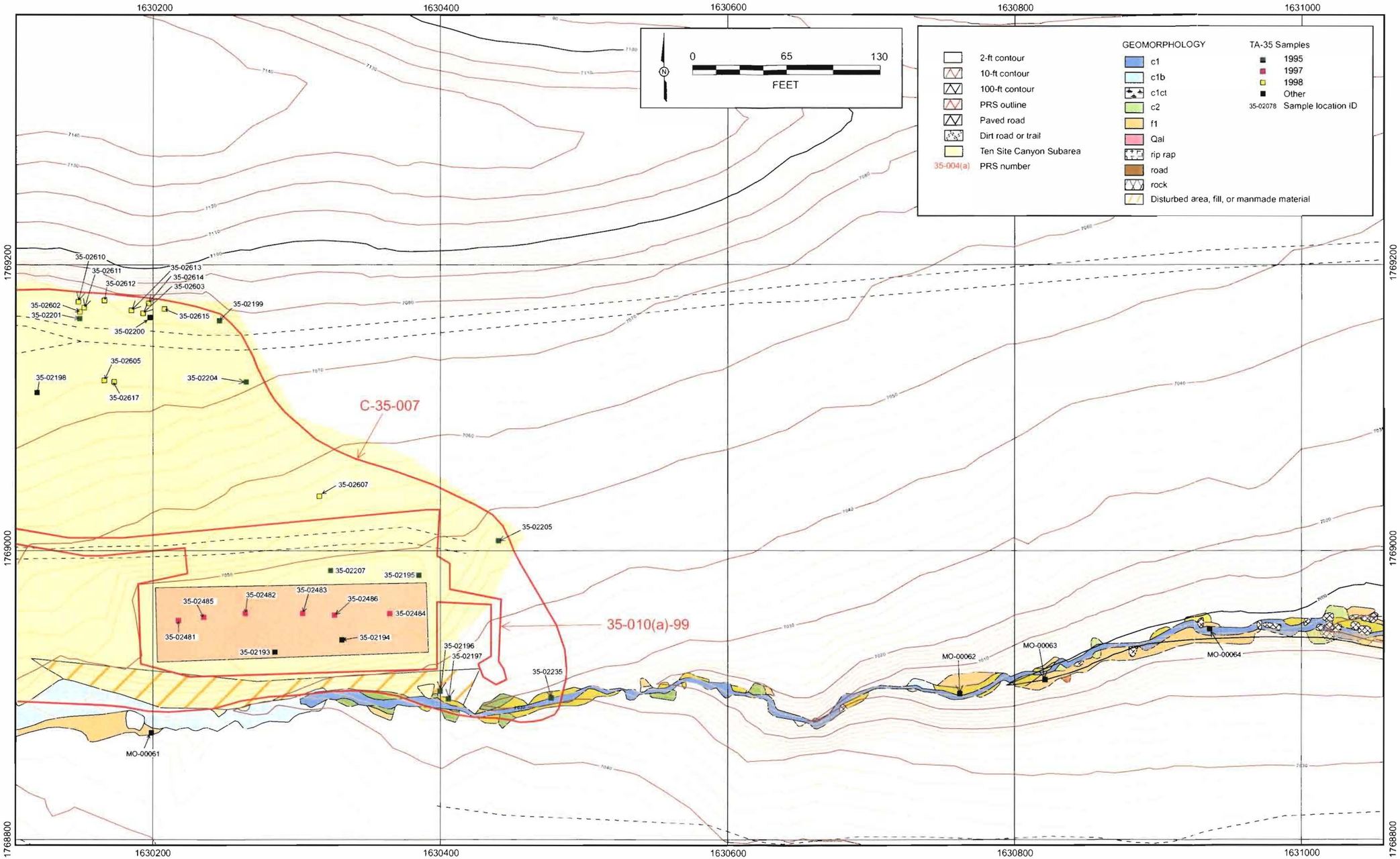

FIMAD Plot ID: G110336 / TA-35 ISAP_032702

Figure 2.1-13. Existing sample locations in eastern portion of Ten Site Canyon Subarea

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Ten Site Canyon Subarea includes much of the Ten Site Canyon floor extending from the west end of TA-35 to east of the confluence with Pratt Canyon. In addition to receiving potential impact from hillslope PRSs (e.g., Ten Site Slope Subarea and TA-50) and the Pratt Canyon Subarea, the Ten Site Canyon Subarea is directly associated with components of an inactive sanitary wastewater treatment facility and its discharges. The facility was built in stages: the lagoons were constructed and began operating in 1975, the sand filter beds and NPDES-permitted outfall EPA-SSS-10S were installed in 1983. Before construction of the sand filter beds, the lagoons discharged via an unpermitted outfall located at the southeast corner of the southeast lagoon [PRS 35-010(c)]. The facility ceased operations in 1992, when sanitary waste was redirected to the Laboratory's Sanitary Wastewater Consolidation System (SWCS) facility at TA-46.

The current land use designation of the Ten Site Canyon Subarea is industrial and is expected to remain so for the next 30 years or more (LANL 1998, 57224). Site access is uncontrolled: an unpaved road provides vehicle access from the unnamed mesa located south of Ten Site Mesa, and the site is accessible by walking from Ten Site Mesa. In addition to providing facility access, the road is used by Laboratory employees as hiking and biking trails. Table 2.1-6 briefly describes the Ten Site Canyon Subarea PRSs and current availability of residual contaminants remaining at the site. Detailed descriptions of the PRSs are given in Appendix B; historic ER Project RFI data from the subarea PRSs are presented in section 2.2.5 and in Appendix C, with corresponding sample locations presented on Figure 2.1-12 and Figure 2.1-13.

Table 2.1-6
Ten Site Canyon Subarea PRSs and Their Current Status

PRS		PRS Description	Current Ground Cover	Description of Source Term Removal	ER Project Confirmatory Sampling Performed?	Comments
35-010(a)-99	35-010(a)	Former wastewater treatment lagoons	Direct contact with soil	None	No	For ER Project RFI data, see table of samples collected (section 2.2)
	35-010(b)	Former wastewater treatment lagoons	Direct contact with soil	None	No	For ER Project RFI data, see table of samples collected (section 2.2)
	35-010(c)	Former wastewater treatment lagoons	Direct contact with soil	None	No	For ER Project RFI data, see table of samples collected (section 2.2)
	35-010 (d)	Former sand filter beds	Direct contact with soil	None	No	For ER Project RFI data, see table of samples collected (section 2.2)
	35-010(e)	Former outfall for wastewater treatment system - EPA-SSS-10S	Direct contact with soil	None	No	For ER Project RFI data, see table of samples collected (section 2.2)
C-35-007		Excavated material from former sand filter beds	Direct contact with soil	None	No	For ER Project RFI data, see table of samples collected (section 2.2)

Most of the discharges into the Ten Site Canyon Subarea are related to the former sanitary wastewater treatment facility. In addition to sanitary waste, these lagoons are reported to have received small quantities of radionuclides and other chemicals, and photographic processing wastes from TA-35, -48, -50, and -55 (LANL 1990, 7511; CEARP 1986, 8657).

2.1.5.1 Neighboring Influences to the Ten Site Canyon Subarea

Additional impacts to the Ten Site Canyon Subarea may come from discharges to Pratt Canyon from the former WWTP. Discussion of the Pratt Canyon Subarea is presented in section 2.1.2.4 of this document.

The list of potential contaminants expected in the Pratt Canyon Aggregate is derived from the operational history of that facility as presented in section 2.2.4.

TA-55 is a neighboring influence to the Ten Site Canyon Subarea; information on potential contaminants from TA-55 is stated in section 2.1.1.

2.2 Existing Data

The existing data for TA-35 include RFI data from site-characterization investigations from 1994 through 1998. Results of the investigations have been detailed in various RFI reports and SAPs, as described in section 1.3. This section contains summaries of the data collected to date; a complete electronic version of the data (by subarea) can be found on the CD enclosed with this document. Appendix C of this document contains tables of the samples collected. Those tables show all samples collected at each subarea and information about the depth and type of sample, as well as what analytical suites each sample was analyzed for. Appendix C also contains tables (by sample for each subarea) of detected inorganic chemicals above background values, detected organic chemicals, and detected radionuclides above background values or above fallout values.

2.2.1 Mesa Top Subarea

2.2.1.1 Samples Collected in the Mesa Top Subarea

Samples collected in the Mesa Top Subarea were analyzed for the chemical suites listed in Table 2.2-1. The samples are shown on Figure 2.1-2 and Figure 2.1-3. Complete lists of each sample collected and what analytical suites each was analyzed for can be found in Appendix C. The number of samples analyzed for organic chemicals, inorganic chemicals (target analyte list [TAL] metals), and radionuclides is also presented in Table 2.2-1.

Table 2.2-1
Number of Samples Analyzed from the Mesa Top Subarea

Analytical Suite	Soil
PCBs	120
Pesticides and PCBs	5
SVOCs	181
Volatile organic compounds (VOCs)	67
TPH diesel range organics (DRO)	70
TPH lubricant range organics (LRO)	36
Inorganic chemicals (TAL metals)	99
Limited list TAL metals	7
Other metals	40
XRF[a] metals	72
Gamma spectroscopy radionuclides	127
Tritium	121
Isotopic plutonium	199
Isotopic uranium	199
Strontium-90	90

[a] XRF = x-ray fluorescence

The objective of this data review is to determine which analytes differed from LANL background values or fallout values and which organic chemicals were detected in each subarea. For the purposes of discus-

sion, the term *soil samples* will be used to describe solid samples and can represent any of the geological units shown in the tables including, soil, sediment, Qbt 2,3,4, Qbt 1g, Qbt 1v, or Qbo.

2.2.1.2 Comparison of Inorganic Chemicals with Background Values for the Mesa Top Subarea

TAL metals were analyzed for in a total of 106 soil samples (99 for the full TAL metal suite and 7 for a limited-list TAL suite) collected in the Mesa Top Subarea. Inorganic chemical sample results were compared with the background values that are presented in "Inorganic and Radionuclide Background Data for Soils, Canyon Sediments, and Bandelier Tuff at Los Alamos National Laboratory" (LANL 1998, 59730) for the associated media listed in Table 2.2-2.

Table 2.2-2 presents the concentration range and frequency of results above the background values for the inorganic chemicals in the Mesa Top Subarea. For soil, 13 TAL metals (antimony, barium, beryllium, cadmium, calcium, chromium, copper, lead, mercury, nickel, silver, thallium, and zinc) were detected above background values in at least 1 sample. Aluminum, arsenic, cobalt, iron, magnesium, manganese, potassium, selenium, sodium, and vanadium were detected below background values.

Table 2.2-2
Frequency of Detected Inorganic Chemicals in the Mesa Top Subarea

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range (mg/kg)[a]	Background Value (mg/kg)	Frequency of Detects Above Background Value[b]	Frequency of Nondetects Above Background Value[c]
Aluminum	Soil	106	106	149 to 14,600	29200	0/106	0/0
Antimony	Soil	103	2	[0.00062 to 11]	0.83	2/103	85/101
Arsenic	Soil	106	76	[0.16] to 4	8.17	0/106	0/30
Barium	Soil	106	106	4.6 to 392	295	1/106	0/0
Beryllium	Soil	106	97	0.07 to 2	1.83	1/106	0/9
Boron	Soil	34	15	[0.36] to 5.4	NA[d]	15/34	NA
Cadmium	Soil	106	11	[0.04] to 1.6	0.4	6/106	61/95
Calcium	Soil	106	105	146 to 24,000	6120	10/106	0/1
Chromium (total)	Soil	106	99	[0.47] to 219	19.3	8/106	0/7
Cobalt	Soil	106	79	[0.16] to 7.6	8.64	0/106	0/27
Copper	Soil	106	88	[0.42] to 128	14.7	5/106	0/18
Iron	Soil	106	106	266 to 16,700	21500	0/106	0/0
Lead	Soil	106	104	1.3 to 81.6	22.3	5/106	0/2
Lithium	Soil	6	5	[0.4] to 14	NA	5/6	NA
Magnesium	Soil	106	105	15.7 to 2730	4610	0/106	0/1
Manganese	Soil	106	106	61.4 to 490	671	0/106	0/0
Mercury	Soil	99	17	[0.01] to 2	0.1	10/99	3/82
Molybdenum	Soil	6	0	[0.9 to 2]	NA	0/6	NA
Nickel	Soil	106	91	0.59 to 246	15.4	10/106	0/15
Potassium	Soil	106	102	86.8 to 1940	3460	0/106	0/4
Selenium	Soil	106	10	[0.12 to 1.1]	1.52	0/106	0/96
Silver	Soil	106	4	[0.1 to 2.3]	1	2/106	47/102
Sodium	Soil	106	103	32 to 591	915	0/106	0/3
Strontium	Soil	6	6	1.6 to 18	NA	6/6	NA
Thallium	Soil	106	6	[0.09] to 1.7	0.73	1/106	9/100

Table 2.2-2
Frequency of Detected Inorganic Chemicals in the Mesa Top Subarea (continued)

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range (mg/kg)[a]	Background Value (mg/kg)	Frequency of Detects Above Background Value[b]	Frequency of Nondetects Above Background Value[c]
Titanium	Soil	34	34	8.7 to 224	NA	34/34	NA
Vanadium	Soil	106	98	[0.4] to 23.3	39.6	0/106	0/8
Zinc	Soil	106	106	7.2 to 204	48.8	5/106	0/0

[a] Values in square brackets indicate nondetected results.

[b] Value is the ratio of the number of detected values exceeding the background value to the number of analyses.

[c] Value is the ratio of the number of not detected values exceeding the background value to the number of not detected analyses.

[d] NA = not applicable.

For the mesa-top samples collected for the analyses of inorganic chemicals, Table 2.2-3 shows the 13 TAL metals (antimony, barium, beryllium, cadmium, calcium, chromium, copper, lead, mercury, nickel, silver, thallium, and zinc) that were detected above LANL background values. For a list of specific samples with detects above background values and with details, see Appendix C.

Table 2.2-3
Inorganic Chemical Data Review for the Mesa Top Subarea

	Comparison to Background Values for Soil			Comparison to Background Values for Qbt 2,3,4		
Analyte	*Not detected above background*	*Reporting limits above background*	*Detected above background*	*Not detected above background*	*Reporting limits above background*	*Detected above background*
Aluminum	•			•		
Antimony		•	•		•	•
Arsenic	•			•		
Barium			•			•
Beryllium	•					•
Cadmium			•	•		
Calcium			•			•
Chromium			•			•
Cobalt	•			•		
Copper			•			•
Iron	•			•		
Lead			•			•
Magnesium	•			•		
Manganese	•			•		
Mercury			•			•
Nickel			•			•
Potassium	•			•		
Selenium	•				•	•
Silver		•	•		•	
Sodium	•			•		
Thallium		•	•	•		
Vanadium	•			•		
Zinc			•	•		

2.2.1.3 Evaluation of Organic Chemicals Detected in the Mesa Top Subarea

Soil samples in the Mesa Top Subarea were analyzed for SVOCs by EPA SW-846 Method 8270, for VOCs by EPA Method 8260, for organochlorine pesticides by EPA Method 8081, for PCBs by EPA Method 8082, and for TPH (both DRO and LRO) by EPA Method 8015. A total of 181 samples were analyzed for SVOCs, 67 were analyzed for VOCs, 5 were analyzed for pesticides/PCBs, 120 were analyzed for PCBs only, 70 were analyzed for TPH DRO, and 36 were analyzed for TPH LRO. Forty-eight organic compounds were detected in these samples.

Table 2.2-4 presents the concentration range and frequency of detects for these analytes. In summary, 48 organic chemicals were detected in at least 1 sample. For a list of specific samples with detected organic chemicals and with sample details, see Appendix C.

Table 2.2-4
Frequency of Detected Organic Chemicals in the Mesa Top Subarea

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range (mg/kg)[a]	Frequency of Detects[b]
Acenaphthene	Soil	178	8	0.038 to [38]	8/178
Acetone	Soil	67	9	[0.002] to 0.28	9/67
Anthracene	Soil	178	12	0.039 to [38]	12/178
Aroclor-1016	Soil	66	1	[0.0102 to 0.51]	1/66
Aroclor-1221	Soil	66	1	[0.0102 to 1]	1/66
Aroclor-1232	Soil	66	1	[0.0102 to 0.51]	1/66
Aroclor-1242	Soil	124	1	[0.0102 to 0.51]	1/124
Aroclor-1248	Soil	66	4	[0.0102 to 0.51]	4/66
Aroclor-1254	Soil	123	4	[0.0102] to 1.3	4/123
Aroclor-1260	Soil	125	21	[0.014] to 14.2	21/125
Benzo(a)anthracene	Soil	178	16	0.027 to [38]	16/178
Benzo(a)pyrene	Soil	178	15	0.039 to [38]	15/178
Benzo(b)fluoranthene	Soil	178	14	0.027 to [38]	14/178
Benzo(g,h,i)perylene	Soil	178	8	[0.0484 to 38]	8/178
Benzo(k)fluoranthene	Soil	175	6	0.043 to [38]	6/175
Bis(2-ethylhexyl)phthalate	Soil	179	36	0.036 to [130]	36/179
Butanone[2-]	Soil	65	3	0.003 to 0.095	3/65
Butylbenzene[sec-]	Soil	50	1	0.002 to [0.006]	1/50
Butylbenzylphthalate	Soil	178	1	[0.0484 to 38]	1/178
Chrysene	Soil	178	15	0.038 to [38]	15/178
Di-n-butylphthalate	Soil	178	8	0.052 to [38]	8/178
Di-n-octylphthalate	Soil	178	2	0.04 to [38]	2/178
Dibenz(a,h)anthracene	Soil	178	2	[0.0484 to 38]	2/178
Dibenzofuran	Soil	178	6	0.059 to [38]	6/178
DRO	Soil	70	17	[4.1] to 44000	17/70
Dimethyl Phthalate	Soil	178	1	0.06 to [38]	1/178
Ethylbenzene	Soil	65	3	0.002 to [0.0061]	3/65
Fluoranthene	Soil	178	17	0.056 to 65	17/178
Fluorene	Soil	178	6	[0.0846 to 38]	6/178
Hexanone[2-]	Soil	65	2	0.006 to 0.18	2/65
Indeno(1,2,3-cd)pyrene	Soil	178	10	[0.0484 to 38]	10/178
Isopropyltoluene[4-]	Soil	50	2	0.004 to [0.006]	2/50

Table 2.2-4
Frequency of Detected Organic Chemicals in the Mesa Top Subarea (continued)

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range (mg/kg)[a]	Frequency of Detects[b]
LRO	Soil	36	21	27 to 55000	21/36
Methyl-2-pentanone[4-]	Soil	65	1	[0.011 to 0.026]	1/65
Methylene Chloride	Soil	65	9	[0.003 to 0.041]	9/65
Methylnaphthalene[2-]	Soil	178	4	[0.121 to 38]	4/178
Naphthalene	Soil	182	5	[0.005 to 38]	5/182
Phenanthrene	Soil	178	18	[0.0605] to 64	18/178
Phenol	Soil	178	1	0.048 to [38]	1/178
Pyrene	Soil	178	19	[0.0484] to 55	19/178
Tetrachloroethene	Soil	65	3	0.001 to [0.0061]	3/65
Toluene	Soil	65	10	0.002 to [0.069]	10/65
Trichloro-1,2,2-trifluoro-ethane[1,1,2-]	Soil	50	2	0.002 to [0.006]	2/50
Trichloroethene	Soil	67	6	0.001 to 0.017	6/67
Trichlorofluoromethane	Soil	65	11	0.002 to 0.017	11/65
Trimethylbenzene[1,2,4-]	Soil	50	2	0.005 to 0.01	2/50
Trimethylbenzene[1,3,5-]	Soil	50	2	0.003 to [0.006]	2/50
Xylene (total)	Soil	63	6	0.001 to 0.032	6/63

[a] Values in square brackets indicate nondetected results.

[b] Value is the ratio of the number of detected values to the number of analyses.

2.2.1.4 Comparison of Radionuclides with Background Values/Fallout Values for the Mesa Top Subarea

The number of samples analyzed for each radionuclide analytical suite are presented in Table 2.2-1. These analyses were compared with the Laboratory background values that are presented in "Inorganic and Radionuclide Background Data for Soils, Canyon Sediments, and Bandelier Tuff at Los Alamos National Laboratory" (LANL 1998, 59730). The analytical methods used for the Mesa Top Subarea radionuclide analyses are comparable to those used for the Laboratory background data.

The detected radionuclides associated with worldwide fallout in soil include cesium-137, plutonium-238, plutonium-239, and strontium-90. Cobalt-60, europium-152, tritium, uranium-234, uranium-235, and uranium-238 were also detected in soil.

Detection status was determined by quantitation limits agreed upon in contracts with the analytical laboratories, minimum detectable activities/concentrations determined by the analytical laboratories, or the 1-sigma total propagated uncertainty (TPU). Detection status was used as the preliminary data evaluation step for isotopic uranium by alpha spectroscopy, for isotopic plutonium by alpha spectroscopy, for tritium by liquid scintillation, and for strontium-90 by beta scintillation.

Gamma spectroscopy measured concentrations of 42 radionuclides with varying certainty and applicability to Laboratory discharges. According to Laboratory ER Project guidance (LANL 2000, 71233), the eight gamma spectroscopy radionuclides that should be retained and evaluated in data review are americium-241, cesium-134, cesium-137, cobalt-60, europium-152, ruthenium-106, sodium-22, and uranium-235. This list represents radionuclides that are potential historical contaminants, have half-lives greater than 1 year, and are reliably measured by gamma spectroscopy. Among these eight gamma spectroscopy radionuclides, cesium-137, cobalt-60, europium-152, and uranium-235 were detected in the soil samples.

Table 2.2-5 presents the concentration range and frequency of detects above background values for these radionuclides in the Mesa Top Subarea.

Table 2.2-5
Frequency of Detected Radionuclides in the Mesa Top Subarea

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range (pCi/g)[a]	Background Value (pCi/g)	Frequency of Detects Above Background Value[b, c]
Americium-241	Soil	127	0	[-0.49 to 0.814]	0.013	0/127
Cesium-134	Soil	46	0	[-0.064 to 0.1]	NA[d]	0/46
Cesium-137	Soil	127	17	[-0.067] to 2.94	1.65	17/127
Cobalt-60	Soil	127	8	[-0.09] to 0.654	NA	8/127
Europium-152	Soil	126	4	[-0.205] to 0.506	NA	4/126
Plutonium-238	Soil	199	9	[-0.776 to 0.228]	0.023	7/199
Plutonium-239	Soil	199	29	[-0.601] to 6.61	0.054	27/199
Ruthenium-106	Soil	127	0	[-0.622 to 1.517]	NA	0/127
Sodium-22	Soil	127	0	[-0.0778 to 0.2267]	NA	0/127
Strontium-90	Soil	90	50	[-0.86] to 1140	1.31	50/90
Tritium	Soil	121	63	[-1.07 to 165]	NA	63/121
Uranium-234	Soil	199	193	[0] to 9.75	2.59	4/199
Uranium-235	Soil	202	98	[-0.214] to 1.124	0.2	6/202
Uranium-238	Soil	199	194	0.222 to 55.327	2.29	2/199

[a] Values in square brackets indicate nondetected results.

[b] Value is the ratio of the number of detected values exceeding the background value/fallout value to the number of analyses.

[c] Detected fallout radionuclides at a depth greater than 6 in. are included as detects above background, whether or not the detected result was above the background value.

[d] NA = not applicable.

Table 2.2-6 presents the Mesa Top Subarea radionuclides that were detected above background values or that were detected and for which there are no associated background values. For a list of specific samples and details, see Appendix C

Table 2.2-6
Radionuclide Data Review for the Mesa Top Subarea

	Comparison to Background Values for Soil			Comparison to Background Values for Qbt 2,3,4		
Analyte	*Not detected above background, or not detected if background value is not available*	*Reporting limits above background*	*Detected above background, or detected if background value is not available*	*Not detected above background, or not detected if background value is not available*	*Reporting limits above background*	*Detected above background, or detected if background value is not available*
Americium-241		•		•		
Cesium-134	•			•		
Cesium-137			•	•		
Cobalt-60			•	•		
Europium-152			•			•
Ruthenium-106	•			•		
Sodium-22	•			•		
Tritium			•			•
Plutonium-238		•	•			•
Plutonium-239		•	•			•
Strontium-90			•			•

Table 2.2-6
Radionuclide Data Review for the Mesa Top Subarea (continued)

	Comparison to Background Values for Soil			Comparison to Background Values for Qbt 2,3,4		
Analyte	*Not detected above background, or not detected if background value is not available*	*Reporting limits above background*	*Detected above background, or detected if background value is not available*	*Not detected above background, or not detected if background value is not available*	*Reporting limits above background*	*Detected above background, or detected if background value is not available*
Uranium-234			•			•
Uranium-235		•	•		•	•
Uranium-238			•	•		

In summary, 10 radionuclides were detected above background values or fallout values, or were detected and had no associated background values or fallout values.

2.2.2 Ten Site Slope Subarea

2.2.2.1 Samples Collected in the Ten Site Slope Subarea

Samples collected in the Ten Site Slope Subarea were analyzed for the chemical suites listed in Table 2.2-7. The samples are shown on Figure 2.1-5 and Figure 2.1-6. Complete lists of each sample collected and what analytical suites each was analyzed for can be found in Appendix C. The number of samples analyzed for organic chemicals, TAL metals, and radionuclides is also presented in Table 2.2-7.

Table 2.2-7
Number of Samples Analyzed from the Ten Site Slope Subarea

Analytical Suite	All Horizons	Sediment	Qbt 3	Total
PCBs	19	2	—	21
Pesticides and PCBs	5	—	—	5
SVOCs	87	2	9	98
VOCs	18	—	1	19
TPH DRO	15	—	—	15
TPH LRO	15	—	—	15
Inorganic chemicals (TAL metals)	25	2	8	35
Limited list TAL metals	27	—	—	27
Non-TAL metals	27	—	—	27
XRF	29	—	—	29
Gamma spectroscopy radionuclides	123	2	13	138
Tritium	34	—	—	34
Isotopic plutonium	97	2	7	106
Isotopic uranium	127	2	13	142
Strontium-90	40	0	0	40

2.2.2.2 Comparison of Inorganic Chemicals with Background Values for the Ten Site Slope Subarea

TAL metals were analyzed for in 62 soil samples (35 for the full TAL suite and 27 for a limited-list TAL metal suite) collected in the Ten Site Slope Subarea. Inorganic chemical sample results were compared with background values (LANL 1998, 59730).

Table 2.2-8 presents the concentration range and frequency of results above background values for the detected inorganic chemicals in the Ten Site Slope Subarea. For soil, ten TAL metals (antimony, beryllium, cadmium, chromium, cobalt, copper, lead, mercury, silver, and zinc) were detected above the background values in at least one sample. Also, antimony, cadmium, mercury, selenium, silver, and thallium reporting limits were above background values. Aluminum, arsenic, barium, calcium, iron, magnesium, manganese, nickel, potassium, sodium, and vanadium were detected below background values.

For the sediment samples, there were no TAL metals detected above the background values. Two selenium results had reporting limits above the background values.

For the tuff samples, barium, chromium, copper, lead, mercury, nickel, and zinc were detected above background values in at least one sample. Also, arsenic, cobalt, mercury, and selenium results had reporting limits above background values. Aluminum, antimony, beryllium, cadmium, calcium, iron, magnesium, manganese, potassium, silver, sodium, thallium, and vanadium were detected below background values.

Table 2.2-8
Frequency of Detected Inorganic Chemicals in the Ten Site Slope Subarea

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range (mg/kg)[a]	Background Value (mg/kg)	Frequency of Detects Above Background Value[b]	Frequency of Nondetects Above Background Value[c]
Aluminum	Qbt 3	8	8	1300 to 6960	7340	0/8	0/0
Antimony		1	1	0.5 to 0.5	0.5	0/1	0/0
Arsenic		8	0	[0.89 to 3.1]	2.79	0/8	1/8
Barium		8	7	17 to 59.7	46	2/8	0/1
Beryllium		8	7	[0.24] to 0.67	1.21	0/8	0/1
Cadmium		8	0	[0.1 to 0.3]	1.63	0/8	0/8
Calcium		8	7	[448] to 1530	2200	0/8	0/1
Chromium (total)		8	8	4 to 56.6	7.14	5/8	0/0
Cobalt		8	0	[0.18 to 3.7]	3.14	0/8	2/8
Copper		8	7	2.7 to 44.8	4.66	2/8	0/1
Iron		8	8	2680 to 9310	14500	0/8	0/0
Lead		8	8	3.2 to 26.7	11.2	3/8	0/0
Magnesium		8	7	[283] to 964	1690	0/8	0/1
Manganese		8	8	87.8 to 338	482	0/8	0/0
Mercury		8	6	[0.02] to 2.7	0.1	2/8	1/2
Nickel		8	7	[2.3] to 27.9	6.58	4/8	0/1
Potassium		8	7	[217] to 995	3500	0/8	0/1
Selenium		8	0	[0.3 to 1.1]	0.3	0/8	6/8
Silver		8	0	[0.1 to 0.19]	1	0/8	0/8
Sodium		8	0	[84.8 to 396]	2770	0/8	0/8
Thallium		8	1	[0.41 to 1.1]	1.1	0/8	0/7
Vanadium		8	7	[2.3] to 12.7	17	0/8	0/1
Zinc		8	8	14.4 to 194	63.5	2/8	0/0

Table 2.2-8
Frequency of Detected Inorganic Chemicals in the Ten Site Slope Subarea (continued)

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range (mg/kg)[a]	Background Value (mg/kg)	Frequency of Detects Above Background Value[b]	Frequency of Nondetects Above Background Value[c]
Aluminum	Sediment	2	2	4700 to 6700	15400	0/2	0/0
Antimony		2	0	[0.4 to 0.4]	0.83	0/2	0/2
Arsenic		2	2	2.5 to 3	3.98	0/2	0/0
Barium		2	2	45 to 58	127	0/2	0/0
Beryllium		2	0	[0.5 to 0.51]	1.31	0/2	0/2
Cadmium		2	0	[0.025 to 0.025]	0.4	0/2	0/2
Calcium		2	2	940 to 970	4420	0/2	0/0
Chromium (total)		2	2	4.9 to 6.3	10.5	0/2	0/0
Cobalt		2	2	2.7 to 3.9	4.73	0/2	0/0
Copper		2	2	3.2 to 4.1	11.2	0/2	0/0
Iron		2	2	8400 to 10000	13800	0/2	0/0
Lead		2	2	7.8 to 10	19.7	0/2	0/0
Magnesium		2	2	740 to 1000	2370	0/2	0/0
Manganese		2	2	180 to 210	543	0/2	0/0
Mercury		2	0	[0.1 to 0.1]	0.1	0/2	0/2
Nickel		2	2	2.6 to 3.7	9.38	0/2	0/0
Potassium		2	2	990 to 1100	2690	0/2	0/0
Selenium		2	0	[1 to 1]	0.3	0/2	2/2
Silver		2	0	[0.2 to 0.2]	1	0/2	0/2
Sodium		2	2	70 to 83	1470	0/2	0/0
Thallium		2	0	[0.25 to 0.25]	0.73	0/2	0/2
Vanadium		2	2	7.4 to 11	19.7	0/2	0/0
Zinc		2	2	37 to 49	60.2	0/2	0/0

Table 2.2-8
Frequency of Detected Inorganic Chemicals in the Ten Site Slope Subarea (continued)

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range (mg/kg)[a]	Background Value (mg/kg)	Frequency of Detects Above Background Value[b]	Frequency of Nondetects Above Background Value[c]
Aluminum	Soil	52	52	306 to 15800	29200	0/52	0/0
Antimony		44	2	[0.1 to 10.4]	0.83	2/44	25/42
Arsenic		52	21	[0.61] to 3.7	8.17	0/52	0/31
Barium		52	30	[5] to 130	295	0/52	0/22
Beryllium		52	22	[0.21] to 1.9	1.83	1/52	0/30
Cadmium		52	5	[0.026] to 2.3	0.4	2/52	30/47
Calcium		52	31	[170] to 3620	6120	0/52	0/21
Chromium (total)		52	35	[1] to 25.7	19.3	1/52	0/17
Cobalt		52	15	[0.14] to 11	8.64	1/52	0/37
Copper		52	30	[0.61] to 88.3	14.7	5/52	0/22
Iron		52	52	1990 to 12300	21500	0/52	0/0
Lead		52	52	1.1 to 92	22.3	6/52	0/0
Lithium		27	2	[0.4] to 25	NA[d]	2/27	NA
Magnesium		52	29	[73] to 3220	4610	0/52	0/23
Manganese		52	52	61.8 to 349	671	0/52	0/0
Mercury		25	8	[0.02] to 1.3	0.1	3/25	10/17
Molybdenum		27	0	[2 to 6.6]	NA	0/27	NA
Nickel		52	24	[1.8] to 10.1	15.4	0/52	0/28
Potassium		52	28	200 to 2200	3460	0/52	0/24
Selenium		52	3	0.19 to [3.4]	1.52	0/52	1/49
Silver		52	3	[0.05] to 13.7	1	2/52	8/49
Sodium		52	15	[20 to 366]	915	0/52	0/37
Strontium		27	3	[0.61 to 22.9]	NA	3/27	NA
Thallium		52	2	[0.1 to 1.5]	0.73	0/52	9/50
Vanadium		52	27	[1.2] to 21.4	39.6	0/52	0/25
Zinc		28	28	24 to 752	48.8	10/28	0/0

[a] Values in square brackets indicate nondetected results.

[b] Value is the ratio of the number of detected values exceeding the background value to the number of analyses.

[c] Value is the ratio of the number of not detected values exceeding the background value to the number of not detected analyses.

[d] NA = not applicable.

In summary, for both soil and tuff in the Ten Site Slope Subarea, 15 inorganic chemicals (antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, mercury, nickel, selenium, silver, thallium, and zinc) were either detected above background values or had reporting limits above background values (Table 2.2-9). For a list of specific samples with detects above background values and sample details, see Appendix C.

Table 2.2-9
Inorganic Chemical Data Review for the Ten Site Slope Subarea

	Comparison to Background Values for Soil			Comparison to Background Values for Qbt 2,3,4		
Analyte	*Not detected above background*	*Reporting limits above background*	*Detected above background*	*Not detected above background*	*Reporting limits above background*	*Detected above background*
Aluminum	•			•		
Antimony		•	•		•	•
Arsenic	•				•	•
Barium	•					•
Beryllium			•	•		
Cadmium		•	•	•		
Calcium	•			•		
Chromium			•			•
Cobalt			•		•	
Copper			•		•	•
Iron	•			•		
Lead			•			•
Magnesium	•			•		
Manganese	•			•		
Mercury		•	•		•	•
Nickel	•					•
Potassium	•			•		
Selenium		•			•	
Silver		•	•		•	
Sodium	•			•		
Thallium		•			•	
Vanadium	•			•		
Zinc			•			•

2.2.2.3 Evaluation of Organic Chemicals Detected in the Ten Site Slope Subarea

Samples in the Ten Site Slope Subarea were analyzed for SVOCs by US EPA SW-846 Method 8270, for VOCs by EPA Method 8260, for organochlorine pesticides by EPA Method 8081, for PCBs by EPA Method 8082, and for TPH by EPA Guidance 8015. A total of 98 samples were analyzed for SVOCs, 19 were analyzed for VOCs, 5 were analyzed for pesticides/PCBs, 21 were analyzed for PCBs only, and 15 were analyzed for TPH DRO and TPH LRO. Forty organic compounds were detected in these samples (soil and Qbt).

Table 2.2-10 presents the concentration range and frequency of detects for these analytes. In summary, 40 organic chemicals were detected in at least 1 sample. For a list of specific samples with detected organic chemicals and sample details, see Appendix C.

Table 2.2-10
Frequency of Detected Organic Chemicals in the Ten Site Slope Subarea

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range (mg/kg)[a]	Frequency of Detects[b]
Benzo(a)anthracene	Qbt 3	9	2	0.109 to [0.66]	2/9
Benzo(g,h,i)perylene		9	1	[0.1] to 0.738	1/9
Chrysene		9	1	[0.1 to 0.66]	1/9
Di-n-butylphthalate		7	1	0.035 to [0.66]	1/7
Dibenz(a,h)anthracene	Sediment	2	1	[0.33 to 0.33]	1/2
Acenaphthene	Soil	85	1	0.075 to [7.4]	1/85
Acetone		18	2	[0.005] to 0.61	2/18
Aldrin		5	2	[0.00193] to 0.0106	2/5
Anthracene		85	2	0.083 to [7.4]	2/85
Aroclor-1254		23	1	[0.034 to 0.2807]	1/23
Aroclor-1260		23	3	[0.034 to 0.2807]	3/23
Benzo(a)anthracene		85	8	0.026 to [7.4]	8/85
Benzo(a)pyrene		85	7	0.03 to [7.4]	7/85
Benzo(b)fluoranthene		85	7	0.03 to [7.4]	7/85
Benzo(g,h,i)perylene		85	6	0.021 to [7.4]	6/85
Benzo(k)fluoranthene		85	7	0.029 to [7.4]	7/85
Bis(2-ethylhexyl)phthalate		80	16	[0.038] to 4.8	16/80
Butanone[2-]		18	2	0.004 to [0.026]	2/18
Butylbenzylphthalate		80	1	[0.14 to 7.4]	1/80
Chloroaniline[4-]		80	1	[0.14 to 15]	1/80
Chrysene		85	8	0.037 to [7.4]	8/85
DDD[4,4'-]		5	1	[0.00375] to 0.00877	1/5
DDT[4,4'-]		5	1	[0.00375] to 0.0075	1/5
Dibenz(a,h)anthracene		85	4	0.047 to [7.4]	4/85
Dieldrin		5	1	[0.00375] to 0.0196	1/5
Diethylphthalate		80	2	[0.14 to 7.4]	2/80
Di-n-butylphthalate		80	9	0.018 to [7.4]	9/80
Di-n-octylphthalate		80	1	0.018 to [7.4]	1/80
Endosulfan I		5	1	[0.00193] to 0.0074	1/5
Endrin		5	1	[0.00375] to 0.0163	1/5
Ethylbenzene		18	1	0.002 to [0.006]	1/18
Fluoranthene		85	9	0.035 to [7.4]	9/85

Table 2.2-10
Frequency of Detected Organic Chemicals in the Ten Site Slope Subarea (continued)

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range (mg/kg)[a]	Frequency of Detects[b]
Indeno(1,2,3-cd)pyrene	Soil (continued)	85	3	0.098 to [7.4]	3/85
Isopropyltoluene[4-]		18	1	[0.005] to 0.025	1/18
LRO		15	12	33 to 20000	12/15
Phenanthrene		85	6	0.038 to [7.4]	6/85
Phenol		80	1	0.041 to [7.4]	1/80
Pyrene		85	10	0.034 to [7.4]	10/85
Tetrachloroethene		18	1	0.005 to [0.006]	1/18
Toluene		18	5	0.002 to 0.073	5/18
Trichloro-1,2,2-trifluoroethane[1,1,2-]		12	1	0.002 to [0.006]	1/12
Trichloroethene		18	1	0.003 to [0.006]	1/18
Trichlorofluoromethane		18	2	0.001 to [0.006]	2/18
Trimethylbenzene[1,2,4-]		18	1	0.003 to [0.006]	1/18
Xylene (total)		18	2	0.002 to 0.009	2/18

[a] Values in square brackets indicate nondetected results.

[b] Value is ratio of the number of detected values to the number of analyses.

2.2.2.4 Comparison of Radionuclides with Background Values/Fallout Values for the Ten Site Slope Subarea

The number of samples analyzed for each radionuclide analytical suite are presented in Table 2.1-11. These results were compared with the background values (LANL 1998, 59730). The analytical methods used for the Ten Site Slope Subarea radionuclide analyses are comparable to those used for the Laboratory background data.

The detected radionuclide isotopes associated with worldwide fallout in the soil media include europium-152, tritium, cesium-137, plutonium-238, plutonium-239, and strontium-90. Uranium-234, uranium-235, and uranium-238 were also detected in the soil samples. For sediment samples, cesium-137 and plutonium-239 were detected above fallout values. For the Qbt 3 media, uranium-235 was detected above background values.

Table 2.2-11 presents the concentration range and frequency of results above background values or fallout values for these radionuclides in the Ten Site Slope Subarea.

Table 2.2-11
Frequency of Detected Radionuclides in the Ten Site Slope Subarea

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range (pCi/g)[a]	Background Value (pCi/g)	Frequency of Detects Above Background Value[b, c]
Americium-241	Qbt 3	13	0	[-0.472 to 0.42]	NA[d]	0/13
Cesium-134	Qbt 3	7	0	[0.09 to 0.17]	NA	0/7
Cesium-137	Qbt 3	13	0	[-0.044 to 0.12]	NA	0/13
Cobalt-60	Qbt 3	13	0	[-0.022 to 0.1]	NA	0/13
Europium-152	Qbt 3	13	0	[-0.046 to 0.58]	NA	0/13
Plutonium-238	Qbt 3	7	0	[-0.002 to 0.052]	NA	0/7
Plutonium-239	Qbt 3	7	0	[0.002 to 0.021]	NA	0/7
Ruthenium-106	Qbt 3	13	0	[-0.122 to 1.27]	NA	0/13

Table 2.2-11
Frequency of Detected Radionuclides in the Ten Site Slope Subarea (continued)

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range (pCi/g)[a]	Background Value (pCi/g)	Frequency of Detects Above Background Value[b, c]
Sodium-22	Qbt 3	13	0	[-0.019 to 0.09]	NA	0/13
Uranium-234	Qbt 3	13	13	0.421 to 1.9	1.98	0/13
Uranium-235	Qbt 3	13	12	0.011 to [0.57]	0.09	1/13
Uranium-238	Qbt 3	13	13	0.441 to 1.6	1.93	0/13
Americium-241	Sediment	2	0	[-0.26 to 0.26]	0.04	0/2
Cesium-134	Sediment	2	0	[-0.036 to -0.035]	NA	0/2
Cesium-137	Sediment	2	1	[0.4] to 0.96	0.9	1/2
Cobalt-60	Sediment	2	0	[0.007 to 0.007]	NA	0/2
Europium-152	Sediment	2	0	[-0.18 to -0.06]	NA	0/2
Plutonium-238	Sediment	2	0	[-0.0043 to 0.0026]	0.006	0/2
Plutonium-239	Sediment	2	2	0.164 to 0.173	0.068	2/2
Ruthenium-106	Sediment	2	0	[-0.26 to -0.16]	NA	0/2
Sodium-22	Sediment	2	0	[-0.03 to 0]	NA	0/2
Uranium-234	Sediment	2	2	1.362 to 1.88	2.59	0/2
Uranium-235	Sediment	2	2	0.055 to 0.115	0.2	0/2
Uranium-238	Sediment	2	2	1.7 to 1.85	2.29	0/2
Americium-241	Soil	121	0	[-0.461 to 0.68]	0.013	0/121
Cesium-134	Soil	72	0	[-0.1016 to 0.19]	NA	0/72
Cesium-137	Soil	122	11	[-0.0955] to 0.966	1.65	6/122
Cobalt-60	Soil	121	0	[-0.183 to 0.18]	NA	0/121
Europium-152	Soil	121	3	[-0.384 to 0.925]	NA	3/121
Plutonium-238	Soil	97	7	[-0.0736 to 0.0803]	0.023	6/97
Plutonium-239	Soil	97	28	[-0.0347] to 1.59	0.054	25/97
Ruthenium-106	Soil	121	0	[-0.995 to 1.33]	NA	0/121
Sodium-22	Soil	121	0	[-0.14 to 0.194]	NA	0/121
Strontium-90	Soil	40	2	[-0.37] to 1.25	1.31	2/40
Tritium	Soil	34	27	[0.00677] to 1.74	NA	27/34
Uranium-234	Soil	127	127	0.339 to 96.29	2.59	5/127
Uranium-235	Soil	161	82	[-0.0429] to 5.941	0.2	6/161
Uranium-238	Soil	127	124	[0.0809] to 5.05	2.29	4/127

[a] Values in square brackets indicate nondetected results.

[b] Value is the ratio of the number of detected values exceeding the background value/fallout value to the number of detects.

[c] Detected fallout radionuclides at a depth greater than six inches are included as detects above background, whether or not the detected result was above the background value.

[d] NA = not applicable.

Table 2.2-12 presents the radionuclide results that were detected above background values or fallout values, or that were detected and for which there are no associated background values or fallout values. For a list of specific samples and details, see Appendix C.

Table 2.2-12
Radionuclide Data Review for the Ten Site Slope Subarea

	Comparison to Background Values for Soil			Comparison to Background Values for Qbt 2,3,4		
Analyte	*Not detected above background, or not detected if background value is not available*	*Reporting limits above background*	*Detected above background, or detected if background value is not available*	*Not detected above background, or not detected if background value is not available*	*Reporting limits above background*	*Detected above background, or detected if background value is not available*
Americium-241		•		•		
Cesium-134	•			•		
Cesium-137			•			•
Cobalt-60			•	•		
Europium-152			•			•
Ruthenium-106			•	•		
Sodium-22	•			•		
Plutonium-238		•	•			•
Plutonium-239		•	•			•
Uranium-234			•			•
Uranium-235			•		•	•
Uranium-238			•			•
Strontium-90	•					•
Tritium			•			•

In summary, the radionuclide data review yielded 9 radionuclides (cesium-137, europium-152, plutonium-238, plutonium-239, uranium-234, uranium-235, uranium-238, strontium-90, and tritium) that were detected above background values or fallout values, or that were detected and for which there are no associated background values or fallout values.

2.2.3 Mortandad Slope Subarea

2.2.3.1 Samples Collected in the Mortandad Slope Subarea

Samples collected in the Mortandad Slope Subarea were analyzed for the chemical suites listed in Table 2.2-13. The samples are shown on Figure 2.1-8 and Figure 2.1-9. Complete tables of each sample collected and what analytical suites it was analyzed for can be found in Appendix C. The number of samples analyzed for organic chemicals, TAL metals, and radionuclides is presented in Table 2.2-13.

Table 2.2-13
Number of Samples Analyzed from the Mortandad Slope Subarea

Analytical Suite	All Horizons	Qbt 3	Total
PCBs	69	—	69
Pesticides and PCBs	8	—	8
SVOCs	105	2	107
VOCs	57	—	57
TPH DRO	49	—	49
TPH LRO	46	—	46
Inorganic chemicals (TAL metals)	35	—	35
Limited list TAL metals	6	—	6
Non-TAL metals	6	—	6

Table 2.2-13
Number of Samples Analyzed from the Mortandad Slope Subarea (continued)

Analytical Suite	All Horizons	Qbt 3	Total
XRF	77	2	79
Gamma spectroscopy radionuclides	59	1	60
Tritium	30	—	30
Isotopic plutonium	74	1	75
Isotopic uranium	74	1	75
Strontium-90	35	—	35

2.2.3.2 Comparison of Inorganic Chemicals with Background Values for the Mortandad Slope Subarea

TAL metals were analyzed for in 41 soil samples (35 for the full TAL metal suite and 6 for limited-list TAL metals) collected from the Mortandad Slope Subarea. Inorganic chemical sample results were compared with sediment background values (LANL 1998, 59730).

Table 2.2-14 presents the concentration range and frequency of results above background values for the detected inorganic chemicals at the Mortandad Slope Subarea.

For soil samples, 11 TAL metals (antimony, beryllium, cadmium, chromium, copper, lead, manganese, mercury, nickel, and thallium and zinc) were detected above background values in at least 1 sample. Also, antimony, cadmium, mercury, selenium, silver, and thallium had reporting limits above background values. Aluminum, arsenic, barium, calcium, cobalt, iron, magnesium, potassium, sodium, and vanadium were detected below background values.

Table 2.2-14
Frequency of Detected Inorganic Chemicals in the Mortandad Slope Subarea

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range (mg/kg)[a]	Background Value (mg/kg)	Frequency of Detects Above Background Value[b]	Frequency of Nondetects Above Background Value[c]
Aluminum	Soil	41	41	510 to 13800	29200	0/41	0/0
Antimony	Soil	41	1	[0.25 to 10.8]	0.83	1/41	35/40
Arsenic	Soil	41	30	[0.2 to 3.9]	8.17	0/41	0/11
Barium	Soil	41	36	5.9 to 144	295	0/41	0/5
Beryllium	Soil	41	18	0.22 to 2.6	1.83	2/41	0/23
Cadmium	Soil	41	1	[0.09] to 2.1	0.4	1/41	36/40
Calcium	Soil	41	38	[270] to 4350	6120	0/41	0/3
Chromium (total)	Soil	41	40	[1.6] to 197	19.3	6/41	0/1
Cobalt	Soil	41	12	[0.5 to 5.9]	8.64	0/41	0/29
Copper	Soil	41	36	1.3 to 25.2	14.7	4/41	0/5
Iron	Soil	41	41	1760 to 12300	21500	0/41	0/0
Lead	Soil	41	38	1.6 to 33.5	22.3	1/41	0/3
Lithium	Soil	6	3	[3.3 to 7.6]	NA[d]	3/6	NA
Magnesium	Soil	41	34	116 to 2080	4610	0/41	0/7
Manganese	Soil	41	41	27.7 to 822	671	1/41	0/0
Mercury	Soil	35	3	[0.041] to 0.36	0.1	1/35	2/32
Molybdenum	Soil	6	0	[0.85 to 9.3]	NA	0/6	NA
Nickel	Soil	41	30	[2] to 110	15.4	3/41	0/11

Table 2.2-14
Frequency of Detected Inorganic Chemicals in the Mortandad Slope Subarea (continued)

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range (mg/kg)[a]	Background Value (mg/kg)	Frequency of Detects Above Background Value[b]	Frequency of Nondetects Above Background Value[c]
Potassium	Soil	41	32	[114] to 2550	3460	0/41	0/9
Selenium	Soil	41	0	[0.18 to 8.6]	1.52	0/41	3/41
Silver	Soil	41	5	[0.29 to 1.1]	1	0/41	1/36
Sodium	Soil	41	32	[62.1] to 598	915	0/41	0/9
Strontium	Soil	6	3	1.1 to [17.2]	NA	3/6	NA
Thallium	Soil	41	3	[0.14 to 30.6]	0.73	1/41	6/38
Vanadium	Soil	41	35	1.5 to 29.5	39.6	0/41	0/6
Zinc	Soil	36	36	9.4 to 146	48.8	3/36	0/0

[a] Values in square brackets indicate nondetected results.

[b] Value is the ratio of the number of detected values exceeding the background value to the number of analyses.

[c] Value is the ratio of the number of not-detected values exceeding the background value to the number of not-detected analyses.

[d] NA = not applicable.

In summary, in the Mortandad Slope Subarea, 13 inorganic chemicals (antimony, beryllium, cadmium, chromium, copper, lead, manganese, mercury, nickel, selenium, silver, thallium, and zinc) were either detected above background values or had not-detected results with reporting limits above background values (Table 2.2-15). For a list of specific samples with detects above background values and sample details, see Appendix C.

Table 2.2-15
Inorganic Chemical Data Review for the Mortandad Slope Subarea

	Comparison to Background Values for Soil			Comparison to Background Values for Qbt 2,3,4		
Analyte	*Not detected above background*	*Reporting limits above background*	*Detected above background*	*Not detected above background*	*Reporting limits above background*	*Detected above background*
Aluminum	•			•		
Antimony		•			•	
Arsenic	•			•		
Barium	•			•		
Beryllium			•	•		
Cadmium		•	•	•		
Calcium	•			•		
Chromium			•			•
Cobalt	•			•		
Copper			•		•	
Iron	•			•		
Lead			•			•
Magnesium	•			•		
Manganese			•	•		
Mercury		•	•	•		
Nickel			•			•
Potassium	•			•		
Selenium		•			•	

Table 2.2-15
Inorganic Chemical Data Review for the Mortandad Slope Subarea (continued)

	Comparison to Background Values for Soil			Comparison to Background Values for Qbt 2,3,4		
Analyte	*Not detected above background*	*Reporting limits above background*	*Detected above background*	*Not detected above background*	*Reporting limits above background*	*Detected above background*
Silver		•		•		
Sodium	•			•		
Thallium		•	•	•		
Vanadium	•			•		
Zinc			•	•		

2.2.3.3 Evaluation of Organic Chemicals Detected in the Mortandad Slope Subarea

Samples in the Mortandad Slope Subarea were analyzed for SVOCs by EPA SW-846 Method 8270, for VOCs by EPA Method 8260, for organochlorine pesticides by EPA Method 8081, and for PCBs by EPA Method 8082. A total of 107 samples were analyzed for SVOCs, 57 were analyzed for VOCs, 8 were analyzed for pesticides/PCBs, and 69 were analyzed for PCBs only. Thirty-seven organic compounds were detected in these samples (soil and Qbt).

Table 2.2-16 presents the concentration range and frequency of detects for these analytes. In summary, 37 organic chemicals were detected in at least 1 sample. For a list of specific samples with detected organic chemicals and sample details, see Appendix C.

Table 2.2-16
Frequency of Detected Organic Chemicals in the Mortandad Slope Subarea

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range (mg/kg)[a]	Frequency of Detects[b]
Acenaphthene	Soil	104	11	0.042 to [41]	11/104
Acetone	Soil	57	27	[0.003] to 0.51	27/57
Aniline	Soil	104	1	0.21 to [41]	1/104
Anthracene	Soil	104	15	0.053 to [41]	15/104
Aroclor-1254	Soil	77	9	[0.0149 to 10]	9/77
Aroclor-1260	Soil	77	4	[0.015 to 10]	4/77
Azobenzene	Soil	104	4	[0.33 to 41]	4/104
Benzo(a)anthracene	Soil	104	16	0.026 to [41]	16/104
	Qbt 3	2	1	[0.36] to 0.62	1/2
Benzo(a)pyrene	Soil	104	18	0.04 to 48	18/104
	Qbt 3	2	1	[0.36] to 0.82	1/2
Benzo(b)fluoranthene	Soil	104	17	0.036 to 52	17/104
	Qbt 3	2	1	[0.36] to 0.92	1/2
Benzo(g,h,i)perylene	Soil	104	13	[0.33 to 41]	13/104
	Qbt 3	2	1	[0.36] to 0.48	1/2
Benzo(k)fluoranthene	Soil	104	15	0.027 to 45	15/104
	Qbt 3	2	1	[0.36] to 0.44	1/2
Benzoic acid	Soil	104	5	0.039 to [210]	5/104
Bis(2-ethylhexyl)phthalate	Soil	104	15	0.059 to [41]	15/104
Butanone[2-]	Soil	57	1	[0.011 to 0.1]	1/57

Table 2.2-16
Frequency of Detected Organic Chemicals in the Mortandad Slope Subarea (continued)

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range (mg/kg)[a]	Frequency of Detects[b]
Chloroaniline[4-]	Soil	104	1	0.14 to [82]	1/104
Chrysene	Soil	104	19	0.039 to 47	19/104
	Qbt 3	2	1	[0.36] to 0.83	1/2
Di-n-butylphthalate	Soil	104	11	0.038 to [41]	11/104
Dibenz(a,h)anthracene	Soil	104	7	0.17 to [41]	7/104
Dibenzofuran	Soil	104	7	0.082 to [41]	7/104
DRO	Soil	49	33	[4.1] to 27000	33/49
Diethylphthalate	Soil	104	1	[0.33 to 41]	1/104
Fluoranthene	Soil	104	22	0.058 to 70	22/104
	Qbt 3	2	1	[0.36] to 1.9	1/2
Fluorene	Soil	104	8	0.042 to [41]	8/104
Indeno(1,2,3-cd)pyrene	Soil	104	13	[0.33 to 41]	13/104
	Qbt 3	2	1	[0.36] to 0.52	1/2
Isopropyltoluene[4-]	Soil	55	1	[0.005 to 0.01]	1/55
LRO	Soil	46	38	33 to 140000	38/46
Methyl-2-pentanone[4-]	Soil	57	1	[0.011 to 0.1]	1/57
Methylnaphthalene[2-]	Soil	104	7	0.035 to [41]	7/104
Naphthalene	Soil	104	7	0.13 to [41]	7/104
Pentachlorophenol	Soil	104	1	0.23 to [110]	1/104
Phenanthrene	Soil	104	23	0.043 to 59	23/104
	Qbt 3	2	1	[0.36] to 1.5	1/2
Phenol	Soil	104	5	0.057 to [41]	5/104
Pyrene	Soil	104	21	0.05 to 110	21/104
	Qbt 3	2	1	[0.36] to 1.4	1/2
Toluene	Soil	57	6	0.001 to [0.012]	6/57
Trichlorofluoromethane	Soil	55	4	0.001 to [0.01]	4/55
Trichloropropane[1,2,3-]	Soil	55	7	[0.005] to 0.018	7/55

[a] Values in square bracket indicate nondetected results.

[b] Value is ratio of the number of detected values to the number of analyses.

2.2.3.4 Comparison of Radionuclides with Background Values/Fallout Values for the Mortandad Slope Subarea

The number of samples analyzed for each radionuclide analytical suite are presented in Table 2.2-17. These analyses were compared with background values (LANL 1998, 59730). The analytical methods used for the Mortandad Slope Subarea radionuclide analyses are comparable to those used for the Laboratory background data.

The detected radionuclide isotopes associated with worldwide fallout in soil include ruthenium-106, tritium, cesium-137, plutonium-238, and plutonium-239. Uranium-234, uranium-235, and uranium-238 were also detected in the soil samples. No radionuclides were detected in the Qbt 3 media.

Table 2.2-17 presents the concentration range and frequency of results above the background values or fallout values for these radionuclides in the Mortandad Slope Subarea.

Table 2.2-17
Frequency of Detected Radionuclides in the Mortandad Slope Subarea

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range (pCi/g)[a]	Background Value (pCi/g)	Frequency of Detects Above Background Value[b, c]
Americium-241	Soil	57	0	[-0.409 to 0.576]	0.013	0/57
	Qbt 3	1	0	[0.024 to 0.024]	NA[d]	0/1
Cesium-134	Soil	30	0	[-0.117 to 0.057]	NA	0/30
	Qbt 3	1	0	[-0.004 to -0.004]	NA	0/1
Cesium-137	Soil	58	6	[-0.0791] to 0.8	1.65	5/58
	Qbt 3	1	0	[-0.016 to -0.016]	NA	0/1
Cobalt-60	Soil	57	0	[-0.1463 to 0.117]	NA	0/57
	Qbt 3	1	0	[0.051 to 0.051]	NA	0/1
Europium-152	Soil	57	0	[-0.222 to 0.298]	NA	0/57
	Qbt 3	1	0	[-0.01 to -0.01]	NA	0/1
Plutonium-238	Soil	74	5	[-0.007 to 0.034]	0.023	4/74
	Qbt 3	1	0	[0.0033 to 0.0033]	NA	0/1
Plutonium-239	Soil	74	17	[-0.002] to 0.153	0.054	10/74
	Qbt 3	1	0	[0.0125 to 0.0125]	NA	0/1
Ruthenium-106	Soil	57	1	[-0.876 to 0.806]	NA	1/57
	Qbt 3	1	0	[-0.062 to -0.062]	NA	0/1
Sodium-22	Soil	57	0	[-0.1088 to 0.0864]	NA	0/57
	Qbt 3	1	0	[-0.042 to -0.042]	NA	0/1
Strontium-90	Soil	35	0	[-0.83 to 0.53]	1.31	0/35
Thorium-228	Soil	1	0	[3.706 to 3.706]	2.28	0/1
Tritium	Soil	30	27	[0.03] to 4.71	NA	27/30
Uranium-234	Soil	74	74	0.39 to 3.07	2.59	1/74
	Qbt 3	1	1	0.526 to 0.526	1.98	0/1
Uranium-235	Soil	99	56	[-0.095] to 0.242	0.2	1/99
	Qbt 3	1	0	[0.073 to 0.073]	0.09	0/1
Uranium-238	Soil	74	74	0.357 to 3.33	2.29	1/74
	Qbt 3	1	1	0.464 to 0.464	1.93	0/1

[a] Values in square brackets indicate nondetected results.

[b] Value is the ratio of the number of detected values exceeding the background value/fallout value to the number of detects.

[c] Detected fallout radionuclides at a depth greater than 6 inches are included as detects above background, whether or not the detected result was above the background value.

[d] NA = not applicable.

Table 2.2-18 presents the radionuclides in the Mortandad Slope Subarea that were detected above background values or fallout values, or that were detected and for which there are no associated background values or fallout values.

Table 2.2-18
Radionuclide Data Review for the Mortandad Slope Subarea

	Comparison to Background Values for Soil			Comparison to Background Values for Qbt 2,3,4		
Analyte	*Not detected above background, or not detected if background value is not available*	*Reporting limits above background*	*Detected above background, or detected if background value is not available*	*Not detected above background, or not detected if background value is not available*	*Reporting limits above background*	*Detected above background, or detected if background value is not available*
Americium-241		•		•		
Cesium-134	•			•		
Cesium-137			•	•		
Cobalt-60	•			•		
Europium-152	•			•		
Ruthenium-106			•	•		
Sodium-22	•			•		
Plutonium-238		•	•			•
Plutonium-239			•			•
Uranium-234			•			•
Uranium-235			•		•	
Uranium-238			•			•
Strontium-90	•			•		
Tritium			•			•

In summary, the radionuclide data review yielded 8 radionuclides (cesium-137, ruthenium-106, plutonium-238, plutonium-239, uranium-234, uranium-235, uranium-238, and tritium) that were detected above background values or fallout values, or that were detected and for which there are no associated background values or fallout values. For a list of specific samples and details, see Appendix C.

2.2.4 Pratt Canyon Subarea

2.2.4.1 Samples Collected in the Pratt Canyon Subarea

Approximately 15 boreholes (ranging from 10-ft to 100-ft deep) have been drilled on and along the perimeter of the bench at the head of Pratt Canyon. The depth to tuff encountered in the boreholes ranges from 0.5 ft to 19.9 ft. Fractures were notably absent in the majority of the boreholes; very thin (.125-in. to .25-in. in diameter) isolated red-stained or clay-filled fractures were encountered in only a few boreholes. A single connected fracture zone was observed in one borehole [borehole 35-2526 drilled beneath the former location of PRS 35-003(l)] at depths ranging from just below the tuff contact at approximately 20 ft to 27.5 ft. The fractures were not accompanied by elevated radiological field screening measurements. Elevated beta-gamma activity (700 to 1000 cpm) was observed at, and a few feet below, the backfill/tuff interface in boreholes 35-2008 and 35-2009 located beneath the former location of PRS 35-003(d). Analytical data indicate that radionuclides were detected in the majority of the boreholes at varying depths ranging up to 100 ft (LANL 1996, 54422).

RFI samples have been collected from 12 surface and shallow (3 ft) hand-auger locations on the Pratt Canyon slope and canyon floor. Elevated field-screening beta-gamma activities and radionuclide analytical results indicate that radionuclides are present in most samples, with plutonium and uranium the most per-

vasive. Sample depth did not exceed 3 ft; therefore, it is not known if contaminants have infiltrated to greater depths within the canyon floor sediments or into the underlying tuff.

Borehole 35-2028 was drilled in Pratt Canyon to a depth of 299 ft. The borehole encountered the Cerro Toledo interval between 219.5 and 297 ft and penetrated the Otowi Member from 297 ft to 299 ft. Damp samples were observed in core obtained from depth intervals of 220 ft to 270 ft within the Cerro Toledo interval, which suggests possible intermediate zone moisture (LANL 1997, 56835). Elevated plutonium-239/240 activity was present in a sample collected from the 0- to 0.5-ft surface interval and elevated uranium-235 activity was present in a sample collected from the 133.5- to 134.5-ft depth interval (LANL 1996, 54422).

RFI borehole 35-2370 was drilled to a depth of 30 ft near the southeast perimeter of the cattail area and encountered weathered unit Qbt 2 at a depth of 4 ft and saturation extending to a depth of 7.4 ft. Field-screening data indicate slightly elevated beta-gamma activity in cattail area sediments at depths of 2.5 to 4 ft. The data suggest that contaminants may have been transported at least the length of Pratt Canyon.

Samples collected in the Pratt Canyon Subarea were analyzed for the chemical suites listed in Table 2.2-19. Samples are shown on Figure 2.1-10. Complete lists of each sample collected and what analytical suites it was analyzed for can be found in Appendix C. The number of samples analyzed for organic chemicals, TAL metals, and radionuclides are presented in Table 2.2-19.

Table 2.2-19
Number of Samples Analyzed from the Pratt Canyon Subarea

Analytical Suite	Soil and Sediment	Qbt	Total
PCBs	39	20	59
Pesticides and PCBs	10	6	16
SVOCs	78	22	100
VOCs	25	—	25
TPH DRO	5	—	5
TPH LRO	5	—	5
Inorganic chemicals (TAL metals)	22	28	50
Limited list TAL metals	13	3	16
Non-TAL metals	27	22	49
Cyanide	9	—	9
XRF	85	23	108
Americium-241	9	—	9
Gamma spectroscopy radionuclides	44	27	71
Tritium	26	31	57
Isotopic plutonium	108	48	156
Isotopic uranium	108	48	156
Strontium-90	17	21	38

2.2.4.2 Comparison of Inorganic Chemicals with Background Values for the Pratt Canyon Subarea

TAL metals were analyzed for in 66 samples (50 full-suite TAL metals and 16 limited-list TAL metals) collected from the Pratt Canyon Subarea. Inorganic chemical sample results were compared with the sediment background values (LANL 1998, 59730).

Table 2.2-20 presents the concentration range and frequency of results above the background value for the detected inorganic chemicals in the Pratt Canyon Subarea. For the soil samples, four TAL metals (copper, lead, mercury, and zinc) were detected above their background values in at least one sample. Antimony, cadmium, mercury, selenium, silver, and thallium had reporting limits above their background values. Aluminum, arsenic, barium, beryllium, calcium, chromium, cobalt, iron, magnesium, manganese, nickel, potassium, sodium, and vanadium were detected below their background values.

For sediment, cadmium, copper, mercury, and nickel were detected above their background values in at least one sample. Also, reporting limits for cadmium and selenium were above their sediment background values. Aluminum, antimony, arsenic, barium, beryllium, calcium, chromium, cobalt, iron, lead, magnesium, manganese, potassium, silver, sodium, thallium, vanadium, and zinc were not detected above their sediment background values.

For Qbt, aluminum and thallium were detected above their background values in at least one sample. Antimony, arsenic, cadmium, mercury, nickel, selenium, and thallium had reporting limits above their background values. Iron, load, manganese, vanadium, zinc, beryllium, cobalt, copper, potassium, barium, chromium, magnesium, nickel, and sodium were detected below their background values.

Table 2.2-20
Frequency of Detected Inorganic Chemicals in the Pratt Canyon Subarea

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range (mg/kg)	Background Value (mg/kg)[a]	Frequency of Detects Above Background Value[b]	Frequency of Nondetects Above Background Value[c]
Aluminum	Qbo	1	1	3630 to 3630	3560	1/1	0/0
Antimony		1	0	[0.28 to 0.28]	0.5	0/1	0/1
Arsenic		1	0	[0.43 to 0.43]	0.56	0/1	0/1
Barium		1	0	[20.3 to 20.3]	25.7	0/1	0/1
Beryllium		1	0	[0.45 to 0.45]	1.44	0/1	0/1
Cadmium		1	0	[0.07 to 0.07]	0.4	0/1	0/1
Calcium		1	0	[886 to 886]	1900	0/1	0/1
Chromium (total)		1	0	[0.48 to 0.48]	2.6	0/1	0/1
Cobalt		1	0	[0.32 to 0.32]	8.89	0/1	0/1
Copper		1	0	[0.74 to 0.74]	3.96	0/1	0/1
Iron		1	1	3650 to 3650	3700	0/1	0/0
Lead		1	1	2.8 to 2.8	13.5	0/1	0/0
Magnesium		1	0	[445 to 445]	739	0/1	0/1
Manganese		1	1	125 to 125	189	0/1	0/0
Mercury		1	0	[0.1 to 0.1]	0.1	0/1	0/1
Nickel		1	0	[0.16 to 0.16]	2	0/1	0/1
Selenium		1	0	[0.93 to 0.93]	0.3	0/1	1/1
Silver		1	0	[0.22 to 0.22]	1	0/1	0/1
Sodium		1	0	[395 to 395]	4350	0/1	0/1
Thallium		1	0	[0.89 to 0.89]	1.22	0/1	0/1
Vanadium		1	1	1.5 to 1.5	4.59	0/1	0/0
Zinc		1	1	10.7 to 10.7	40	0/1	0/0

Table 2.2-20
Frequency of Detected Inorganic Chemicals in the Pratt Canyon Subarea (continued)

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range (mg/kg)	Background Value (mg/kg)[a]	Frequency of Detects Above Background Value[b]	Frequency of Nondetects Above Background Value[c]
Aluminum	Qbt 1g	1	1	1420 to 1420	3560	0/1	0/0
Antimony		1	0	[0.28 to 0.28]	0.5	0/1	0/1
Arsenic		1	0	[0.44 to 0.44]	0.56	0/1	0/1
Barium		1	0	[9.4 to 9.4]	25.7	0/1	0/1
Beryllium		1	0	[0.59 to 0.59]	1.44	0/1	0/1
Cadmium		1	0	[0.07 to 0.07]	0.4	0/1	0/1
Calcium		1	0	[347 to 347]	1900	0/1	0/1
Chromium (total)		1	0	[0.09 to 0.09]	2.6	0/1	0/1
Cobalt		1	0	[0.11 to 0.11]	8.89	0/1	0/1
Copper		1	0	[0.77 to 0.77]	3.96	0/1	0/1
Iron		1	1	1090 to 1090	3700	0/1	0/0
Lead		1	1	3.8 to 3.8	13.5	0/1	0/0
Magnesium		1	0	[131 to 131]	739	0/1	0/1
Manganese		1	1	58.5 to 58.5	189	0/1	0/0
Mercury		1	0	[0.11 to 0.11]	0.1	0/1	1/1
Nickel		1	0	[0.13 to 0.13]	2	0/1	0/1
Selenium		1	0	[0.94 to 0.94]	0.3	0/1	1/1
Silver		1	0	[0.22 to 0.22]	1	0/1	0/1
Sodium		1	0	[115 to 115]	4350	0/1	0/1
Thallium		1	0	[1.4 to 1.4]	1.22	0/1	1/1
Vanadium		1	0	[0.46 to 0.46]	4.59	0/1	0/1
Zinc		1	1	5.7 to 5.7	40	0/1	0/0

Table 2.2-20
Frequency of Detected Inorganic Chemicals in the Pratt Canyon Subarea (continued)

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range (mg/kg)	Background Value (mg/kg)[a]	Frequency of Detects Above Background Value[b]	Frequency of Nondetects Above Background Value[c]
Aluminum	Qbt 1v	2	2	1150 to 1720	8170	0/2	0/0
Antimony		2	0	[0.46 to 8.9]	0.5	0/2	1/2
Arsenic		2	0	[0.29 to 0.8]	1.81	0/2	0/2
Barium		2	1	15.7 to [17.9]	26.5	0/2	0/1
Beryllium		2	1	[0.75] to 0.78	1.7	0/2	0/1
Cadmium		2	0	[0.09 to 0.7]	0.4	0/2	1/2
Calcium		2	1	157 to [205]	3700	0/2	0/1
Chromium (total)		2	0	[0.17 to 2]	2.24	0/2	0/2
Cobalt		2	1	[0.24] to 0.7	1.78	0/2	0/1
Copper		2	1	[0.13] to 1.8	3.26	0/2	0/1
Iron		2	2	4790 to 6370	9900	0/2	0/0
Lead		2	2	5.6 to 8.2	18.4	0/2	0/0
Magnesium		2	1	66.3 to [117]	780	0/2	0/1
Manganese		2	2	217 to 318	408	0/2	0/0
Mercury		2	0	[0.05 to 0.11]	0.1	0/2	1/2
Nickel		2	0	[0.22 to 3.1]	2	0/2	1/2
Potassium		2	1	401 to [605]	6670	0/2	0/1
Selenium		2	0	[0.29 to 1]	0.3	0/2	1/2
Silver		2	0	[0.17 to 0.91]	1	0/2	0/2
Sodium		2	1	322 to [351]	6330	0/2	0/1
Thallium		2	0	[0.31 to 1]	1.24	0/2	0/2
Vanadium		2	0	[0.64 to 0.97]	4.48	0/2	0/2
Zinc		2	2	38.8 to 51.4	84.6	0/2	0/0

Table 2.2-20
Frequency of Detected Inorganic Chemicals in the Pratt Canyon Subarea (continued)

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range (mg/kg)	Background Value (mg/kg)[a]	Frequency of Detects Above Background Value[b]	Frequency of Nondetects Above Background Value[c]
Aluminum	Qbt 2	6	6	669 to 2970	7340	0/6	0/0
Antimony		6	0	[0.28 to 8.7]	0.5	0/6	5/6
Arsenic		6	3	0.26 to [3]	2.79	0/6	1/3
Barium		6	4	9.8 to 20.1	46	0/6	0/2
Beryllium		6	4	0.23 to 0.85	1.21	0/6	0/2
Boron		3	0	[1.2 to 1.4]	NA[d]	0/3	NA
Cadmium		6	0	[0.26 to 0.68]	1.63	0/6	0/6
Calcium		6	4	222 to [434]	2200	0/6	0/2
Chromium (total)		6	4	1.2 to 3.6	7.14	0/6	0/2
Cobalt		6	3	[0.42 to 2.2]	3.14	0/6	0/3
Copper		6	1	[0.64 to 1.9]	4.66	0/6	0/5
Iron		6	6	1140 to 3250	14500	0/6	0/0
Lead		6	6	7.9 to 9	11.2	0/6	0/0
Lithium		1	1	5 to 5	NA	1/1	NA
Magnesium		6	4	104 to [290]	1690	0/6	0/2
Manganese		6	6	173 to 240	482	0/6	0/0
Mercury		5	0	[0.05 to 0.11]	0.1	0/5	1/5
Molybdenum		1	0	[0.9 to 0.9]	NA	0/1	NA
Nickel		6	3	[0.23 to 3]	6.58	0/6	0/3
Potassium		6	3	153 to [921]	3500	0/6	0/3
Selenium		6	0	[0.12 to 6.6]	0.3	0/6	2/6
Silver		6	0	[0.21 to 0.88]	1	0/6	0/6
Sodium		6	3	[67.1 to 595]	2770	0/6	0/3
Strontium		1	0	[1.7 to 1.7]	NA	0/1	NA
Thallium		6	0	[0.1 to 23.4]	1.1	0/6	1/6
Titanium		3	3	33.6 to 43.8	NA	3/3	NA
Vanadium		6	4	[1.4 to 3]	17	0/6	0/2
Zinc		5	5	14.5 to 28.7	63.5	0/5	0/0

Table 2.2-20
Frequency of Detected Inorganic Chemicals in the Pratt Canyon Subarea (continued)

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range (mg/kg)	Background Value (mg/kg)[a]	Frequency of Detects Above Background Value[b]	Frequency of Nondetects Above Background Value[c]
Aluminum	Qbt 3	20	20	193 to 1830	7340	0/20	0/0
Antimony		20	0	[2.1 to 8.7]	0.5	0/20	20/20
Arsenic		20	15	0.13 to [1.6]	2.79	0/20	0/5
Barium		20	20	5 to 39.1	46	0/20	0/0
Beryllium		20	20	0.13 to 1.2	1.21	0/20	0/0
Boron		18	0	[0.35 to 1.5]	NA	0/18	NA
Cadmium		20	0	[0.21 to 0.68]	1.63	0/20	0/20
Calcium		20	19	[164] to 2010	2200	0/20	0/1
Chromium (total)		20	17	[0.46] to 2.2	7.14	0/20	0/3
Cobalt		20	9	0.41 to 1.1	3.14	0/20	0/11
Copper		20	10	[0.39] to 3	4.66	0/20	0/10
Iron		20	20	337 to 3750	14500	0/20	0/0
Lead		20	20	2.1 to 8.7	11.2	0/20	0/0
Magnesium		20	20	29.4 to 736	1690	0/20	0/0
Manganese		20	20	73.9 to 234	482	0/20	0/0
Mercury		20	0	[0.05 to 0.06]	0.1	0/20	0/20
Nickel		20	9	[0.42] to 3.1	6.58	0/20	0/11
Potassium		20	19	101 to 380	3500	0/20	0/1
Selenium		20	0	[0.12 to 3.6]	0.3	0/20	1/20
Silver		20	0	[0.21 to 0.88]	1	0/20	0/20
Sodium		20	18	75.7 to 257	2770	0/20	0/2
Thallium		20	1	[0.1] to 17.9	1.1	1/20	0/19
Titanium		18	18	14.1 to 122	NA	18/18	NA
Vanadium		20	17	[0.38] to 3.3	17	0/20	0/3
Zinc		20	20	4.9 to 28	63.5	0/20	0/0

Table 2.2-20
Frequency of Detected Inorganic Chemicals in the Pratt Canyon Subarea (continued)

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range (mg/kg)	Background Value (mg/kg)[a]	Frequency of Detects Above Background Value[b]	Frequency of Nondetects Above Background Value[c]
Aluminum	Sediment	9	9	1640 to 5860	15400	0/9	0/0
Antimony		9	0	[0.51 to 0.7]	0.83	0/9	0/9
Arsenic		9	9	1.1 to 2.8	3.98	0/9	0/0
Barium		9	9	25.2 to 80.5	127	0/9	0/0
Beryllium		9	6	[0.4] to 0.86	1.31	0/9	0/3
Boron		9	0	[1.8 to 2.4]	NA	0/9	NA
Cadmium		9	0	[0.1 to 0.21]	0.4	0/9	0/9
Calcium		9	9	578 to 1760	4420	0/9	0/0
Chromium (total)		9	9	2 to 6.8	10.5	0/9	0/0
Cobalt		9	9	1.4 to 3	4.73	0/9	0/0
Copper		9	9	3.6 to 13.2	11.2	1/9	0/0
Cyanide (total)		9	0	[0.51 to 0.7]	0.82	0/9	0/9
Iron		9	9	3990 to 8740	13800	0/9	0/0
Lead		9	9	6 to 16.1	19.7	0/9	0/0
Magnesium		9	9	386 to 1140	2370	0/9	0/0
Manganese		9	9	173 to 272	543	0/9	0/0
Mercury		9	9	0.01 to 1.6	0.1	7/9	0/0
Nickel		9	9	2.1 to 11.5	9.38	1/9	0/0
Potassium		9	9	332 to 978	2690	0/9	0/0
Selenium		9	0	[0.59 to 0.81]	0.3	0/9	9/9
Silver		9	2	[0.12] to 0.4	1	0/9	0/7
Sodium		9	9	52.1 to 160	1470	0/9	0/0
Thallium		9	0	[0.53 to 0.73]	0.73	0/9	0/9
Vanadium		9	9	4.4 to 11.9	19.7	0/9	0/0
Zinc		9	9	22.8 to 54.9	60.2	0/9	0/0

Table 2.2-20
Frequency of Detected Inorganic Chemicals in the Pratt Canyon Subarea (continued)

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range (mg/kg)	Background Value (mg/kg)[a]	Frequency of Detects Above Background Value[b]	Frequency of Nondetects Above Background Value[c]
Aluminum	Soil	23	23	520 to 12200	29200	0/23	0/0
Antimony		23	1	[0.25 to 5.7]	0.83	0/23	19/22
Arsenic		23	15	0.41 to 4.8	8.17	0/23	0/8
Barium		23	17	7.3 to 92	295	0/23	0/6
Beryllium		23	13	0.17 to 1.2	1.83	0/23	0/10
Boron		8	4	[0.37] to 2.4	NA	4/8	NA
Cadmium		23	2	[0.31] to 2.1	0.4	2/23	11/21
Calcium		23	18	[130] to 2370	6120	0/23	0/5
Chromium (total)		23	20	[1] to 10.6	19.3	0/23	0/3
Cobalt		23	12	0.66 to 4.2	8.64	0/23	0/11
Copper		23	17	0.93 to 54.1	14.7	1/23	0/6
Iron		23	23	1500 to 8980	21500	0/23	0/0
Lead		23	22	0.84 to 29.2	22.3	1/23	0/1
Lithium		10	6	[1.5] to 9.6	NA	6/10	NA
Magnesium		23	16	110 to 2020	4610	0/23	0/7
Manganese		23	23	51.3 to 344	671	0/23	0/0
Mercury		16	2	[0.044] to 1	0.1	1/16	2/14
Molybdenum		10	0	[0.62 to 6.3]	NA	0/10	NA
Nickel		23	13	[1.2] to 8.7	15.4	0/23	0/10
Potassium		23	15	[287] to 1200	3460	0/23	0/8
Selenium		23	0	[0.13 to 7.1]	1.52	0/23	3/23
Silver		23	2	[0.37 to 1.1]	1	0/23	1/21
Sodium		23	13	[42.2 to 760]	915	0/23	0/10
Strontium		10	6	[1.2] to 20.1	NA	6/10	NA
Thallium		23	3	[0.1 to 25.2]	0.73	0/23	4/20
Titanium		8	8	43.4 to 158	NA	8/8	NA
Vanadium		23	15	[0.5] to 16.4	39.6	0/23	0/8
Zinc		16	16	9.3 to 573	48.8	3/16	0/0

[a] Values in square brackets indicate nondetected results.

[b] Value is the ratio of the number of detected values exceeding the background value to the number of detects.

[c] Value is the ratio of the number of not-detected values exceeding the background value to the number of not-detected analyses.

[d] NA = not applicable.

In summary, for soil, sediment, and tuff in the Pratt Canyon Subarea, 12 inorganic chemicals (aluminum, antimony, arsenic, cadmium, copper, lead, mercury, nickel, selenium, silver, thallium, and zinc) were either

detected above background values or had reporting limits above their background values (Table 2.2-21). For a list of specific samples with detects above background values and sample details, see Appendix C.

Table 2.2-21
Inorganic Chemical Data Review for the Pratt Canyon Subarea

	Comparison to Background Values for Soil			Comparison to Background Values for Sediment			Comparison to Background Values for Tuff		
Analyte	*Not detected above background*	*Reporting limits above background*	*Detected above background*	*Not detected above background*	*Reporting limits above background*	*Detected above background*	*Not detected above background*	*Reporting limits above background*	*Detected above background*
Aluminum	•			•					•
Antimony		•			•			•	
Arsenic	•			•				•	
Barium	•			•					•
Beryllium	•			•			•		
Cadmium		•				•		•	
Calcium	•			•			•		
Chromium	•			•					•
Cobalt	•			•			•		
Copper			•			•			•
Iron	•			•			•		
Lead			•	•					•
Magnesium	•			•					•
Manganese	•			•			•		
Mercury		•				•		•	
Nickel	•					•			•
Potassium	•			•			•		
Selenium	•				•			•	
Silver	•			•				•	
Sodium	•			•			•		
Thallium		•			•				•
Vanadium	•			•			•		
Zinc			•	•					•

2.2.4.3 Evaluation of Organic Chemicals Detected in the Pratt Canyon Subarea

Samples in the Pratt Canyon Subarea were analyzed for SVOCs by the US EPA SW-846 Method 8270, for VOCs by EPA Method 8260, for organochlorine pesticides by EPA Method 8081, and for PCBs by EPA Method 8082. A total of 100 samples were analyzed for SVOCs, 25 were analyzed for VOCs, 16 were analyzed for pesticides/PCBs, and 59 were analyzed for PCBs only. Thirty-four organic compounds were detected in these samples (soil, sediment, and tuff).

Table 2.2-22 presents the concentration range and frequency of detects for these analytes. In summary, 34 organic chemicals were detected in at least 1 sample. For a list of specific samples with detected organic chemicals and sample details, see Appendix C.

Table 2.2-22
Frequency of Detected Organic Chemicals in the Pratt Canyon Subarea

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range (mg/kg)[a]	Frequency of Detects[b]
Di-n-butylphthalate	Qbt 2	7	1	[0.33] to 1.5	1/7
Di-n-butylphthalate	Qbt 3	13	2	[0.33] to 2.1	2/13
Aroclor-1260	Sediment	9	9	0.053 to 0.6	9/9
Benzo(a)anthracene	Sediment	9	1	[0.34 to 1.9]	1/9
Benzo(a)pyrene	Sediment	9	1	[0.34 to 1.9]	1/9
Benzo(b)fluoranthene	Sediment	9	1	[0.34 to 1.9]	1/9
Chrysene	Sediment	9	4	[0.34 to 1.5]	4/9
Fluoranthene	Sediment	9	7	[0.34] to 1.8	7/9
Phenanthrene	Sediment	9	5	[0.34 to 1.5]	5/9
Pyrene	Sediment	9	5	[0.34] to 1.7	5/9
Acenaphthene	Soil	69	4	0.12 to 6.4	4/69
Acenaphthylene	Soil	69	1	0.041 to [4]	1/69
Acetone	Soil	25	21	[0.003] to 0.7	21/25
Anthracene	Soil	69	4	0.22 to 5.2	4/69
Aroclor-1254	Soil	40	1	[0.037] to 0.41	1/40
Aroclor-1260	Soil	40	4	[0.037] to 0.91	4/40
Benzo(a)anthracene	Soil	69	5	0.035 to 8.2	5/69
Benzo(a)pyrene	Soil	69	5	0.044 to 7.3	5/69
Benzo(b)fluoranthene	Soil	69	5	0.032 to 7.3	5/69
Benzo(g,h,i)perylene	Soil	69	5	[0.33] to 4.4	5/69
Benzo(k)fluoranthene	Soil	69	5	0.038 to [4]	5/69
Bis(2-ethylhexyl)phthalate	Soil	69	5	0.12 to 1.8	5/69
Butanone[2-]	Soil	25	2	[0.02 to 0.039]	2/25
Carbon Disulfide	Soil	25	1	[0.005 to 0.006]	1/25
Chrysene	Soil	69	5	0.037 to 7.6	5/69
Dibenz(a,h)anthracene	Soil	69	4	0.11 to [4]	4/69
Dibenzofuran	Soil	69	4	0.047 to [4]	4/69
Dieldrin	Soil	1	1	0.00566 to 0.00566	1/1
Di-n-butylphthalate	Soil	69	9	[0.33 to 4]	9/69
Endosulfan II	Soil	1	1	0.0157 to 0.0157	1/1
Fluoranthene	Soil	69	7	0.11 to 24	7/69
Fluorene	Soil	69	4	0.11 to 4.8	4/69
Hexanone[2-]	Soil	25	1	[0.02] to 0.029	1/25
Indeno(1,2,3-cd)pyrene	Soil	69	4	0.3 to 4.8	4/69
LRO	Soil	5	5	3800 to 38000	5/5
Methylnaphthalene[2-]	Soil	69	2	0.32 to [4]	2/69
Methylphenol[4-]	Soil	69	1	0.038 to [4]	1/69
Naphthalene	Soil	69	4	0.057 to 7	4/69
Phenanthrene	Soil	69	5	0.11 to 30	5/69
Pyrene	Soil	69	8	0.1 to 22	8/69

Table 2.2-22
Frequency of Detected Organic Chemicals in the Pratt Canyon Subarea (continued)

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range (mg/kg)[a]	Frequency of Detects[b]
Toluene	Soil	25	2	0.002 to 0.012	2/25
Trichloro-1,2,2-trifluoroethane[1,1,2-]	Soil	25	1	0.001 to [0.006]	1/25
Trichloroethene	Soil	25	1	0.002 to [0.006]	1/25
Trichlorofluoromethane	Soil	25	1	0.004 to [0.01]	1/25

[a] Values in square brackets indicate nondetected results.

[b] Value is ratio of the number of detected values to the number of analyses.

2.2.4.4 Comparison of Radionuclides with Background Values/Fallout Values for the Pratt Canyon Subarea

The number of samples analyzed for each radionuclide analytical suite are presented in Table 2.2-19. These analyses were compared with sediment background values (LANL 1998, 59730). The analytical methods used for the Pratt Canyon Subarea radionuclide analyses are comparable to those used for the Laboratory background data.

The detected radionuclide isotopes associated with worldwide fallout in the soil and sediment media include cesium-137, plutonium-238, plutonium-239, strontium-90, americium-241, cobalt-60, and tritium. Uranium-234 and uranium-238 were also detected in the soil and sediment samples above background values. For the Qbt media, europium-152, plutonium-238, plutonium-239, strontium-90, tritium, and uranium-235 were detected.

Table 2.2-23 presents the concentration range and frequency of detected radionuclides above their background values or fallout values in the Pratt Canyon Subarea.

Table 2.2-23
Frequency of Detected Radionuclides in the Pratt Canyon Subarea

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range (pCi/g)[a]	Background Value (pCi/g)	Frequency of Detects Above Background Value[b, c]
Plutonium-238	Qbo	1	0	[0.0104 to 0.0104]	NA[d]	0/1
Plutonium-239		1	0	[-0.0005 to -0.0005]	NA	0/1
Tritium		1	0	[0.012 to 0.012]	NA	0/1
Uranium-234		1	1	0.6237 to 0.6237	4	0/1
Uranium-235		1	1	0.0442 to 0.0442	0.18	0/1
Uranium-238		1	1	0.6759 to 0.6759	3.9	0/1
Plutonium-238	Qbt 1g	1	0	[-0.0006 to -0.0006]	NA	0/1
Plutonium-239		1	0	[-0.0005 to -0.0005]	NA	0/1
Uranium-234		1	1	1.239 to 1.239	4	0/1
Uranium-235		1	1	0.0571 to 0.0571	0.18	0/1
Uranium-238		1	1	1.266 to 1.266	3.9	0/1
Plutonium-238	Qbt 1v	1	0	[-0.001 to -0.001]	NA	0/1
Plutonium-239		1	0	[-0.001 to -0.001]	NA	0/1
Tritium		1	0	[-0.02628 to -0.02628]	NA	0/1
Uranium-234		1	1	1.762 to 1.762	3.12	0/1
Uranium-235		1	1	0.0879 to 0.0879	0.14	0/1
Uranium-238		1	1	1.839 to 1.839	3.05	0/1

Table 2.2-23
Frequency of Detected Radionuclides in the Pratt Canyon Subarea (continued)

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range (pCi/g)[a]	Background Value (pCi/g)	Frequency of Detects Above Background Value[b, c]
Americium-241	Qbt 2	5	0	[-0.12 to 0.351]	NA	0/5
Cesium-134		3	0	[-0.0185 to 0.0485]	NA	0/3
Cesium-137		5	0	[-0.036 to 0.0348]	NA	0/5
Cobalt-60		5	0	[-0.02 to 0.0558]	NA	0/5
Europium-152		5	2	[-0.044] to 0.456	NA	2/5
Plutonium-238		12	3	[-0.0023] to 0.023	NA	3/12
Plutonium-239		12	3	[-0.0043] to 0.072	NA	3/12
Ruthenium-106		5	0	[-0.415 to 0.171]	NA	0/5
Sodium-22		5	0	[-0.058 to 0.0811]	NA	0/5
Strontium-90		3	1	[-0.3] to 0.933	NA	1/3
Tritium		6	6	0.00595 to 0.405	NA	6/6
Uranium-234		12	12	0.5805 to 1.308	1.98	0/12
Uranium-235		12	7	[0.018] to 0.0905	0.09	1/12
Uranium-238		12	12	0.6502 to 1.2599	1.93	0/12
Americium-241	Qbt 3	21	0	[-0.519 to 0.371]	NA	0/21
Cesium-134		18	0	[-0.0672 to 0.055]	NA	0/18
Cesium-137		21	0	[-0.0635 to 0.1108]	NA	0/21
Cobalt-60		21	0	[-0.0952 to 0.0869]	NA	0/21
Europium-152		21	0	[-0.189 to 0.195]	NA	0/21
Plutonium-238		33	6	[-0.018] to 0.106	NA	6/33
Plutonium-239		33	1	[-0.007] to 0.029	NA	1/33
Ruthenium-106		21	0	[-0.374 to 0.511]	NA	0/21
Sodium-22		21	0	[-0.0969 to 0.095]	NA	0/21
Strontium-90		18	4	[-0.21] to 18.6	NA	4/18
Tritium		23	23	0.00415 to 4.414	NA	23/23
Uranium-234		33	33	0.5168 to 1.3087	1.98	0/33
Uranium-235		33	14	[0.001 to 0.1399]	0.09	1/33
Uranium-238		33	33	0.4625 to 1.2951	1.93	0/33

Table 2.2-23
Frequency of Detected Radionuclides in the Pratt Canyon Subarea (continued)

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range (pCi/g)[a]	Background Value (pCi/g)	Frequency of Detects Above Background Value[b, c]
Americium-241	Sediment	9	7	[0.029] to 0.412	0.04	7/9
Cesium-134		9	0	[-0.033 to 0.051]	NA	0/9
Cesium-137		9	9	0.136 to 25	0.9	8/9
Cobalt-60		9	3	[-0.016] to 0.368	NA	3/9
Europium-152		9	0	[-0.16 to 0.13]	NA	0/9
Plutonium-238		9	0	[-0.0114 to 0.047]	0.006	0/9
Plutonium-239		9	7	[-0.0041] to 1.32	0.068	7/9
Ruthenium-106		9	0	[-0.61 to 1.19]	NA	0/9
Sodium-22		9	0	[-0.067 to 0.044]	NA	0/9
Strontium-90		9	9	4.28 to 118	1.04	9/9
Tritium		9	2	[0] to 0.05	0.093	0/9
Uranium-234		9	9	0.476 to 1.377	2.59	0/9
Uranium-235		9	8	[0.017] to 0.102	0.2	0/9
Uranium-238		9	9	0.426 to 1.42	2.29	0/9
Americium-241	Soil	35	0	[-0.331 to 0.5]	0.013	0/35
Cesium-134		12	0	[-0.062 to 0.0416]	NA	0/12
Cesium-137		35	8	[-0.063] to 5.3834	1.65	6/35
Cobalt-60		35	2	[-0.054] to 0.195	NA	2/35
Europium-152		35	0	[-0.192 to 0.411]	NA	0/35
Plutonium-238		99	20	[-0.02] to 0.09	0.023	16/99
Plutonium-239		99	45	[-0.009] to 1.73	0.054	41/99
Ruthenium-106		35	0	[-0.526 to 0.47]	NA	0/35
Sodium-22		35	0	[-0.1044 to 0.0799]	NA	0/35
Strontium-90		8	7	[0.476] to 38.4	1.31	7/8
Tritium		17	17	0.11627 to 2.0094	NA	17/17
Uranium-234		99	99	0.421 to 2.761	2.59	1/99
Uranium-235		99	73	[0.005] to 0.133	0.2	0/99
Uranium-238		99	99	0.475 to 3.64	2.29	1/99

[a] Values in square brackets indicate nondetected results.

[b] Value is the ratio of the number of detected values exceeding the background value/fallout value to the number of detects.

[c] Detected fallout radionuclides at a depth greater than 6 inches are included as detects above background, whether or not the detected result was above the background value.

[d] NA = not applicable.

Table 2.2-24 presents the radionuclides in the Pratt Canyon Subarea that were detected above background values or fallout values, or that were detected and for which there are no associated background values or fallout values.

Table 2.2-24
Radionuclide Data Review for the Pratt Canyon Subarea

	Comparison to Background Values for Soil			Comparison to Background Values for Sediment			Comparison to Background Values for Tuff		
Analyte	*Not detected above background, or not detected if background value is not available*	*Reporting limits above background*	*Detected above background, or detected if background value is not available*	*Not detected above background, or not detected if background value is not available*	*Reporting limits above background*	*Detected above background, or detected if background value is not available*	*Not detected above background, or not detected if background value is not available*	*Reporting limits above background*	*Detected above background, or detected if background value is not available*
Americium-241	•	•				•	•		
Cesium-134	•			•			•		
Cesium-137		•			•		•		
Cobalt-60	•					•			•
Europium-152	•			•					•
Ruthenium-106	•			•			•		
Sodium-22	•			•			•		
Plutonium-238			•			•			•
Plutonium-239			•			•			•
Uranium-234	•					•	•		
Uranium-235	•			•					•
Uranium-238	•					•	•		
Strontium-90			•			•			•
Tritium			•			•		•	

In summary, in the Pratt Canyon Subarea, 11 radionuclides (americium-241, cesium-137, cobalt-60, europium-152, plutonium-238, plutonium-239, uranium-234, uranium-235, uranium-238, strontium-90, and tritium) were detected above background values or fallout values, or were detected and for which there are no associated background values or fallout values. For a list of specific samples and details, see Appendix C.

2.2.5 Ten Site Canyon Subarea

2.2.5.1 Samples Collected in the Ten Site Canyon Subarea

Samples collected in the Ten Site Canyon Subarea were analyzed for the chemical suites listed inTable 2.2-25. Samples are shown on Figure 2.1-12 and Figure 2.1-13. Complete lists of each sample collected and what analytical suites it was analyzed for can be found in Appendix C. The number of samples analyzed for organic chemicals, TAL metals, and radionuclides are presented in Table 2.2-25.

Table 2.2-25
Number of Samples Analyzed from the Ten Site Canyon Subarea

Analytical Suite	Soil	Sediment	Qbt 3	Total
PCBs	54	—	30	84
Pesticides and PCBs	20	—	—	20
SVOCs	67	—	29	96
VOCs	30	—	30	60
Inorganic chemicals (TAL metals)	61	—	16	77
Limited-list TAL metals	—	—	1	1

Table 2.2-25
Number of Samples Analyzed from the Ten Site Canyon Subarea (continued)

Analytical Suite	Soil	Sediment	Qbt 3	Total
Non-TAL metals	—	—	1	1
XRF	14	—	14	28
Gamma spectroscopy radionuclides	53	—	17	70
Tritium	37	—	15	52
Isotopic plutonium	48	5	14	67
Isotopic uranium	42	5	14	61
Isotopic thorium	10	—	—	10
Strontium-90	47	—	16	63

2.2.5.2 Comparison of Inorganic Chemicals with Background Values for the Ten Site Canyon Subarea

TAL metals were analyzed for in 78 samples (77 full-suite TAL metals and 1 limited-list TAL metals) collected from the Ten Site Canyon Subarea. Inorganic chemical sample results were compared with background values (LANL 1998, 59730).

Table 2.1-43 presents the concentration range and frequency of results above the background value for the inorganic chemicals in the Ten Site Canyon Subarea. For soil, 14 TAL metals (barium, cadmium, calcium, chromium, cobalt, copper, lead, manganese, mercury, nickel, silver, thallium, vanadium, and zinc) were detected above their background values in a least 1 sample. Also, antimony, cadmium, mercury, silver, and thallium had reporting limits above their background values. Aluminum, arsenic, beryllium, iron, magnesium, potassium, selenium, and sodium were detected below their background values.

For the Qbt media, aluminum, barium, beryllium, calcium, chromium, copper, lead, manganese, and nickel were detected above their background values in at least one sample. Antimony, arsenic, mercury, selenium, silver, and thallium had reporting limits above their background values. Cadmium, cobalt, iron, magnesium, potassium, sodium, vanadium, and zinc were detected below their background values.

Table 2.2-26
Frequency of Detected Inorganic Chemicals in the Ten Site Canyon Subarea

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range (mg/kg)[a]	Background Value (mg/kg)	Frequency of Detects Above Background Value[b]	Frequency of Nondetects Above Background Value[c]
Aluminum	Qbt 3	17	17	444 to 9200	7340	1/17	0/0
Antimony		12	0	[4.2 to 11]	0.5	0/12	12/12
Arsenic		17	11	[0.21 to 3]	2.79	0/17	1/6
Barium		17	16	9.3 to 100	46	2/17	0/1
Beryllium		17	10	0.17 to 1.4	1.21	1/17	0/7
Cadmium		17	0	[0.34 to 0.58]	1.63	0/17	0/17
Calcium		17	16	[237] to 2700	2200	1/17	0/1
Chromium (total)		17	15	[0.85] to 65	7.14	12/17	0/2
Cobalt		17	3	[0.7] to 1.3	3.14	0/17	0/14
Copper		17	11	[1.1] to 5.9	4.66	1/17	0/6
Iron		17	17	953 to 7800	14500	0/17	0/0
Lead		17	16	1.9 to 21	11.2	3/17	0/1
Lithium		1	0	[0.8 to 0.8]	NA[d]	0/1	NA
Magnesium		17	12	[27] to 1600	1690	0/17	0/5
Manganese		17	17	115 to 670	482	1/17	0/0
Mercury		16	0	[0.05 to 0.12]	0.1	0/16	11/16
Molybdenum		1	0	[0.66 to 0.66]	NA	0/1	NA
Nickel		17	16	[1.2] to 30	6.58	10/17	0/1
Potassium		17	13	84 to 1300	3500	0/17	0/4
Selenium		17	0	[0.32 to 6.6]	0.3	0/17	17/17
Silver		17	0	[0.74 to 2.3]	1	0/17	16/17
Sodium		17	16	86 to [421]	2770	0/17	0/1
Strontium		1	1	2.3 to 2.3	NA	1/1	NA
Thallium		17	2	0.15 to [23.4]	1.1	0/17	6/15
Vanadium		17	15	[0.76] to 8.5	17	0/17	0/2
Zinc		16	16	15.4 to 39.2	63.5	0/16	0/0

Table 2.2-26
Frequency of Detected Inorganic Chemicals in the Ten Site Canyon Subarea (continued)

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range (mg/kg)[a]	Background Value (mg/kg)	Frequency of Detects Above Background Value[b]	Frequency of Nondetects Above Background Value[c]
Aluminum	Soil	61	61	160 to 16800	29200	0/61	0/0
Antimony		51	0	[0.17 to 12]	0.83	0/51	32/51
Arsenic		61	44	[0.19] to 4	8.17	0/61	0/17
Barium		61	50	5.4 to 440	295	1/61	0/11
Beryllium		61	45	0.06 to 1.1	1.83	0/61	0/16
Cadmium		61	25	0.039 to 3.7	0.4	8/61	34/36
Calcium		61	61	156 to 9300	6120	2/61	0/0
Chromium (total)		61	57	0.93 to 77	19.3	10/61	0/4
Cobalt		61	44	[0.14] to 8.8	8.64	1/61	0/17
Copper		61	60	[1.1] to 430	14.7	24/61	0/1
Iron		61	61	460 to 16000	21500	0/61	0/0
Lead		61	61	1.1 to 98	22.3	14/61	0/0
Magnesium		61	61	40 to 2310	4610	0/61	0/0
Manganese		61	61	1.7 to 994	671	1/61	0/0
Mercury		60	20	[0.02] to 4	0.1	19/60	8/40
Nickel		61	46	0.81 to 29	15.4	5/61	0/15
Potassium		61	60	68.9 to 3100	3460	0/61	0/1
Selenium		61	9	[0.17 to 1.3]	1.52	0/61	0/52
Silver		61	21	[0.05] to 56	1	19/61	22/40
Sodium		61	60	26 to 308	915	0/61	0/1
Thallium		61	27	[0.15] to 2.1	0.73	4/61	12/34
Vanadium		61	59	[0.72] to 69	39.6	1/61	0/2
Zinc		61	61	3.9 to 690	48.8	25/61	0/0

[a] Values in square brackets indicate nondetected results.

[b] Value is the ratio of the number of detected values exceeding the background value to the number of detects.

[c] Value is the ratio of the number of not-detected values exceeding the background value to the number of not-detected analyses.

[d] NA = not applicable.

In summary, for soil, sediment, and tuff in the Ten Site Canyon Subarea, 19 inorganic chemicals (aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, lead, manganese, mercury, nickel, selenium, silver, thallium, vanadium, and zinc) were either detected above background values or had reporting limits above their background values (Table 2.2-27). For a list of specific samples with detects above background values and sample details, see Appendix C.

Table 2.2-27
Inorganic Chemical Data Review for the Ten Site Canyon Subarea

	Comparison to Background Values for Soil			Comparison to Background Values for Tuff		
Analyte	*Not detected above background*	*Reporting limits above background*	*Detected above background*	*Not detected above background*	*Reporting limits above background*	*Detected above background*
Aluminum	•					•
Antimony		•	•		•	
Arsenic	•				•	

Table 2.2-27
Inorganic Chemical Data Review for the Ten Site Canyon Subarea (continued)

	Comparison to Background Values for Soil			Comparison to Background Values for Tuff		
Analyte	*Not detected above background*	*Reporting limits above background*	*Detected above background*	*Not detected above background*	*Reporting limits above background*	*Detected above background*
Barium			•			•
Beryllium	•					•
Cadmium		•	•	•		
Calcium			•			•
Chromium			•			•
Cobalt			•	•		
Copper			•			•
Iron	•			•		
Lead			•			•
Magnesium	•			•		
Manganese			•			•
Mercury		•	•		•	
Nickel			•			•
Potassium	•			•		
Selenium	•				•	
Silver		•	•		•	
Sodium	•			•		
Thallium		•	•		•	
Vanadium			•	•		
Zinc			•	•		

2.2.5.3 Evaluation of Organic Chemicals Detected in the Ten Site Canyon Subarea

Samples in the Ten Site Canyon Subarea were analyzed for SVOCs by the US EPA SW-846 Method 8270, for VOCs by EPA Method 8260, for organochlorine pesticides by EPA Method 8081, and for PCBs by EPA Method 8082. A total of 96 samples were analyzed for SVOCs, 60 were analyzed for VOCs, 20 were analyzed for pesticides/PCBs, and 84 were analyzed for PCBs only. Twenty-eight organic compounds were detected in these samples (soil and tuff).

Table 2.2-28 presents the concentration range and frequency of detects for these analytes. In summary, 28 organic chemicals were detected in at least 1 sample. For a list of specific samples with detected organic chemicals and sample details, see Appendix C.

Table 2.2-28
Frequency of Detected Organic Chemicals in the Ten Site Canyon Subarea

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range (mg/kg)[a]	Frequency of Detects[b]
Bis(2-ethylhexyl)phthalate	Qbt 3	23	2	0.052 to [0.38]	2/23
Tetrachloroethene		24	1	0.001 to [0.025]	1/24
Toluene		24	1	0.004 to [0.025]	1/24
Xylene (total)		24	1	0.002 to [0.025]	1/24

Table 2.2-28
Frequency of Detected Organic Chemicals in the Ten Site Canyon Subarea (continued)

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range (mg/kg)[a]	Frequency of Detects[b]
Acetone	Soil	30	3	[0.004] to 2.6	3/30
Aroclor-1254		74	17	[0.0165 to 2.5062]	17/74
Aroclor-1260		74	7	[0.0165] to 2.8	7/74
Benzo(a)anthracene		67	2	0.039 to [19]	2/67
Benzo(b)fluoranthene		66	1	0.048 to [19]	1/66
Benzo(g,h,i)perylene		66	1	0.057 to [19]	1/66
Benzoic acid		67	1	0.023 to [93]	1/67
Bis(2-ethylhexyl)phthalate		67	24	0.041 to [19]	24/67
Butanone[2-]		30	1	[0.02 to 0.35]	1/30
Butylbenzylphthalate		67	4	0.091 to [19]	4/67
Carbon Disulfide		30	2	[0.005 to 0.028]	2/30
Chloromethane		30	1	[0.004 to 0.056]	1/30
Chrysene		67	4	0.038 to [19]	4/67
Dichlorobenzene[1,2-]		89	3	[0.005 to 19]	3/89
Di-n-butylphthalate		67	7	0.017 to [19]	7/67
Di-n-octylphthalate		66	2	0.037 to [19]	2/66
Ethylbenzene		30	2	[0.005 to 0.028]	2/30
Fluoranthene		67	4	0.038 to [19]	4/67
Indeno(1,2,3-cd)pyrene		66	1	0.051 to [19]	1/66
Isopropyltoluene[4-]		30	3	[0.005] to 0.284	3/30
Pyrene		67	6	0.036 to [19]	6/67
Tetrachloroethene		30	5	0.001 to [0.028]	5/30
Toluene		30	17	0.002 to 0.16	17/30
Trichloro-1,2,2-trifluoroethane[1,1,2-]		19	1	0.0009 to [0.028]	1/19
Trichloroethene		30	4	0.002 to [0.028]	4/30
Trimethylbenzene[1,2,4-]		30	5	[0.005] to 0.129	5/30
Trimethylbenzene[1,3,5-]		30	2	[0.005] to 0.033	2/30
Xylene (total)		30	10	0.001 to 0.041	10/30

[a] Values in square brackets indicate nondetected results.

[b] Value is ratio of the number of detected values to the number of analyses.

2.2.5.4 Comparison of Radionuclides with Background Values/Fallout Values for the Ten Site Canyon Subarea

The number of samples analyzed for each radionuclide analytical suite are presented in Table 2.2-25. These analyses were compared with the background values or fallout values (LANL 1998, 59730). The analytical methods used for the Ten Site Canyon Subarea radionuclide analyses are comparable to those used for the Laboratory background data.

The detected radionuclide isotopes associated with worldwide fallout in soil and sediment media include americium-241, europium-152, cesium-137, plutonium-238, plutonium-239, strontium-90, and tritium. Uranium-234 and uranium-238 were also detected in the soil and sediment samples above background values. For the Qbt media, plutonium-238, plutonium-239, ruthenium-106, strontium-90, and tritium were detected.

Table 2.2-29 presents the concentration range and frequency of results above background values or fallout values for these radionuclides in the Ten Site Canyon Subarea.

Table 2.2-29

Frequency of Detected Radionuclides in the Ten Site Canyon Subarea

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range (pCi/g)[a]	Background Value (pCi/g)	Frequency of Detects Above Background Value[b, c]
Plutonium-238	Qbt 2	6	4	[-0.002] to 0.023	NA[d]	4/6
Plutonium-239		6	2	[0 to 0.041]	NA	2/6
Uranium-234		6	6	0.887 to 1.052	1.98	0/6
Uranium-235		6	6	0.027 to 0.068	0.09	0/6
Uranium-238		6	4	0.806 to [1.014]	1.93	0/6
Americium-241	Qbt 3	17	0	[-0.45 to 0.15]	NA	0/17
Cesium-134		6	0	[-0.04 to 0.07]	NA	0/6
Cesium-137		17	0	[-0.05 to 0.04]	NA	0/17
Cobalt-60		17	0	[-0.055 to 0.06]	NA	0/17
Europium-152		17	0	[-0.1 to 0.38]	NA	0/17
Plutonium-238		8	5	[-0.004] to 0.02	NA	5/8
Plutonium-239		8	3	[0] to 0.056	NA	3/8
Ruthenium-106		17	1	[-0.493] to 0.527	NA	1/17
Sodium-22		17	0	[-0.06 to 0.045]	NA	0/17
Strontium-90		16	4	[-0.58] to 2.4	NA	4/16
Tritium		15	4	[-1.53] to 3	NA	4/15
Uranium-234		8	8	0.725 to 0.959	1.98	0/8
Uranium-235		14	8	[-0.15 to 1.15]	0.09	0/14
Uranium-238		8	8	0.73 to 1.016	1.93	0/8
Plutonium-238	Sediment	5	2	[0.047] to 0.171	0.006	2/5
Plutonium-239		5	1	[0.023] to 0.083	0.068	1/5
Uranium-234		5	0	[0.592 to 0.867]	2.59	0/5
Uranium-235		5	0	[0.014 to 0.059]	0.2	0/5
Uranium-238		5	0	[0.615 to 0.899]	2.29	0/5

Table 2.2-29
Frequency of Detected Radionuclides in the Ten Site Canyon Subarea (continued)

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range (pCi/g)[a]	Background Value (pCi/g)	Frequency of Detects Above Background Value[b, c]
Americium-241	Soil	53	1	[-0.42] to 0.536	0.013	1/53
Cesium-134		31	0	[-0.05 to 0.06]	NA	0/31
Cesium-137		53	12	[-0.04] to 0.46	1.65	2/53
Cobalt-60		53	0	[-0.063 to 0.052]	NA	0/53
Europium-152		53	2	[-0.101 to 0.42]	NA	2/53
Plutonium-238		48	15	[-0.02] to 2.523	0.023	15/48
Plutonium-239		48	13	[-0.0112] to 3.46	0.054	13/48
Ruthenium-106		53	0	[-0.31 to 0.27]	NA	0/53
Sodium-22		53	0	[-0.09 to 0.055]	NA	0/53
Strontium-90		47	4	[-1.09] to 7.86	1.31	3/47
Thorium-228		10	10	0.185 to 0.821	2.28	0/10
Thorium-230		10	8	0.285 to 1.17	2.29	0/10
Thorium-232		10	10	0.211 to 0.879	2.33	0/10
Tritium		37	19	[-0.66] to 178	NA	19/37
Uranium-234		41	23	0.157 to 4.45	2.59	4/41
Uranium-235		63	12	[-0.19 to 0.46]	0.2	0/63
Uranium-238		41	23	0.154 to 3.5	2.29	3/41

[a] Values in square brackets indicate nondetected results.

[b] Value is the ratio of the number of detected values exceeding the background value/fallout value to the number of detects.

[c] Detected fallout radionuclides at a depth greater than 6 inches are included as detects above background, whether or not the detected result was above the background value.

[d] NA = not applicable.

Table 2.2-30 presents the radionuclides in the Ten Site Canyon Subarea that were detected above background values or fallout values, or that were detected and for which there are no associated background values or fallout values. For a list of specific samples and details, see Appendix C.

Table 2.2-30
Radionuclide Data Review for the Ten Site Canyon Subarea

	Comparison to Background Values for Soil			Comparison to Background Values for Tuff		
Analyte	*Not detected above background, or not detected if background value is not available*	*Reporting limits above background*	*Detected above background, or detected if background value is not available*	*Not detected above background, or not detected if background value is not available*	*Reporting limits above background*	*Detected above background, or detected if background value is not available*
Americium-241		•	•	•		
Cesium-134	•			•		
Cesium-137	•			•		
Cobalt-60	•			•		
Europium-152			•	•		
Ruthenium-106	•					•
Sodium-22	•			•		
Plutonium-238			•			•
Plutonium-239			•			•

Table 2.2-30
Radionuclide Data Review for the Ten Site Canyon Subarea (continued)

	Comparison to Background Values for Soil			Comparison to Background Values for Tuff		
Analyte	*Not detected above background, or not detected if background value is not available*	*Reporting limits above background*	*Detected above background, or detected if background value is not available*	*Not detected above background, or not detected if background value is not available*	*Reporting limits above background*	*Detected above background, or detected if background value is not available*
Uranium-234			•	•		
Uranium-235			•	•	•	
Uranium-238			•	•		
Strontium-90			•			•
Tritium			•			•

In summary, in the Ten Site Canyon Subarea, 10 radionuclides (americium-241, cesium-137, europium-152, ruthenium-106, plutonium-238, plutonium-239, uranium-234, uranium-238, strontium-90, and tritium) were detected above background values or were detected with no associated background values.

2.3 TA-35 Conceptual Model

The TA-35 investigation is designed to support the assessment of the Middle Mortandad/Ten Site Aggregate of the Mortandad Watershed. The objective of the conceptual model is to identify potential contaminant release and migration scenarios for the TA-35 subareas to support the objectives of this SAP as presented in section 1.1. For the purpose of this investigation, the conceptual model is addressed in the context of environmental setting (subarea) and types of release.

The conceptual model is used as a tool for identifying and analyzing the processes that may affect each subarea in order to predict locations where residual contamination is expected to be present. The strategy for testing the conceptual model is incorporated into the design of the Investigatory Approach presented in section 3.0 of this SAP.

Facility discharges such as the TA-50 RLWTF outfall are known to be an important contributor of radionuclides and chemicals to Mortandad Canyon. A brief summary of the TA-50 RLWTF is presented in section 2.1.3 of this SAP. Other drainlines from the TA-50 facility discharged to the head of Ten Site Canyon during the 1960s and early 1970s, and are discussed in section 2.1.2 of this SAP. One of the challenges of this TA-35 investigation is to assess relative contribution of contaminants from neighboring facilities to the Mortandad and Ten Site Canyon settings. The data assessment phase of this investigation will include the evaluation of data collected from canyon sediment reach investigations to determine contaminant inventories in sediments at established locations both upgradient and downgradient of the hillslope subareas. Data from the hillslope investigations will be evaluated with respect to the inventories identified in the canyon sediment reach to determine the relative contribution of TA-35 PRSs to each respective canyon system (LANL 1997, 62316).

Subarea site descriptions, operational history and descriptions of PRSs by subarea are presented in section 2.1 and Appendix B of this SAP. The physical, biological, and release profiles of the subarea settings are presented below.

2.3.1 Physical Profile

2.3.1.1 Mesa-Top Setting

TA-35 is currently used for nuclear safeguard studies, laser research and development, physical research, fusion work, and other experimental research. It is one of the most highly used technical areas at the Lab-

oratory, with approximately 300 designated structures (LANL 1997, 56835) covering an area of approximately 150 acres. The industrialized mesa top at TA-35 occupies a relatively flat area at an elevation of approximately 7200 ft. Over time, the mesa top has been leveled with up to 10 m of clean fill material from offsite sources. Approximately 90% of the mesa top is covered with asphalt or gravel or is the footprint of a structure.

2.3.1.2 Hillslope and Canyon Settings

Mortandad Canyon is a narrow east/southeast trending canyon that extends approximately 10 miles from the southern part of TA-3 to the confluence with the Rio Grande. The canyon heads on the central part of the Pajarito Plateau at an elevation of 7417 ft. The upper canyon is incised approximately 100 ft into the Tshirege Member of the Bandelier Tuff. The canyon borders TA-48 on the north approximately 0.7 mi from the head of the canyon; at this location it is between 700 and 800 ft wide at the rim and approximately 100 ft deep. Middle Mortandad Canyon, the portion included in this investigation, is the deep narrow part of the canyon that extends eastward from the confluence of Effluent Canyon about 1.1 mi as depicted on Figure 1.0-4. Effluent Canyon heads at the east side of TA-48 at an elevation of approximately 7300 ft. At the confluence with Effluent Canyon, Mortandad Canyon is approximately 1000 ft across, rim to rim, and approximately 150 ft deep. The area of Mortandad Canyon below TA-35 consists of several different physical environmental settings, which in turn contain ecological habitats/communities that reflect changes in elevation, climate, and moisture. The environmental settings include a steep north-facing slope below TA-35, a bench area, and a deep, narrow ravine containing a stream channel that is entirely ephemeral. The elevation changes approximately 100 ft from the mesa top to the bench, and then another 20 to 60 ft from the bench to the canyon bottom.

The Ten Site Canyon slope faces south and is relatively steep, falling from 7200 ft to 7090 ft over 100 to 200 horizontal feet (LANL 1997, 56835). The upper slope consists of fill material several yards deep that was added to level the mesa top for industrial development. The fill material is heavily eroded in places as a result of heavy runoff from asphalt parking lots, roads, roof tops, and facility discharges. About 10–25% of the slope is bare tuff outcrops or bare fill. The area along the edge of the mesa still retains some portion of the original vegetative cover. There is an ephemeral stream channel at the base of the slope that runs following storms and snowmelt, also from occasional discharges from the mesa top facilities. This stream channel runs parallel to TA-35 and eventually joins with the Mortandad Canyon stream channel east of the mesa. The Ten Site Canyon Subarea, designated as the sludge drying beds on a level bench below Pratt Canyon, is also an east trending canyon at an elevation of approximately 7090 ft.

Pratt Canyon, a small tributary canyon of Ten Site Canyon, is located at the eastern end of TA-35 and received treated wastewater containing radionuclides from the former WWTP. This canyon extends approximately .25 mi from the TA-35 mesa edge to its confluence with Ten Site Canyon with an elevation change of approximately 100 to 120 ft. The subarea consists of a steep slope below TA-35, a gently sloping bench containing an ephemeral drainage channel, and a small cattail area above the confluence.This subarea is drier than the north-facing slope of TA-35 (Mortandad Canyon) and comparable to the south-facing slope (Ten Site Canyon).

2.3.2 Biological Profile

2.3.2.1 Mesa-Top Setting

The original vegetation of TA-35 probably consisted of a piñon-juniper woodland (Koch et al. 1997, 62882; Foxx et al. 1997, 70061, Fig. 3; Dick-Peddie 1992, 70062). However, prior to establishment of the Laboratory much of the mesa top had been cleared for cropland (Foxx et al. 1997, 70061). There are small patches of bare soil or grass that have been landscaped to some extent and patches that contain native and non-native trees, shrubs, forbs, and grasses. These patches provide limited habitat for invertebrate and small vertebrates (birds and small mammals), particularly those species associated with human habi-

tation and disturbance. The area along the edge of the mesa still retains some portion of the original vegetative cover. This consists primarily of piñon-juniper with some ponderosa pine mixed in (Dunham 1992, 31276). Because limited habitat on the mesa top limits the populations inhabiting or foraging on this area, food web transfer of contaminants on the mesa top is also limited.

There is no aquatic habitat on the mesa top but runoff from the mesa top does flow into Mortandad, Ten Site, and Pratt Canyons where riparian vegetation has been found. A review of the mesa top for threatened and endangered (T&E) species habitat was conducted by the Ecology Group (ESH-20). Information was reviewed to determine whether or not this area is in or near nesting and/or foraging habitat of federally listed T&E species. Also, the relative amount or frequency of potential foraging in or near the vicinity of the area was estimated. The review found that the Mesa Top Subarea is partially within Mexican Spotted Owl nesting habitat and is entirely within an area in which the owl can conservatively be assumed to forage at a high frequency. This subarea is also within an area in which the bald eagle is conservatively assumed to forage at a low frequency. No T&E species currently occupy the mesa top area.

The most prevalent receptors on the mesa top are workers that occupy the offices and laboratories that make up TA-35.

2.3.2.2 Hillslope and Canyon Settings

2.3.2.2.1 Mortandad Slope and Canyon

The steep north-facing slope of Mortandad Canyon can be categorized as a mixed conifer forest. The forest is dominated by Douglas fir with some ponderosa pine and piñon-juniper as the overstory, Gambel oak and mountain mahogany are the shrub component, and the understory is comprised of grasses (mountain muhly and *Bromus* spp.) and forbs (pussytoes, mountain lover, and wormwood) (Dunham 1992, 31276). The bench area is characterized by an open ponderosa pine habitat with some Douglas fir and juniper in the overstory and similar shrub and understory components (Gambel oak, mountain mahogany, grasses, and forbs) to the slope. The deep, narrow ravine is riparian in nature with Gambel oak and Russian olive predominating along with willows as the overstory/shrub component. This area also has grasses (smooth brome, western wheatgrass, and Canadian wild rye) and forbs (green amaranth, white sweet clover, and rippleseed plantain) species as the understory. In addition, the area of Mortandad Canyon below TA-35 contains several species of plants that are used by humans as food and medicinal sources including strawberries, raspberries, roses, mullein, currants, pussytoes, and juniper (LANL 1997, 56835).

The portion of Mortandad Canyon below TA-35 also provides excellent habitat for a variety of terrestrial fauna. This includes large mammals such as mule deer, elk, fox, coyote, and black bear, which are common to abundant in this area (Dunham 1992, 31276; Gonzales and Newell 1996, 56045). Small mammals found in this area include the cottontail, porcupine, deer mouse, piñon mouse, and least chipmunk as common to abundant species (Gonzales and Newell 1996, 56045; LANL 1997, 56835). Other mammals less frequently observed include the pocket gopher, meadow vole, long-tailed vole, brush mouse, rock squirrel, and woodrat (Miera et al. 1977, 05569; Gonzales and Newell 1996, 56045). Birds are also well represented in Mortandad Canyon and include the robin, warbler, jay, sparrow, finch, bluebird, hummingbird, woodpecker, raven, towhee, and dove (Dunham 1992, 31276). Larger birds may include owls, kestrels, and hawks (Dunham 1992, 31276).

The deep, narrow ravine containing the intermittent stream channel at the bottom of Mortandad Canyon also provides aquatic habitat by virtue of the effluent discharge from TA-50. There are no apparent emerging, aquatic macrophytes but there is algae (green, blue-green, and brown) present. There are also aquatic insects such as caddis flies inhabiting the stream channel and possibly some amphibian species (salamanders and toads). No fish are present in the ephemeral stream channel.

A review of Mortandad Canyon below TA-35 for T&E species habitat was conducted by ESH-20. Information was reviewed to determine whether or not this area is in or near nesting and/or foraging habitat of federally listed T&E species. Also, the relative amount or frequency of potential foraging in or near the vicinity of the area was estimated. The review found that the Mortandad Slope Subarea below TA-35 was entirely within Mexican Spotted Owl nesting habitat and is within an area in which the owl can conservatively be assumed to forage at a high frequency. This subarea is also within an area in which the bald eagle is conservatively assumed to forage at a low frequency. No other T&E species are potentially present in this subarea of Mortandad Canyon.

2.3.2.2.2 Ten Site Slope and Canyon

The steep, north-facing slope of Ten Site Canyon can be categorized as piñon-juniper with some Ponderosa pine mixed in (Dunham 1992, 31276). The dominant vegetation on the lower portion of the slope and the canyon bottom is Ponderosa pine forest (Koch et al. 1997, 62882; Dick-Peddie 1992, 70062), with exotic species common in the fill material on the upper slope. There is an ephemeral stream channel at the base of the slope that runs following storms and snowmelt and from occasional discharges from the mesa top facilities.

The Ten Site Slope is drier than the Mortandad Canyon system on the north slope of TA-35. The biological community is well established here, especially as the slope approaches the canyon floor, and provides excellent habitat for a variety of terrestrial fauna. This includes large mammals such as mule deer, elk, fox, coyote, and black bear, which are common to abundant in this area (Dunham 1992, 31276; Gonzales and Newell 1996, 56045). Small mammals found in this area include the cottontail, porcupine, deer mouse, piñon mouse, and least chipmunk as common to abundant species (Gonzales and Newell 1996, 56045; LANL 1997, 56835). Other mammals less frequently observed include the pocket gopher, meadow vole, long-tailed vole, brush mouse, rock squirrel, and woodrat (Miera et al. 1977, 05569; Gonzales and Newell 1996, 56045). Birds are also well represented in Ten Site Canyon and include the robin, warbler, jay, sparrow, finch, bluebird, hummingbird, woodpecker, raven, towhee, and dove (Dunham 1992, 31276). Larger birds may include owls, kestrels, and hawks (Dunham 1992, 31276). Except where the fill has been deposited adjacent to the industrialized mesa top, there are no overt signs of human impact to the slope ecosystem. Therefore the food web provides for a viable transfer pathway for contaminants in the hillslope environment.

A review of Ten Site Slope and Ten Site Canyon for T&E species habitat was conducted by ESH-20. Information was reviewed to determine whether or not this area is in or near nesting and/or foraging habitat of federally listed T&E species. Also the relative amount or frequency of potential foraging in or near the vicinity of the area was estimated. The review found that the Ten Site Slope and Canyon Subareas are partially within Mexican Spotted Owl nesting habitat and is entirely within an area in which the owl can conservatively be assumed to forage at a high frequency. These subareas are ones in which the bald eagle is conservatively assumed to forage at a low frequency. Critical habitat (cliffs and rock crevices) for the spotted bat *Euderma maculatum* was found in the area (but not on the mesa top) (Dunham 1992, 31276). The bat's occurrence in the canyon is restricted primarily because of the lack of open water in this system.

2.3.2.2.3 Pratt Canyon

The steep slope of Pratt Canyon below TA-35 is dominated by an overstory of piñon-juniper near the mesa top and gives way to ponderosa pine towards the bottom of the slope. The understory consists of Gambel oak, juniper, and fir along with a variety of grasses and forbs (Dunham 1992, 31276). The lower area is characterized by an open ponderosa pine habitat with scattered juniper, oak, and mountain mahogany in the overstory and similar grasses and forbs. A small cattail area is dominated by cattails and other hydrophilic plants.

The portion of Pratt Canyon below TA-35 also provides excellent habitat for a variety of terrestrial fauna. The mammal and bird species found in this area is similar to those described for Mortandad Canyon (Miera et al. 1977, 05569; Dunham 1992, 31276; Gonzales and Newell 1996, 56045; LANL 1997, 56835). However, the abundance of some small mammals may be less than that found in Mortandad Canyon (Miera et al. 1977, 05569).

The small cattail area above the confluence with Ten Site Canyon also provides some aquatic habitat. This cattail area is characterized by cattails and hydrophytic grasses but no emerging, aquatic macrophytes are present. There may be tadpoles present at certain times of the year as well as some aquatic insects (e.g., caddis flies) inhabiting the area. No fish are present in the wetland.

A review of Pratt Canyon for T&E species habitat was conducted by ESH-20. Information was reviewed to determine whether or not this area is in or near nesting and/or foraging habitat of federally listed T&E species. Also the relative amount or frequency of potential foraging in or near the vicinity of the area was estimated. The review found that the Pratt Canyon Slope Subarea was entirely within Mexican Spotted Owl nesting habitat and is within an area in which the owl can conservatively be assumed to forage at a high frequency. This subarea is also within an area in which the bald eagle is conservatively assumed to forage at a low frequency. No other T&E species are potentially present in this subarea.

2.3.3 Release Profile

2.3.3.1 Mesa-Top Setting

PRSs associated with the Mesa Top Subarea are categorized by the following release types:

- *Small, localized spills associated with container storage areas [PRSs 35-004(a and h)]*—The storage areas in this category are small in scale, typically ranging from a single drum to a few square feet, and located on flat, paved portions of the mesa top. Releases at these sites are limited to relatively small volumes (i.e., less than 55 gal.); therefore the potential for extensive lateral migration of contaminants away from the immediate region of the storage area is low. Contaminants associated with the storage areas potentially include dielectric oils (PCB-containing) and other oils and organic chemicals (e.g., freon).
- *Oil spills associated with oil handling facilities, generators, transformers, aboveground storage tanks, and USTs [PRSs 35-003(j)-99, 35-011(d), 35-014(f), 35-015(a), and 35-018(a)]*—Volumes associated with these releases are unknown. However, released volumes are potentially large due to the volumes of liquid handled by the structures involved. This category includes aboveground and underground structures located either in unpaved areas or on paved areas located adjacent to or near unpaved areas. Contaminants in this category are associated with dielectric oils.
- *Liquid releases from components of the TA-35 WWTP [PRS 35-003(a)-99] and septic systems [PRS 35-009(a)]*—Volumes associated with these releases are undocumented, and may range from slow seeps to leaks of unknown proportions. This category includes aboveground and underground structures; most of which were located in formerly unpaved areas. Contaminants associated with the TA-35 WWTP include radionuclides.
- *Stack emissions [PRS 35-014(a)]*—Several thousand curies of tritium were released annually from a glovebox facility in building TA-35-2 between 1954 and 1979. The PRS associated with these emissions is an area of soil located on the southwest side of the building.
- *Soil contamination from Los Alamos Power Reactors (PRS 35-002)*—MDA X consists of previously contaminated material that remained from reactor components removed during a 1990 D&D. The area lies under a parking lot near the southeast corner of building TA-35-2. Confirmatory soil sampling was conducted to verify the removal of all contaminants of concern (mainly radionuclides) which revealed minimal contamination at a depth of 15 ft of europium-152 and cesium-137. However, sampling for hazardous chemicals at depth has not been ade-

quately performed.

The conceptual model for the mesa-top setting takes into account the similarity in nature of the PRSs and the environmental setting of the Mesa Top Subarea. With the exception of PRS 35-014(a) (stack emissions), all the PRSs are associated with liquid releases consisting either of oil spills of varying scale or radioactive liquids associated with the TA-35 WWTP. The similarities in both the behavior of such releases and the mesa top environmental setting support several fundamental elements of the conceptual model.

Surface releases (associated with container storage areas and aboveground tanks and structures) are likely to result in infiltration of contaminants into surface soils and through cracks in asphalt into backfill soils and possibly into the underlying tuff. Contaminants associated with surface releases may also be transported laterally to nearby unpaved areas or mesa-top drainages either as release-driven surface flow or by stormwater runoff. Contaminants transported to surface soils or drainages may either be locally contained or transported as sorbed species on soil particles by stormwater runoff. Soluble contaminants may be transported by stormwater runoff as dissolved species to the hillslopes and canyon floor.

Subsurface releases (associated with underground tanks and lines) are likely to result in infiltration of contaminants into backfill soils and underlying tuff. Vertical and lateral migration within the tuff may occur through unsaturated flow or fracture flow.

Airborne releases associated with stack emissions may result in the deposition of contaminants on paved and unpaved portions of the mesa top and possibly the Ten Site slope. It is hypothesized that contaminants associated with the emissions were deposited proximally to the location of the stack at building TA-35-2 and that any potential residual contamination is likely limited to the soil contained by concrete curbs adjacent to the building. Due to the effects of wind dispersal on airborne releases and soluble nature of tritium, it is expected that distal deposits on the mesa top and/or Ten Site slope have since been transported into Ten Site Canyon by storm events.

2.3.3.2 Hillslope Setting

The environmental setting and release profile of the Ten Site Slope Subarea and the Mortandad Slope Subarea are sufficiently similar that the conceptual model for both subareas can effectively be addressed in the discussion of a single hillslope setting conceptual model.

PRSs associated with the Ten Site Slope and Mortandad Slope Subareas are categorized by the following release types:

- *Liquid/steam releases associated with stormwater outfalls and surface drainages [PRSs 35-016(i)-00, 35-016(f,j,n,o)], cooling water and process outfalls [PRSs 35-016(c)-00, 35-016(a)-00, 35-016(b,e,p)], septic systems and drainlines [PRSs 35-009(a,b,c,e)], and steam blow-off outfalls (PRS 35-017)*—Liquid releases comprise the greatest volumetric contribution to the hillslopes. Volumes associated with these releases are largely undocumented; stormwater-related releases are tied to storm and snowmelt events. Liquid releases potentially discharge contaminants associated with a process or remobilize surface contaminants associated with other PRSs.
- *Container storage areas [PRSs 35-004(b and m) and 35-004(g)-00] and small, localized oil spills [PRS 35-014(g)-00]*—This category contains asphalt-paved storage areas that range in size from a few square feet to several hundred square feet and small oil stains. Based on the evidence of staining present at these sites, releases have been limited to relatively small volumes; therefore, the potential for extensive lateral migration of contaminants away from the immediate region of the storage area is low. Potential contaminants associated with the storage areas and stains collectively include dielectric and other oils, rags, alcohol, organic chemicals, and iron pellets.

- *Oil spills associated with oil-handling facilities [PRSs 35-008-00, 35-016(i)-00, and 35-014(g_3)]*—Oil spills in this category are of unknown volume, however volumes may potentially be large considering the size of associated structures (releases from an aboveground storage tank, an oil truck, and overflows from a surface impoundment) and extent of physical staining present at the sites. These spills may have impacted relatively large areas on the mesa top (several hundreds of square feet) and flow onto the adjacent hillslopes may have been both sheet flow and flow confined to drainages. The soil affected by the spill associated with PRS 35-014(e_1) was bulldozed off the mesa top onto the Mortandad Slope. Potential contaminants associated with these spills include PCB-containing dielectric oils.
- *Canyonside debris pile (PRS 35-008-00)*—This site consists of a disposal area once reported to contain scrap metal, pipe, paint cans, a 55-gal drum, concrete, asphalt, conduits, and rebar. The disposal area covers an area of the upper Mortandad Slope measuring approximately 100 ft by 100 ft. Releases have not been documented, however, potential contaminants include organic chemicals, inorganic chemicals, and TPH.

With the exception of the engineered subsurface leachfields associated with three septic systems, the PRSs associated with the hillslope setting can be categorized as surface releases. Two scenarios address contaminant migration: infiltration of contaminants into surface soils and possibly the underlying tuff (primarily associated with the large oil spills and septic systems), and transport of contaminants from surface soils and paved areas on the mesa top to the hillslope drainages.

Septic system leachfields, by design, release sanitary effluent into a shallow subsurface bed that is intentionally constructed of porous crushed tuff and fill material to facilitate infiltration. Contaminants discharged to sanitary septic systems are likely to have infiltrated underlying tuff, which can then be transported vertically and laterally by saturated flow, unsaturated flow, or fracture flow to greater depths.

The sites associated with the oil spill category may have potentially impacted relatively broad areas on the mesa top and hillslopes and contaminants may not be confined to existing drainage channels. These releases may have resulted in infiltration of contaminants into surface soils and the underlying tuff. Contaminants in surface soils may be transported onto the hillslopes and to the canyon floor. Contaminants in the underlying tuff may be transported vertically and laterally by saturated flow, unsaturated flow, or fracture flow.

Distribution of contaminants associated with these releases on the hillslopes is primarily driven by stormwater and outfall discharge and is predominantly confined to defined drainage channels. Understanding the physical and chemical processes affecting hillslope drainages provides an effective tool for predicting the likely present location of residual contaminants. Contaminants with high solubilities may have been transported beyond the hillslope into the canyon via surface water flow. Contaminants with lower solubilities are more likely to sorb onto soils and sediments, preferentially to finer grained particles. Soils and sediments may be deposited in local "pockets" within drainages. These pockets are areas of accumulation that may represent present contaminant inventory within the drainage. Soils and sediments within the drainage may also be subsequently remobilized during higher energy stormwater or discharge events and preferentially deposited in sediment fans located at the toe of the drainage slope. Examination of fan sediments provides information of the nature of contaminants present in the drainage and may provide a tool for estimating contaminant inventory on the hillslope.

2.3.3.3 Canyon Settings

2.3.3.3.1 Pratt Canyon Setting

PRSs associated with the Pratt Canyon Subarea are categorized by the following release types: surface and subsurface liquid releases associated with stormwater drainages [PRS 35-016(m)], cooling water outfalls and drainages [PRS 35-016(k)-00], abandoned septic systems [PRS 35-009(d)], and structures associated with the former TA-35 WWTP [PRSs 35-003(d)-00].

Surface releases (associated with aboveground tanks and structures) are likely to result in infiltration of contaminants into surface soils and through cracks in asphalt into backfill soils and possibly into the underlying tuff. Contaminants associated with surface releases may also be transported laterally to nearby unpaved areas or mesa-top drainages either as release-driven surface flow or by stormwater runoff. Contaminants transported to surface soils or drainages may either be locally contained or transported as sorbed species on soil particles by stormwater runoff. Soluble contaminants may be transported by stormwater runoff as dissolved species to the Pratt Canyon slope and canyon floor.

Subsurface releases (associated with underground tanks, septic systems, and lines) are likely to result in infiltration of contaminants into backfill soils and underlying tuff. Vertical and lateral migration within the tuff or along the soil/tuff interface may occur through saturated flow, unsaturated flow, or fracture flow. The available data support the model element of infiltration into fill material and the underlying tuff and indicate that fracture flow may not be a significant transport mechanism beneath the bench in upper Pratt Canyon.

The setting of Pratt Canyon is distinct from the other subareas addressed by this investigation in that there are three distinct features comprising the profile of the canyon: the head of the canyon, the canyon slope, and the canyon floor. The operational history of the TA-35 WWTP combined with the highly disturbed nature of the site creates a complex conceptual model.

The head of Pratt Canyon comprises a broad, gently sloping bench that served as the location for former structures associated with the TA-35 WWTP. Large volumes of fill material were introduced to the site as the mesa top was laterally extended during the construction of the TA-35 WWTP. Records indicate that large volumes of planned and unplanned surface releases of radioactive wastewater were discharged to the area during facility operation (Appendix B). Contaminants released during these discharges may have infiltrated into the fill material and possibly into the underlying tuff and also may have been transported from the bench directly onto the Pratt Canyon slope and the canyon floor. The WWTP structures located on the bench and some surrounding soil were removed in 1985. Field screening data indicates that up to 356 pCi/g gross-beta activity from strontium-90 and yttrium-90 was left in the soil at the base of the 20 ft excavation and covered with non-compacted clean fill (Cox 1985, 783). A 12-in. diameter corrugated metal pipe (CMP) discharged stormwater onto the southwest corner of the bench; the discharge flow formed an erosion channel that crossed the southeast portion of the filled excavation. The channel was incised to depths ranging from 1 ft to 22 ft originating at the CMP outfall and sloping westward approximately 160 ft to the edge of the bench at the head of the canyon and onto the Pratt Canyon slope. The magnitude of erosion at the site suggests that residual contamination present in the impacted regions originating either from the surface discharges or potential releases from the structures in the area may have been exposed and transported into Pratt Canyon. In 1996, an IA was performed on the bench at the head of the slope of Pratt Canyon (LANL 1996, 55809). As part of the IA activities, the CMP was removed and the associated stormwater was rerouted via installation of a new CMP to Ten Site Canyon, clean fill was placed into the erosion channel on the bench and slope of Pratt Canyon. An earth berm was installed along the slope break between the bench at the head of the canyon and the Pratt Canyon slope to divert runoff from the Pratt Canyon slope northward to a rock-lined outfall below PRS 35- 016(k). These engineering modifications have effectively reduced the volume of stormwater discharge entering Pratt Canyon.

Pratt Canyon served as the effluent discharge area for the TA-35 WWTP. Prior to the IA, a well-defined drainage channel was present on the slope. A colluvial fan composed of boulders and cobbles of tuff backfill material was present below the erosional channel and extended approximately 75 ft down the upper canyon. Discharges through the channel were observed to be broken into several braided channels across the colluvial fan (LANL 1996, 54422). Stormwater discharges associated with the former CMP are believed to have been the cause of the channel formation. The volumes of wastewater released to the slope suggest that discharge may have occurred as sheet flow and therefore contaminants present on the slope may not be confined to the channel but may have affected the flood plain and canyon bottom of Pratt Canyon. Portions of the Pratt Canyon slope are steep (approximately 1:1), suggesting that erosion and transport of contaminants into those portions of the slope to the canyon floor may be a more dominant

mechanism than sediment deposition on the slope or within the channel. If discharges occurred as sheet-flow, it is unlikely that infiltration occurred across a broad portion of the slope but rather resulted in the introduction of contaminants into surface soils and the underlying tuff in the canyon floor and less steep slope portions. As part of the IA activities, fill material was placed within the drainage and on the slope to minimize the potential for redistribution of contaminated soils and sediments. Residual contamination on the slope at the head of the canyon is likely to be present in the buried channel sediments, slope soils, and tuff underlying the fill and possibly along the walls of the canyon near the edge of the fill.

The canyon floor at the base of the Pratt Canyon slope is relatively wide and flat containing an aggradational sequence of sediments resting on weathered tuff (Qbt 3). The canyon floor contains a stream channel controlled by ephemeral flow associated with stormwater and snowmelt events. At the eastern boundary of the subarea, canyon surface alluvium is intersected by shallow alluvial water to form a small cattail area. Processes affecting the canyon floor may include deposition of sediment derived from the bench at the head of the canyon and slope within the channel and possibly as overbank deposits, redistribution of sediments by stormwater events and channel migration, infiltration of contaminants through canyon floor sediments and into the underlying tuff, and introduction of contaminants to the cattail area either as sorbed species on sediment deposits or as dissolved species mixing with alluvial groundwater. Residual contamination on the canyon floor is most likely to be present in post-1943 depositional features, and possibly in the underlying tuff and in water and sediments within the cattail area.

2.3.3.3.2 Ten Site Canyon Setting

PRSs associated with the Ten Site Canyon Subarea are categorized by the following release types:

- *Liquid discharges associated with former sanitary wastewater treatment facility components [PRS 35-010(a)-99] and septic system [PRS 35-009(b)]*—The wastewater treatment facility structures are located on a tuff bench above the Ten Site Canyon floor. A clay liner was installed in the lagoons [former PRS 35-010(a-c)]; however, previous RFI investigations revealed that the liner was thin or absent in some sampling locations. The liner in the sand filter beds [former PRS 35-010(d)] is of a poly-sheeting or Hypalon-type composition and was observed to be intact. Treated liquids were discharged from the sand filter beds through NPDES-permitted outfall EPA-SSS-10S [former PRS 35-010(e)].
- *Sand and gravel piles (PRS C-35-007) potentially derived from cleanout maintenance of the sand filter beds*—Non-indigenous sand and gravel piles are located north of the sand filter beds. It is unknown whether these piles represent material removed from the sand filter beds or material stored on-site intended for future use.

The TA-35 sewage lagoons were designed to have a capacity of 12,000 gal. per day (gpd) (Emelity 1974, 55116) yet discharged an average of 45,000 gpd into Ten Site Canyon. Alluvial observation wells in lower Ten Site Canyon have historically been dry, which suggests that alluvial groundwater flow does not reach the lower canyon (LANL 1997, 55687). Discharge records are available for the years 1983 to 1992 and indicate that the volume of water discharged from the facility during this period alone is approximately 147.8 million gal.

The discontinuous liner found in the lagoons indicates that seepage may have occurred into the underlying tuff. The liners present in the sand filter beds appeared to be intact where inspected, however, if unobserved holes or tears are present, then similar localized infiltration may have occurred beneath the beds as well. Contaminants released to the tuff may be transported vertically and laterally by unsaturated flow or fracture flow.

Contamination potentially present in the pile material may be transported as sorbed or dissolved species by stormwater flow to the main Ten Site Canyon channel. Sand and gravel from the piles may be present in depositional "pockets" within the two engineered drainages constructed to divert stormwater around the sand filter beds.

2.4 Data Gaps

2.4.1 Introduction

A high performing team (HPT) was created to develop the integrated watershed sampling approach with input from NMED-HWB, DOE, and ER Project Focus Areas. The HPT pioneered the needed elements of this aggregate sampling plan. Because this aggregate SAP is the first of its kind with an emphasis on PRS-affected areas, a watershed approach to decision making, and the sanctioning of user groups for long-term monitoring, endpoints had to be agreed upon to streamline document production.

The existing TA-35 RFI data that was assessed and reviewed included data from 1994, 1995, 1996, and 1997; Canyons Focus Area RFI data; TA-50 RFI data; and Laboratory environmental surveillance data gathered by the ESH groups (published annually). Mobile chemical van data and XRF data were not included in the assessment because of their high detection limits, and because it is not possible to compare them to background values.

Because the data set from these numerous sources needed to be summarized in a useful manner, several data assessment tools were implemented. The HTP agreed upon the following elements for evaluating existing data, identifying data gaps, and designing the sampling approach (ER Project 2002, 71483):

- Existing sampling locations would be evaluated by PRS-affected areas (instead of PRS by PRS) prior to determination of data gaps.
- For hillslope-affected areas, physical parameters (i.e., incised channel) would be used to bound lateral extent of contamination. The hillslope investigations would be focused on alluvial fans and sample selection would be based on geomorphic characterization of the fans and drainages.
- Not all data would be included in the aggregate SAP in hard copy format; only summary level tables would be needed. These are frequency of detection, greater-than-background-value results for metals and radionuclides, results of detected organic chemicals, and samples taken, which list all the samples collected at each PRS and what analyses were performed on each (see section 2.2).
- Visualization tools to assess the data set would be developed (box plot and spoke plot designs), with a target group of contaminants selected (most toxic to environment, most carcinogenic, etc.).
- Chemicals selected for the spoke plot visualization tool, would be based on the chemical's detection frequency, human health and ecological drivers, and geochemical properties of the chemicals.
- Canyons Focus Area data would be included as part of the data set.
- For sample-collection tables in the aggregate SAP, duplication efforts would be reduced by eliminating analytical suites where existing data or process knowledge is defensible.

2.4.2 Data Tools

2.4.2.1 Data Summary Tables

Tables were created to summarize information about what samples were taken, what chemicals were detected, and at what frequency they were detected. Summary tables include the following information:

- Samples-taken tables list all the samples collected at a PRS or PRS aggregate, sample attributes, and the analytes each sample was analyzed for (represented by the analytical request numbers on the tables, see section 2.2).
- Frequency-of-detect tables include the frequency of detection (represented by the number of

detected values over the total number of samples analyzed) for all analytes and are not sample-specific.

- Greater-than-background-values and detected chemicals tables include sample-specific information for each detected sample (i.e., depth), but only for greater-than-background values for those inorganic chemicals and radionuclides with background values, and for detected organic chemicals or radionuclides which have no background values.

2.4.2.2 Spoke Plots

Spoke plots are used to provide a snapshot of the relative concentration of a specific analyte at a given locale where the relative concentration of each analyte is shown as a spoke radiating from a hub (a sample location). Spoke plots help the reader to visualize information about

- where samples of each analyte type were collected,
- spatial data gaps,
- the distribution of contaminant concentrations within and among the PRS-affected area, and
- the relation of contaminant concentrations between PRS-affected areas and canyon sediments.

For each subarea, a map with spoke plots was created for each "class" of chemicals (i.e., organic chemicals, inorganic chemicals, and radioisotopes). For each map, six chemicals were chosen. The chemicals selected for each spoke were based on the chemical's detection frequency (in that subarea), on human health and ecological drivers, and on geochemical properties of the chemical. Table 2.4-1 shows the chemicals that were selected for the spoke plots for each subarea.

Table 2.4-1
Chemicals Selected for Spoke Plots by Subarea

Mesa Top	Ten Site Slope	Mortandad Slope	Pratt Canyon	Ten Site Canyon
Inorganic Chemicals				
Cadmium (Cd)	Cadmium (Cd)	Beryllium (Be)	Copper (Cu)	Chromium (Cr)
Chromium (Cr)	Copper (Cu)	Chromium (Cr)	Lead (Pb)	Copper (Cu)
Lead (Pb)	Lead (Pb)	Copper (Cu)	Silver (Ag)	Lead (Pb)
Mercury (Hg)	Mercury (Hg)	Mercury (Hg)	Thallium (Tl)	Mercury (Hg)
Nickel (Ni)	Silver (Ag)	Nickel (Ni)	Vanadium (V)	Silver (Ag)
Zinc (Zn)	Zinc (Zn)	Zinc (Zn)	Zinc (Zn)	Zinc (Zn)
Organic Chemicals				
Aroclor-1260	Aldrin	Aroclor-1254	Aroclor-1260	Acetone
Benzo(a)anthracene	Aroclor-1254	Benzo(a)fluoranthene	Benzo(a)anthracene	Aroclor-1254
Benzo(a)pyrene	Aroclor-1260	Benzo(a)pyrene	Benzo(a)pyrene	Aroclor-1260
Benzo(b)fluoranthene	Benzo(a)pyrene	Bis(2-ethylhexyl)phthalate	Chrysene	Benzo(a)anthracene
Bis(2-ethyl-hexyl)phthalate	Bis(2-ethyl-hexyl)phthalate	Chrysene	Dibenzo(a,h)-anthracene	Benzo(a)fluoranthene
Chrysene	Dibenzo(a,h)-anthracene	Trichloropropane[1,2,3-]	Napthalene	Bis(2-ethyl-hexyl)phthalate

Table 2.4-1
Chemicals Selected for Spoke Plots by Subarea (continued)

Mesa Top	Ten Site Slope	Mortandad Slope	Pratt Canyon	Ten Site Canyon
Radionuclides				
Cobalt-60	Cesium-137	Cesium-137	Americium-241	Americium-241
Cesium-137	Plutonium-238	Plutonium-238	Cesium-137	Plutonium-238
Plutonium-239	Plutonium-239	Plutonium-239	Plutonium-238	Plutonium-239
Strontium-90	Uranium-234	Tritium	Plutonium-239	Tritium
Tritium	Uranium-235	Uranium-234	Strontium-90	Uranium-234
Uranium-235	Uranium-238	Uranium-238	Tritium	Uranium-238

Spoke plots depict relative concentrations for a specific (subarea) data set only. Each analyte is represented by a spoke of a different color and occupies a given location on the hub. For example, if spoke plots were used to depict analytical results for metals (chromium, copper, lead, mercury, silver, and zinc) from four sample locations, then each of the six metals would be represented by a spoke on one of four hubs: six metals tested, six spokes at each of the four sample locations.

In the Ten Site Canyon spoke plot (Appendix E), lead (Pb) is represented by a green spoke in the 8 o'clock position. Then each of the hubs representing sample locations has a green spoke at the 8 o'clock position representing relative lead concentrations. By comparing the lengths of the green spokes the reader can quickly determine which locations had the highest, or lowest, concentrations of lead in the samples. It is important to understand that the length of the spoke only indicates the relative concentrations for a given sample set (four in this case) and does not imply that the concentrations exceed or fall below threshold levels or any regulatory standard. The longest spoke in this case could be well below background values for lead. Conversely, if four samples were collected from a saturated source (e.g., near the outfall from mine waste) then even the shortest spoke could be above regulatory levels. Spoke plots simply shows the relative concentrations of a given analyte for a given locale. Also, the maps show the relative distribution of chemicals in two dimensions (i.e., lateral distribution) but not the vertical component.

As stated above, the length of each spoke shows relative concentrations normalized to maintain a reasonable scale. In the case of inorganic chemicals they were normalized relative to background values. In the case of organic chemicals, because there are no background values, one-tenth of the SAL was used to normalize the concentrations of the chemicals in the samples. And in the case of radioisotopes, if a background value was available it was used; if not, one-tenth of the SAL was used.

Spoke plots allow the reader to see the presence of a chemical with respect to background values (or SALs, as appropriate) within a subarea. Also, by using the tables printed within the spoke plot maps, the reader can discern which chemicals are present within the same order of magnitude as the background value, or one order of magnitude greater, or two. For example, using the inorganic chemical's spoke plots for the Ten Site Canyon Subarea, one can make the following observations: mercury has a maximum concentration of 4 ppm, its background value is 0.1 ppm. The normalized concentration is 40.0. This means that the maximum value for mercury in this subarea is present at a concentration that is 40 times greater than the background value. Therefore, the normalized concentration for mercury is 40. On the other hand, for lead, the maximum concentration is 98 ppm and the background value is 22.3 ppm. This means that lead is present at 4.3 times greater than the background value. Therefore, the normalized concentration is 4.3. Although the concentration of lead is much greater, the relative concentration of lead to mercury is smaller by a factor of almost 10.

The longest spoke (approximately 1 in.) is set to be the maximum ratio. In the example above, for mercury the 1-in. spoke represents the normalized concentration of 40; for lead the 1-in. spoke represents the normalized concentration of 4.3. The purpose of spoke plots is to look at the relative differences between

spokes for each chemical, not between chemicals. The relative differences must be kept in mind when looking at the different chemicals.

2.4.3 Organization of Data Gap Determination Tables

After all the data reviews described above were completed, the HPT determined which PRSs had sufficient data for risk or screening assessments, and what data were still needed. The team chose the physical location of the samples and the corresponding depths at which those samples were to be collected.

The following data gap determination tables present the existing data for each subarea (Tables 2.4-2 through 2.4-6). The columns contain headings which serve as questions to be answered in the rows below. For each type of analysis is an aggregate of columns: inorganic chemicals for TAL metals; organic chemicals for SVOC, VOC, and PCB/pesticide suites; and radionuclides for alpha and gamma spectroscopy, strontium-90, and tritium suites.

Each row contains information regarding the reviewed data for an individual PRS or group of PRSs. If warranted, a summary of contaminant depths and other specific information is given. In some cases, a particular analysis was not performed due to process knowledge of the PRS or PRS aggregate; this is noted in the summary. The conclusions column summarizes the overall data gap evaluation for the PRS. These tables correspond to the existing data tables in section 2.2 as well as the proposed sample tables in section 3.2.

The first question asks if, based on process knowledge, the particular contaminant(s) would be *expected* at the PRS or PRS aggregate. The second question asks how many fixed-laboratory samples were collected at the PRS. The third question asks if any samples were collected and, if so, did the resulting data contain concentrations greater than background values (or in a case where there is no background value, a detected value). The fourth and fifth questions ask the data reviewers if they believe that the vertical (depth) and lateral (top to bottom and side to side) extents of contamination have been defined, respectively. Vertical extent refers to defining the depth that contamination has reached at the PRS or PRS aggregate (i.e., has a decreasing trend with depth been found). Lateral extent refers to the north/south, east/west limit of contamination from the PRS or PRS aggregate (i.e., have contaminant concentrations been found to decrease outwardly from the source).

Because outfall channels are eroded into the slope from the mesa edge to the canyon bottom, the lateral (bank-to-bank) boundary of the channel is a physical feature that is visible; therefore, the lateral extent of possible contamination from bank to bank is determined. In addition, outfall channels can be eroded or scoured to tuff, where the potential contaminated soil/sediments have been moved beyond the PRS boundary or reside at a great distance from the source. Transecting and sampling the alluvial fans, which are most apt to have received and contain the contaminated sediment, is the best alternative for determining the lateral and vertical extent of contamination at these types of sites. If the alluvial fan at an "outfall type" of PRS or PRS aggregate has not been sampled, a data gap most likely exists.

Table 2.4-2
Data Gap Determination for the Mesa Top Subarea

Consolidated Unit Number, Individual PRS Number, and Description	Inorganics					Organics: SVOCs					Organics: VOCs					Organics: PCBs/Pesticides					Radionuclides: Alpha Spectroscopy					Radionuclides: Gamma Spectroscopy					Radionuclides: Strontium-90					Radionuclides: Tritium					Data Gap Conclusions						
	COPCs expected at PRS?[a]	Number of fixed-laboratory samples	> Background value?[b]	Vertical extent defined?[c]	Lateral extent defined?[d]	COPCs expected at PRS?	Number of fixed-laboratory samples	Detected?	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	Detected?	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	Detected?	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	> Background value or detected?[e]	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	> Background value or detected?	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	> Background value or detected?	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	> Background value or detected?	Vertical extent defined?	Lateral extent defined?	Metals	SVOCs and /or VOCs	PCBs	Alpha spectroscopy	Gamma spectroscopy	Strontium-90	Tritium
35-015(a), waste oil treatment facility	Y[f]	18	Y	N[g]	N	Y	20	Y	N	N	U[h]	6	Y	N	N	U	6	N	Y	Y	N	17	Y	Y	Y	N	16	Y	Y	Y	N	0	—	—	—	N	0	—	—	—	✓	✓					
	Barium, cadmium, calcium, chromium, copper, lead, nickel, thorium, and zinc detected in most AAC prefix samples from 0 to 3 ft; calcium, chromium, and nickel detected in 1997 samples from 0 to 3 ft, concentrations decreasing with depth					Samples were also analyzed for DRO and LRO; the highest detects are from lubricant range TPH at locations 35-2500 and 35-2499, from 1 to 2 ft					Trace amounts of 4 VOCs (e.g., acetone, toluene and trichloroethenes) detected in samples to depths of 3 ft					Nothing detected					One sample (97-0108) contained uranium-235 just above background at 1- to 2-ft depth; 1 (97-0104) contained plutonium-239 below background in a surface sample					One sample (97-0108) contained europium-152 just above background from 1- to 2-ft depth					Based on process knowledge, no samples were collected for this chemical					Based on process knowledge, no samples were collected for this chemical					Checked categories have detected constituents whose extent has not been defined (between location 35-2499 and 35-2500 for SVOCs)						
35-011(d), waste oil USTs (2)	U	0	—	N	N	Y	0	—	N	N	U	0	—	N	N	U	0	—	N	N	U	0	—	N	N	U	0	—	N	N	U	0	—	N	N	U	0	—	N	N	✓	✓	✓	✓	✓	✓	✓
	No existing RFI data					No existing RFI data					No existing RFI data					No existing RFI data					No existing RFI data					No existing RFI data					No existing RFI data					No existing RFI data					ESH-18 removed tanks in 1991; TPH was detected up to 500 ppm at bottom of excavation (20 ft), no hazardous chemical data were collected						
35-014(f), oil spill stain	U	0	—	N	N	Y	6	Y	N	Y	U	0	—	N	N	Y	6	N	Y	Y	N	0	—	—	—	N	0	—	—	—	N	0	—	—	—	N	0	—	—	—	✓	✓					
	No existing RFI data					DRO only type of SVOC analyzed for at this site; DRO detected from 45 to 6500 ppm in all 6 samples from 0- to 1-ft depth below excavation					No existing RFI data					Nothing detected					Based on process knowledge, no samples were collected for this chemical					Based on process knowledge, no samples were collected for this chemical					Based on process knowledge, no samples were collected for this chemical					Based on process knowledge, no samples were collected for this chemical .					No existing RFI metals or VOC data exist, and they could be a contaminant in the oil that spilled; also, vertical extent has not been defined for TPH						
35-014(a), contaminated soil from stack emissions	N	2	Y	N	N	N	2	Y	Y	Y	N	0	—	—	—	N	2	N	Y	Y	Y	27	Y	Y	Y	Y	20	Y	Y	Y	Y	18	N	Y	Y	Y	27	Y	N	Y							✓
	Only XRF data available; several metals (10) detected in 2 surface samples at values consistent with industrial nature of entire TA					Two phthalates detected in 2 surface samples					Based on process knowledge, no samples were collected for this chemical					Nothing detected					Plutonium-239 (2 detects) and uranium-234/235 (3 detects) contain less than 3.0 pCi/g from 0- to 2-ft depth					Cesium-137 (3 detects), cobalt-60, and europium-152 (1 detect) contain ≤0.2 pCi/g from 0- to 2-ft depth					Nothing detected					Tritium detected in 12 samples, all less than 0.6 pCi/g from 0- to 3-ft depth; however, highest values are at 3-ft depth					Tritium needs to be bounded beyond 3-ft depth; however, it is already less than background values; if the concentrations do not change with depth, do not chase						
35-004(a), outdoor container storage area	U	0	—	—	—	Y	0	—	—	—	Y	0	—	—	—	U	0	—	—	—	Y	2	N	Y	Y	N	0	—	—	—	N	0	—	—	—	N	0	—	—	—	✓	✓	✓				✓
	No existing RFI data					No existing RFI data					No existing RFI data					No existing RFI data					Nothing detected					Based on process knowledge, no samples were collected for this chemical					Based on process knowledge, no samples were collected for this chemical					Based on process knowledge, no samples were collected for this chemical					Because of no existing data for inorganics, organics, or tritium (contaminants that may be expected at this site), samples need to be collected						
35-009(a), septic system	Y	3	Y	N	N	Y	8	Y	N	N	N	0	—	—	—	N	0	—	—	—	Y	6	Y	Y	Y	N	0	—	—	—	N	0	—	—	—	N	0	—	—	—	✓	✓					
	Copper, mercury, and zinc detected in at least 1 sample from fixed laboratory					Trace amounts of 2 SVOCs detected in 1 sample from alongside and below septic tank					Based on process knowledge, no samples were collected for this chemical					Based on process knowledge, no samples were collected for this chemical					Based on process knowledge, no samples were collected for this chemical					Based on process knowledge, no samples were collected for this chemical					Based on process knowledge, no samples were collected for this chemical					Based on process knowledge, no samples were collected for this chemical					Checked categories have detected constituents whose vertical extent has not been defined						

Table 2.4-2
Data Gap Determination for the Mesa Top Subarea (continued)

Consolidated Unit Number, Individual PRS Number, and Description	Inorganics					Organics: SVOCs					Organics: VOCs					Organics: PCBs/Pesticides					Radionuclides: Alpha Spectroscopy					Radionuclides: Gamma Spectroscopy					Radionuclides: Strontium-90					Radionuclides: Tritium					Data Gap Conclusions						
	COPCs expected at PRS?[a]	Number of fixed-laboratory samples	> Background value?[b]	Vertical extent defined?[c]	Lateral extent defined?[d]	COPCs expected at PRS?	Number of fixed-laboratory samples	Detected?	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	Detected?	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	Detected?	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	> Background value or detected?[e]	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	> Background value or detected?	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	> Background value or detected?	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	> Background value or detected?	Vertical extent defined?	Lateral extent defined?	Metals	SVOCs and/or VOCs	PCBs	Alpha spectroscopy	Gamma spectroscopy	Strontium-90	Tritium
35-003(j)-99 **PRSs 35-003(j,k), PRSs 35-014(b,d), PRS 35-015(b)** aboveground oil storage tanks and releases	Y	8	Y	Y	Y	Y	62	Y	N	N	Y	27	Y	N	N	Y	48	Y	N	N	Y	23	Y	Y	Y	U	8	N	Y	Y	N	0	—	—	—	N	3	N	Y	Y		✓	✓				
	Calcium, copper, lead, and mercury detected in 1 surface sample, but nothing deeper					Sixty of the samples also analyzed for DRO and LRO TPH; the highest detects come from LRO TPH at locations 35-2534 and 35-2535, from 5 to 12 ft (most VOCs are there also); highest detects for DRO at location 35-02291, from 1 to 10 ft; highest detects from SVOCs in general at PRS 35-014(b) are location 35-2568, from 0.5 to 1.5 ft					Trace amounts of 15 VOCs (e.g., acetone, toluene, ethenes, and xylenes) detected in samples to depths of 12.5 ft; toluene and xylenes were detected the most at locations 35-2534 and 35-2535; also need lateral extent to the north					In all, 9 samples had detected aroclors (Aroclor-1248 and -1260), all less than 0.1 ppm except for 2.9 ppm Aroclor-1260 at 4-ft depth; the deepest depth with a detect is 12.5 ft; also need lateral extent to the north					Three uranium-235 detects, mainly in surface samples just above background; plutonium-239 detected at 6.6 pCi/g in deepest sample (5 ft)					Nothing detected					Based on process knowledge, no samples were collected for this chemical					Nothing detected					Need more organic data from deeper intervals at a location north of where existing data came from						
35-018(a), former site of leaking transformer	Y	3	Y	Y	Y	Y	8	Y	N	Y	N	0	—	—	—	U	10	N	N	Y	N	0	N	—	—	N	3	N	Y	Y	N	0	—	—	—	N	0	—	—	—		✓	✓				
	Cadmium, mercury, and zinc detected in 1 of the 3 samples at the 2- to 3-ft depth; other samples were surface samples at 2 other locations					SVOCs detected in 7 of 8 surface samples (0 to 1 ft)					Based on process knowledge, no samples were collected for this chemical					Ten samples contained PCBs; the deepest sample (3.5 ft) had the highest value (12 ppm)					Based on process knowledge, no samples were collected for this chemical					Nothing detected					Based on process knowledge, no samples were collected for this chemical					Based on process knowledge, no samples were collected for this chemical					Need more PCB and SVOC data from deeper intervals						
35-003(a)-99 **PRSs 35-003(a,b, c,e,f,g,h,m,misc., n,o,p),** WWTP components	Y	113	Y	N	N	U	77	Y	N	N	U	35	Y	N	N	U	49	N	N	N	Y	150	Y	N	N	Y	80	Y	N	N	Y	72	Y	N	N	Y	91	Y	N	N	✓	✓	✓	✓	✓	✓	✓
	Antimony, barium, cadmium, chromium, copper, lead, mercury, nickel, selenium, and zinc detected; titanium high in surface samples but decreases with depth; need lateral extent to the northeast, south, southeast, and southwest					PAH-type SVOCs detected at all depths [mainly at PRS 35-003(misc.) and PRS 35-003(p)]; also need lateral extent to the northeast, south, southeast, southwest					Trace amounts of acetone, butanone, hexanone, dimethylene chloride, and trichloroethene detected at PRS 35-003(misc.) and PRS 35-003(p); also need lateral extent to the southeast and southwest					One surface sample (35-2271) had all aroclors; Aroclor-1260 detected in 8 samples up to 14 ppm at a 9.5-ft depth					Plutonium detected just over background in most samples, PRS 35-003(p) and PRS 35-003(misc.) had the most detects; location 35-2026 had 4 uranium hits with uranium-238 the highest at 55 pCi/g at the 3-ft depth, but nothing deeper					PRS 35-003(p) had the most detects of cesium-137 and the only cobalt-60 detects; cesium-137 showed a clearer decreasing trend than cobalt-60					Strontium-90 detected in more than half the samples, no decreasing trend noted; PRS 35-003(p) had detects in 20 out of 21 samples					Tritium detected in more than half the samples; no decreasing trend noted					All categories have detected constituents whose vertical extent has not been defined						

Table 2.4-2
Data Gap Determination for the Mesa Top Subarea (continued)

Consolidated Unit Number, Individual PRS Number, and Description	Inorganics					Organics: SVOCs					Organics: VOCs					Organics: PCBs/Pesticides					Radionuclides: Alpha Spectroscopy					Radionuclides: Gamma Spectroscopy					Radionuclides: Strontium-90					Radionuclides: Tritium					Data Gap Conclusions						
	COPCs expected at PRS?[a]	Number of fixed-laboratory samples	> Background value?[b]	Vertical extent defined?[c]	Lateral extent defined?[d]	COPCs expected at PRS?	Number of fixed-laboratory samples	Detected?	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	Detected?	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	Detected?	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	> Background value or detected?[e]	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	> Background value or detected?	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	> Background value or detected?	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	> Background value or detected?	Vertical extent defined?	Lateral extent defined?	Metals	SVOCs and /or VOCs	PCBs	Alpha spectroscopy	Gamma spectroscopy	Strontium-90	Tritium
35-004(h), outdoor container storage area (cleaned up in 1985 D&D)	Y	4	Y	Y	Y	Y	4	Y	Y	Y	Y	0	—	—	—	Y	4	N	Y	Y	Y	4	Y	Y	Y	Y	2	N	Y	Y	N	0	—	—	—	N	0	—	—	—							
	Only XRF data available; area was remediated during D&D for TA-35-7					Phthalates detected in 1 sample from 1- to 2-ft depth					Based on process knowledge, no samples were collected for this chemical					Nothing detected					Nothing detected					Nothing detected					Based on process knowledge, no samples were collected for this chemical					Based on process knowledge, no samples were collected for this chemical					No further data needed						
35-002, MDA X (1991 D&D)	U	0	—	N	N	U	0	—	N	N	U	0	—	N	N	U	0	—	N	N	Y	0	—	N	N	Y	0	—	N	N	Y	0	—	N	N	Y	0	—	N	N							
	No existing RFI data					No existing RFI data					No existing RFI data					No existing RFI data					No existing RFI data					No existing RFI data					No existing RFI data					No existing RFI data					Because this sample location is collocated with part of PRS 35-009(a)-99, data will be used from 35-009(a)-99 to assess both sites						

[a] From process knowledge, is class of chemical *expected* to be present as a contaminant at the site?
[b] Are chemicals from this class present above background concentrations?
[c] Is vertical extent of contaminants present defined?
[d] Is lateral extent of contaminants present defined?
[e] Is radionuclide above background value, or detected if a background value is either not applicable or not available?
[f] Y = yes.
[g] N = no.
[h] U = unknown if chemical might be present.

Table 2.4-3
Data Gap Determination for the Ten Site Slope Subarea

Consolidated Unit Number, Individual PRS Number, and Description	Inorganics					Organics: SVOCs					Organics: VOCs					Organics: PCBs/Pesticides					Radionuclides: Alpha Spectroscopy					Radionuclides: Gamma Spectroscopy					Radionuclides: Strontium-90					Radionuclides: Tritium					Data Gap Conclusions						
	COPCs expected at PRS?[a]	Number of fixed-laboratory samples	> Background value?[b]	Vertical extent defined?[c]	Lateral extent defined?[d]	COPCs expected at PRS?	Number of fixed-laboratory samples	Detected?	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	Detected?	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	Detected?	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	> Background value or detected?[e]	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	> Background value or detected?	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	> Background value or detected?	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	> Background value or detected?	Vertical extent defined?	Lateral extent defined?	Metals	SVOCs and /or VOCs	PCBs	Alpha spectroscopy	Gamma spectroscopy	Strontium-90	Tritium
35-016(j), roof drains and fire-protection outfall water	N[f]	1	N	N	N	N	1	Y[g]	N	N	N	1	N	N	N	N	0	—	—	—	N	3	N	N	N	N	2	N	N	Y	N	0	—	—	—	N	0	—	—	—	✔	✔		✔	✔		
	Nothing detected; however, no data exist for slope toe					Detected PAHs are found in asphalt or tar roofing material through which the water traveled before discharging to outfall; no samples collected near slope toe					Nothing detected; however, no data exist for slope toe					Based on process knowledge, no samples were collected for this chemical					Detected plutonium-239 in 1 sample just over background; no data exist for slope toe					Nothing detected; however, no data exist for slope toe					Based on process knowledge, no samples were collected for this chemical					Based on process knowledge, no samples were collected for this chemical					Checked categories have detected constituents whose extent has not been defined; more data needed for metals, SVOCs, and alpha and gamma spectroscopy analysis, especially at slope toe						
35-014(g3), oil spill	U[h]	2	N	N	N	Y	16	Y	N	N	U	10	Y	N	N	U	2	N	Y	Y	N	2	N	Y	Y	N	14	Y	Y	Y	N	0	—	—	—	N	0	—	—	—	✔	✔					
	Samples collected at top of slope from 0- to 12-in. depth, nothing detected; no data from 3 alluvial fans at toe of slope					SVOCs, including DRO and LRO, are present in soils; no data from 1 of 3 fans at toe of slope					Samples collected for VOCs near top of slope; analyses indicate chlorinated organic chemicals are in the spilled oil; no data from 1 of 3 fans at toe of slope					Two samples collected for pesticides/PCBs near top of slope, nothing detected; no data from 3 fans at toe of slope but, if no PCBs are detected at origin of oil spill, extent is defined					Two samples collected for isotopic uranium and isotopic plutonium; 1 plutonium-239 was detected < background; no data from 3 fans at toe of slope, but OK because nothing detected > background					Europium-152 detected and cesium-137 detected (1- to 2-ft depth), below background level; no data from 1 of 3 fans at toe of slope					Based on process knowledge, no samples were collected for this chemical					Based on process knowledge, no samples were collected for this chemical					More data needed for metals at toe of slope; only SVOCs and VOCs needed in middle channel and to define vertical extent in other fans; because PCBs were not detected at the source, no further sampling needed; radionuclides detected were all < background						
35-004(g)-00: **35-016(n)*** **35-004(m)*** **35-014(g1)** **35-014(g2),** outfall and oil spill/stained areas	U	11	Y	N	N	Y	10	Y	N	N	N	2	N	Y	Y	N	10	N	Y	Y	U	33	Y	N	N	U	33	Y	Y	Y	N	0	—	—	—	N	0	—	—	—	✔	✔		✔			
	Only 1 surface sample detected antimony, cadmium, chromium, cobalt, copper, lead, and zinc; 2 other surface samples detected zinc; no data from toe of slope					SVOCs detected in 4 of the 10 samples at PRS 35-016(n); no data from toe of slope					Nothing detected; no data from toe of slope but, if no VOCs are detected at origin of oil spill, extent is defined					Nothing detected; no data from toe of slope but, if no PCBs are detected at origin of oil spill, extent is defined					Thirty-three isotopic uranium and 14 isotopic plutonium samples collected; PRS 35-016(n) had 5 plutonium-239 hits in surface samples; PRS 35-004(m) had 1 hit of plutonium-239 and uranium-234/235 in 2 surface samples					PRS 35-004(m) had europium-152 in 1 sample; PRS 35-016(n) surface sample had cesium-137 > sediment background					Based on process knowledge, no samples were collected for this chemical					Based on process knowledge, no samples were collected for this chemical					More data needed for metals, SVOCs, and alpha spectroscopy in alluvial fan at toe of slope, for both vertical and lateral extents						
35-009(b) septic system; **35-004(g)** outdoor storage area	U	2	Y	N	N	Y	9	N	N	N	U	1	N	N	N	U	6	Y	N	N	Y	33	Y	N	N	Y	14	N	N	Y	N	0	—	—	—	N	0	—	—	—	✔	✔	✔	✔	✔		
	Only 1 metal (zinc) detected at PRS 35-004(g); only 1 sample from 6- to 7-ft depth at PRS 35-009(b), nothing detected; could use more samples at south end of leach field					Nothing detected in top portion of leach field to a 20-ft depth; however, could use more samples from south end of leach field					One surface sample at PRS 35-004(g), nothing detected from 0 to 6 in.; nothing collected at PRS 35-009(b) because VOCs are not expected					Aroclor-1254 and Aroclor-1260 were detected in 2 of 5 samples from 35-004(g); no detects from 1 sample at PRS 35-009(b); need data from toe of slope and leachfield at depth					Plutonium-238 detected in 2 samples; uranium-234/235/238 detected in 2 samples; no data from toe of slope or leach field at depth					No data from toe of slope or leach field at depth					Based on process knowledge, no samples were collected for this chemical					Based on process knowledge, no samples were collected for this chemical					More data needed for metals, SVOCs, VOCs, PCBs, and alpha and gamma spectroscopy at toe of slope and within old leach field, to define vertical and lateral extent						
35-016(b), photo-processing effluent outfall	Y	1	Y	N	Y	N	1	N	N	Y	N	1	N	Y	Y	N	0	—	—	—	U	10	Y	N	Y	U	6	N	N	Y	N	0	—	—	—	N	0	—	—	—	✔	✔		✔	✔		
	Lead detected in sample at 2- to 3-ft depth; no data from toe of slope					Nothing detected; no data from toe of slope					Nothing detected; no data exist from toe of slope, screening at toe should be sufficient					Based on process knowledge, no samples were collected for this chemical					Uranium-234/238 detected in 1 sample at 1- to 2-ft depth; no data from toe of slope					Nothing detected; no data from toe of slope					Based on process knowledge, no samples were collected for this chemical					Based on process knowledge, no samples were collected for this chemical					More data needed for metals, SVOCs, and alpha and gamma spectroscopy at toe of slope to define extent; cyanide data also need to be collected; screening for VOCs should be adequate as conceptual model and knowledge of process (KOP) do not anticipate VOCs						

Table 2.4-3
Data Gap Determination for the Ten Site Slope Subarea (continued)

Consolidated Unit Number, Individual PRS Number, and Description	Inorganics					Organics: SVOCs					Organics: VOCs					Organics: PCBs/Pesticides					Radionuclides: Alpha Spectroscopy					Radionuclides: Gamma Spectroscopy					Radionuclides: Strontium-90					Radionuclides: Tritium					Data Gap Conclusions						
	COPCs expected at PRS?[a]	Number of fixed-laboratory samples	> Background value?[b]	Vertical extent defined?[c]	Lateral extent defined?[d]	COPCs expected at PRS?	Number of fixed-laboratory samples	Detected?	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	Detected?	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	Detected?	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	> Background value or detected?[e]	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	> Background value or detected?	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	> Background value or detected?	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	> Background value or detected?	Vertical extent defined?	Lateral extent defined?	Metals	SVOCs and /or VOCs	PCBs	Alpha spectroscopy	Gamma spectroscopy	Strontium-90	Tritium
35-016(c)-00: 35-016(c), 35-016(d), noncontact cooling water outfall	Y	13	Y	N	N	U	13	Y	N	N	N	1	N	U	N	N	0	—	—	—	U	14	Y	N	N	Y	13	Y	N	N	N	0	—	—	—	N	0	—	—	—	✓	✓		✓	✓		
	Antimony, barium, chromium, cobalt, lead, mercury, nickel, silver, and zinc detected in least 1 of 10 samples; no data exist from alluvial fan of outfall channel					SVOCs (PAHs) detected in 5 samples, probably from stormwater runoff over asphalt surfaces; no data exist from alluvial fan of outfall channel					Nothing detected; no data exist from toe of slope, screening at toe should be sufficient					Based on process knowledge, no samples were collected for this chemical					Plutonium-238 detected in 1 sample and uranium-235 detected in 1 sample; no data exist from alluvial fan of outfall channel					Europium-152 detected in 1 surface sample and cesium-137 detected in 2 surface samples; no data exist from alluvial fan of outfall channel					Based on process knowledge, no samples were collected for this chemical					Based on process knowledge, no samples were collected for this chemical					More data needed for metals, SVOCs, and alpha and gamma spectroscopy at toe of slope; screening for VOCs should be adequate as conceptual model and KOP do not anticipate VOCs						
35-009(e), septic system	U	1	N	N	N	U	1	N	N	N	N	1	N	N	N	N	1	N	N	N	U	5	Y	N	N	U	4	Y	N	N	N	3	N	Y	Y	N	3	Y	Y	Y	✓	✓	✓	✓	✓		
	Vertical and lateral extents have not been defined with only 1 sample; no data exist from alluvial fan below outfall					Vertical and lateral extents have not been defined with only 1 sample; no data exist from alluvial fan below outfall					Vertical and lateral extents have not been defined with only 1 sample; no data exist from alluvial fan below outfall; because VOCs are not expected at this site, screening for them should be sufficient					Vertical and lateral extents have not been defined with only 1 sample; no data exist from alluvial fan below outfall					Plutonium-239 detected in 2 samples; uranium-234/235/238 detected in 1 sample; vertical and lateral extents have not been defined; no data exist from alluvial fan below outfall					One detect < background; vertical and lateral extents have not been defined; no data exist from alluvial fan below outfall					Nothing detected					Three detects < background					More data needed for metals, SVOCs, PCBs, and alpha and gamma spectroscopy at toe of slope; screening for VOCs should be adequate as conceptual model and KOP do not anticipate VOCs						
35-009(a), sanitary septic system	U	26	Y	N	N	U	32	Y	N	N	N	0	—	—	—	N	0	—	—	—	U	41	Y	N	N	U	37	N	N	N	U	34	N	Y	Y	U	28	Y	Y	Y	✓	✓	✓	✓	✓		
	Metals beryllium, cadmium, copper, lead, mercury, silver, and zinc detected in up to 3 samples; extent not complete for alluvial fan or leach field					SVOCs (PAHs) detected in 4 samples; extent not complete for alluvial fan or leach field					Based on PRS use, no samples were collected for this chemical					Based on PRS use, no samples were collected for this chemical					Plutonium-238 detected in 2 samples and plutonium-239 detected in 6 samples > background; extent not complete for alluvial fan or leach field					Nothing detected; however, extent not complete for alluvial fan or leach field					2 detects < background					Two tritium samples have detected values just > background, and 20 samples < background values; values do not increase or decrease with depth					More data needed for metals, SVOCs, PCBs, and alpha and gamma spectroscopy at toe of slope and additional areas in leach field; screening for VOCs should be adequate as conceptual model and KOP do not anticipate VOCs						
35-016(a)-00: 35-016(a), noncontact cooling water	Y	5	Y	N	N	N	8	Y	Y	Y	N	1	N	Y	Y	N	0	—	Y	Y	U	8	Y	N	N	U	7	N	Y	Y	U	3	N	Y	Y	U	3	Y	Y	Y	✓			✓			
	Metals chromium, copper, nickel, and zinc detected in up to 3 samples					SVOCs (PAHs) detected in 6 of 7 samples (as expected from asphalt road runoff adjacent to site)					Although no VOCs detected, no data exist from alluvial fan below outfall					Based on process knowledge, no samples were collected for this chemical					Plutonium-239 detected in 1 sample; uranium-235 detected in 2 samples					Nothing detected					Nothing detected					Tritium detected in 2 samples < background, from 0 to 2 ft					More data needed for metals and alpha spectroscopy; screening for VOCs should be adequate as conceptual model and KOP do not anticipate VOCs						
35-016(a)-00: 35-016(q), stormwater outfall	N	0	—	N	N	Y	6	Y	N	N	N	1	N	N	N	N	6	Y	N	N	N	6	Y	N	N	N	8	N	N	N	N	0	—	—	—	N	0	—	—	—	✓	✓	✓	✓	✓		
	No metals data exist					SVOCs (PAHs) detected in 4 of 5 samples; no data exist from alluvial fan below outfall					Nothing detected, but no data exist from alluvial fan below outfall					Aroclor-1260 detected in 2 of 6 samples; no data exist from alluvial fan below outfall					Plutonium-238/239 detected in 2 samples; no data exist from alluvial fan below outfall					Nothing detected; however, no data exist from alluvial fan below outfall					Based on process knowledge, no samples were collected for this chemical					Based on process knowledge, no samples were collected for this chemical					More data needed for metals, SVOCs, PCBs, alpha and gamma spectroscopy at toe of slope; screening for VOCs should be adequate as conceptual model and KOP do not anticipate VOCs						

Table 2.4-3
Data Gap Determination for the Ten Site Slope Subarea (continued)

Consolidated Unit Number, Individual PRS Number, and Description	Inorganics					Organics															Radionuclides																	Data Gap Conclusions						
						SVOCs					VOCs					PCBs/Pesticides					Alpha Spectroscopy					Gamma Spectroscopy					Strontium-90					Tritium								
	COPCs expected at PRS?[a]	Number of fixed-laboratory samples	> Background value?[b]	Vertical extent defined?[c]	Lateral extent defined?[d]	COPCs expected at PRS?	Number of fixed-laboratory samples	Detected?	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	Detected?	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	Detected?	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	> Background value or detected?[e]	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	> Background value or detected?	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	> Background value or detected?	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	> Background value or detected?	Vertical extent defined?	Lateral extent defined?	Metals	SVOCs and /or VOCs	PCBs	Alpha spectroscopy	Gamma spectroscopy	Strontium-90	Tritium
35-017, steam vent outfall	N	0	—	—	—	N	0	—	—	—	N	0	—	—	—	N	0	—	—	—	N	0	—	N	N	N	0	—	N	N	N	0	—	—	—	N	0	—	—	—				✓	✓		
	No RFI sample data					No RFI sample data					No RFI sample data					No RFI sample data					Only D&D screening data exist from pipe removal, but no screening from where pipe daylighted					Only D&D screening data exist from pipe removal, but no screening from where pipe daylighted					No RFI sample data					No RFI sample data					Need additional screening data for alpha and gamma spectroscopy at outfall where pipe daylighted						

Note: Some PRSs in a sample aggregate do not have data to report, the PRSs starred within the aggregate are the ones that have data reported in this table.

[a] From process knowledge, is class of chemical *expected* to be present as a contaminant at the site?
[b] Are chemicals from this class present above background concentrations?
[c] Is vertical extent of contaminants present defined?
[d] Is lateral extent of contaminants present defined?
[e] Is radionuclide above background value, or detected if a background value is either not applicable or not available?
[f] N = no.
[g] Y = yes.
[h] U = unknown if chemical should be present.

Table 2.4-4
Data Gap Determination for the Mortandad Slope Subarea

	Consolidated Unit Number, Individual PRS Number, and Description	Inorganics					Organics: SVOCs					Organics: VOCs					Organics: PCBs/Pesticides					Radionuclides: Alpha Spectroscopy					Radionuclides: Gamma Spectroscopy					Radionuclides: Strontium-90					Radionuclides: Tritium					Data Gap Conclusions						
		COPCs expected at PRS?[a]	Number of fixed-laboratory samples	> Background value?[b]	Vertical extent defined?[c]	Lateral extent defined?[d]	COPCs expected at PRS?	Number of fixed-laboratory samples	Detected?	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	Detected?	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	Detected?	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	> Background value or detected?[e]	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	> Background value or detected?	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	> Background value or detected?	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	> Background value or detected?	Vertical extent defined?	Lateral extent defined?	Metals	SVOCs and /or VOCs	PCBs	Alpha spectroscopy	Gamma spectroscopy	Strontium-90	Tritium
	35-016(f), stormwater drain north of TA-35-85	U[f]	1	N[g]	N	N	Y[h]	2	Y	N	N	U	1	N	Y	Y	U	4	N	N	Y	N	0	—	—	—	N	0	—	—	—	N	0	—	—	—	N	0	—	—	—	✔	✔	✔				
		Nothing detected in the one surface sample					PAH-type SVOCs detected in 1 of 2 samples from 0- to 1-ft depth					Nothing detected in the 1 surface sample					Nothing detected from 0 to 3 ft					Based on process knowledge, no samples collected for alpha radionuclides					Based on process knowledge, no samples collected					Based on process knowledge, no samples collected					Based on process knowledge, no samples collected					More data needed for checked categories to define extent; PCBs may have moved downstream with sediment to alluvial fan						
35-008-00	35-014(e1), dielectric oil spill north of TA-35-85	U	0	—	—	—	Y	4	Y	N	N	U	4	N	Y	Y	U	27	N	Y	Y	N	0	—	—	—	N	0	—	—	—	N	0	—	—	—	N	0	—	—	—	✔	✔					
		No RFI samples exist					TPHs detected in 2 samples from 0 to 1 ft, for LRO up to 7100 ppm					Nothing detected; samples collected from 0- to 3-ft depths					Nothing detected; samples collected from 0- to 3-ft depths					Based on process knowledge, no samples collected					Based on process knowledge, no samples collected					Based on process knowledge, no samples collected					Based on process knowledge, no samples collected					More data needed for checked categories to define extent, especially in alluvial fan of outfall channel, which is collocated with PRSs 35-008 and 35-016(e)						
	35-008, canyon-side disposal area north of TA-35-85	U	15	4	N	N	Y	36	Y	N	Y	U	20	Y	Y	Y	U	10	N	Y	Y	U	18	Y	N	N	U	16	Y	Y	Y	N	0	—	—	—	N	0	—	—	—	✔	✔		✔			
		Six samples contained at least 1 of the following metals: antimony, beryllium, cadmium, chromium, copper, mercury, Mg, nickel, lead, thallium from 0- to 3.5-ft sampled intervals; chromium was in the 3-ft interval of location ID 35-2456					TPH-type SVOCs were detected in 19 samples from 0-3 ft sampled intervals. LRO up to 48,000 ppm, decreasing trend not established. Location IDs 35-2282, -2283, -2458, -2259 have highest TPH levels					Eight samples contain trace (ppb) amounts of VOCs (hits do not correlate with SVOC location IDs)					Nothing detected; samples collected from 0-3 ft depths					One sample contains Pu-239 <background, three samples contain one of each of U-234, -235, -238 just >background levels; samples collected from 0-3 ft depths. Decreasing trend in most samples					Cs-137 and Ru-106 each detected in one sample at <0.6 pCi/g					No samples were collected based on process knowledge					No samples were collected based on process knowledge					More data needed for the categories checked above to define extent, especially in the alluvial fan of the outfall channel (which is collocated with PRSs 35-008 and 35-016(e)						
	35-016(e), non-contact cooling water outfall from TA-35-85	Y	0	—	—	—	N	0	—	—	—	N	1	N	Y	Y	N	4	N	Y	Y	U	0	—	—	—	U	0	—	—	—	N	0	—	—	—	N	0	—	—	—	✔	✔					
		No RFI samples exist					No samples were collected for this chemical based on process knowledge					Nothing detected; samples collected from 2-3 ft depth					Nothing detected; samples collected from 0 to 3-ft depths					No RFI samples exist					No RFI samples exist					No samples were collected based on process knowledge					No samples were collected based on process knowledge					More data needed for checked categories to define extent, especially in the alluvial fan of the outfall channel (which is collocated with PRSs 35-008 and 35-016(e)						
	35-004(b), chemical storage area outside TA-35-85	U	1	N	N	Y	U	1	N	N	Y	U	0	—	—	—	U	1	N	Y	Y	N	0	—	—	—	N	0	—	—	—	N	0	—	—	—	N	0	—	—	—	✔	✔					
		Nothing detected; sample collected at 0-1 ft depth					Nothing detected; sample collected at 2-3 ft depth					No RFI data exist					Nothing detected; samples collected at 2-3 ft depth					No samples were collected based on process knowledge					No samples were collected based on process knowledge					No samples were collected based on process knowledge					No samples were collected based on process knowledge					More data could be used for checked categories to better define vertical extent						
35-016(i)-00	35-014(e2), oil spill in impoundment area northeast of TA-35-85	U	0	—	—	—	Y	1	N	N	N	U	1	N	Y	Y	U	1	Y	N	N	N	0	—	—	—	N	0	—	—	—	N	0	—	—	—	N	0	—	—	—	✔	✔	✔				
		No RFI data exist					Nothing detected from the 0-1 ft depth.					Nothing detected from the 2-3 ft depth					Aroclor-1260 was detected at less than 0.06 ppm from 0-1 ft depth					No samples were collected based on process knowledge					No samples were collected based on process knowledge					No samples were collected based on process knowledge					No samples were collected based on process knowledge					More data needed for categories checked above to define extent, especially in alluvial fan of outfall channel; PRS is collocated with PRS 35-016(i)						
	35-016(i), open-air, surface, stormwater channel from a parking lot	U	0	—	—	—	U	0	—	—	—	U	0	—	—	—	U	1	N	Y	Y	N	0	—	—	—	N	0	—	—	—	N	0	—	—	—	N	0	—	—	—	✔	✔	✔				
		No RFI data exist					No RFI data exist					No RFI data exist					Nothing detected from surface soil.					No samples were collected based on process knowledge					No samples were collected based on process knowledge					No samples were collected based on process knowledge					No samples were collected based on process knowledge					More data needed for categories checked above to define extent, especially in alluvial fan of outfall channel. This PRS is collocated with PRS 35-014(e2)						

Table 2.4-4
Data Gap Determination for the Mortandad Slope Subarea (continued)

Consolidated Unit Number, Individual PRS Number, and Description	Inorganics					Organics: SVOCs					Organics: VOCs					Organics: PCBs/Pesticides					Radionuclides: Alpha Spectroscopy					Radionuclides: Gamma Spectroscopy					Radionuclides: Strontium-90					Radionuclides: Tritium					Data Gap Conclusions						
	COPCs expected at PRS?[a]	Number of fixed-laboratory samples	> Background value?[b]	Vertical extent defined?[c]	Lateral extent defined?[d]	COPCs expected at PRS?	Number of fixed-laboratory samples	Detected?	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	Detected?	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	Detected?	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	> Background value or detected?[e]	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	> Background value or detected?	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	> Background value or detected?	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	> Background value or detected?	Vertical extent defined?	Lateral extent defined?	Metals	SVOCs and /or VOCs	PCBs	Alpha spectroscopy	Gamma spectroscopy	Strontium-90	Tritium
35-009(c), abandoned, inactive septic system north of TA-35-2	U	4	Y	Y	Y	U	30	Y	N	Y	U	30	Y	N	N	U	2	Y	N	N	U	30	Y	N	N	U	21	N	Y	Y	U	17	N	Y	Y	U	12	Y	N	N	✔	✔	✔	✔			✔
	Nothing detected; samples collected to 20-ft depths					Diethylphthalate detected in 1 sample from 19-20 ft depth (deepest interval of location ID 35-2049)					27 samples contained acetone (lab contaminant) Trace amounts of trichloropropane at location ID 35-2051, -2052 (3.5 – 20 ft depth) and 3 other VOCs at location ID 35-2053 at 14-15 ft depth					1 sample contained Aroclor-1254 and mixed Aroclors at <0.94 ppm from 4-5 ft depth					Pu-238 was detected in 3 samples (2 were <background), Pu-239 in 4 samples (3 were <background). All <0.2 pCi/g from 4-20 ft					Nothing detected; samples collected to 20-ft depths					Nothing detected; samples collected to 20-ft depths					Tritium was detected in 11 of 12 samples, all <background from 1 – 12 ft					More data needed for the categories checked above to define extent, especially in the alluvial fan of outfall channel. This area is collocated with PRS 35-016(o)						
35-016(o), stormwater drains north of TA-35-261	U	20	Y	N	N	U	33	Y	N	N	N	0	—	—	—	U	27	Y	N	N	U	24	Y	N	N	U	21	Y	Y	Y	U	18	N	Y	Y	U	18	Y	N	N	✔	✔	✔				
	Nine samples contained at least one of the following: chromium, copper, lead, mercury, nickel, and zinc from the 0-2 ft depth. Decreasing trend not established					SVOCs were detected in 20 samples. DRO and LRO showed a decreasing trend except at two locations: 35-2506 and –2511 from 0- to 2-ft depth					No samples were collected for this chemical based on process knowledge					Aroclor-1254 was detected in 8 samples, Aroclor-1260 in 3 samples and mixed Aroclors in 8 samples from 0-3 ft depth. Most <0.1 ppm, 4 are between 1-2 ppm					Pu-238 and –239 was detected in 4 samples (2 were <background) at <0.09 pCi/g from 0-3 ft depth					Cs-137 was detected in 3 samples at <background from 0-3 ft depth					No further samples needed based on data set and process knowledge					Tritium was detected in 16 samples (4 >background and 12 <background) at very low levels (5 down to 0.06 pCi/g) all in shallow samples (0-2 ft)					More data needed for the categories checked above to define extent, especially in the alluvial fan of outfall channel. This area is collocated with PRS 35-009(c)						
35-016(p), cooling water outfall north of TA-35-27	Y	0	—	—	—	U	4	Y	N	N	N	0	—	—	—	N	0	—	—	—	U	3	Y	N	Y	U	2	N	Y	Y	N	0	—	—	—	N	0	—	—	—	✔	✔					
	No RFI data exist					PAHs were detected in 1 sample from the 2-3 ft depth					No samples were collected based on process knowledge					No samples were collected based on process knowledge					Pu-239 was detected in 1 sample at 0.06 pCi/g (just greater than background) from 0-0.5 ft depth (surface sample)					Cs-137 was detected in 1 sample at <background from 0-1 ft depth					No samples were collected based on process knowledge					No samples were collected based on process knowledge					More data needed for categories checked above to define extent						

[a] From process knowledge, is class of chemical *expected* to be present as a contaminant at the site?
[b] Are chemicals from this class present above background concentrations?
[c] Is vertical extent of contaminants present defined?
[d] Is lateral extent of contaminants present defined?
[e] Is radionuclide above background value, or detected if a background value is either not applicable or not available?
[f] U = unknown if chemical should be present.
[g] N = no.
[h] Y = yes.

Table 2.4-5
Data Gap Determination for the Pratt Canyon Subarea

Consolidated Unit Number, Individual PRS Number, and Description	Inorganics					Organics: SVOCs					Organics: VOCs					Organics: PCBs/Pesticides					Radionuclides: Alpha Spectroscopy					Radionuclides: Gamma Spectroscopy					Radionuclides: Strontium-90					Radionuclides: Tritium					Data Gap Conclusions						
	COPCs expected at PRS?[a]	Number of fixed-laboratory samples	> Background value?[b]	Vertical extent defined?[c]	Lateral extent defined?[d]	COPCs expected at PRS?	Number of fixed-laboratory samples	Detected?	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	Detected?	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	Detected?	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	> Background value or detected?[e]	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	> Background value or detected?	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	> Background value or detected?	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	> Background value or detected?	Vertical extent defined?	Lateral extent defined?	Metals	SVOCs and /or VOCs	Pesticides/PCBs	Alpha spectroscopy	Gamma spectroscopy	Strontium-90	Tritium
35-003(e), former WWTP[f] storage tank	U[g]	1	N[h]	Y[i]	Y	U	8	Y	Y	Y	N	0	—	—	—	U	8	N	Y	Y	Y	8	Y	Y	Y	Y	1	N	Y	Y	N	0	—	—	—	N	0	—	—	—							
	Nothing detected in the one confirmatory sample collected at 30-ft depth below the former tank					Pyrene was only SVOC detected					No samples were collected for this chemical based on process knowledge					Nothing detected					Pu-239 was detected in 2 samples < background values					Nothing detected in the one confirmatory sample collected at 30 ft depth below the former tank					No samples were collected for this chemical based on process knowledge					No samples were collected for this chemical based on process knowledge					No additional data required for risk or screening assessments						
35-003(d)-00 **35-003(d, l, q),** former WWTP holding tank bldg, pump pit and trench	U	29	Y	N	N	U	39	Y	N	Y	N	0	—	—	—	U	45	Y	Y	Y	Y	70	Y	N	Y	Y	32	Y	Y	Y	N	24	Y	N	N	N	41	Y	Y	Y	✓	✓		✓		✓	
	Only thallium detected in 1 sample from 34-35 ft depth; however, several metals had detection limits greater than background values, so better data needed for risk or screening assessment purposes					14 samples contained PAH type SVOCs. More samples are needed in the diversion channel					No samples were collected for this chemical based on process knowledge					Only one detect of Aroclor-1254 in 1 sample 1-2 ft deep					Pu-239 was detected in 17 samples (8 > background values); Pu-238 was detected in 17 samples (3 > background values). Pu seems to slightly increase with depth					Cs-137 was detected in 3 samples, all < background. Co-60 and Eu-152 were detected in one sample					Sr-90 was detected in 9 samples. Values increase with depth at location ID 35-2311. Also need more data from diversion ditch					Tritium was detected in all samples, only 11 were > background values. Decreasing trend.					The categories checked above have detected constituents that do not have extent defined						
35-003(r), former WWTP effluent receiving canyon	Y	23	Y	N	N	Y	18	Y	N	N	N	0	—	—	—	N	18	Y	N	N	Y	47	Y	N	N	Y	17	Y	N	N	Y	14	Y	N	N	Y	16	N	Y	Y	✓	✓	✓	✓	✓	✓	
	Analysis detected 1 aluminum, 1 cadmium, 1 copper, 8 mercury, and 1 nickel hit(s) in the samples. 9 cyanide samples were collected; none detected. Need geomorphic mapping near road					SVOCs (PAHs) detected in 8 samples; need geomorphic mapping near road					No samples collected for this chemical based on process knowledge					Aroclor-1260 detected in 9 samples; pesticides dieldrin and endosulfan-II detected in 1 sample; need geomorphic mapping near road					Analysis detected 6 plutonium-238 (5 < background); 31 plutonium-239 (8 < background), and 1 uranium-234/-235/-238 hit(s) 2 samples; need geomorphic mapping near road					Analysis detected 10 Cs-137 (8 in sediment samples), and 3 colbalt-60 hits in the samples. Need geomorphic mapping near road. Nine samples were analyzed for americium-241, 7 samples had detected values					Ten samples contained strontium-90 in the sediment samples (up to 63 pCi/g) that spanned 0-3 ft depths, 2 detected samples in soil.; need geomorphic mapping near road					Nothing detected					Categories checked above have detected constituents that do not have extent defined; more data needed for metals (concentrate on mercury in sediments), SVOCs, Aroclor-1260, Pu-239, Cs-137, Am241, and Sr-90 (again, sediments show highest values from Canyons Focus Area data)						
35-016(k)-00 **35-016(k),** former cooling water outfall **35-016(l),** stormwater outfall	Y	5	Y	N	Y	Y	5	Y	N	Y	U	2	Y	N	Y	U	4	Y	N	Y	N	5	Y	Y	Y	N	5	N	Y	Y	N	0	—	—	—	N	0	—	—	—	✓	✓	✓				
	Copper, lead, and zinc were detected in 1 sample from 0-6 in depth. Zinc was also detected in 2 more samples. Need vertical extent at location ID 35-2112					SVOCs were detected in all 5 samples [4 samples are from 35-016(k), 1 is for 35-016(l)]. Need vertical extent beyond 2-ft depth					VOCs were detected in 1 of 2 samples from 35-016(k) from the 1-2 ft depth; Toluene, trichloro and trifluoro ethanes. Need vertical extent beyond 2-ft depth					Aroclor-1260 was detected in all 4 samples from 35-016(k). Need vertical extent beyond 2-ft depth					One Pu-239 sample < background					Nothing detected					No samples were collected for this chemical based on process knowledge					No samples were collected for this chemical based on process knowledge					Categories checked above have detected constituents that do not have extent defined; more data needed for metals, PAHs, VOCs, and Aroclor-1260 beyond a 2-ft depth						
35-016(m), former cooling water outfall	Y	4	N	N	N	Y	4	Y	N	N	N	0	—	—	—	N	0	—	—	—	N	1	N	Y	Y	N	0	—	—	—	N	0	—	—	—	N	0	—	—	—	✓	✓					
	Nothing detected, however, need data from alluvial fan at toe of slope					2 SVOCs were detected in 2 of the 4 samples. Need data from alluvial fan at toe of slope					No samples were collected for this chemical based on process knowledge					No samples were collected for this chemical based on process knowledge					Nothing detected					No samples were collected for this chemical based on process knowledge					No samples were collected for this chemical based on process knowledge					No samples were collected for this chemical based on process knowledge					Categories checked above have detected constituents that do not have extent defined. More data needed at alluvial fan for metals and SVOCs						

Table 2.4-5
Data Gap Determination for the Pratt Canyon Subarea (continued)

Consolidated Unit Number, Individual PRS Number, and Description	Inorganics					Organics															Radionuclides																	Data Gap Conclusions						
						SVOCs					VOCs					PCBs/Pesticides					Alpha Spectroscopy					Gamma Spectroscopy					Strontium-90					Tritium									
	COPCs expected at PRS?[a]	Number of fixed-laboratory samples	> Background value?[b]	Vertical extent defined?[c]	Lateral extent defined?[d]	COPCs expected at PRS?	Number of fixed-laboratory samples	Detected?	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	Detected?	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	Detected?	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	> Background value or detected?[e]	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	> Background value or detected?	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	> Background value or detected?	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	> Background value or detected?	Vertical extent defined?	Lateral extent defined?	Metals	SVOCs and/or VOCs	Pesticides/PCBs	Alpha spectroscopy	Gamma spectroscopy	Strontium-90	Tritium
35-009(d), abandoned septic system	U	4	Y	N	N	U	26	N	Y	Y	U	23	Y	N	N	N	0	—	—	—	Y	25	Y	Y	Y	Y	16	N	Y	Y	U	0	—	—	—	U	0	—	—	—	✓	✓				✓	✓
	Antimony, cadmium, and silver had non-detected values which are greater than background levels. Need more data with better detection limits for screening assessment					Nothing detected					Acetone detected in 21 samples (not eliminated as lab contaminant), 2-Butanone in 2 samples, carbon disulfide in 1 sample, and 2-Hexanone in 1 sample					No samples collected for this chemical based on process knowledge					Plutonium-238 detected in 2 samples; plutonium-239 detected in 1 sample, all < background values					Nothing detected					No samples were collected for this chemical. However, samples should be collected near tank at depth and in alluvial fan					No samples were collected for this chemical. However, samples should be collected near tank at depth and in alluvial fan					Categories checked above have detected constituents that do not have extent defined; more data needed for metals, VOCs, tritium, and strontium-90						

[a] From process knowledge, is class of chemical *expected* to be present as a contaminant at the site?
[b] Are chemicals from this class present above background concentrations?
[c] Is vertical extent of contaminants present defined?
[d] Is lateral extent of contaminants present defined?
[e] Is radionuclide above background value, or detected if a background value is either not applicable or not available?
[f] WWTP = waste water treatment plant.
[g] U = unknown if chemical might be present.
[h] N = no.
[i] Y = yes.

Table 2.4-6
Data Gap Determination for the Ten Site Canyon Subarea

Consolidated Unit Number, Individual PRS Number, and Description		Inorganics					Organics: SVOCs					Organics: VOCs					Organics: PCBs/Pesticides					Radionuclides: Alpha Spectroscopy					Radionuclides: Gamma Spectroscopy					Radionuclides: Strontium-90					Radionuclides: Tritium/Other					Data Gap Conclusions						
		COPCs expected at PRS?[a]	Number of fixed-laboratory samples	> Background value?[b]	Vertical extent defined?[c]	Lateral extent defined?[d]	COPCs expected at PRS?	Number of fixed-laboratory samples	Detected?	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	> Background value detected?	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	Detected?	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	> Background value or detected?[e]	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	> Background value or detected?	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	> Background value or detected?	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	> Background value or detected?	Vertical extent defined?	Lateral extent defined?	Metals	SVOCs and /or VOCs	Pesticides/PCBs	Alpha spectroscopy	Gamma spectroscopy	Strontium-90	Tritium
35-010(a)-00	35-010(a), WWTP lagoon	Y	9	Y	Y	N[g]	Y	17	Y	Y	Y	Y	18	Y	Y	Y	Y	21	Y	Y	N	Y	12	Y	Y	Y	Y	9	Y	Y	Y	U[h]	9	N	Y	Y	Y	9	Y	Y	Y	✓		✓				
		Barium, cadmium, chromium, copper, lead, mercury, nickel, silver, thallium, vanadium, and zinc were detected. In most cases concentrations decrease with depth. Location ID 35-2467 at the 4-8" depth has higher values than the surface sample but lower values in tuff for most detected metals. Location ID 35-2470 has highest values but shows decreasing trend					SVOCs detected in 8 samples from 0 to 2.5 ft; most values <2 ppm except for bis(2-ethylhexyl)phthalate at 19 ppm in 6- to 12-in.interval; location ID 35-2467 at the 4- to 8-in. depth has higher values than surface sample but lower values in tuff (decreasing trend established)					Trace amounts (<0.2 ppm) of VOCs were detected in 8 samples from 0 to 2.5 ft, except for acetone where 1 of 2 detects is 2.6 ppm; location ID 35-02467 at the 4- to 8-in. depth has higher values than surface sample but lower values in tuff (decreasing trend established)					PCBs detected in 5 surface soils to 12 in.; highest value is 1.2 ppm; location ID 35-02467 at the 4-8" depth has a higher value than surface sample but lower values in tuff (decreasing trend established)					Plutonium-238/239 detected in up to 9 samples (4 < background levels) 6 samples from 0- to 1-in. depth and 3 samples in Qbt2/3 from 8-40 ft); uranium-234/-238 detected in up to 3 surface samples to 1-ft depth; decreasing trend observed					Americium-241detected in 1 surface sample; cesium-137 detected in 2 surface samples (< background levels)					Nothing detected					Tritium detected in 8 samples (1 < background) with highest level at Loc ID 35-2470 (0-4 in depth). Decreasing trend observed except at Location ID 35-02467; the 4-8" depth has a higher value than the surface sample but lower values in tuff					Additional samples needed to define extent of contamination for PCBs and metals; decreasing trend established at most locations where contaminants were detected						
	35-010(b), WWTP lagoon	Y	25	Y	N	N	Y	31	Y	Y	Y	Y	27	Y	Y	Y	Y	35	Y	Y	Y	Y	12	Y	Y	Y	Y	24	Y	Y	Y	U	23	Y	N	Y	Y	23	Y	Y	Y						✓	
		Aluminum, barium, beryllium, calcium, detected in 1 sample, 0435-97-0257, at 5-6 ft depth (Qbt 3); manganese, strontium, and thallium also only detected in 1 sample (various locations and depths); cadmium, copper, lead, mercury, silver, and zinc detected in up to 11 samples (cadmium only 2 samples), values all decrease with depth (from surface soil to Qbt 3); chromium and nickel increase with depth (mostly in Qbt 3 from 1.5 to 6 ft)					SVOCs were detected in up to 15 samples from 0-3 ft depths only, nothing deeper; decreasing trend observed					Trace amounts of VOCs were detected in 8 samples from 0-1 ft, most hits in the 6-12" interval, nothing detected deeper					PCBs detected in 7 samples from the 0-8" depth. Two samples were detected from 8-12" depth, nothing deeper; decreasing trend observed					Plutonium-238/239 was detected in up to 9 samples from 0-40 ft at <3 pCi/g, nothing detected in the 50-ft sample; uranium-234/238 was detected in 1 surface sample					One Qbt 3 sample contained Ru-106 at the 3.5 – 4.5 ft depth					Strontium-90 detected in 4 Qbt 3 tuff samples from 1.5 to 6 ft; three surface samples from 0 to 1 ft also contained strontium-90; highest value of strontium-90 in 3 out of 4 samples is at deepest depth					Three 0- to 8-in. samples contained tritium; decreasing trend observed					Need more strontium-90 data at location ID 35-2471 beyond 5 ft						

Table 2.4-6
Data Gap Determination for the Ten Site Canyon Subarea (continued)

Consolidated Unit Number, Individual PRS Number, and Description	Inorganics					Organics: SVOCs					Organics: VOCs					Organics: PCBs/Pesticides					Radionuclides: Alpha Spectroscopy					Radionuclides: Gamma Spectroscopy					Radionuclides: Strontium-90					Radionuclides: Tritium/Other					Data Gap Conclusions						
	COPCs expected at PRS?[a]	Number of fixed-laboratory samples	> Background value?[b]	Vertical extent defined?[c]	Lateral extent defined?[d]	COPCs expected at PRS?	Number of fixed-laboratory samples	Detected?	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	> Background value detected?	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	Detected?	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	> Background value or detected?[e]	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	> Background value or detected?	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	> Background value or detected?	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	> Background value or detected?	Vertical extent defined?	Lateral extent defined?	Metals	SVOCs and /or VOCs	Pesticides/PCBs	Alpha spectroscopy	Gamma spectroscopy	Strontium-90	Tritium
35-010(a)-00: **35-010(c)**, WWTP lagoon	Y	16	Y	N	N	Y	19	N	Y	Y	Y	14	Y	Y	Y	Y	19	N	Y	Y	Y	4	Y	N	Y	Y	15	Y	Y	Y	N	15	N	Y	Y	N	14	Y	N	N	✓			✓			✓
	Cadmium, cobalt, copper, lead, manganese, mercury, silver, thallium, zinc detected in up to 9 samples (0-2 ft), decreasing trend with depth; chromium and nickel increase with depth at location IDs 35-2478 (4- to 5-ft depth) and 35-2479 (1- to 2-ft depth)					Nothing detected					Four samples contained VOCs from the 3- to 6-in. depth of surface soils, nothing detected deeper					PCBs detected in 4 samples from 3- to 6-in. depth of surface soils; nothing detected deeper					Plutonium detected in all 4 samples from the 6- to 12-in. depth at location IDs 35-2065/66; no samples collected for plutonium at other locations or depths; no uranium detected					Two samples contained europium-152 at the 4- to 6-in. depth at location IDs 35-2478/80; nothing detected deeper					Nothing detected					Ten samples contained detectable tritium at depths up to 5 ft, decreasing trend established except at location ID 2478 at depths > 5 ft					Chromium and nickel need vertical extent beyond 5 ft at location ID 35-2478, and beyond 2 ft at location ID 35-2479 (highest values at deepest depths at this location); need more isotopic plutonium data for vertical extent						
35-010(d), sand filter beds (4)	Y	11	Y	Y	Y	Y	11	Y	Y	Y	N	1	N	Y	Y	N	11	N	Y	Y	N	17	N	Y	Y	N	11	N	Y	Y	N	10	N	Y	Y	N	0	—	—	—							
	Silver and mercury detected in one 0-to 6-in. sample					The only SVOCs detected in 3 samples to depths of 2.5 ft were bis(-2ethylhexyl) phthalate (2 hits) and di-n-butyphthalate (1 hit)					Nothing detected					Nothing detected					Nothing detected					Nothing detected					Nothing detected					Based on process knowledge, no samples collected for this chemical					No additional data needed at this PRS site						
35-010(e), discharge from sand filters	N	0	—	—	—	N	0	—	—	—	N	0	—	—	—	N	0	—	—	—	N	5	Y	Y	Y	N	0	—	—	—	N	0	—	—	—	N	0/10	N	Y	Y							
	Based on process knowledge, no samples collected for this chemical					Based on process knowledge, no samples collected for this chemical					Based on process knowledge, no samples collected for this chemical					Based on process knowledge, no samples collected for this chemical					Plutonium-238/239 detected in 2 surface samples from 0- to 1-ft depth, nothing detected deeper					Based on process knowledge, no samples collected for this chemical					Based on process knowledge, no samples collected for this chemical					Based on process knowledge, no samples collected for this chemical; however, 10 samples were collected for thorium, nothing detected					No additional data needed at this PRS site						

Table 2.4-6
Data Gap Determination for the Ten Site Canyon Subarea (continued)

Consolidated Unit Number, Individual PRS Number, and Description	Inorganics					Organics: SVOCs					Organics: VOCs					Organics: PCBs/Pesticides					Radionuclides: Alpha Spectroscopy					Radionuclides: Gamma Spectroscopy					Radionuclides: Strontium-90					Radionuclides: Tritium/Other					Data Gap Conclusions						
	COPCs expected at PRS?[a]	Number of fixed-laboratory samples	> Background value?[b]	Vertical extent defined?[c]	Lateral extent defined?[d]	COPCs expected at PRS?	Number of fixed-laboratory samples	Detected?	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	> Background value detected?	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	Detected?	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	> Background value or detected?[e]	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	> Background value or detected?	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	> Background value or detected?	Vertical extent defined?	Lateral extent defined?	COPCs expected at PRS?	Number of fixed-laboratory samples	> Background value or detected?	Vertical extent defined?	Lateral extent defined?	Metals	SVOCs and /or VOCs	Pesticides/PCBs	Alpha spectroscopy	Gamma spectroscopy	Strontium-90	Tritium
C-35-007, excavated material from sand filter beds	N	18	Y	N	Y	Y	18	Y	N	Y	N	0	--	—	—	Y	18	Y	N	Y	N	17	Y	N	Y	N	11	N	Y	Y	N	6	N	Y	Y	N	6	N	Y	Y							
	Only calcium detected in 2 surface samples from 0-to 6-in. depth; no deeper samples at these locations					The only SVOCs detected in 3 samples to depths of 1.5 ft were bis(-2ethylhexyl) phthalate (1 hit), di-n-butylphthalate (3 hits), and benzoic acid (1 hit); all <0.06 ppm					Based on process knowledge, no samples collected for this chemical					Aroclor-1254 detected in 1 surface sample (0-6 in.); no deeper samples at this location					Plutonium-238 and plutonium-239 detected in 1 surface sample (0-6 in.) up to 2.5 pCi/g; no uranium detected					Nothing detected					Nothing detected					Nothing detected					Because this sand is the same sand once used in the sand filter beds [35-010(d)] removed to a new location, number of samples collected is sufficient to determine if contaminants are present in the sand piles						

[a] From process knowledge, is class of chemical *expected* to be present as a contaminant at the site?
[b] Are chemicals from this class present above background concentrations?
[c] Is vertical extent of contaminants present defined?
[d] Is lateral extent of contaminants present defined?
[e] Is radionuclide above background value, or detected if a background value is either not applicable or not available?
[f] Y = yes.
[g] N = no.
[h] U = unknown if chemical might be present.

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3.0 INVESTIGATORY APPROACH

3.1 General Technical Approach

In response to the current comprehensive risk-based decision-making requirements, the ER Project is shifting its focus from the characterization of individual PRSs to the characterization of PRSs in the context of watershed aggregates (portions of watersheds) or entire watersheds (LANL 1999, 63448). This is the approach that will be taken at TA-35 where PRSs will be evaluated in the context of their contribution to risk for the Middle Mortandad/Ten Site Aggregate of the Mortandad Watershed.

As part of this approach, the ER Project has initially characterized several of the canyon reaches in this aggregate. The canyon reach data provide important information about the presence or absence of specific contaminants through the watershed aggregate and the entire watershed. This information and any additional data collected will be used to establish the nature and extent of contamination at TA-35 subarea aggregates, to rank relative risks due to source areas, and to focus remediation efforts within the TA-35 portion of Middle Mortandad/Ten Site Aggregate.

The data collected at each PRS to determine if contaminant levels are elevated within the Middle Mortandad/Ten Site Aggregate will be used, along with the canyons reach data, to develop and/or verify the conceptual model for migration and exposure. The data, conceptual model, and risk or screening assessment for the Middle Mortandad/Ten Site Aggregate will be presented in an aggregate RFI report. The combined data set will also be used to develop a Mortandad Canyon surface aggregate report. Both reports will make recommendations for NFA, additional remediation, and/or long-term surveillance and monitoring.

The decision process for TA-35 is tied to the process for completing RCRA corrective actions within the watersheds (LANL 2000, 66802) and is presented in Figure 3.1-1. As shown in the flowchart (Figure 3.1-1), the existing data for this aggregate SAP were evaluated by subarea to identify land use, habitat, and release and transport mechanisms (see section 1). TA-35 site data were evaluated for data quality (appropriate detection limits and analytical methods), source removal, and, if applicable, quality and adequacy of verification sampling. All good quality data were used to identify data gaps by evaluating the nature of contaminants and defining the lateral and vertical extent of contamination.

Data from each subarea will be evaluated using the appropriate risk scenario to rank sources of contamination. Similarly, ecological risk will be evaluated and sources ranked based on potential receptor impacts through application of the ER Project's ecological scoping checklist. Once all sources within a subarea have been ranked with respect to their contributions to potential unacceptable risk, remedial actions will be identified to reduce/remove the overall risk to acceptable levels for human health and environmental endpoints.

The following sections describe the data quality objectives (DQOs) and risk scenario approach for two main types of settings at TA-35: (1) the Mesa Top Subarea, and (2) the hillslope and canyon subareas.

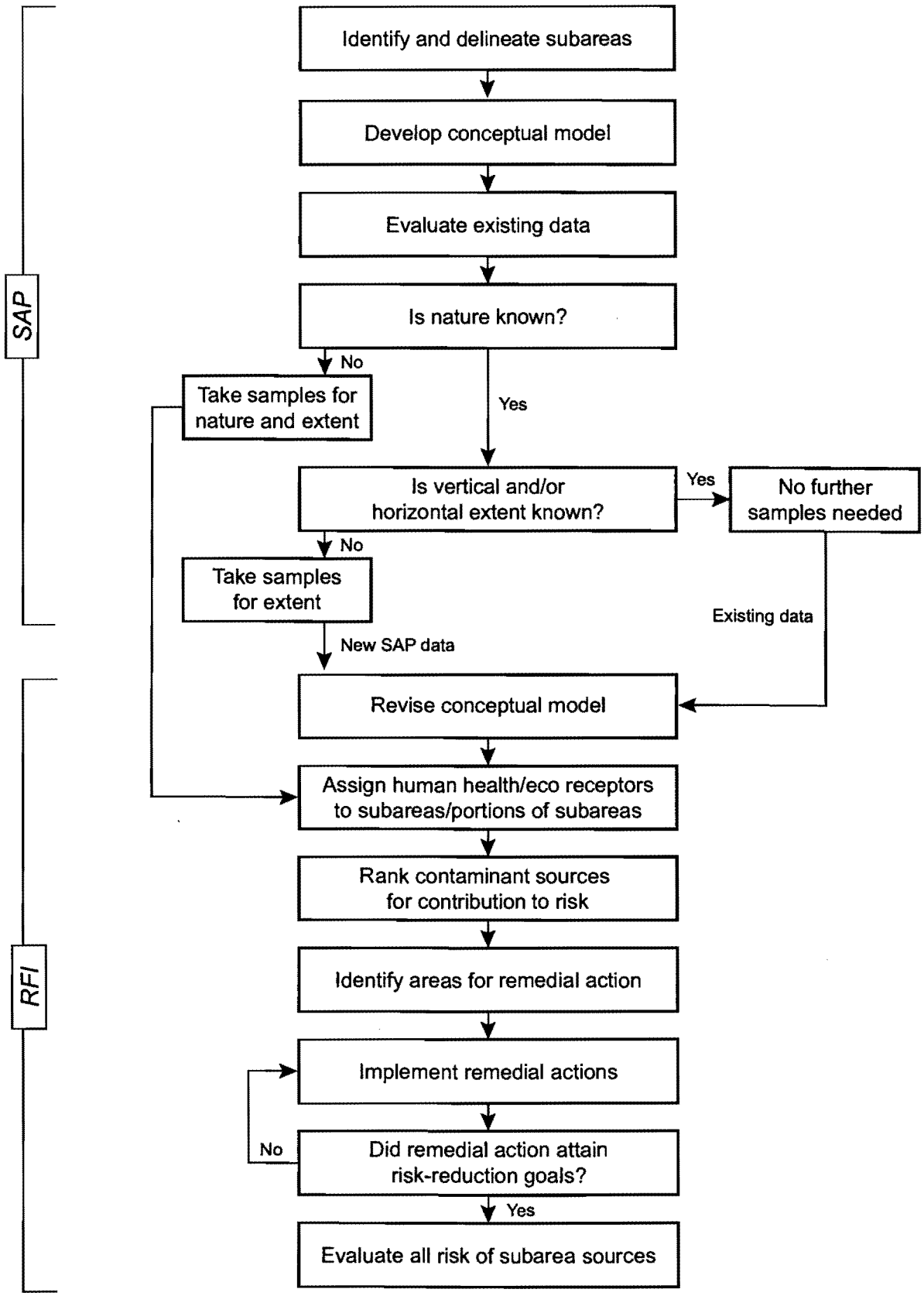

Figure 3.1-1. TA-35 approach to decision-making in the corrective action process

3.1.1 Data Quality Objectives

Problem Statement

The problem to be addressed by this aggregate SAP is that existing contamination in surface and subsurface media for the TA-35 subareas may not be adequately characterized (vertical and lateral extent of contamination may not be defined). These issues need to be addressed in this aggregate SAP to enable contaminant sources to be ranked or prioritized by risk (industrial for mesa top and recreational for hillslopes and canyons).

Decision to Be Made

The question to be asked throughout the aggregate SAP data analysis and assessment processes, "Are the data for each subarea adequate to characterize extent (vertical and lateral) of contamination?"

Inputs to the Decision

The data to be used include analytical data collected in previous investigations (TA-35, Mortandad and Ten Site Canyon) and verification data from historic remedial actions within these TA-35 subareas. Data from canyon(s) reach areas are used to help define extent in hillslope and canyon PRSs with alluvial deposits.

Study Boundary

The data collected will be used to evaluate and then refine the contaminant transport components of the conceptual model, if necessary. The projected impact of contaminated soil/sediments will be assessed by projecting trends that may result from migration of contaminants off-site, identifying the nature and amount of contamination that has migrated beyond Laboratory boundaries, and identifying processes that could result in future migration. The study area is shown on Figure 1.0-5. The TA-35 subareas that will be evaluated are also shown on this figure.

Decision Rule

- Existing data adequately characterize residual contamination from sources or expected releases.
- Contaminant concentrations decrease from the source both laterally and vertically, thereby defining extent.
- The data support the conceptual model such that additional samples are not required to characterize nature and extent of contamination.

Tolerable Limits on Decision Errors

Limits on decision errors will be based on statistical evaluation of the data set. In developing this aggregate SAP, decision errors were biased toward collecting additional data rather than assuming existing data are sufficient. The technical team will judge whether the remaining uncertainties in the data are acceptable for evaluating the conceptual model.

If uncertainties are acceptable and/or no reduction in uncertainty can be reasonably achieved, the existing level will be deemed acceptable, and the conceptual model will be refined as required by the data. Statistical evaluation will also be used to determine the degree of reduction in uncertainty (i.e., reduction in measurements of variance) to be gained by the collection and analysis of additional samples.

Data adequately characterize the sources when

- complete analytical suites are available for known processes or for historic data;
- detection limits are sufficiently low to detect levels at or above background concentrations;

- appropriate analytical methods are used; and
- samples are collected from locations within potential release and transport boundaries from the source.

Design for Obtaining Data

The optimal design for obtaining the required data consists of selecting the optimal sampling locations and analyzing for the correct compounds using methods that will provide good quality data for the risk or screening assessments. The sampling locations will be presented in the subarea-specific SAP sections (section 3.2).

3.1.2 Risk Assessment and Exposure Models

The TA-35 mesa top will be evaluated as continuing industrial land (LANL 1998, 57224). Human health and ecological risks will be assessed on a spatial scale consistent with appropriate exposure models. Potentially complete exposure routes for TA-35 subarea receptors under this land-use condition include incidental soil ingestion, dermal absorption via skin contact, inhalation of contaminated soil as dust, inhalation of vapor-phase contaminants, and external gamma irradiation.

3.1.2.1 Human Receptors and Exposure

Collection and use of plant materials by human receptors under the industrial land use of the Mesa Top Subarea is not considered to be a likely exposure pathway; however, it may be for the recreational scenario of the hillslopes and canyons subareas.

The widespread industrial development of the mesa-top area greatly limits the amount of resuspended particulates from this area. Exposure via incidental ingestion of soil and dermal contact would be isolated and would most likely occur near the mesa edge, on the slopes, and in the canyon bottom. Construction and landscaping workers may have a greater opportunity for direct contact and incidental ingestion of contaminants than the general site worker population.

For hillslope and canyon subarea human receptors, exposure to contaminants on the slope itself would be limited. The ruggedness of the slope limits the opportunities for casual use of the area. Opportunities for exposure via inhalation, incidental ingestion, and dermal absorption could arise for the few individuals who venture to climb the slopes or who traverse the area along the stream channel at the base of the slope in the canyon. These exposures may occur as a result of recreational activities such as hiking or jogging, or as a result of maintenance activities of lines, roads, best management practices, and the surrounding forested areas.

Assessment of potential impacts to human receptors on the mesa top and hillslope/canyon will proceed by an initial screening assessment of site data (maxima or 95% upper confidence limit on the mean) using ER Project SALs. The SALs represent a residential exposure level; therefore, they are more conservative than screening values for industrial exposure. If necessary, the screening assessment will be followed by a more formal risk assessment. In addition, risk assessors will establish the relative contribution of residual contamination at TA-35 subareas to potential human and ecological risk assessment results supporting a risk ranking of affected areas. Table 3.1-1 lists potentially complete mesa-top and hillslope/canyon exposure routes to types of chemicals associated with releases at TA-35.

Table 3.1-1
Potentially Complete Mesa-Top and Hillslope/Canyon Exposure Routes to Human Receptors

Chemical Class	Soil Ingestion		Plant Ingestion		Dermal Absorption		Dust Inhalation		Vapor Inhalation		External Gamma	
	MT[a]	H/C[b]	MT	H/C	MT	H/C	MT	H/C	MT	H/C	MT	H/C
Metals	x	x		x			x	x				
VOCs	x	x		x	x	x			x	x		
SVOCs, pesticides, PCBs	x	x		x	x	x	x	x				
Alpha-emitters	x	x		x			x	x				
Beta/gamma-emitters	x	x		x			x	x			x	x
Tritium	x	x		x	x	x			x	x		

[a] MT = mesa top.

[b] H/C = hillslope/canyons.

It is anticipated that all of the TA-35 subarea exposure routes can be assessed using data from soil and tuff samples. For dust inhalation, a resuspension model such as the EPA Particulate Emission Factor model (40 CFR 61.93, Subpart H) will be used to relate soil concentrations to ambient air concentrations. Similar models will be used to evaluate the concentration of VOC vapors in air based on concentrations in soil or tuff. Only if an assessment indicates that potentially unacceptable risks may exist based on model results for these pathways will the collection of ambient air samples be considered.

Direct exposure of receptors to subsurface contamination is not possible without some form of intrusion to expose the contaminated medium and, in the case of tuff, crush the medium to a sufficiently small size that particles might be incidentally ingested or inhaled. In an industrial area such as TA-35, it is possible that subsurface contamination may be exposed due to construction work or erosion near the mesa edge. For mesa-top sites, contamination as deep as 12 ft (new basement depth) will be assumed to be available for receptor exposure during construction activities.

3.1.2.2 Ecological Receptors and Exposure

Given the industrial nature of the mesa top, use of this subarea by ecological receptors can be expected to be less than the use of the hillslope and canyon subareas. Potentially complete exposure pathways for ecological receptors on the mesa top and hillslopes/canyons include incidental soil ingestion, dermal absorption via skin contact, inhalation of contaminated soil as dust, inhalation of vapor-phase contaminants, and external gamma irradiation. Potential effects through the food chain is also a primary concern. Not all pathways are applicable for every type of contaminant or every release location. Table 3.1-2 relates potentially complete exposure pathways to contaminant classes associated with releases at TA-35.

Because of extensive development of the mesa top, there is limited area in which ecological receptors can be exposed to COPCs. In general there are no exposure pathways for COPCs occurring under asphalt or structures to contact ecological receptors. PRSs for which contaminant releases are limited to the deep subsurface will not be evaluated for potential ecological impacts.

The primary exposure pathways for most ecological receptors are expected to be soil and food ingestion. Dermal and vapor inhalation are expected to be minor components for ecological exposure; any assess-

ment of these pathways is expected to be limited to screening-level models using soil chemical concentrations. Therefore, no air samples are proposed for evaluating ecological exposure.

Table 3.1-2

Potentially Complete Mesa-Top and Hillslope/Canyon Exposure Routes to Ecological Receptors

COPC Class	Soil Ingestion		Food Uptake		Dermal Absorption		Dust Inhalation		Vapor Inhalation		External Gamma		Bioaccumulation	
	MT[a]	H/C[b]	MT	H/C	MT	H/C	MT	H/C	MT	H/C	MT	H/C	MT	H/C
Metals	x	x	x	x			x	x					x	x
VOCs	x	x	x	x	x	x			x	x				
SVOCs, pesticides, PCBs	x	x	x	x	x	x	x	x					x	x
Alpha-emitters	x	x	x	x			x	x					x	x
Beta/gamma-emitters	x	x	x	x			x	x			x	x	x	x
Tritium	x	x	x	x	x	x			x	x				

[a] MT = mesa top.

[b] H/C = hillslope/canyons.

The objectives of this SAP focus on establishing the types and concentrations of chemicals in soils and sediments; no additional biota samples are planned.

Ecological risk assessments, by subarea, will be conducted using all the data available through implementation of this aggregate SAP.

3.2 Subarea-Specific Sampling and Analysis Plan

Sections 3.2.1 through 3.2.5 contain sample tables that give a synopsis of the proposed samples for each subarea. The table columns are labeled, from left to right, with the consolidated or individual PRS number, the description of the sample location that corresponds to a sample location map, and the number of each type of samples to be collected, followed by any special instructions.

Because there is a large volume of existing data of acceptable quality many types of analyses are not required and are marked *na*. The VOC column may contain the notation to "screen," which instructs the sampling team to screen for volatile contaminants as they are extracting the soil sample intervals and to collect a sample from any interval that produces an elevated reading on the screening instrument. If there is no variation in the screened intervals, no sample will be collected, as VOCs are not an expected contaminant at that particular PRS. The gamma spectroscopy column also contains the notation to "screen," which instructs the sampling team to screen for elevated radiation of the sample interval or transect and collect a sample if the reading is 2 to 3 times greater than background (ER-SOP-10.14, "Performing and Documenting Gross Gamma Radiation Scoping Surveys"); if there is no variation in the screened intervals, no sample will be collected.

All samples will be collected according to ER Project SOPs (as described in section 4) for one or more of the following groups of analytes: TAL metals, including mercury; SVOCs; VOCs; PCBs (and pesticides if required); alpha and gamma spectroscopy; strontium-90; and tritium. Data quality will be assured by adherence to the ER Project quality assurance project plan, part of the IWP (LANL 2000, 66802).

3.2.1 Mesa Top Subarea

3.2.1.1 Specific Sampling Approach Assumptions

The sampling approach for the mesa-top subarea PRSs differs from the approach to sampling the hillslopes or canyons for several reasons.

- The mesa top's future use remains industrial [i.e., the endstate (ultimate fate of area) of TA-35 will be industrial and future environmental stewardship will belong to the facilities owner/manager/developer].
- The subarea will be evaluated as an aggregate.
- Because of the ecology of the mesa top (few receptors and pathways), the screening assessment will be primarily focused on human health, based on industrial use.
- There is little potential of contaminant transport on the mesa top because contaminant transport is most likely from surface runoff to slopes, and transport from subsurface contaminants left in place below structures/piping to groundwater is less likely.

The mesa top's contaminated sources are identified and ranked by relative risk: to humans by exposure, and to the environment by transport. Previous D&Ds or VCAs have removed most contaminant sources in this subarea; contaminated material left in place at depth no longer presents a source term.

3.2.1.2 Field Surveys and Mapping

For the most part, this subarea's specific sites to be sampled in this aggregate SAP have been previously surveyed. The sampling team may need to retrieve existing survey data from past excavations and drilling to determine a sample location. Some mapping of the VCA and D&D excavations may also be conducted to help locate the areas proposed in Table 3.2-1.

3.2.1.3 Sample Collection and Analysis

Based on the assessment of existing data and subsequent data gap conclusions presented in section 2.4.3, additional samples need to be collected for the Mesa Top Subarea. Table 3.2-1 lists the proposed samples to be collected to complete the data set needed for assessments. The PRSs identified in the table and summarized below are listed in the same order presented on Figure 3.2-1 and Figure 3.2-2, reading from left to right.

PRS 35-015(a), the former waste oil treatment facility, needs additional samples for TAL metals and mercury, SVOCs, and VOCs analyses to complete the data set for assessment. An auger hole will be installed near location ID 35-2499 and 35-2500 to a depth of 10 ft to determine the vertical extent of contamination.

PRS 35-011(d), made up of 2 former USTs, was never sampled for RCRA constituents. Therefore, additional sample data needed (to determine that oil was the only substance stored in the tanks) are analyses for TAL metals, SVOCs (plus DRO and LRO), and VOCs.

PRS 35-014(f), a former oil spill, needs additional samples for TAL metals, SVOCs, and VOCs analyses to complete the data set for assessment. There is no existing RFI metals data or VOC data that could be a contaminant in the oil that spilled. Also, vertical extent has not been defined for TPH.

PRS 35-014(a), former stack emissions from building TA-35-7, needs additional samples for tritium analyses to complete the data set for assessment. Tritium needs to be bounded beyond a 3-ft depth; however, tritium concentrations are already less than background values. If the concentrations do not decrease and remain the same from depths ranging from 3 to 10 ft, no additional samples need be collected to define vertical extent.

PRS 35-004(a) is a former outdoor container storage area which was used to store containers of organic chemicals and oil. Because there is no existing data for inorganics or organics (contaminants that may be expected at this site), samples need to be collected for these constituents. The tritium samples being collected at this PRS are actually intended to laterally bound PRS 35-014(a).

PRS 35-009(a), a septic system, needs additional samples for TAL metals and SVOC analyses to complete the data set for assessment. A borehole will be drilled to 15 ft and samples collected from directly below the abandoned septic tank (10 ft) and at 15 ft to determine the vertical extent of contamination.

PRS 35-003(j)-99, aboveground oil storage tanks and releases, needs additional samples for SVOCs, VOCs, and PCB analyses to complete the data set for assessment. VOCs and LROs appear to be collocated at the 5- to 12-ft interval at location ID 35-2534. The highest detects for DRO are at location ID 35-2291 from the 1- to 10-ft interval. The highest detects from SVOCs in general are at PRS 35-014(b) at location ID 35-2568 from 0.5 to 1.5 ft. Need to collect more organic data from deeper intervals at a location north of existing data.

PRS 35-018(a), former site of leaking transformer, needs additional samples collected for PCB and SVOC analysis to provide data from deeper intervals than currently exist and thereby to obtain vertical extent of contamination.

PRS 35-003(a)-99, former WWTP components, need additional samples for TAL metals including mercury, SVOCs, VOCs, PCBs, alpha and gamma spectroscopy, strontium-90, and tritium analyses to complete the data set for assessment.

PRS 35-004(h) is a former container storage area. No further data are needed from this site because it was excavated during the D&D of the air filter building TA-35-07 in 1996.

PRS 35-002 is the former site of the LAPRE experiments, later designated MDA X. Because this sample location is collocated with part of PRS 35-009(a)-99, data will be used from 35-009(a)-99 to assess both sites.

Table 3.2-1
Proposed Samples for the Mesa Top Subarea

PRS Number and Description	Description of Sample Locations (see Figure 3.2-1 or Figure 3.2-2 for map)		Metals	SVOCs	VOCs	Pest-icides/ PCBs	Alpha Spec-troscopy	Gamma Spec-troscopy	Strontium-90/ Tritium	Comments
35-015(a), waste oil treatment facility	Hand auger (AH1) to a depth of 10 ft, sample at 5-ft intervals (or most appropriate for VOCs based on screening)	AH1	2	2	2	2	N/A[a]	N/A	N/A	—
35-011(d), two USTs	Drill borehole (BH1) to 25 ft at location ID 35-01100, sample at 10-ft intervals	BH1	2	2 + TPH analysis	2	2	N/A	N/A	N/A	Need DRO and LRO in SVOC suite
35-014(f), former oil spill	Hand auger (AH2) to a depth of 10 ft at location ID 35-2364, sample at 5-ft intervals	AH2	2	2	2	N/A	N/A	N/A	N/A	Need DRO and LRO in SVOC suite
35-014(a), stack emissions	Hand auger (AH3) to a depth of 10 ft, sample at 5-ft intervals	AH3	N/A	N/A	N/A	N/A	N/A	N/A	2	Tritium will be chased only if concentra-tions change
35-004(a), outdoor container storage areas	Hand auger (AH4) to a depth of 10 ft, sample at 5-ft intervals.	AH4	2	2	2	2	N/A	N/A	2	Tritium sam-ple is actually to bound 35-014(a)
35-009(a), septic system	Drill borehole (BH2) to 15 ft, sample at 6-, 10-, and 15-ft intervals	BH2	2	2	N/A	N/A	N/A	N/A	N/A	—
35-003(j)-99, aboveground storage tanks and oil releases	Drill 1 borehole (BH3) to 20 ft, sample at 10-ft intervals (or most appropriate for VOCs based on screening)	BH3	N/A	2 + TPH analysis	2 (screen)	2	N/A	N/A	N/A	Need DRO and LRO in SVOC suite
35-018(a), former oil leak	Hand auger (AH5) to a depth of 7 ft	AH5	N/A	1	1	1	N/A	N/A	N/A	—

Table 3.2-1
Proposed Samples for the Mesa Top Subarea (continued)

PRS Number and Description	Description of Sample Locations (see Figure 3.2-1 or Figure 3.2-2 for map)		Metals	SVOCs	VOCs	Pest-icides/ PCBs	Alpha Spec-troscopy	Gamma Spec-troscopy	Strontium-90/ Tritium	Comments
35-003(a)-99, WWTP components	Drill 4 boreholes (BH4–BH7) to 30 ft, collect two samples at BH4 (1 from 15- to 20-ft depth and 1 from 25- to 30-ft depth), collect 3 samples each at BH5, BH6, and BH7 (1 from 0- to 5-ft depth, 1 from 10- to 15-ft depth, and 1 from 25- to 30-ft depth)	BH4	2	2	2	N/A	2	2	2	—
		BH5	3	3	3	3	3	3	3	
		BH6	3	3	N/A	N/A	3	3	3	
		BH7	3	3	N/A	N/A	3	3	3	
	Dig transect[b] (TR1) to a depth of 20 ft, sample to investigate soil around lines	TR1	2-3	2-3	N/A	N/A	2-3	2-3	2-3	—
35-004(h), outdoor container storage area	No samples needed		N/A	N/A	N/A	N/A	N/A	N/A	N/A	—
35-002, MDA X	See 35-009(a)-99; BH2 will provide data for this PRS									—
	Total Minimum Number of Samples		**23**	**26**	**14**	**12**	**13**	**13**	**17**	—

[a] N/A indicates that a sample is not required based on existing data or process knowledge.

[b] Transect depth varies to include all post-Laboratory sediments/soils; does not extend into tuff but can go as deep as the soil/tuff interface.

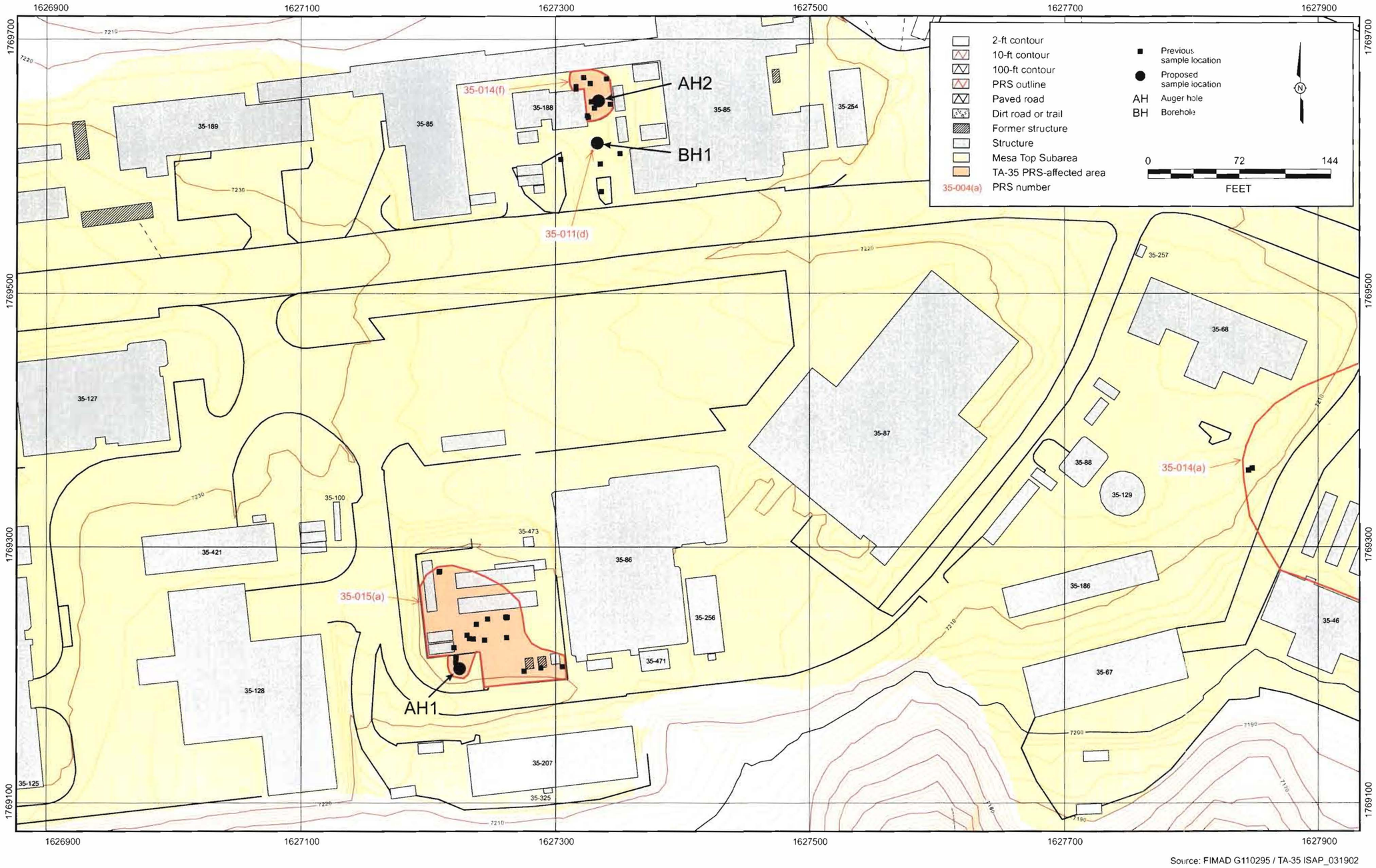

Figure 3.2-1. Proposed sample locations in western portion of Mesa Top Subarea

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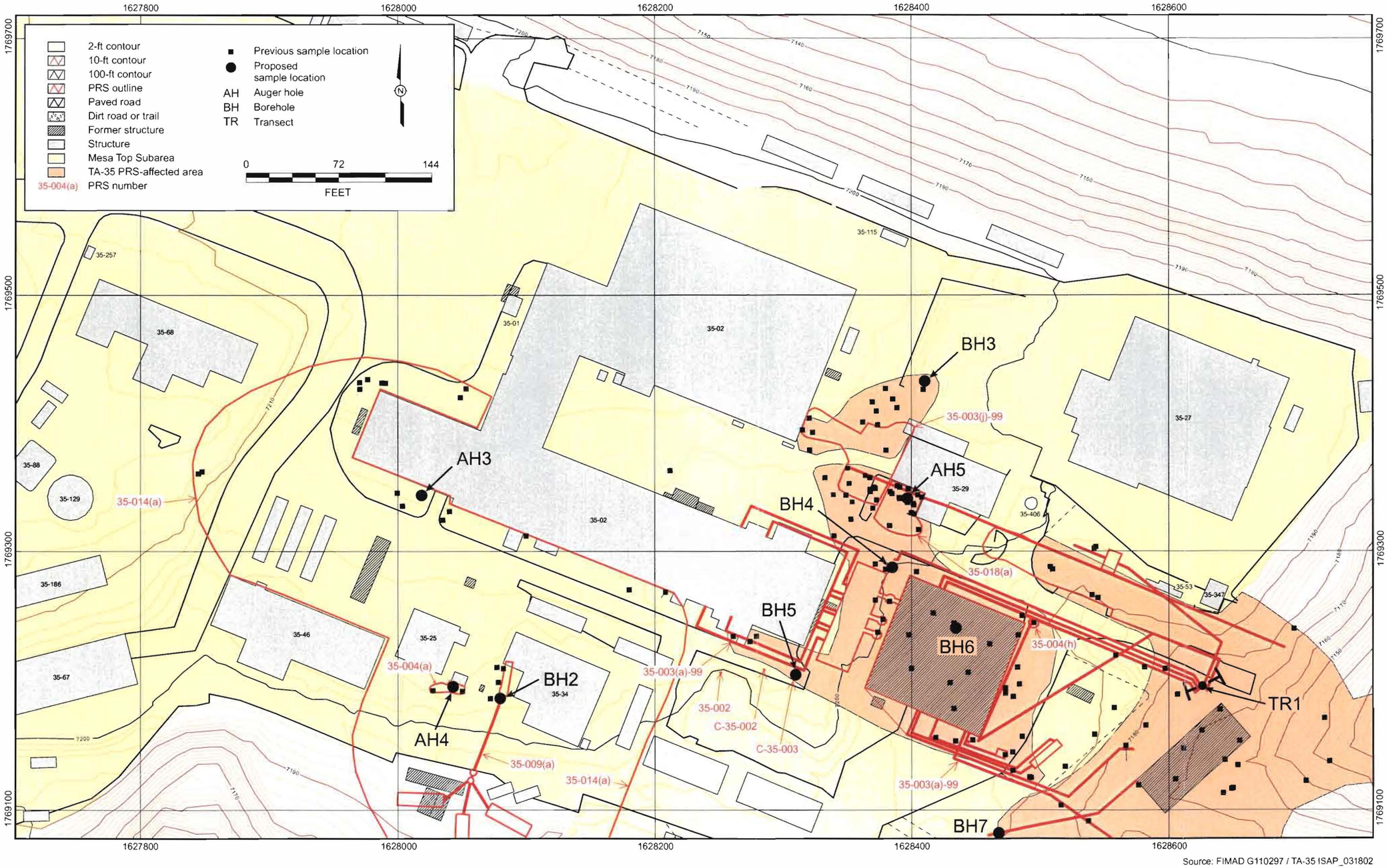

Figure 3.2-2. Proposed sample locations for eastern portion of Mesa Top Subarea

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3.2.2 Ten Site Slope Subarea

3.2.2.1 Specific Sampling Approach Assumptions

The objective of the Ten Site Slope Subarea investigation is to determine the nature and extent of Laboratory-derived contaminants in post-1951 sediment deposits (the date TA-35 was occupied). By identifying the types, concentrations, and distribution of contaminants within the Ten Site Slope Subarea and using the data from the canyon reach below the slope, a determination can be made as to whether a potential exists for migration of contaminants and if remediation is warranted.

The sampling approach for Ten Site Slope Subarea PRSs is similar to Mortandad Slope and the Pratt Canyon Subareas. The following assumptions are built into the sampling design:

- The Ten Site Slope land-use scenario and future use is expected to be recreational.
- The subarea sample design identified individual outfall channels for sampling.
- Each outfall channel's alluvial fan is the emphasis of the investigation where the focus will be on determining the nature and extent of potentially contaminated sediment deposits (post-1942 for Laboratory operations and post-1951 for this site) but will also include supplemental characterization of pre-1943 deposits.
- The following criteria are used to select transect locations:
  - choose areas where contaminant concentrations are expected to be highest as judged from previous sampling and analysis activities, and
  - choose areas with a variety of geomorphologic characteristics to allow better estimates of the total contaminant inventory and of variation in contaminant distribution.
- Topographic boundaries are recognized for lateral extent of contamination.
- Subdivisions of geomorphic units within each alluvial fan identified by the geomorphologist may require (rapid) phased sampling.
- Contaminant suites are determined based on knowledge of process and existing data.
- The sampling design supports the Canyons Focus Area investigations and is derived from the "Core Document for Canyons Investigations" (LANL 1997, 62316).

3.2.2.2 Field Surveys and Mapping

Hillslope operational discharges or releases may lead to migration of contaminants down the steep slope to the canyon bottom, with packages of sediment moving with each storm event or operational discharge or spill. A geomorphic understanding of the depositional area, typically the "alluvial fan" at the toe of the slope where soil/sediments tend to migrate and diffuse, is necessary for this investigation to help identify areas of historic sediment accumulation. The geomorphic mapping of the channels and alluvial fans will be used to identify different ages of sediment packages, young (post-1942 for Laboratory operations and post-1951 for this site) or old (pre-1943) and depositional settings, which may contain varying concentrations of contaminants. Concentrations of radionuclides in the WWTP effluent discharged to this area may vary based on the decay potential of the radionuclide. Contaminant concentrations may also vary based on the age of sediment and grain size. The geomorphic mapping data collected will also indicate subdivisions within any geomorphic unit (definable areas with potential variations in thickness, history, and/or contaminants) and sample collection will be planned accordingly. If units have significant vertical variation in contaminant concentrations, the units may be subdivided into two or more distinct stratigraphic layers. Radiation screening results and laboratory analyses will be examined to determine whether the geomorphic units are appropriate to define the contaminant distributions and inventories. Geomorphic criteria

used to distinguish pre-1943 sediments are discussed in section 5.6.2.2 of the canyons core document (LANL 1997, 62316) and summarized in section 4.1 of this SAP.

The Ten Site Slope Subarea releases, from the PRSs listed in section 3.2.2, tended to be large volumes of liquids during storm events or smaller volumes of liquids discharged continually through operational processes. Migration of contaminants down the steep slopes to the canyon bottom has been indicated from previous sampling events. However, a data gap exists in the geomorphic understanding of the alluvial fan at the toe of the Ten Site Slope, and extent of contamination has not been confirmed in sediment packages within all the channels.

In addition to the fan mapping, a geodetic survey will be conducted from engineering drawings showing the exact location of the LAPRE I and II steam blow-off line (PRS 35-017). Sample locations will be selected from appropriate sediment packages down the canyon slope below the identified steam line outlet to determine if radionuclide contamination from historical discharges has decayed to below background values/ fallout levels.

3.2.2.3 Sample Collection and Analysis

Based on the assessment of existing data and subsequent data gap conclusions presented in section 2.4.3, additional samples need to be collected for the Ten Site Slope Subarea. This section presents the number of samples needed from each drainage channel to complete the data set. The Ten Site Slope Subarea has been mapped out to distinguish 11 separate channels where contaminant transport is likely (Figure 3.2-3 and Figure 3.2-4). The channels terminate in alluvial fans before merging with the stream channel in the canyon bottom. The alluvial deposits and sediment packages in the channels will be characterized by geomorphic surveys and by chemical analysis of sediment samples collected from potentially contaminated geomorphic units.

Table 3.2-2 lists the minimum number of samples to be collected from each channel on Ten Site Slope and the alluvial fan at the base of the channel. Each PRS, or group of PRSs, in the table represents a channel or PRS-affected area. The PRSs identified in the table and summarized below are listed in the order presented on Figure 3.2-3 and Figure 3.2-4, reading from left to right. Additional samples may be collected if several geomorphic units are identified within the sample area.

Sites designated as PRSs 35-009(a) and 35-016(a) were the only two areas in this subarea where strontium is considered a potential contaminant. The data set for these PRSs indicate no further sampling is needed for strontium; therefore, it is not listed on the column heading in Table 3.2-2.

PRS 35-016(j), roof drains and fire-protection outfall water, needs additional samples for TAL metals, SVOCs, and alpha and gamma spectroscopy analysis, especially at the channel's alluvial fan, to complete the data set for assessment. The PAHs that were detected are typically found in asphalt or tar roofing material (through which this water traveled prior to discharging to the outfall). Plutonium-239 was detected in one sample just over background. Two transects are proposed: one at the top of the slope and one at the bottom in the alluvial fan, with samples to be collected at two depths to determine both vertical and lateral extent of contaminants.

PRS 35-014(g3), a former oil spill, needs additional samples for TAL metals, SVOCs and VOCs, especially at the channel's alluvial fan, to complete the data set for assessment. Samples for TAL metals were collected at the top of the slope from the 0- to 12-in. depth. Nothing was detected; however, no data exist from the three alluvial fans at the toe of the slope. SVOCs, including DRO and LRO, were detected in soils from two of the three fans, but vertical extent is not defined, and there is no SVOC data from one of the three fans at the toe of the slope. Samples were also collected for VOCs near the top of the slope; analyses indicate chlorinated organic chemicals are in the oil that spilled. No VOC data exist from one of three fans at the toe of the slope, and extent is not defined in any fan. Two samples were collected for pesticides/PCBs

near the top of the slope; nothing was detected. Although there is no data from the three fans at the toe of the slope for PCBs, because they were not detected at origin of the oil spill, extent is complete. The radionuclides detected were all less than background values. Four transects are proposed to define vertical and lateral extent: one near the top of the slope and one in each of the three alluvial fans. Samples will be collected from two depths.

PRS 35-004(g)-00, a stormwater outfall and former oil spill/stained areas, needs additional samples for TAL metals, SVOCs, and alpha spectroscopy analyses, especially at the channel's alluvial fan, to complete the data set for assessment. One surface sample detected several metals, two other surface samples detected only zinc. No metals data exist from the alluvial fan at the slope toe. SVOCs were detected in 4 of the 10 samples at PRS 35-016(n). No PCBs or VOCs were detected at the origin of the oil spill; therefore, extent is defined for these analytes. Thirty-three isotopic uranium and 14 isotopic plutonium samples were collected. PRS 35-016(n) had 5 plutonium-239 hits in surface samples, PRS 35-004(m) had 1 hit of plutonium-239 and uranium-234/235 in 2 surface samples. For gamma spectroscopy, PRS 35-004 (m) had europium-152 in 1 sample. One PRS 35-016(n) surface sample has cesium-137 greater than sediment background levels. Two transects are proposed to define vertical and lateral extent, one near the top of the slope and one in the alluvial fan at base of slope. Samples will be collected from two depths.

PRS 35-009(b), a former septic system, and PRS 35-004(g), a former outdoor storage area, need additional samples for TAL metals, SVOCs, VOCs, PCBs, and alpha and gamma spectroscopy analyses, especially at the channel's alluvial fan and within the old leach field, to complete the data set for assessment. The only metal detected was zinc at PRS 35-004(g); only one sample was collected from the 6- to 7-ft depth at PRS 35-009(b). Nothing was detected; however, more samples are needed from the south end of the leach field. Nothing was detected in the top portion of the leach field to a 20-ft depth for SVOCs; however, more samples could be used from the south end of the leach field. One surface sample at 35-004(g) was collected for VOCs. Nothing was detected from 0 to 6 in. (but this is not an adequate depth to collect a VOC sample). No VOC samples were collected at 35-009(b) because VOCs are not expected. Aroclors-1254/1260 were detected in 2 of 5 samples from 35-004(g). Nothing was detected in the 1 PCB sample at 35-009(b). Data are needed from the toe of the slope and the leach field at depth. Plutonium-238 and uranium-234/235/238 were detected in 2 samples; however, there is no data from the toe of the slope or leach field at depth. Four boreholes are proposed in the leach field to a 30-ft depth to define vertical and lateral extent of contamination. Two transects are proposed to define vertical and lateral extent: one near the top of the slope and one in the alluvial fan at base of slope. Samples will be collected from two depths.

PRS 35-016(b), an active photo-processing effluent outfall, needs additional samples for TAL metals, SVOCs, cyanide, and alpha and gamma spectroscopy analyses, especially at the channel's alluvial fan, to complete the data set for assessment. Lead was detected in a sample at 2- to 3-ft depth; no data were collected from the toe of the slope. No SVOCs or VOCs were detected; however, no data exist at the alluvial fan. Screening for VOCs at the slope toe should be sufficient. Based on process knowledge, no samples were collected for PCBs, tritium, or strontium-90. Uranium-234/238 was detected in one sample at 1- to 2-ft depth; nothing was detected in the gamma spectroscopy analysis. No data exist from toe of slope for either alpha or gamma spectroscopy analyses. Two transects are proposed to define vertical and lateral extent. One transect will be dug at the base of the slope in the alluvial fan and the other transect dug parallel to the first, but farther upslope (see proposed sample map). Samples will be collected from two depths in the upper transect and from three depths in the lower transect.

PRS 35-016(c)-00, inactive non-contact cooling water outfalls, needs additional samples for TAL metals including mercury, SVOCs, and alpha and gamma spectroscopy analyses, especially at the channel's alluvial fan, to complete the data set for assessment. Several metals were detected in at least 1 of each of the 10 samples; no data exist at alluvial fan of outfall channel. SVOCs (PAHs) were detected in 5 samples, probably from stormwater runoff over asphalted surfaces; no data exist at alluvial fan of outfall channel.

VOCs were not detected in the samples collected, and even though no data exist at the toe of the slope for VOCs, additional screening should be sufficient. Based on process knowledge, no samples were collected for PCBs, strontium-90, or tritium. Plutionium-238 was detected in 1 sample and uranium-235 was detected in 1 sample. Europium-152 was detected in 1 surface sample, and cesium-137 was detected in 2 surface samples. No data exist at alluvial fan of outfall channel for either alpha or gamma spectroscopy analyses. Four transects are proposed to define vertical and lateral extent; one for each PRS near the top of the slope and two in the alluvial fan at base of slope where the PRSs boundaries combine. Samples will be collected from two depths.

PRS 35-009(e), a former outfall from floor drains and sanitary toilet in TA-35-25, needs additional samples for TAL metals, SVOCs, PCBs, and alpha and gamma spectroscopy analysis, especially at the channel's alluvial fan to complete the data set for assessment. Vertical and lateral extents have not been defined, as only one sample was collected for metals, VOCs, SVOCs, and PCBs, and no data from the alluvial fan below outfall exist. Because VOCs are not expected at this site, screening should be sufficient during future sample events. Plutionium-239 was detected in 2 samples, and uranium-234/-235/-238 was detected in 1 sample; vertical and lateral extents have not been defined and no data from the alluvial fan below outfall exist. Cesium-137 was detected in one sample at less than background values; however, vertical and lateral extents have not been defined, and no data from the alluvial fan below outfall exist. No strontium-90 was detected. Three tritium samples had detects less than background values. Two transects are proposed to define vertical and lateral extent: one near the top of channel and one in the alluvial fan at base of slope. Samples will be collected from two depths.

PRS 35-009(a), a sanitary septic system, needs additional samples for TAL metals including mercury, SVOCs, PCBs, and alpha and gamma spectroscopy analysis, especially at the channel's alluvial fan to complete the data set for assessment. Several metals were detected in up to 3 samples. SVOCs (PAHs) were detected in 4 samples. Extent is not complete for the alluvial fan or the leach field for metals or SVOCs. No samples were collected for VOCs and PCBs based on PRS use; however, PCBs have been detected in sanitary sludge at other sites, so PCB analysis will be added to the sampling list. Plutonium-238 was detected in 2 samples and plutonium-239 was detected in 6 samples levels greater than background, gamma radionuclides were not detected. However, extent is not complete for alpha or gamma radionuclides in the alluvial fan or leach field. There were 2 strontium-90 and 20 tritium detects less than background; 2 tritium samples have detected values just greater than background values. Tritium values do not increase or decrease with depth. Three boreholes are proposed to a depth of 30 ft south of the old septic system. Two transects are proposed to define vertical and lateral extent: one near the top of channel and one in the alluvial fan at base of slope. Samples will be collected from 2 to 3 depths. Screening for VOCs should be adequate as neither the conceptual model nor process knowledge anticipate VOCs.

PRS 35-016(a)-00 consists of two PRSs: 35-016(a), an inactive noncontact cooling water outfall, and 35-016(q), an active stormwater outfall. PRS 35-016(a) needs additional samples for TAL metals and alpha spectroscopy analysis within the existing outfall channels to complete the data set for assessment. Several metals were detected in up to 3 samples. SVOCs (PAHs) were detected in 6 of 7 samples (expected to be from asphalt roadway runoff adjacent to site). Although no VOCs were detected, no data from the alluvial fan below outfall exist. No samples were collected for PCBs based on process knowledge. Plutonium-239 was detected in 1 sample; uranium-235 was detected in 2 samples. No gamma-emitting radionuclides or strontium-90 were detected. Tritium was detected in 2 samples less than background levels from 0- to 2-ft depths. Two transects are proposed to define vertical and lateral extent, both within the existing outfall channels just south of the mesa top. Samples will be collected from 2 depths. Screening for VOCs should be adequate as conceptual model and process knowledge does not anticipate VOCs.

Table 3.2-2
Proposed Samples for the Ten Site Slope Subarea

PRS Number and Description	Description of Sample Locations (see Figure 3.2-3 or Figure 3.2-4 for map)		Metals	SVOCs	VOCs	Pesticides/ PCBs	Alpha Spectroscopy	Gamma Spectroscopy	Tritium	Comments
35-016(j), outfall	Dig 2 transects[a] or auger holes (TR1–TR2) for geomorphic characterization (1 near top of slope [TR1] and 1 in alluvial fan at base of slope [TR2]), collect samples from 2 depths	TR1	2	2	N/A[b]	N/A	N/A	N/A	N/A	Add cyanide to metals suite
		TR2	2	2	N/A	N/A	2	2	N/A	
35-014(g3), oil spill	Dig 4 transects or auger holes (TR3–TR6) for geomorphic characterization (1 near top of slope and 3 in alluvial fan at base of slope), collect samples from 2 depths	TR3	2	2	2	N/A	N/A	N/A	N/A	Need DRO and LRO in SVOC suite
		TR4	2	2	2	N/A	N/A	N/A	N/A	
		TR5	2	2	2	N/A	N/A	N/A	N/A	
		TR6	2	2	2	N/A	N/A	N/A	N/A	
35-004(g)-00: **35-016(n), 35-004(m), 35-014(g1,g2),** outfall area	Dig 2 transects or auger holes (TR7–TR8) for geomorphic characterization (1 near top of slope [TR7] and 1 in alluvial fan at base of slope [TR8]), collect samples from 2 depths	TR7	2	2	N/A	N/A	N/A	N/A	N/A	Need DRO and LRO in SVOC suite
		TR8	2	2	2	N/A	2	N/A	N/A	
35-004(g)-00: **35-009(b),** septic system; **35-004(g),** outdoor storage area	Drill 4 boreholes (BH1–BH4) to 30 ft in leachfield, sample at 10-ft intervals; hand auger (AH11) at location ID 35-2100, collect 1 sample from 12–18 in.; dig transect (TR11) for geomorphic characterization in alluvial fan at base of slope, collect samples from 2 depths	BH1	3	1	N/A	3	3	3	N/A	BH1 and BH2 need SVOCs at 30-ft depth only
		BH2	3	1	N/A	3	3	3	N/A	
		BH3	3	3	N/A	3	3	3	N/A	
		BH4	3	3	N/A	3	3	3	N/A	
		AH1	1	1	1	1	N/A	N/A	N/A	
		TR11	2	2	N/A	2	2	2	N/A	
35-016(b)	Dig 2 transects or auger holes (TR9–TR10) for geomorphic characterization (1 at mid-point from top to base of alluvial fan [TR9] and 1 in alluvial fan at base of slope [TR10]), collect samples from 2 depths at TR9 and from 3 depths at TR10	TR9	2	2	N/A	N/A	N/A	N/A	N/A	Add cyanide to metals suite
		TR10	3	3	N/A	N/A	3	3	N/A	
35-016(c,d), outfall	Dig 4 transects or auger holes (TR12–TR15) for geomorphic characterization (1 near top of slope at each PRS [TR12–TR13] and 2 in alluvial fan at base of slope where PRSs join [TR14–TR15]), collect samples from 2 depths	TR12	2	N/A	N/A	N/A	N/A	N/A	N/A	—
		TR13	2	N/A	N/A	N/A	N/A	N/A	N/A	
		TR14	2	2	Screen	N/A	2	2	N/A	
		TR15	2	2	Screen	N/A	2	2	N/A	

Table 3.2-2
Proposed Samples for the Ten Site Slope Subarea (continued)

PRS Number and Description	Description of Sample Locations (see Figure 3.2-3 or Figure 3.2-4 for map)		Metals	SVOCs	VOCs	Pesticides/ PCBs	Alpha Spectroscopy	Gamma Spectroscopy	Tritium	Comments
35-017, steam line outfall	Geodetic survey will be conducted to locate steam blow-off line; geomorphic characterization and radiation screening will determine if radionuclide contamination from historical releases may be present	N/A	N/A	N/A	N/A	N/A	Screen	Screen	N/A	—
35-009(e), septic system	Dig 2 transects or auger holes (TR16–TR17) for geomorphic characterization (1 near top of slope [TR16] and 1 in alluvial fan at edge of PRS [TR17]), collect samples from 2 depths	TR16	2	2	Screen	2	2	2	N/A	—
		TR17	2	2	Screen	2	2	2	N/A	
35-009(a), septic system	Drill 3 boreholes (BH5–BH7) to 30 ft in distribution box, sample at 10-ft intervals; dig 2 transects or auger holes (TR18–TR19) for geomorphic characterization (1 near top of slope [TR18] and 1 in alluvial fan at base of slope [TR19]), collect samples from 2 to 3 depths	BH5	3	3	Screen	3	3	N/A	N/A	—
		BH6	3	3	Screen	3	3	N/A	3	
		BH7	3	3	Screen	3	3	N/A	N/A	
		TR18	2	2	Screen	2	2	2	N/A	
		TR19	3	3	Screen	3	3	3	N/A	
35-016(a)-00 **35-016(a),** outfall	Dig 2 transects or auger holes (TR20–TR21) for geomorphic characterization, collect samples from 2 depths	TR20	2	N/A	Screen	N/A	2	N/A	N/A	—
		TR21	2	N/A	Screen	N/A	N/A	N/A	N/A	
35-016(a)-00 **35-016(q),** outfall	Dig transect or auger hole (TR22) for geomorphic characterization in alluvial fan at base of slope, collect samples from 3 depths	TR22	3	3	Screen	3	3	3	N/A	—
	Total Minimum Number of Samples		**69**	**57**	**11**	**36**	**48**	**35**	**3**	—

[a] Transect depth varies to include all post-Laboratory sediments/soils; does not extend into tuff but can go as deep as the soil/tuff interface.

[b] N/A indicates that a sample is not required based on existing data or process knowledge.

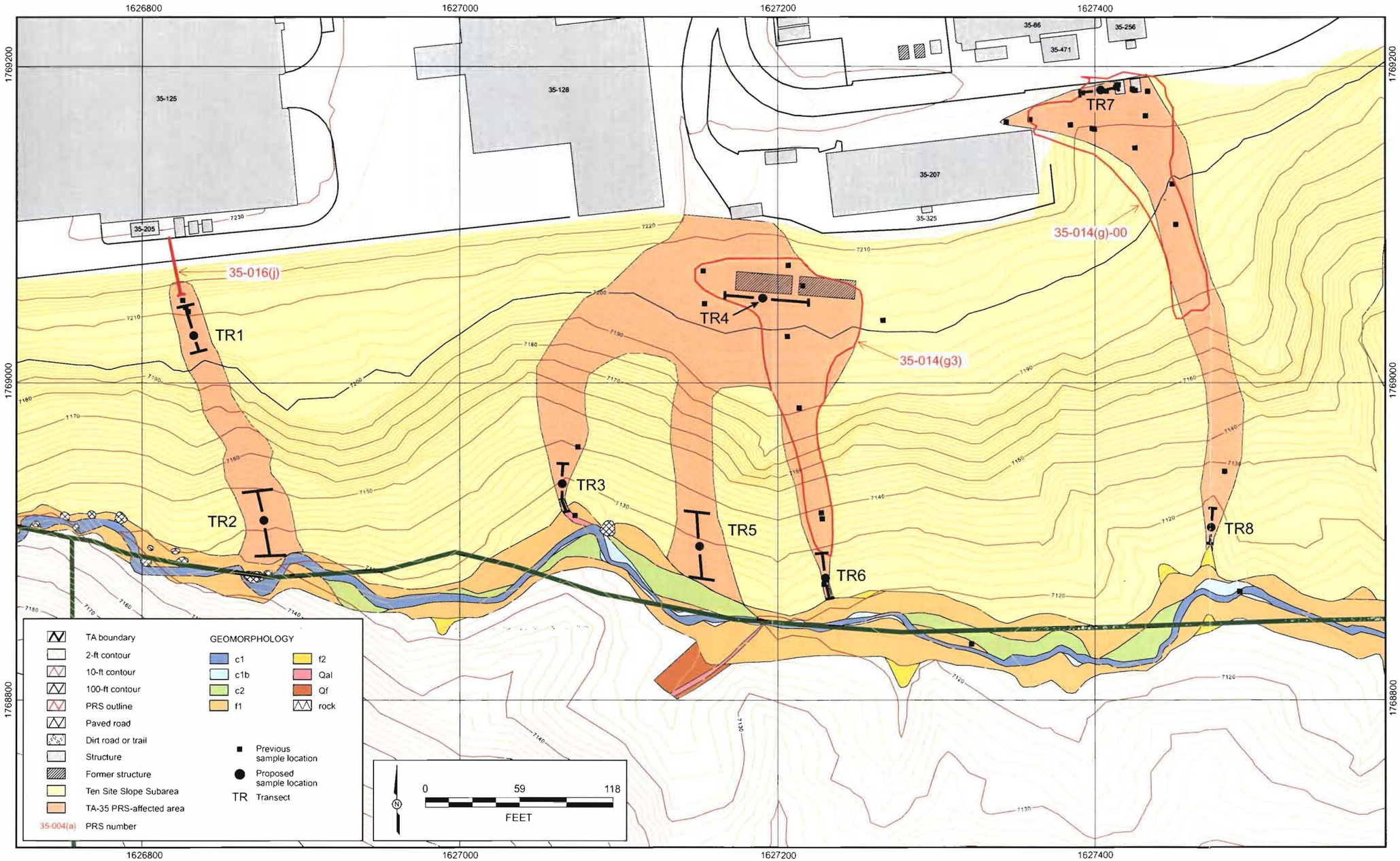

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Figure 3.2-3. Proposed sample locations in western portion of Ten Site Slope Subarea

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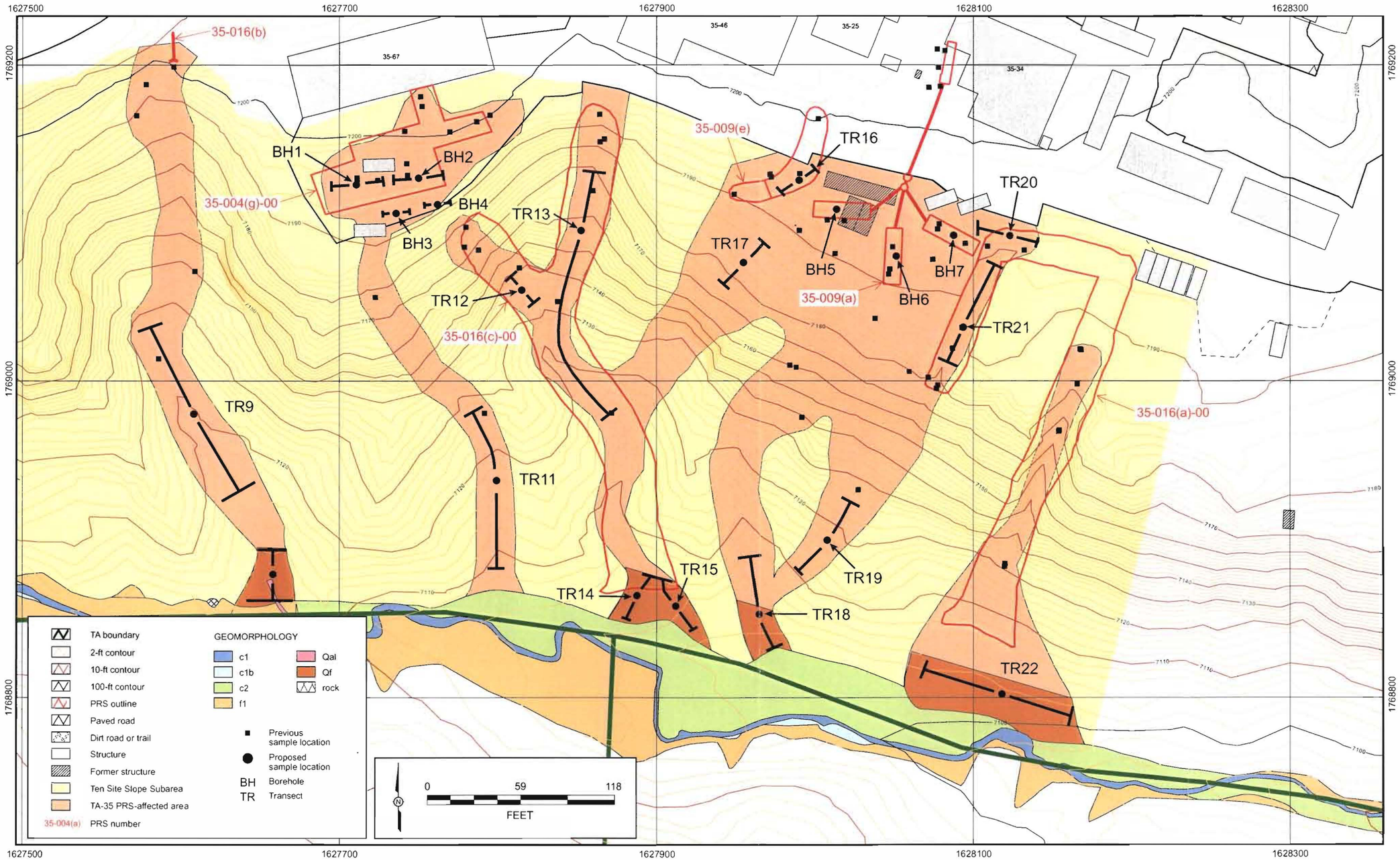

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Figure 3.2-4. Proposed sample locations in eastern portion of Ten Site Slope Subarea

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PRS 35-016(q) needs additional samples for TAL metals, SVOCs, PCBs, and alpha and gamma spectroscopy analysis at channel's alluvial fan to complete the data set for assessment. No metals data exist. No VOCs were detected. SVOCs (PAHs) were detected in 4 of 5 samples, Aroclor-1260 was detected in 2 of 6 samples. No data exist from the alluvial fan below the outfall for VOCs, SVOCs, or PCBs. Plutonium-238/239 was detected in 2 samples, no gamma-emitting radionuclides were detected in any samples. However, no data exist from the alluvial fan below the outfall for alpha or gamma analyses. Based on process knowledge, no samples were collected for strontium-90 or tritium. One transect is proposed to define vertical and lateral extent at the base of the slope within the alluvial fan. Samples will be collected from 3 depths. Screening for VOCs should be adequate as conceptual model and process knowledge does not anticipate VOCs.

PRS 35-017, a former steam vent outfall. There is no RFI sample data. Only D&D screening data exists from pipe removal, but no screening from where pipe daylighted. Because this pipe was removed during the most recent D&D efforts for the old LAPRE equipment, it is possible that there is no contaminated soil remaining from the line's outfall area. However, additional screening data for alpha and gamma spectroscopy at outfall where pipe daylighted will ensure all possible exposure pathways were assessed.

3.2.3 Mortandad Slope Subarea

3.2.3.1 Specific Sampling Approach Assumptions

As with Ten Site Slope, geomorphic mapping will be the approach used to determine the nature and extent of Laboratory-derived contaminants in post-1951 sediment deposits within the Mortandad Slope Subarea. By identifying the types, concentrations, and distribution of contaminants within the Mortandad Slope Subarea and the data from the canyon reach below the slope, a determination can be made as to whether a potential exists for migration of contaminants and if remediation is warranted based on risk ranking. The following assumptions are built into the sampling design:

- The Mortandad Slope land-use scenario and future use is expected to be recreational.
- The subarea sample design identified individual outfall channels for sampling.
- Each outfall channel's alluvial fan is the emphasis of the investigation where the focus will be on determining the nature and extent of potentially contaminated sediment deposits (post-1951).
- The following criteria are used to select transect locations:
  - choose areas where contaminant concentrations are expected to be highest as judged from previous sampling and analysis activities, and
  - choose areas with a variety of geomorphologic characteristics to allow better estimates of the total contaminant inventory and of variation in contaminant distribution.
- Topographic boundaries are recognized for lateral extent of contamination.
- Subdivisions of geomorphic units within each alluvial fan identified by the geomorphologist may require (rapid) phased sampling.
- Contaminant suites are determined based on knowledge of process and existing data.
- The sampling design supports the Canyons Focus Area investigations and is derived from the "Core Document for Canyons Investigations" (LANL 1997, 62316).

3.2.3.2 Field Surveys and Mapping

As stated in section 3.2.2, hillslope operational discharges or releases may lead to migration of contaminants down the steep slope to the canyon bottom, with packages of sediment moving with each storm

event or operational discharge or spill. A geomorphic understanding of the depositional area, typically the "alluvial fan" at the toe of the slope where soil/sediments tend to migrate and diffuse, is necessary for this investigation to help identify areas of historic sediment accumulation. The geomorphic mapping of the channels and alluvial fans will be used to identify different ages of sediment packages, young (post-1942, actually 1951 for this site) or old (pre-1943) and depositional settings, which may contain varying concentrations of contaminants. Contaminant concentrations may vary based on the age of sediment and grain size. The geomorphic mapping data collected will also indicate subdivisions within any geomorphic unit (definable areas with potential variations in thickness, history, and/or contaminants) and sample collection will be planned accordingly. If units have significant vertical variation in contaminant concentrations, the units may be subdivided into two or more distinct stratigraphic layers. Radiation screening results and laboratory analyses will be examined to determine whether the geomorphic units are appropriate to define the contaminant distributions and inventories in each reach. Geomorphic criteria used to distinguish pre-1943 sediments are discussed in section 5.6.2.2 of thecanyons core document and summarized in section 4.1 of this SAP.

The Mortandad Slope Subarea releases, from the PRSs listed in Table 3.2-3, tended to be large volumes of liquids during storm events or smaller volumes of liquids released continually through operational processes. Migration of contaminant(s) down the steep slopes to the canyon bottom has been indicated from previous sampling events. However, a data gap exists in the geomorphic understanding of the alluvial fan at the toe of the Mortandad Slope, and extent of contamination has not been confirmed in sediment packages within all the channels.

3.2.3.3 Sample Collection and Analysis

Releases to the Mortandad Slope Subarea are primarily operational discharges and/or stormwater runoff. This section presents the number of samples needed from each drainage channel to complete the data set. The Mortandad Slope Subarea has been mapped out to distinguish 10 separate channels were contaminant transport is likely. The channels terminate in alluvial fans before merging with the stream channel in the canyon bottom. The alluvial deposits and sediment packages in the channels will be characterized by geomorphic surveys and by chemical analysis of sediment samples collected from potentially contaminated geomorphic units.

Table 3.2-3 lists the minimum number of samples to be collected from each channel on Mortandad Slope and the alluvial fan at the base of the channel. Each PRS, or group of PRSs in the table, represent a channel or PRS-affected area. The PRSs identified in the table and summarized below are listed in the order presented on Figure 3.2-6 and Figure 3.2-7, reading from left to right. Additional samples may be collected if several geomorphic units are identified within the sample area.

PRS 35-016(f), a stormwater drain north of TA-35-85, needs additional samples for TAL metals, SVOC, and PCB analysis, especially at the channel's alluvial fan, to complete the data set for assessment. One sample was collected for metals and VOCs, nothing was detected, however, it is difficult to determine vertical extent with one sample. PAH type SVOCs were detected in 1 of the 2 samples from the 0- to 1-ft depth. Out of 4 samples, no PCBs were detected from the 0- to 3-ft depth. No samples were collected for alpha and gamma radionuclides, strontium-90, or tritium based on process knowledge. Two transects are proposed to define vertical and lateral extent; one near the top of channel and one in the alluvial fan at base of slope. Samples will be collected from two depths. PCBs may have moved down stream with sediment to alluvial fan so samples will be collected even though nothing was detected at the top of the slope. Screening for VOCs should be adequate as conceptual model and process knowledge does not anticipate VOCs.

Consolidated PRS 35-008-00 is comprised of PRSs 35-014(e1), a former dielectric oil spill north of TA-35-85, and 35-008, a former canyon side disposal area north of TA-35-6. Consolidated PRS 35-008-00 needs

additional samples for TAL metals, SVOC, and alpha and gamma spectroscopy analyses, especially at the channel's alluvial fan [which is collocated with PRSs 35-008 and 35-016(e)] to complete the data set for assessment. No RFI data for metals exist. TPHs were detected in 2 samples from the 0-1 ft depth for LRO up to 7100 ppm. VOCs and PCBs were not detected in the 4 samples collected from 0-3 ft depths. No samples were collected for alpha and gamma radionuclides, strontium-90, or tritium based on process knowledge. PRS 35-008 samples contained several metals from 0-3.5 ft depths. Chromium was in the 3-ft interval of location ID 35-2456. TPH-type SVOCs were detected in 19 samples from 0-3 ft sampled intervals. LROs were detected up to 48,000 ppm, a decreasing trend was not established. Location IDs 35-2282, -2283, -2458, -2259 have the highest TPH levels. Eight samples contain trace (ppb) amounts of VOCs (hits do not correlate with SVOC location IDs). One sample contains plutonium-239 less than background, and three samples contain one each of uranium-234, -235, -238 just greater than background levels; samples were collected from 0- to 3-ft depths and a decreasing trend was established in most samples. Cesium-137 and ruthenium-106 were each detected in one sample at less than 0.6 pCi/g. No samples were collected for strontium-90 or tritium based on process knowledge. Eight transects are proposed to define vertical and lateral extent of contamination at collocated PRSs 35-008-00 and 35-016(e). Samples will be collected from two depths.

PRS 35-016(e), non-contact cooling water outfall from TA-35-85, is collocated with consolidated PRS 35-008-00 which will be sampled for TAL metals, SVOC, and alpha and gamma spectroscopy analyses to complete the data set for assessment. No TAL metals or alpha or gamma spectroscopy data exist. No samples were collected for SVOCs, strontium-90 and tritium based on process knowledge. Nothing was detected from 2-3 ft depth for VOC samples and no PCBs were detected in samples collected from 0 to 3-ft depths. Eight transects are proposed to define vertical and lateral extent of collocated PRSs 35-008-00 and 35-016(e). Samples will be collected from two depths.

PRS 35-004(b), outdoor drum storage area outside TA-35-85, needs additional samples for TAL metals, SVOC, and VOCs to complete the data set for assessment. No TAL metals were detected in the 1 sample collected at 0-1 ft depth and no SVOCs or PCBs detected in the 2-3 ft deep sample. No RFI VOC data exists. No radionuclide data was collected based on process knowledge. One sample location will be hand augered through the asphalt and basecourse to sample the underlying material. Samples will be collected from 2 depths.

Consolidated PRS 35-016(i)-00 is comprised of PRSs 35-016(i), a stormwater outfall, and 35-014(e2), a former oil spill in the former impoundment area northeast of TA-35-85. Consolidated PRS 35-016(i)-00 needs additional samples for TAL metals, SVOC, and PCB analyses, especially at the channel's alluvial fan, to complete the data set for assessment. At PRS 35-014(e2), no RFI metals data exists. Also, no samples were collected for radionuclide analyses based on process knowledge. No SVOCs were detected from the 0-1 ft depth and no VOCs were detected from the 2-3 ft depth. Aroclor-1260 was detected in the one sample collected at less than 0.06 ppm from 0-1 ft depth. PRS 35-016(i) had only one sample collected for PCBs, nothing was detected. One sample location will be hand augered through the asphalt and basecourse to sample the underlying material; samples will be collected from 3 depths. Six transects are also proposed to define vertical and lateral extent of consolidated PRS 35-016(i)-00. Samples will be collected from two depths.

PRS 35-009(c), an abandoned, inactive septic system north of TA-35-2, is collocated with PRS 35-016(o) which will be sampled for TAL metals, SVOC, PCB, alpha and gamma spectroscopy, and tritium analyses to complete the data set for assessment. No TAL metals were detected in samples collected to 20-ft depths. Diethylphthalate (an SVOC) was detected in 1 sample from 19-20 ft depth (deepest interval of location ID 35-2049). Twenty-seven VOC samples contained acetone and trace amounts of trichloropropane at location ID 35-2051, -2052 (3.5 – 20 ft depth) and 3 other VOCs at location ID 35-2053 at a 14- to 15-ft depth. One PCB sample contained Aroclor-1254 and mixed Aroclors at < 0.94 ppm from the 4-5 ft

depth. Plutonium-238 was detected in 3 samples (2 were <background), plutonium-239 was detected in 4 samples (3 were <background). No gamma emitting nuclides or strontium-90 was detected in the samples collected to 20-ft depths. Tritium was detected in 11 of 12 samples, all <background from 1-12 ft. Three sample locations will be hand augered and samples will be collected from 3 depths. Four transects are also proposed to define vertical and lateral extent of collocated PRSs 35-009(c) and 35-016(o). Samples will be collected from two depths.

PRS 35-016(o), stormwater drains north of TA-35-26, is collocated with PRS 35-009(c) which will be sampled for TAL metals, SVOC, PCB, alpha and gamma spectroscopy, and tritium analyses to complete the data set for assessment. Nine TAL metals samples contained at least one of several metals from the 0-2 ft depth and a decreasing trend is not established. SVOCs were detected in 20 samples. DRO and LRO showed a decreasing trend except at two locations: 35-2506 and 35-2511 from the 0- to 2-ft depth. No VOC samples were collected based on process knowledge. Aroclor-1254 was detected in 8 PCB samples, Aroclor-1260 was detected in 3 PCB samples and mixed Aroclors were detected in 8 PCB samples from the 0-3 ft depth; most results are < 0.1 ppm; 4 are between 1 and 2 ppm. Plutonium-238/-239 was detected in 4 samples (2 were less than background) at less than 0.09 pCi/g from the 0-3 ft depth. Cesium-137 was detected in 3 samples at less than background from the 0-3 ft depth. Tritium was detected in 16 samples (4 greater than background and 12 less than background) at very low levels (5 down to 0.06 pCi/g), all in shallow samples (0 to 2 ft). Three sample locations will be hand augered and samples will be collected from 3 depths. Four transects are also proposed to define vertical and lateral extent of collocated PRSs 35-009(c) and 35-016(o). Samples will be collected from two depths.

PRS 35-016(p), a cooling water outfall north of TA-35-27, needs samples for TAL metals and SVOC analyses to complete the data set for assessment. No RFI data exist for TAL metals. PAH-type SVOCs were detected in 1 sample from the 2- to 3-ft depth. No samples were collected for VOCs, PCBs, strontium-90, or tritium based on process knowledge. Plutonium-239 was detected in one sample just greater than background from the 0-0.5 ft depth (surface sample). Cesium-137 was detected in 1 sample at less than background from the 0- to 1-ft depth. To define vertical and lateral extent of contamination, three transects are proposed. Samples will be collected from two depths.

Table 3.2-3
Proposed Samples for the Mortandad Slope Subarea

PRS Number and Description		Description of Sample Locations (see Figure 3.2-6 or Figure 3.2-7 for map)		Metals	SVOCs	VOCs	Pest-icides/ PCBs	Alpha Spec-troscopy	Gamma Spec-troscopy	Tritium	Comments
35-016(f), outfall (stormwater)		Dig 3 transects[a] or auger holes (TR1–TR3) for geomorphic charac-terization, collect samples from 2 depths	TR1	2	2	N/A[b]	2	N/A	N/A	N/A	PCBs could have moved down drain channel to fan
			TR2	2	2	N/A	2	N/A	N/A	N/A	
			TR3	2	2	N/A	2	N/A	N/A	N/A	
35-008-00	**35-014(e1),** oil spill (former)	To gather data for collocated PRSs 35-014(e1), 35-008, and 35-016(e), dig 8 transects or auger holes (TR4–TR11) for geomorphic characterization, collect samples from 2 depths	TR4	2	2	N/A	N/A	N/A	N/A	N/A	—
			TR5	2	2	N/A	N/A	N/A	N/A	N/A	
			TR6	2	2	N/A	N/A	2	2	N/A	
			TR7	2	2	N/A	N/A	N/A	N/A	N/A	
			TR8	2	2	N/A	N/A	N/A	N/A	N/A	
			TR9	2	2	N/A	N/A	2	2	N/A	
			TR10	2	2	N/A	N/A	2	2	N/A	
			TR11	2	2	N/A	N/A	2	2	N/A	
	35-008, disposal area	See PRS 35-014(e1); data gathered will include area of PRS 35-008									—
35-016(e), outfall		See PRS 35-014(e1); data gathered will include area of PRS 35-016(e)									—
35-004(b), outdoor storage area		Hand auger (AH1) through asphalt, collect samples from 2 depths (1 from immediately below base course and 1 from 2 ft below base course)	AH1	2	2	2	N/A	N/A	N/A	N/A	—

Table 3.2-3
Proposed Samples for the Mortandad Slope Subarea (continued)

	PRS Number and Description	Description of Sample Locations (see Figure 3.2-6 or Figure 3.2-7 for map)		Metals	SVOCs	VOCs	Pest-icides/ PCBs	Alpha Spec-troscopy	Gamma Spec-troscopy	Tritium	Comments
35-016(i)-00	**35-014(e2),** former oil spill	Hand auger (AH2) and sample at 3 depths (above tuff, at soil/tuff interface, and in tuff); dig 6 transects or auger holes (TR12–TR17) for geomorphic characterization, collect samples from 2 depths	AH2	3	3	N/A	3	N/A	N/A	N/A	Additional TPH screen for location TR13 only
			TR12	2	2	N/A	2	N/A	N/A	N/A	
			TR13	2	2	N/A	2	N/A	N/A	N/A	
			TR14	2	2	N/A	2	N/A	N/A	N/A	
			TR15	2	2	N/A	2	N/A	N/A	N/A	
			TR16	2	2	N/A	2	N/A	N/A	N/A	
			TR17	2	2	N/A	2	N/A	N/A	N/A	
	35-016(i), stormwater outfall	See PRS 35-014(e2); data gathered will include area of PRS 35-016(i)									—
	35-009(c) and collocated **35-016(o),** [outfall 1]	Hand auger (AH3–AH5) 3 locations, sample at 3 depths (above tuff, at soil/tuff interface, and in tuff); dig 4 transects or auger holes (TR18–TR21) for geomorphic characterization, collect samples from 2 depths	AH 3	3	N/A	N/A	3	N/A	N/A	N/A	—
			AH4	3	N/A	N/A	3	N/A	N/A	N/A	
			AH5	3	N/A	N/A	3	N/A	N/A	N/A	
			TR18	2	2	N/A	2	2	2	2	
			TR19	2	2	N/A	2	2	2	2	
			TR20	2	2	N/A	2	2	2	2	
			TR21	2	2	N/A	2	2	2	2	
	35-016(o), [outfalls 2 and 3]	Dig 4 transects or auger holes (TR22–TR25) for geomorphic characterization, collect samples from 2 depths	TR22	2	2	N/A	2	N/A	N/A	N/A	—
			TR23	2	2	N/A	2	N/A	N/A	N/A	
			TR24	2	2	N/A	2	N/A	N/A	N/A	
			TR25	2	2	N/A	2	N/A	N/A	N/A	
	35-016(p), outfall	Dig 3 transects or auger holes (TR26–TR28) for geomorphic characterization, collect samples from 2 depths	TR26	2	2	N/A	N/A	N/A	N/A	N/A	—
			TR27	2	2	N/A	N/A	N/A	N/A	N/A	
			TR28	2	2	N/A	N/A	N/A	N/A	N/A	
		Total Minimum Number of Samples		**70**	**61**	**2**	**46**	**16**	**16**	**8**	—

[a] Transect depth varies to include all post-Laboratory sediments/soils; does not extend into tuff but can go as deep as the soil/tuff interface.

[b] N/A indicates that a sample is not required based on existing data or process knowledge.

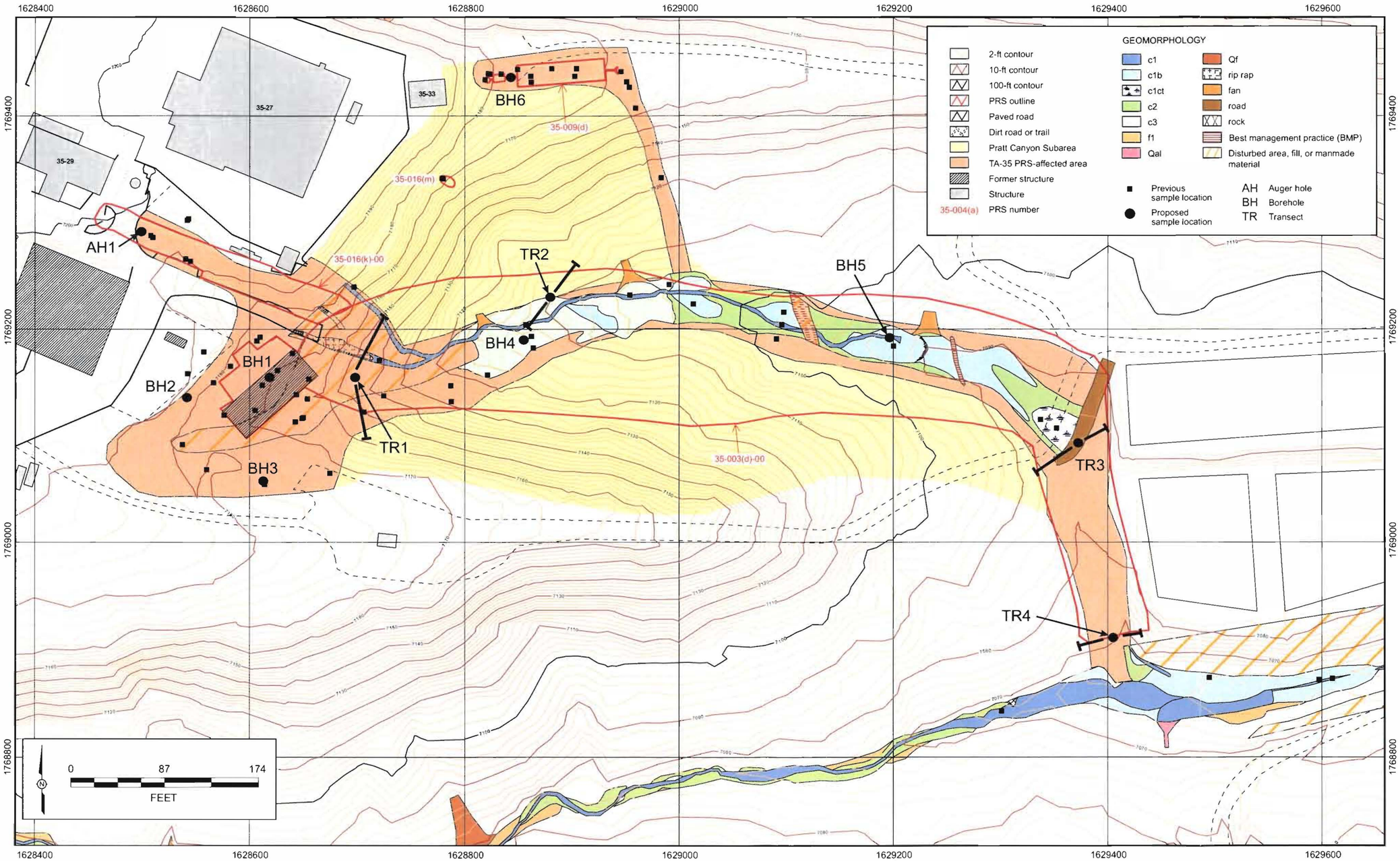

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Figure 3.2-5. Proposed sample locations in Pratt Canyon

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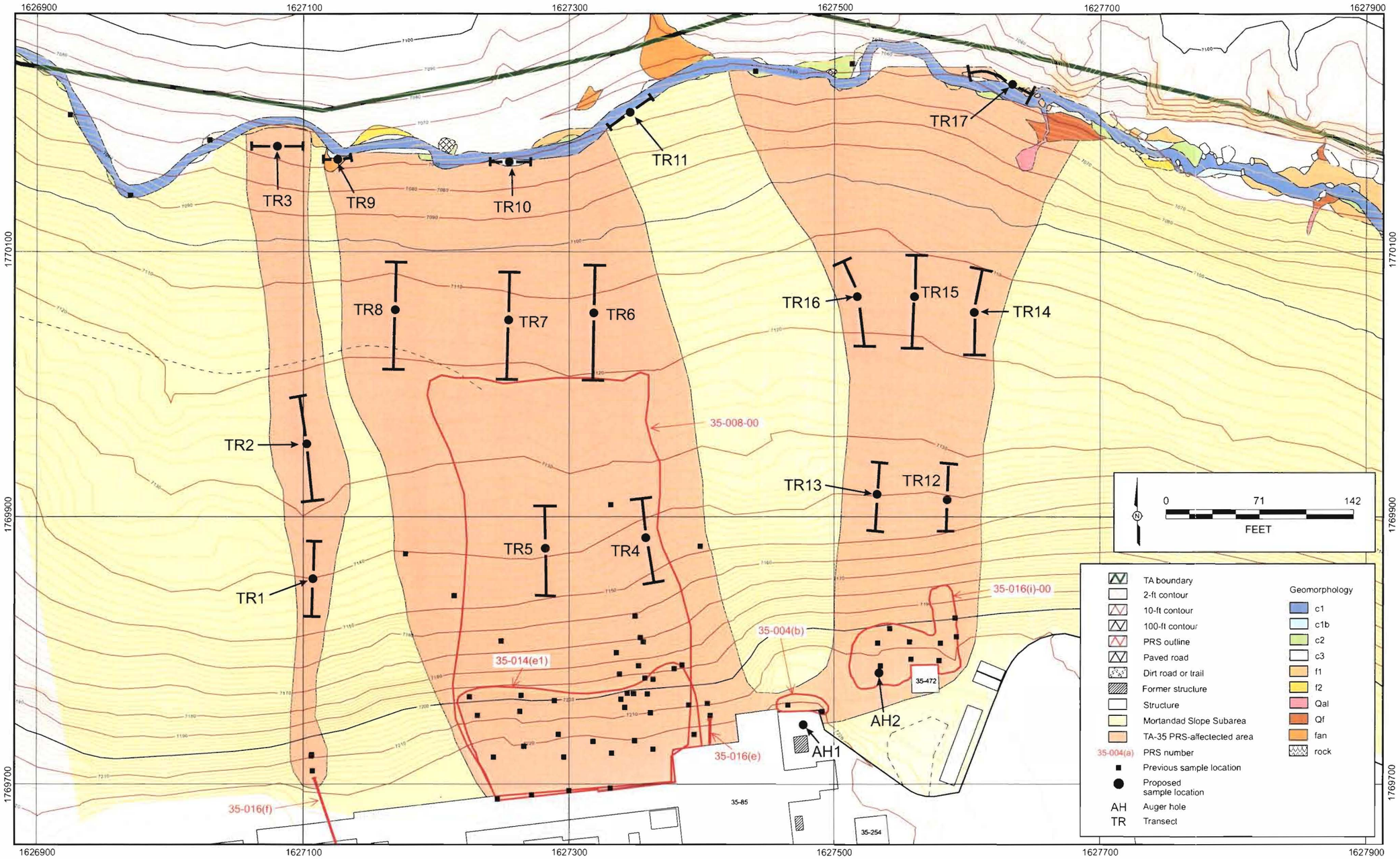

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Figure 3.2-6. Proposed sample locations in western portion of Mortandad Slope Subarea

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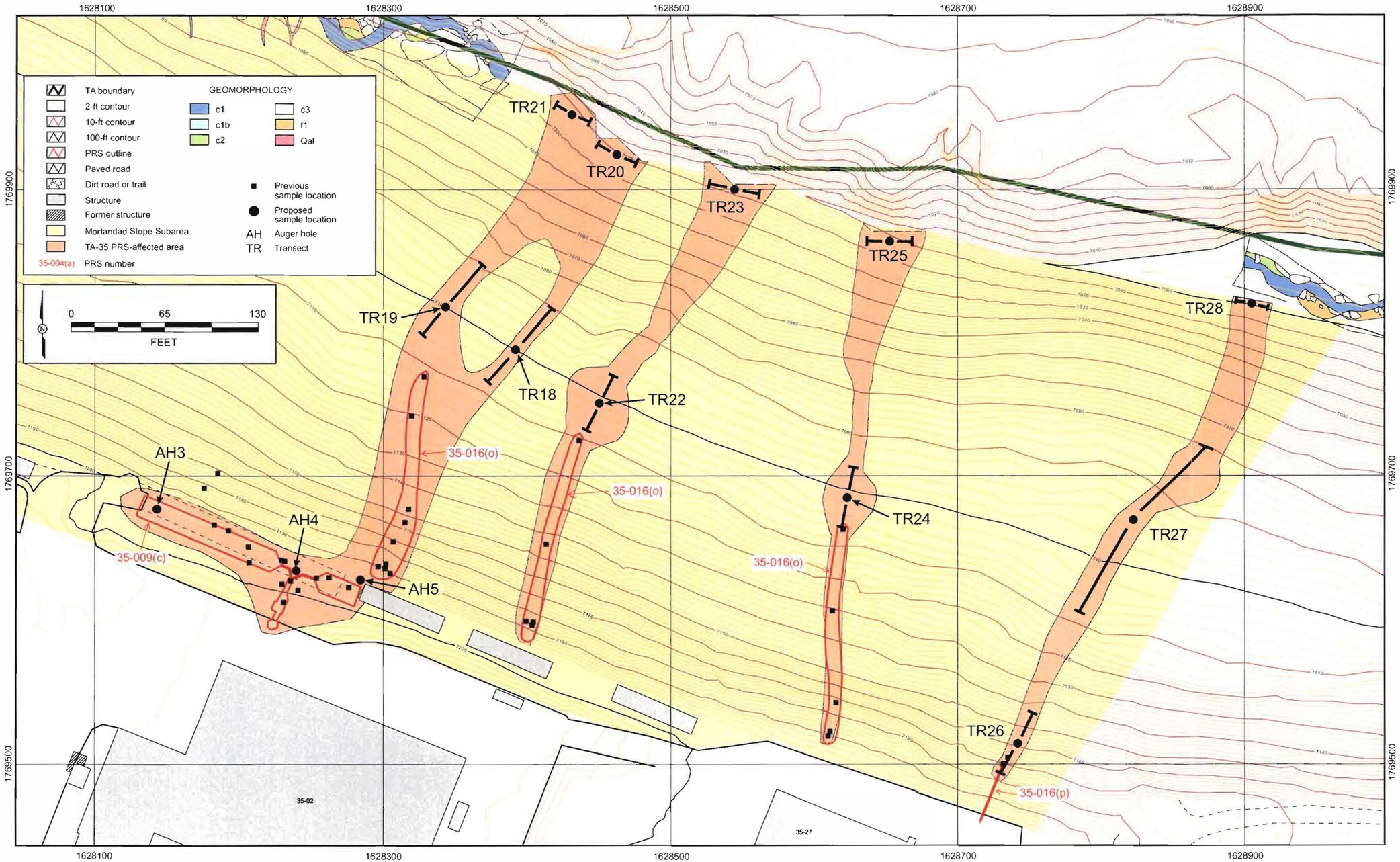

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Figure 3.2-7. Proposed sample locations in eastern portion of Mortandad Slope Subarea

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3.2.4 Pratt Canyon Subarea

3.2.4.1 Specific Sampling Approach Assumptions

The objective of the Pratt Canyon Subarea investigation is to determine the nature and extent of contaminants available for transport within sediments deposited by the TA-35 WWTP. By identifying the types, concentrations, and distribution of contaminants in the Pratt Canyon Subarea, a determination can be made as to whether a potential exists for migration of contaminants and if remediation is warranted based on risk ranking.

The following assumptions are built into the sampling design for the Pratt Canyon Subarea investigation:

- The Pratt Canyon land-use scenario and future use is expected to be industrial/recreational.
- The subarea sample design identified individual outfall channels for sampling.
- Each outfall channel's alluvial fan is the emphasis of the investigation where the focus will be on determining the nature and extent of potentially contaminated sediment deposits (post-1951).
- The following criteria are used to select transect locations:
  - choose areas where contaminant concentrations are expected to be highest as judged from previous sampling and analysis activities, and
  - choose areas with a variety of geomorphologic characteristics to allow better estimates of the total contaminant inventory and of variation in contaminant distribution.
- Topographic boundaries are recognized for lateral extent of contamination.
- Subdivisions of geomorphic units within each alluvial fan identified by the geomorphologist may require (rapid) phased sampling.
- Contaminant suites will be determined based on knowledge of process and existing data.
- The sampling design supports the Canyons Focus Area investigations and is derived from the "Core Document for Canyons Investigations" (LANL 1997, 62316).

3.2.4.2 Field Surveys and Mapping

As stated in section 3.2.2, operational discharges or releases may lead to migration of contaminants down the steep slope to the canyon bottom, with packages of sediment moving with each storm event or operational discharge or spill. A geomorphic understanding of the depositional area, typically the "alluvial fan" at the toe of the slope where soil/sediments tend to migrate and diffuse, is necessary for this investigation to help identify areas of historic sediment accumulation. The geomorphic mapping of the channels and alluvial fans will extend to include areas that were not previously mapped. The geomorphologist will identify different ages of sediment packages, young (post-1942, actually 1951 at this site) or old (pre-1943) and depositional settings, which may contain varying concentrations of contaminants. Concentrations of radionuclides in the WWTP effluent released to this area may vary based on the decay potential of the radionuclide. Contaminant concentrations may also vary based on the age of sediment and grain size. The additional geomorphic mapping data collected—together with existing information—will also indicate subdivisions within any geomorphic unit (definable areas with potential variations in thickness, history, and/or contaminants) and sample collection will be planned accordingly. If units have significant vertical variation in contaminant concentrations, the units may be subdivided into two or more distinct stratigraphic layers. Radiation screening results and laboratory analyses will be examined to determine whether the geomorphic units are appropriate to define the contaminant distributions and inventories in each reach. Geomorphic criteria used to distinguish pre-1943 sediments are discussed in section 5.6.2.2 of the "Core

Document for Canyons Investigations" (LANL 1997, 62316) and summarized in section 4.1 of this aggregate SAP.

The Pratt Canyon Subarea releases, from the PRSs listed in Table 3.2-4, tended to be large volumes of liquids discharged through operational processes (planned and unplanned). Migration of the contaminant down the slopes to the canyon bottom has been indicated from previous sampling events. However, extent of contamination has not been confirmed in sediment packages within all the channels.

3.2.4.3 Sample Collection and Analysis

Table 3.2-4 lists the proposed samples to be collected to complete the data set for the Pratt Canyon Subarea. The PRSs in the table are listed in the order presented on Figure 3.2-5 reading from left to right.

PRS 35-003(e), a former WWTP storage tank, needs no additional samples to complete the data set for assessment. No TAL metals were detected in the one confirmatory sample collected at 30-ft depth below the former tank. Pyrene was the only SVOC detected. No samples were collected for VOCs, strontium-90, or tritium based on process knowledge. No PCBs were detected. Plutonium-239 was detected in 2 samples at less than background values. No gamma-emitting nuclides were detected in the one confirmatory sample collected at 30-ft depth below the former tank.

Consolidated PRS 35-003(d)-00 is comprised of PRSs 35-003(d,l,q), a former WWTP holding tank building, pump pit, and trench, and PRS 35-003(r), the former WWTP effluent-receiving canyon. Consolidated PRS 35-003(d)-00 needs additional samples for TAL metals, SVOCs, alpha spectroscopy and strontium-90 analyses to complete the data set for assessment. Only thallium was detected in 1 sample from a 34- to 35-ft depth. However, several metals had detection limits greater than background values, so better data are needed for risk or screening assessment purposes. Fourteen samples contained PAH-type SVOCs; more samples are needed in the diversion channel. No samples were collected for VOCs based on process knowledge.There was only one detect of Aroclor-1254 in 1 sample at the 1- to 2-ft depth. Plutonium-239 was detected in 17 samples (8 greater than background values); plutonium-238 was detected in 17 samples (3 greater than background values). Plutonium seems to slightly increase with depth. Cesium-137 was detected in 3 samples, all less than background. Cobalt-60 and europium-152 were detected in one sample. Strontium-90 was detected in 9 samples; values increase with depth at location ID 35-2311. More data are also needed from the diversion ditch. Tritium was detected in all samples, only 11 were greater than background values, and a decreasing trend was observed.

PRS 35-003(r) needs additional samples for TAL metals including mercury, SVOC, PCBs, alpha and gamma spectroscopy, and strontium-90 analyses to complete the data set for assessment. Four TAL metals were detected in one sample each; 8 mercury hits were detected in the samples. Nine cyanide samples were collected, nothing was detected. SVOCs (PAHs) were detected in 8 samples. No samples were collected for VOCs based on process knowledge. Aroclor-1260 was detected in 9 samples. Pesticides dieldrin and endosulfan-II were detected in 1 sample. Analysis detected 6 plutonium-238 (5 less than background), 31 plutonium-239 (8 less than background), and 1 uranium-234/-235/-238 hit(s) in 2 samples. Analysis also detected 10 cesium-137 (8 in sediment samples), and 3 cobalt-60 hits in the samples. Nine samples were analyzed for americium-241; 7 samples had detected values. No tritium was detected. Ten samples contained strontium-90 in the sediment samples (up to 63 pCi/g) that spanned 0- to 3-ft depths; 2 detected samples were in soil. Need geomorphic mapping (for all analytes that had hits) near the road. More data are needed for metals (concentrate on mercury in sediments), SVOCs, Aroclor-1260, plutonium-239, cesium-137, americium-241, and strontium-90 (again, sediments show highest values from Canyons Focus Area data). Five boreholes and 2 transects are proposed to define vertical and lateral extent of collocated PRSs 35-003(d)-00. Samples will be collected from 2 to 8 depths.

Consolidated PRS 35-016(k)-00 is comprised of PRSs 35-016(k), a former cooling water outfall, and 35-016(l), a stormwater outfall. Consolidated PRS 35-016(k)-00 needs additional samples for TAL metals, SVOC, PCBs, and strontium-90 analyses to complete the data set for assessment. TAL metals were detected in all 5 samples [4 samples are from 35-016(k), 1 is for 35-016(l)] and vertical extent is needed beyond a 2-ft depth. VOCs were detected in 1 of 2 samples from 35-016(k) from the 1-2 ft depth, toluene, trichloro and trifluoro ethanes; vertical extent is needed beyond a 2-ft depth. Aroclor-1260 was detected in all 4 samples from 35-016(k), need vertical extent beyond 2-ft depth. One plutonium-239 sample < background. No gamma emitting radionuclides were detected. No samples were collected for strontium-90 and tritium based on process knowledge. One auger hole and 1 transect are proposed to define vertical and lateral extent of contamination. Samples will be collected from 2-3 depths.

PRS 35-016(m), a former cooling water outfall, needs additional samples for TAL metals and SVOC analyses to complete the data set for assessment. No TAL metals were detected. Two SVOCs were detected in 2 of the 4 samples; need data from alluvial fan at toe of slope for metals and SVOCs. No samples were collected for VOCs, PCBs, gamma emitting radionuclides, strontium-90 and tritium based on process knowledge. No plutonium or uranium was detected. One transect is proposed to define vertical and lateral extent of contamination. Samples will be collected from 2 depths.

PRS 35-009(d), an abandoned septic system, needs additional samples for TAL metals, VOC, tritium, and strontium-90 analyses to complete the data set for assessment. A few metals had non-detected values which are greater than background levels, therefore, data with better detection limits is needed for risk or screening assessment. No SVOCs were detected. Acetone was detected in 21 samples (not eliminated as lab contaminant), 2-butanone in 2 samples, carbon disulfide in 1 sample, and 2-hexanone in 1 sample. No samples were collected for PCBs, strontium-90 and tritium based on process knowledge. However, samples should be collected near tank at depth and in alluvial fan for strontium-90 and tritium. Plutonium-238 was detected in 2 samples; plutonium-239 was detected in 1 sample, all less than background values. No gamma emitting radionuclides were detected. One borehole is proposed to define vertical and lateral extent of contamination. Samples will be collected from 2 depths.

Table 3.2-4
Proposed Samples for the Pratt Canyon Subarea

PRS Number and Description		Description of Sample Locations (see Figure 3.2-5 for map)		Metals	SVOCs	VOCs	PCBs	Alpha Spec-troscopy	Gamma Spec-troscopy	Strontium-90	Tritium	Comments
35-003(d)-00	35-003(d,l,q)	Drill 100-ft borehole (BH1) near location ID 35-2013, sample at 20-ft intervals (5 samples) and/or at fractures encountered	BH1	5	N/A[a]	N/A	N/A	5	N/A	N/A	N/A	—
		Drill 2 30-ft boreholes (BH2–BH3) in diversion channel, sample at 10-ft intervals (3 samples per hole)	BH2	3	1	N/A	N/A	N/A	N/A	3	N/A	SVOCs from bottom of each BH only
			BH3	3	1	N/A	N/A	N/A	N/A	3	N/A	
	35-003(r)	Dig 2 transects[b] (TR3–TR4) in Pratt Canyon stream channel from eastern boundary of 35-003(r) south to Ten Site Canyon stream channel for geomorphic characterization; geomorphic units to be sampled are C1, C1b, C1ct (lobes and cattails), C2, and C3; collect 2–3 samples from each unit for organics and inorganics, 1–2 samples for rad	TR3	8	8	N/A	10	4	4	4	N/A	Isotopic plutonium only for TR3 and TR4 alpha spectroscopy; PCBs should be collected from 2- to 5-ft depth at TR4; unit C1 needs only PCB analysis; need mercury in metals suite
			TR4	8	8	N/A	10	4	4	4	N/A	
		Drill 2 boreholes (BH4–BH5) within Pratt Canyon stream channel, drill 2–3 ft into tuff, sample material from above soil/tuff interface and at bottom of hole within tuff	BH4	2	2	N/A	2	2	2	2	N/A	—
			BH5	2	2	N/A	2	2	2	2	N/A	
35-016(k)-00	35-016(k,l)	Hand auger (AH1) to 5 ft, sample at 2- and 5-ft depths	AH1	2	2	N/A	2	N/A	N/A	N/A	N/A	Need DRO and LRO in SVOC suite
		Dig transect (TR1) at head of Pratt Canyon for geomorphic characterization, collect 3 samples	TR1	3	3	N/A	3	N/A	N/A	3	N/A	
35-016(m)		Dig transect (TR2) in alluvial fan for geomorphic characterization, collect 2 samples	TR2	2	2	N/A	N/A	N/A	N/A	N/A	N/A	—
35-009(d)		Drill borehole (BH6) near tank to 15 ft, sample at 5-ft intervals	BH6	3	N/A	3	N/A	N/A	N/A	3	3	—
		Total Minimum Number of Samples		**41**	**29**	**3**	**29**	**17**	**12**	**24**	**3**	—

[a] N/A indicates that a sample is not required based on existing data or process knowledge.

[b] Transect depth varies to include all post-Laboratory sediments/soils; does not extend into tuff but can go as deep as the soil/tuff interface.

3.2.5 Ten Site Canyon Subarea

3.2.5.1 Specific Sampling Approach Assumptions

The objective of the Ten Site Canyon Subarea investigation is to determine extent of specific contaminants located in the TA-35 sanitary lagoons. Additional data will be collected at PRSs 35-010(a) and 35-010(b) to reduce uncertainties associated with strontium-90 and PCBs. Once supplemental data are collected, additional screening assessments and alternatives for removal or stabilization in place will be completed to make decisions about the path forward.

The following assumptions are built into the sampling design for the Ten Site Canyon Subarea PRS investigation:

- The Ten Site Canyon future use is expected to be industrial (at least in the area that houses the old WWTP lagoons) and recreational for the rest of the canyon.
- The subarea sample design identified specific locations and contaminants for sampling.

3.2.5.2 Field Surveys and Mapping

The Ten Site Canyon Subarea PRSs have been surveyed during previous ER Project sample campaigns. The sampling team may need to retrieve the existing survey data to determine a sample location proposed in Table 3.2-5.

3.2.5.3 Sample Collection and Analysis

Table 3.2-5 lists the proposed samples to be collected to complete the data set for the Ten Site Canyon Subarea. The PRSs in the table are listed in the order presented on Figure 3.2-8, reading from left to right.

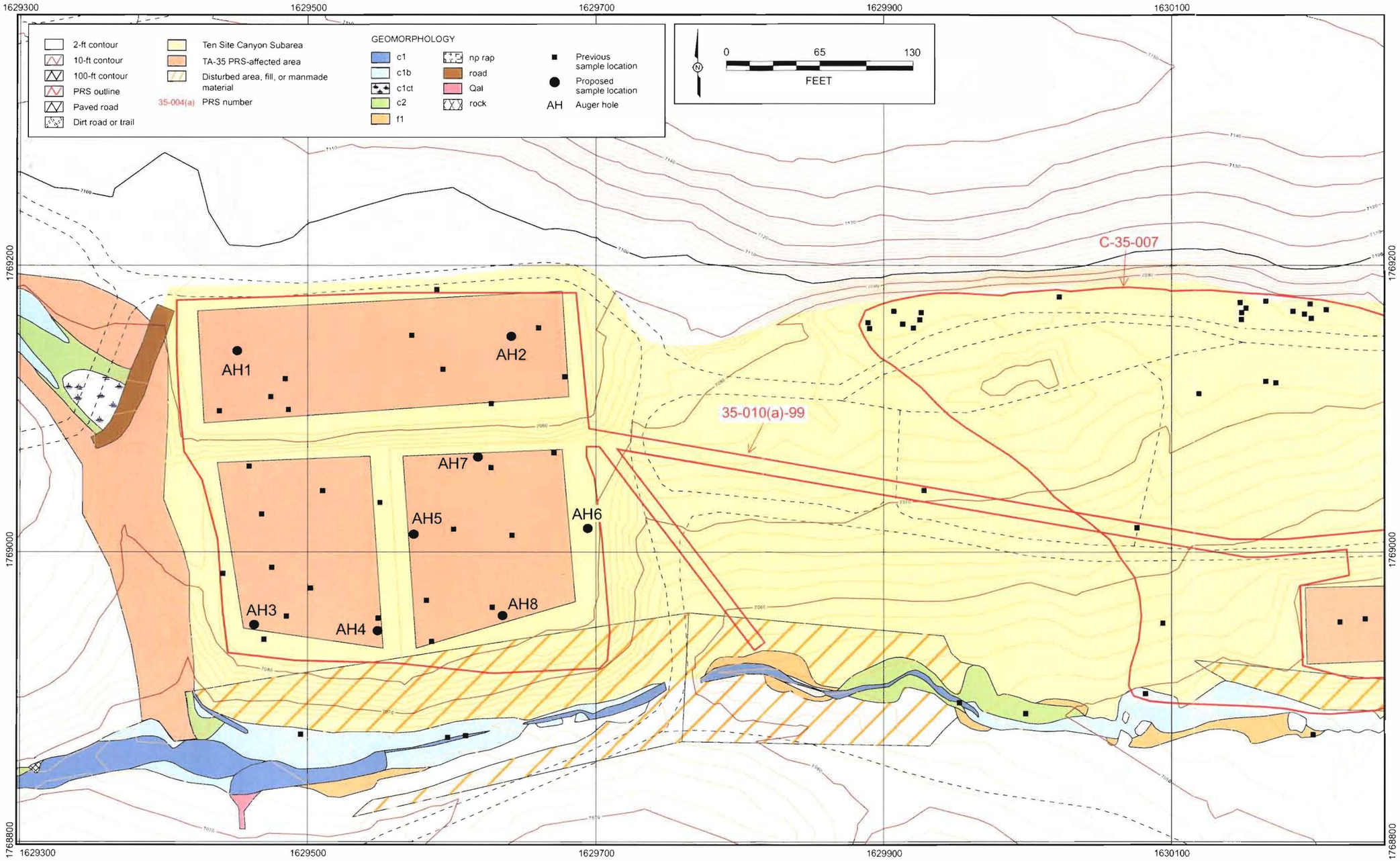
Consolidated PRS 35-010(a)-00 is comprised of PRSs 35-010(a,b,c), WWTP lagoons; 35-010(d), sand filter beds; and 35-010(e), discharges from sand filter beds. Each PRS is discussed separately below.

PRS 35-010(a). Several TAL metals were detected. In most cases, concentrations decrease with depth. Location ID 35-2470 has the highest values but shows a decreasing trend. SVOCs were detected in 8 samples from 0-2.5 ft. Most values were less than 2 ppm except for bis(2-ethylhexyl)phthalate at 19 ppm in the 6- to 12-in. interval. Trace amounts (less than 0.2 ppm) of VOCs were detected in 8 samples from 0 to 2.5 ft, except for acetone where 1 of 2 detects is 2.6 ppm. PCBs were detected in 5 surface soils to 12 in. Highest value is 1.2 ppm. Plutonium-238/239 was detected in up to 9 samples (4 less than background levels), 6 samples from the 0- to 1-in. depth and 3 samples in Qbt 2,3 from 8 to 40 ft. Uranium-234/-238 was detected in up to 3 surface samples to the 1-ft depth, with a decreasing trend observed. Americium-241was detected in 1 surface sample. Cesium-137 was detected in 2 surface samples (at less than background level). No strontium-90 was detected. Tritium was detected in 8 samples (1 at less than background level) with the highest level at location ID 35-2470 (0- to 4-in. depth). A decreasing trend is observed, except at location ID 35-02467. In general at location ID 35-2467, all analytes at the 4- to 8-in. depth have higher values than the surface sample but lower values in the underlying tuff. Additional samples are needed to define the extent of contamination for PCBs and metals.A decreasing trend is established at most locations where contaminants were detected. Two auger holes are proposed to define vertical and lateral extent of contamination. Samples will be collected from 3 depths.

Table 3.2-5
Proposed Samples for the Ten Site Canyon Subarea

PRS Number and Description		Description of Sample Locations (see Figure 3.2-8 for map)		Metals	Pest-icides/ PCBs	Alpha Spec-troscopy	Strontium-90	Tritium	Comments
35-010(a)-99	35-010(a)	Hand auger at 2 locations (AH1–AH2) through clay liner to tuff, collect 3 samples (1 from sludge, 1 from clay liner, and 1 from tuff)	AH1	3	3	N/A[a]	N/A	N/A	—
			AH2	3	3	N/A	N/A	N/A	
	35-010(b)	Hand auger at 2 locations (AH3–AH4) through clay liner to tuff; at AH3, collect 3 samples (1 from sludge, 1 from clay liner, 1 from tuff); at AH4, collect 2 samples (1 from clay liner and 1 in tuff below 5 ft)	AH3	N/A	3	N/A	N/A	N/A	—
			AH4	N/A	N/A	N/A	2	N/A	
	35-010(c)	Hand auger at 4 locations (AH5–AH8) through clay liner to tuff; at AH5 and AH6, collect 2 samples each in tuff (1 from 4- to 5-ft depth and 1 from 9- to 10-ft depth); at AH7 and AH8, collect 3 samples each (1 from sludge, 1 from 4- to 5-ft depth, and 1 from 9- to 10-ft depth)	AH5	2	N/A	2	N/A	2	Alpha spectroscopy for isotopic plutonium only
			AH6	2	N/A	2	N/A	2	
			AH7	N/A	N/A	3	N/A	3	
			AH8	N/A	N/A	3	N/A	3	
	35-010(d)	No data gaps identified	—	—	—	—	—	—	—
	35-010(e)	No data gaps identified	—	—	—	—	—	—	—
C-35-007		No data gaps identified	—	—	—	—	—	—	—
		Total Minimum Number of Samples		**10**	**9**	**10**	**2**	**10**	—

[a] N/A indicates that a sample is not required based on existing data or process knowledge.



FIMAD Plot ID: G110334 / TA-35 ISAP_032702

Figure 3.2-8. Proposed sample locations in Ten Site Canyon Subarea

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PRS 35-010(b). Several TAL metals were detected at various locations and depth, most values decrease with depth (from surface soil to Qbt 3) except for chromium and nickel which increase with depth (mostly in Qbt 3 from 1.5 to 6 ft). SVOCs were detected in up to 15 samples from 0-3 ft depths only, nothing deeper; decreasing trend observed. Trace amounts of VOCs were detected in 8 samples from 0 to 1 ft, most hits in the 6- to 12-in. interval and nothing detected deeper. PCBs were detected in 7 samples from the 0- to 8-in. depth. Two samples were detected from 8- to 12-in. depth and nothing deeper. Plutonium-238/239 was detected in up to 9 samples from 0 to 40 ft at less than 3 pCi/g; nothing detected in the 50-ft sample. Uranium-234/238 was detected in 1 surface sample. One Qbt 3 sample contained ruthenium-106 at the 3.5-4.5 ft depth. Strontium-90 was detected in 4 Qbt 3 tuff samples from 1.5 to 6 ft. Three surface samples from 0 to 1 ft also contained strontium-90. The highest value of strontium-90 in 3 out of 4 samples is at the deepest depth. Three 0- to 8-in. samples contained tritium, with a decreasing trend observed. More strontium-90 data are needed at location ID 35-2471 beyond 5 ft. Two auger holes are proposed to define vertical and lateral extent of contamination. Samples will be collected from 2 to 3 depths.

PRS 35-010(c). Several TAL metals were detected in up to 9 samples (0-2 ft), decreasing trend with depth is present. Chromium and nickel increase with depth at location IDs 35-2478 (4-5 ft depth), and 35-2479 (1-2 ft depth). No SVOCs were detected. Four samples contained VOCs from the 3-6 in depth of surface soils, nothing detected deeper. PCBs were detected in 4 samples from the 3-6 in depth of surface soils, nothing detected deeper. Plutonium was detected in all 4 samples from the 6-12 in depth at Location IDs 35-2065/66. No samples were collected for isotopic plutonium at other locations or depths. No uranium was detected. Two samples contained europium-152 at the 4-6 in depth at location IDs 35-2478/80, nothing detected deeper. No strontium-90 was detected. Ten samples contained detectable tritium at depths up to 5 ft, decreasing trend established except at location ID 2478 at depths > 5 ft. Chromium and Nickel need vertical extent beyond 5 ft at location ID 35-2478 and beyond 2 ft at location ID 35-2479 (highest values at deepest depths at this location). Also, need additional isotopic plutonium data for vertical extent. Four auger holes are proposed to define vertical and lateral extent of contamination. Samples will be collected from 2-3 depths.

PRS 35-010(d). Silver and mercury were detected in one 0-6 in sample. The only SVOCs detected in 3 samples to depths of 2.5 ft were Bis(-2ethylhexyl) phthalate (2 hits) and Di-n-butyphthalate (1 hit). No VOCs, PCBs, alpha or gamma emitting radionuclides, or strontium-90 were detected. No samples were collected for tritium based on process knowledge. No additional data are needed at this PRS site.

PRS 35-010(e). The only samples collected at this site were for plutonium-238/239, which was detected in 2 surface samples from 0-1 ft depth (nothing detected deeper) and thorium, where nothing was detected. No additional data needed at this PRS site.

PRS C-35-007. Calcium was the only metal detected in 2 surface samples from 0-6 in depth, there are no deeper samples at these locations. The only SVOCs detected in 3 samples to depths of 1.5 ft were bis(-2ethylhexyl) phthalate (1 hit) and di-n-butyphthalate (3 hits), and benzoic acid (1 hit); all <0.06 ppm. No samples were collected for VOCs based on process knowledge. Aroclor-1254 was detected in 1 surface sample (0-6 in), there are no deeper samples at this location. Plutonium-238/239 detected in 1 surface sample (0-6 in) up to 2.5 pCi/g, no uranium was detected. No gamma emitting radionuclides, strontium-90, or tritium was detected. Because this sand is the same sand once used in the sand filter beds [35-010(d)] moved to a different location, the number of samples collected is sufficient to determine if contaminants are present in the sand piles. No additional data are needed at this PRS site.

4.0 DATA COLLECTION AND SAMPLING PROCEDURES

The following sections present the methods to be used in conducting the investigation at TA-35.

4.1 Geomorphic and Topographic Mapping

During implementation of this aggregate SAP, a geomorphic survey will be performed for the purpose of refining selection of sample locations presented in section 3.2. The geomorphic survey will delineate areas that drain from PRSs or PRS-affected areas, then identifying by mapping areas of soil/sediment that are most likely to contain contamination. The survey will focus on identifying young, potentially contaminated sediment deposits (post-1942).

An additional function of the geomorphic survey will be to identify the functional geomorphic boundary between areas primarily influenced by TA-35 activities and areas in Ten Site and Mortandad Canyons that are likely to contain sediments or soils from non-TA-35 influences. This process will be coordinated with personnel from the Canyons Focus Area to incorporate their understanding of canyon sediment dynamics in Ten Site and Mortandad Canyons, including Pratt Canyon.

The geomorphic survey(s) will be conducted in accordance with ER-SOP-3.08, "Geomorphic Characterization." Field activities will be documented according to ER-SOP-3.11, "Geodetic Surveys." Geomorphic characterization activities will focus on identifying, describing, and mapping surface drainages and deposits on hillslopes below PRSs and PRS-affected areas. The identifying, describing, and mapping will be conducted by a geomorphologist. It is anticipated that at least two geomorphic units will be identified: active (post-1942) depositions and inactive (pre-1943) depositions. Laboratory-derived contaminants are expected to occur in the active depositions but not in the inactive depositions. For this SAP, active deposits are defined as the alluvial fan or colluvial deposits from both flooding in the canyon and operational releases from the mesa top migrating to the slope toe. Further subdivision of geomorphic units may be required for the more complex deposits. For example, several levels of inactive deposits may occur within an alluvial fan and the boundaries between units may not be distinct.

Identifying the pre-1943 and post-1942 deposits is necessary for focusing the geomorphic contaminant surveys within the general boundaries of the alluvial fan of each outfall channel. Boundaries of geomorphic units are commonly marked by distinct topographic breaks although, in places, such boundaries may be gradational and more difficult to delineate. Direct visual observation of partially buried objects and debris, especially those that can be linked to Laboratory activities, provide conclusive evidence of post-1942 deposition events and, therefore, the general age of some geomorphic units. Further evidence for the age of geomorphic units can be obtained by observing the nature and age of vegetation (e.g., the bases of trees buried by sediment). Flood debris, such as driftwood, may provide additional evidence of the extent of historic flooding and the distributions of historic overbank sediment deposition to the alluvial fan. Further geomorphic criteria used to distinguish pre-1943 sediments are discussed in section 5.6.2.2 of the "Core Document for Canyons Investigations" (LANL 1997, 62316).

All documentation generated during the survey(s) will be submitted to the ER Records Processing Facility (RPF) according to QP-4.4, "Record Transmittal to the Records Processing Facility," and mapping or other data will be incorporated into the Facility for Information Management, Analysis, and Display (FIMAD) as appropriate.

4.2 Geodetic Surveying

A licensed New Mexico surveyor will perform geodetic surveying. Geodetic surveying will be used to accurately locate pertinent site features. Surveying will also precisely locate sampling locations. All locations will be recorded in New Mexico State plane coordinates, and location identification numbers will be assigned for submission to FIMAD.

All sample locations will be surveyed in accordance with the applicable ER SOPs. Significant geomorphic boundaries or other features identified during the geomorphic survey will be included as part of the geo-

detic survey as appropriate. The geodetic survey will be coordinated, conducted, and evaluated in accordance with ER-SOP-3.11, "Geodetic Surveys."

4.3 Sample Collection

The number of samples and the locations chosen for collection are presented in section 3.2 where the sampling strategy for each subarea is presented. The SOPs that will be used for sample collection are listed in section 4.4.

From each location chosen through the geomorphic characterization process, one set of samples will be collected for analysis of chemicals. Geomorphic characterization will be conducted using ER-SOP-3.08, "Geomorphic Characterization," and following the technical approach described in the "Core Document for Canyons Investigations" (LANL 1997, 62316).

For samples selected by geomorphic characterization, and other samples, including boreholes and auger holes, three primary sampling methods will be used, as appropriate. For relatively shallow soil samples, the spade and scoop method will be used. For deeper soil samples, a hand auger may be used if the soil is relatively free of large rocks and debris that make hand augering impractical. At locations where hand augering is ineffective or where tuff is encountered, powered hand augering equipment may be utilized. Other options include use of a backhoe to dig a small trench from which the sample can be collected, and for deep holes or boreholes, a drill rig. The following LANL ER Project SOPs are pertinent to sampling: ER-SOP-6.09, "Spade-and-Scoop Method for the Collection of Soil Samples"; ER-SOP-6.10, "Hand Auger and Thin-Wall Tube Sampler"; ER-SOP-6.24, "Sample Collection from Split-Spoon Samplers and Shelby Tube Samplers"; ER-SOP-6.26, "Core Barrel Sampling for Subsurface Earth Materials"; ER-SOP-4-01, "Drilling Methods and Drill Site Management"; ER-SOP-4.04, "Contract Geophysical Logging."

Items to be recorded for each sample collected using the geomorphic characterization procedure include soil horizon, according to current United States Department of Agriculture (USDA) soil taxonomy nomenclature, estimates of texture, clay content, and color. The geomorphic position of the sediments, such as channel or sediment trap will also be noted, or the depth of the sample. In addition, the nature and quantity (percentage estimate) of ground cover and the approximate slope and aspect or the hillslope will be recorded. Finally, the appearance of major disturbances to the natural drainage will be added to the location description.

Items to be recorded for samples collected not using the geomorphic characterization procedure include, but are not lmited to, a description of the sample material, a description of the sample's matrix (examples are soil, rock, engineered material, fill, etc.), sample begin and end depths, formation name (if sampling tuff, for example), the results of field screening conducted on a given sample (for example, photoionization detector or flame ionization detector readings in ppm).

During completion of the field investigation, direct screening for volatile organic vapors will be performed using a Thermo Environmental Instruments, Inc., organic vapor monitor Model 580B, or equivalent photoionization detector (PID). The PID will be calibrated and checked by the site safety officer, as recommended by the manufacturer. Calibration records will be kept in the field log book. PID readings will be recorded in the field logbook and/or the sample collection logs in accordance with QP-5.7, "Notebook Documentation for Environmental Restoration Technical Activities." Screening for ionizing radiation will be performed using a Ludlum Model 139 rate meter, or equivalent, with an air proportional (alpha) probe and an Eberline ESP-1 rate meter, or equivalent, with a beta/gamma probe or as outlined in ER-SOP-10.10, "Radiation Scoping and Background Surveys" and ER-SOP-10.14, "Performing and Documenting Gross Gamma Radiation Scoping Surveys." The measured radioactivity levels will be recorded in the field log book and/or the sample collection logs, following ER-SOP-1.04, "Sample Control and Field Documentation."

4.4 Quality Assurance/Quality Control

The Laboratories' quality assurance program is described in the IWP (LANL 2000, 66802). Within the ER Project, the quality assurance program is administered by the Quality Program Project Leader and the Quality Improvement and Integration Team. The quality assurance program has prepared quality procedures (QPs) and standard operating procedures (SOPs) and designed programs to evaluate conformance to these procedures to insure that the quality goals for the ER Project are attained. As part of the quality management plan (QMP), the sampling and analysis to be conducted for this evaluation of TA-35 will follow the requirements of the QMP outlined in "Quality Management Plan for the Los Alamos National Laboratory Environmental Restoration Project" (LANL 2001, ER2000-0703).

Quality control (QC) is the set of activities conducted in the field and the laboratory to fulfill the requirements for quality. The numbers and types of QC samples will be added to the number of samples presented in the sampling tables in section 3.2. The SOP that specifies the number of QC samples to be collected is ER-SOP-1.05, "Field Quality Control Samples."

Field duplicate samples will be collected at each PRS and PRS aggregate at a frequency of one duplicate for every 20 samples collected. If fewer than 20 samples are collected at a subarea, one duplicate will be collected for the subarea.

Field blanks may be collected when VOCs are sampled. ER-SOP-1.05 "Field Quality Control Samples," will be followed.

All sampling and analysis activities will be conducted according to the requirements in the QMP. All field measurements, sampling, and surveys will follow the procedures outlined in ER Project SOPs and QPs; these include but are not limited to

- ER-SOP-1.01, General Instruction for Field Investigations
- ER-SOP-1.04, Sample Control and Field Documentation
- ER-SOP-1.05, Field Quality Control Samples
- ER-SOP-1.06, Management of ER Project Waste
- ER-SOP-1.10, Waste Characterization
- ER-SOP-1.12, Field Site Closeout Checklist
- ER-SOP-6.09, Spade-and-Scoop Method for the Collection of Soil Samples
- ER-SOP-10.14, Performing and Documenting Gross Gamma Radiation Scoping Surveys
- QP-2.1, Documenting Personnel Qualifications
- QP-2.2, Personnel Orientation and Training
- QP-3.2, Lessons Learned
- QP-3.5, Peer Review Process
- QP-4.4, Record Transmittal to the Records Processing Facility
- QP-5.3, Readiness Planning and Reviews
- QP-5.7, Notebook Documentation for Environmental Restoration Technical Activities

Data from the analytical laboratories will comply with the statement of work for analytical laboratories (LANL 2000, 71233) and will include all the normal QA/QC parameters specified by the statement of work (SOW). All data collected will be loaded into the ER Project database (ERDB). Risk assessors and project team members will review the data to determine whether any data gaps remain. The review will also

assess whether the data are sufficient to conduct the required human health and ecological risk assessments.

4.5 Investigation-Derived Waste Management

Management of investigation derived wastes will follow the guidelines and requirements discussed in the Waste Characterization Strategy Form and in accordance with all applicable regulations and DOE/LANL/ER implementing requirements, including but not limited to RCRA/HSWA, 20NMAC4.1, 20NMAC9.1, Clean Water Act (CWA), 20NMAC6.2, Toxic Substances Control Act (TSCA), Clean Air Act (CAA), the Laboratory Implementation Requirement (LIR) 404 series, ER-SOP-1.06, "Management of ER Project Waste," and ER-SOP-1.10, "Waste Characterization."

4.6 Sample Designation Protocol

Each sample location will be marked, surveyed, and assigned a unique ER Project sample location identification number.

4.7 Sample Handling and Analysis

The following laboratory analytical methods with the required detection limits will be used for routine analytical services. Table 4.7-1 through Table 4.7-5 include the maximum required reporting limits or quantitation limits in accordance with the statement of work for analytical laboratories (LANL 2000, 71233) and the "Quality Assurance Project Plan Requirements for Sampling and Analysis" (LANL 1996, 54609). In most cases, the reporting limits for the analytes were significantly lower than the detection or quantitation limits reported in these tables. The sample-specific detection or quantitation limits for each analyte are accessible in the ERDB. The detection limits for inorganic analytes will be below Laboratory background values.

Table 4.7-1
Target Analytes and Maximum Required Detection Limits for Inorganic Chemical Analyses

Analyte	EPA Sample Preparation Method	Analytical Technique	EDL[a] (mg/kg)
Aluminum	3050A	ICPES[b]	10
Antimony	3050A	ICPMS[c]	0.2
Arsenic	7060/3050A	ICPMS	0.2
Barium	3050A	ICPES	10
Beryllium	3050A	ICPMS	0.1
Cadmium	3050A	ICPMS	0.25
Calcium	3050A	ICPES	250
Chromium	3050A	ICPES	0.5
Cobalt	3050A	ICPES	0.5
Copper	3050A	ICPMS	0.5
Cyanide	9012	Colorimetric	0.2
Iron	3050A	ICPES	300
Lead	7421/3050A	ICPES	2
Magnesium	3050A	ICPES	250
Manganese	3050A	ICPES	20
Mercury	7471	CVAA[d]	0.05
Nickel	3050A	ICPMS	0.2
Potassium	3050A	ICPES	250

Table 4.7-1
Target Analytes and Maximum Required Detection Limits for Inorganic Chemical Analyses (continued)

Analyte	EPA Sample Preparation Method	Analytical Technique	EDL[a] (mg/kg)
Selenium	7740/3050A	ICPMS	0.2
Silver	3050A	ICPMS	0.2
Sodium	3050A	ICPES	250
Thallium	7841/3050A	ICPMS	0.1
Vanadium	3050A	ICPMS	0.5
Zinc	3050A	ICPES	5

[a] EDL = estimated detection limit.

[b] ICPES = inductively coupled plasma emission spectroscopy by EPA SW-846 Method 6010.

[c] ICPMS = inductively coupled plasma mass spectroscopy by EPA SW-846 Method 6020.

[d] CVAA = cold vapor atomic absorption spectroscopy.

Table 4.7-2
Target Analytes and Maximum Required Quantitation Limits for Radiochemical Analyses

Analyte	Soil/Solid EQL (pCi/g)	Analytical Technique[a]
Plutonium-238, -239	0.05	Alpha spectroscopy
Uranium-234, -235, -238	0.1	Alpha spectroscopy
Americium-241	0.05	Alpha spectroscopy
Gamma-emitting isotopes[b]	Americium-241 = 1.0, cesium-137 = 0.1	Gamma spectroscopy
Tritium	250 pCi/L	Liquid scintillation
Strontium-90	0.5	Air proportional beta analysis

[a] The LANL methods for these analytes are contained in "Health and Environmental Chemistry: Analytical Techniques, Data Management, and Quality Assurance" (LANL 1993, 31793).

[b] EQLs are not specified for the other 16 gamma-emitting isotopes commonly analyzed; they are determined on a case-specific basis.

Table 4.7-3
Target Analytes and Maximum Required Detection Limits for SVOC Analyses[a]

Target Analyte	Soil/Solids EQL[b] (μg/kg)	Target Analyte	Soil/Solids EQL[b] (μg/kg)
Acenaphthene	330	4,6-Dinitro-2-methylphenol	1650
Acenaphthylene	330	2,4-Dinitrotolulene	330
Aniline	660	2,6-Dinitrotolulene	330
Anthracene	330	Di-n-octyl phthalate	330
Azobenzene	660	Bis(2-ethylhexyl)phthalate	330
Benz(a)anthracene	330	Fluoranthene	330
Benzoic acid	3300	Fluorene	330
Benzo(b)fluoranthrene	330	Hexachlorobenzene	330

Table 4.7-3

Target Analytes and Maximum Required Detection Limits for SVOC Analyses[a] (continued)

Target Analyte	Soil/Solids EQL[b] (µg/kg)	Target Analyte	Soil/Solids EQL[b] (µg/kg)
Benzo(k)fluoranthrene	330	Hexachlorobutadiene	330
Benzo(g,h,i)perylene	330	Hexachlorocyclopentadiene	330
Benzo(a)pyrene	330	Hexachloroethane	330
Benzyl alcohol	1300	Indeno(1,2,3-cd)pyrene	330
Bis(2-chloroethoxy)methane	330	Isophorone	330
Bis(2-chloroethyl)ether	330	2-Methylnaphthalene	330
4-Bromophenyl phenylether	330	2-Methylphenol	330
Butylbenzylphthalate	330	4-Methylphenol	330
4-Chloroaniline	1300	Naphthalene	330
4Chloro-3-methylphenol	660	2-Nitroaniline	1650
2-Chloronaphthalene	330	3-Nitroaniline	1650
2-Chlorophenol	330	4-Nitroaniline	660
4-Chloropehnyl phenylether	330	Nitrobenzene	330
Chrysene	330	2-Nitrophenol	330
Dibenzo(a,h)anthracene	330	4-Nitrophenol	1650
Dibenzofuran	330	N-Nitrosodimethylamine	330
1,2-Dichlorobenzene	330	N-Nitrosodiphenylamine	330
1,3-Dichlorobenzene	330	N-Nitro-di-n-propylamine	330
1,4-Dichlorobenzene	330	2,2'-oxybis(1-Chloropropane)	330
3,3'-Dichlorobenzidine	660	Pentachlorophenol	1650
2,4-Dichlorophenol	330	Phenanthrene	330
Diethylphthalate	330	Phenol	330
Dimethyl phthalate	330	Pyrene	330
2,4-Dimethylphenol	330	1,2,4-Trichlorobenzene	330
2,4-Dinitrophenol	1600	2,4,5-Trichlorophenol	1600
Di-n-butylphthalate	330	2,4,6-Trichlorophenol	330

[a] All analyses done by EPA contract laboratory program Method OLM2.0 or the equivalent EPA Method 8270. These methods are based on solvent extraction, concentration, and gas chromatography/mass spectroscopy detection and quantitation.

[b] EQLs for the samples are based on no gel permeation chromatography (GPC) cleanup being performed. The laboratories' GPC equipment determines the sample-specific EQL based on the volume of extract the GPC equipment uses. However, the laboratories are requested, if possible, to report sample-specific EQLs of no more than twice the value listed in the table.

Table 4.7-4

Target Analytes and Maximum Required Quantitation Limits for VOC Analyses[a]

Target Analyte	Soil/Solids (µg/kg)	Target Analyte	Soil/Solids (µg/kg)
Chloromethane	10	1,3-Dichloropropane	5
Vinyl Chloride	10	Chlorodibromomethane	5
Bromomethane	10	4-Methyl-2-Pentanone	10
Chloroethane	10	Toluene	5

Table 4.7-4

Target Analytes and Maximum Required Quantitation Limits for VOC Analyses[a] (continued)

Target Analyte	Soil/Solids (µg/kg)	Target Analyte	Soil/Solids (µg/kg)
Acetone	10	2-Hexanone	10
Dichlorodifluoromethane	10	1,2-Dibromenthane	5
Iodomethane	5	Tetrachloroethene	5
Trichlorotrifluoroethane	5	Chlorobenzene	5
Trichlorotrifluoromethane	5	1,1,1,2-Tetrachloroethane	5
Methyl Chloride	5	Ethylbenzene	5
1,1-Dichloroethane	5	o,m,p-Xylene (mixed)	5
Carbon Disulfide	5	Styrene	5
1,1-Dichloroethane	5	Bromoform	5
1,2-Dichloroethene (total)	10	1,1,2,2-Tetrachloroethane	5
Bromochloromethane	5	1,2,3-Trichloropropane	5
Chloroform	5	Isopropylbenzene	5
1,2-Dichloroethane	5	Bromobenzene	5
1,1-Dichloropropene	5	n-Propylbenzene	5
2-Butanone	10	2-Chlorotolulene	5
2,2-Dichloropropane	5	4-Chlorotolulene	5
1,1,1-Trichloroethane	5	1,3,5-Trimethylbenzene	5
Carbon Tetrachloride	5	tert-Butylbenzene	5
Benzene	5	1,2,4-Trimethylbenzene	5
1,2-Dichloropropane	5	Sec.-Butylbenzene	5
Trichloroethene	5	1,3-Dichlorobenzene	5
Dibromomethane	5	1,4-Dichlorobenzene	5
Bromodichloromethane	5	p-Isopropyltoluene	5
t-1,3-Dichloropropene	5	1,2-Dichlorobenzene	5
c-1,3-Dichloroprepene	5	n-Butylbenzene	5
1,1,2-Trichloroethane	5	1,2-Dimbromo-3-Chloropropane	10

[a] All analyses done by EPA contract laboratory program Method OLM2.0 or the equivalent EPA Method 8260. These methods are based on purge and trap sample extraction/concentration followed by gas chromatography/mass spectroscopy.

Table 4.7-5
Target Analytes and Maximum Required Quantitation Limits for Pesticide/PCB Analyses[a]

Analyte	Soil/Solids[b] (µg/kg)
Aldrin	1.7
a-BHC	1.7
b-BHC	1.7
d-BHC	1.7
g-BHC (lindane)	1.7
a-Chlordane	1.7
g-Chlordane	1.7
4,4'-DDD	3.3
4,4'-DDE	3.3
4,4'-DDT	3.3
Dieldrin	3.3
Endosulfan I	1.7
Endosulfan II	3.3
Endosulfan sulfate	3.3
Endrin	3.3
Endrin ketone	3.3
Endrin aldehyde	3.3
Heptachlor	1.7
Heptachlor epoxide	1.7
Methoxychlor	1.7
Toxaphene	170
Aroclor-1016	33
Aroclor-1221	67
Aroclor-1232	33
Aroclor-1242	33
Aroclor-1248	33
Aroclor-1254	33
Aroclor-1260	33

[a] All analyses done by EPA contract laboratory program Method OLM1.8 or the equivalent EPA Method 8081. These methods are based on solvent extraction, concentration, and gas chromatography/electron capture detection and quantitation.

[b] EQLs for the samples are based on no GPC cleanup being performed. The laboratories' GPC equipment determines the sample-specific EQL based on the volume of extract the GPC equipment uses. However, the laboratories are requested, if possible, to report sample-specific EQLs of no more than twice the value listed in the table.

All sampling will be conducted in accordance with LANL ER Project procedures for sample control and documentation, and sample handling, packaging, and shipping. All sample containers will be appropriately labeled and assigned unique LANL sample identification numbers with bar codes for tracking purposes.

The samples will be documented on sample collection logs, placed in coolers with blue ice, and transported to the Sample Management Office (SMO) under chain-of-custody.

The following LANL ER Project SOPs will be followed:

- ER-SOP-1.01, General Instructions for Field Investigations;
- ER-SOP-1.02, Sample Containers and Preservation;
- ER-SOP-1.03, Handling, Packaging, and Shipping of Samples;
- ER-SOP-1.04, Sample Control and Field Documentation; and,
- ER-SOP-1.08, Field Decontamination of Drilling and Sampling Equipment.

4.8 Data Management

All original field documents will be transferred to the ER Project Records Processing Facility in accordance with QP-4.4, "Record Transmittal to the Records Processing Facility". Data generated by the analytical laboratories will be submitted to the SMO in accordance with the requirements of the ER Project analytical services statement of work (LANL 1995, 49738). The reporting requirements included electronic and hard-copy deliverables for routine analyses. The Data Analysis and Assessment Team within the Analysis and Assessment Focus Area is responsible for data verification, validation, and transfer into the ERDB.

5.0 PROJECT MANAGEMENT

5.1 Project Scheduling and Reporting Requirements

Implementation of this SAP will be directed by the Industrial Sites (IS) Team of the Remedial Actions Focus Area (RAFA) of the LANL ER Project. No date has been determined for beginning implementation of this SAP, and no schedule for the work is provided here. Reporting requirements in conjunction with SAP implementation have not been determined.

5.2 Health and Safety Plan

A site-specific health and safety plan (SSHASP) will be developed in accordance with the Environmental Restoration Project Site-Specific Health and Safety Plan (LANL 1995, 56448).

5.3 Investigation-Derived Waste Plan

Investigation-derived waste, if any, will be handled in accordance with ER-SOP-1.06, "Management of Environmental Restoration Project Waste."

5.4 Community Relations Plan

Community relations are governed by the Public Involvement Plan in Chapter 7 of the 2000 ER Project Installation Work Plan (IWP) (LANL 2000, 66802).

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Appendix A

Acronyms, Abbreviations, and Glossary

A-1.0 Acronyms and Abbreviations

AA	administrative authority
AH	auger hole
ALARA	as low as reasonably achievable
AOC	area of concern
bgs	below ground surface
BH	borehole
BS	black steel
CAA	Clean Air Act
CMP	corrugated metal pipe
CVAA	cold vapor atomic absorption (spectroscopy)
CWA	Clean Water Act
D&D	decontamination and decommissioning
DI	duriron
DOE	U.S. Department of Energy
DOE/NNSA	U.S. Department of Energy/National Nuclear Security Administration
DQO	data quality objective
DRO	diesel range organic
EDL	estimated detection limit
EPA	U.S. Environmental Protection Agency
EQL	estimated quantitation limit
ER	environmental restoration
ERDB	ER Project database
ESH	Environment, Safety, and Health (Laboratory division)
FIMAD	Facility for Information Management, Analysis, and Display
gpc	gel permeation chromatography
gpd	gallons per day
GS	galvanized steel
HPT	high performing team
HSE	Health, Safety, and Environment (former Laboratory Division, now ESH Division)
HSWA	Hazardous and Solid Waste Amendments
IA	interim action
ICPES	inductively coupled plasma emission spectroscopy
ICPMS	inductively coupled plasma mass spectroscopy
IDW	investigation-derived waste
IS	Industrial Sites Team (part of the Remedial Actions Focus Area within the ER Project)
IWP	Installation Work Plan
KOP	knowledge of process
LANL	Los Alamos National Laboratory
LAPRE	Los Alamos Power Reactor Experiment
LIR	Laboratory Implementation Requirement
LLW	low-level waste
LRO	lubricant range organic
MDA	material disposal area
NFA	no further action
NMED	New Mexico Environment Department
NMED-HWB	New Mexico Environment Department-Hazardous Waste Bureau
NNSA	National Nuclear Security Administration
NPDES	National Pollutant Discharge Elimination System

OLASO	Office of Los Alamos Site Operations
ORAU	Oak Ridge Associated Universities
PAH	polyaromatic hydrocarbon
PCB	polychlorinated biphenyl
PID	photo-ionization detector
PRS	potential release site
PSP	phase separator pit
QA	quality assurance
Qbo	Quaternary Otowi Member of the Bandelier Tuff, ignimbrite
Qbof	Quaternary Otowi Member, ash flow
Qbog	Quaternary Otowi Member of the Bandelier Tuff, Guaje Pumice Bed
Qbt 1g	Quaternary Tshierge Member of the Bandelier Tuff 1g
Qbt 1v	Quaternary Tshierge Member of the Bandelier Tuff 1v
Qbt 2	Quaternary Tshierge Member of the Bandelier Tuff 2
Qbt 3	Quaternary Tshierge Member of the Bandelier Tuff 3
Qbt 4	Quaternary Tshierge Member of the Bandelier Tuff 4
Qbtt	Quaternary Tshierge Member of the Bandelier Tuff, Tsankawi Pumice Bed
QC	quality control
QMP	quality management plan
QP	quality procedure
RAFA	Remedial Actions Focus Area
RCRA	Resource Conservation and Recovery Act
RFI	RCRA facility investigation
RLWLR	radioactive liquid waste line removal
RLWTF	Radioactive Liquid Waste Treatment Facility
RPF	Records Processing Facility (part of the ER Project)
SAL	screening action level
SMO	Sample Management Office
SOP	standard operating procedure
SOW	statement of work
SS	stainless steel
SSHASP	site-specific health and safety plan
SVOC	semivolatile organic compound
SWCS	Sanitary Wastewater Consolidation System
SWMU	solid waste management unit
T&E	threatened and endangered
TA	technical area
TAL	target analyte list
TSCA	Toxic Substances Control Act
TCLP	toxicity characteristic leaching procedure
TPH DRO	total petroleum hydrocarbon, diesel range organic
TPH LRO	total petroleum hydrocarbon, lubricant range organic
TPU	total propagated uncertainty
TR	transect
USDA	U.S. Department of Agriculture
UST	underground storage tank
VCA	voluntary corrective action
VCP	vitrified clay pipe
VOC	volatile organic compound
WWTP	wastewater treatment plant

XRF	x-ray fluorescence

A-2.0 Glossary

absorption — The penetration of substances into the bulk of a solid or liquid.

accuracy — A measure of the closeness of measurements to the true value of the parameter being measured.

action level — Health- and environmental-based concentrations derived using *chemical*-specific toxicity information and standardized exposure assumptions. Action levels can be developed on a facility-specific basis or can be taken from standardized lists (61 Federal Register 19446). Contamination found in a particular *medium* below an appropriate action level would not generally be subject to *remediation* or further study.

administrative authority (AA) — The New Mexico Environment Department, the US Environmental Protection Agency, or the US Department of Energy, as appropriate.

alluvial — Relating to geologic deposits or features formed by running water.

alluvial fan — A fan-shaped *piedmont* accumulation of *alluvium*.

alluvium — Clay, silt, sand, and gravel *transported* by water and deposited on streambeds, *flood plains*, and *alluvial fans*.

alpha radiation — *Radiation* composed of alpha particles emitted during the *radioactive decay* of certain nuclides. The least penetrating of the three common types of *radiation* (*alpha*, *beta*, and *gamma*), alpha radiation can be blocked easily (for example, by a sheet of paper or the outer layer of skin).

analysis — Includes physical analysis, *chemical analysis*, and knowledge-of-process determinations. (Laboratory Hazardous Waste Facility Permit)

analyte — The element, nuclide, or ion a *chemical analysis* seeks to identify and/or quantify; the *chemical* constituent of interest.

analytical method — A body of procedures and techniques for systematically performing an activity.

aquifer — Body of permeable geologic material whose saturated portion is capable of readily yielding *groundwater* to wells.

area of concern (AOC) — Areas at the Laboratory that might warrant further investigation for *releases* based on past facility waste-management activities.

area of contamination (AOC) — Discrete areas of generally dispersed contamination.

as low as reasonably achievable (ALARA) — An approach to *radiation* protection to control or manage exposures (both individual and collective) to the work force and the general public. Also to control or manage *releases* of radioactive material to the environment as low as social, technical, economic, practical, and public-policy considerations permit. Used in this sense, ALARA is not a *dose* limit.

background level — Naturally occurring concentrations (levels) of an inorganic *chemical* and naturally occurring *radionuclides* in soil, *sediment*, and *tuff*.

background radiation — Amount of radioactivity naturally present in the environment, including cosmic rays from space and natural *radiation* from soils and rock.

background screening value (BSV) — A threshold used to identify site *sample* results that may be greater than *background levels*.

basalt — A fine grained, dark volcanic rock comprised chiefly of plagioclase, augite, olivine, and magnetite.

baseline level — *Anthropogenic* concentrations of a given *chemical* in the soil associated with Laboratory and/or commercial activities or processes that may not be related to source material(s) or a *release(s)* from within a *potential release site*. Examples of baseline levels are nuclear fallout and organic *chemicals* associated with urban activities.

baseline risk assessment (also known as *risk assessment*) — A site-specific *analysis* of the potential adverse effects of *hazardous constituents* that are *released* from a site in the absence of any control or *mitigation* actions. A baseline risk assessment consists of four steps: data collection and *analysis*, exposure assessment, toxicity assessment, and *risk characterization*.

bentonite — A clay composed of the mineral montmorillonite and variable amounts of magnesium and iron, formed over time by the alteration of volcanic ash. As bentonite can *adsorb* large quantities of water and expand to several times its normal volume, it is a common additive to drilling mud.

best management practices (BMPs) — For facilities that manufacture, use, store, or *discharge* toxic or hazardous pollutants as defined by the 1977 Clean Water Act, a required program to control the potential spill or *release* of those materials to surface waters. (*The Facts on File Dictionary of Environmental Science,* edited by L. Harold Stevenson and Bruce Wyman)

beta radiation — Radioactive transformation of a nuclide in which the nucleus emits a beta particle (electron or positron). Beta radiation can be blocked by an inch of wood or by a thin sheet of aluminum.

bias — Systematic deviation from the true value that remains constant over replicated measurements within the statistical *precision* of the measurement process.

calibration — Process used to identify the relationship between the true (reference) *analyte* concentration or other variable and the response of a measurement instrument, *chemical analysis method*, or other measurement system.

calibration blank — A *calibration standard* prepared to contain negligible or unmeasurable amounts of *analytes*. It is used to establish the zero concentration point for analytical-measurement *calibration*.

calibration standard — *Sample* prepared to contain known amounts of the *analytes* of interest and of other constituents required for an *analysis*.

catchment — (1) A structure, such as a basin or reservoir, used for collecting or draining water. (2) The amount of water collected in such a structure. (3) A catching or collecting of water, especially rainwater.

chain of custody — Unbroken, documented trail of accountability designed to ensure the uncompromised physical integrity of *samples*, data, and records.

chemical — Any naturally occurring or man-made substance characterized by a definite molecular composition, including molecules that contain *radionuclides*.

chemical analysis — Process used to measure one or more attributes of a *sample* in a clearly defined, controlled, systematic manner. Often requires treating a *sample* chemically or physically before measurement.

chemical interference — A *chemical* or physical entity whose influence results in a decrease or increase in the response of an *analytical method* or other measurement system relative to the response obtained in the absence of the entity.

chemical of concern — *Chemical* identified as a potential *risk* during a site-specific human-health or ecological *risk assessment*.

chemical of potential concern (COPC) — A *chemical*, detected at a site, that has the potential to adversely affect human *receptors* due to its concentration, distribution, and mechanism of toxicity. A COPC remains a concern until *exposure pathways* and *receptors* are evaluated in a site-specific human health *risk assessment*.

chemical of potential ecological concern (COPEC) — A *chemical*, detected at a site, that has the potential to adversely affect ecological *receptors* due to its concentration, distribution, and mechanism of toxicity.

cleanup levels — *Media*-specific *contaminant* concentration levels that must be met by a selected *corrective action*. Cleanup levels are established by using criteria such as protection of human health and

the environment; compliance with regulatory requirements; reduction of toxicity, mobility, or volume through *treatment*; long- and short-term effectiveness; implementability; cost; and public acceptance.

Code of Federal Regulation (CFR) — A codification of all regulations developed by federal government agencies and finalized by publication in the *Federal Register*.

cold vapor atomic absorption (CVAA) — An analytical technique used for measuring mercury; it is described in *EPA* Methods 7470A (Mercury in Liquid Waste) and 7471A (Mercury in Solid or Semi-solid Waste). The technique is based on the *absorption* of *radiation* at 253.7-nm by mercury vapor. The mercury is reduced to the elemental state and aerated from solution in a closed system. The mercury vapor passes through a cell positioned in the light path of an atomic *absorption* spectrophotometer. Absorbance (peak height) is measured as a function of mercury concentration.

collocated sample — One of two or more *samples* collected within close proximity of each other meant to represent the same immediate area.

comparability — Qualitative measure of the degree to which one item or data set can be compared with another.

composite sample — A sample collected over a temporal or spatial range that typically consists of a series of discrete, equal samples which are combined or composited.

conceptual model — See *site conceptual model*.

conceptual hydrogeologic model — Mathematical approximation of the occurrence, movement, and quality of *groundwater* in a given area and the relationship of that *groundwater* to the surface water, *soil water*, and geologic framework in that area.

confined — Said of *groundwater* in an artesian *aquifer*.

confluence — Place where two or more streams meet; the point where a tributary meets the main stream.

contaminant — Any *chemical* (including *radionuclides*) present in environmental *media* or on structural debris.

contract-required detection limit (CRDL) — The minimum *reporting limits* required under a contract between Los Alamos National Laboratory and a contract laboratory. The CRDLs are not necessarily intrinsically tied to instrument *sensitivity* but rather are *reporting limits*.

controlled area — Laboratory area to which access is controlled to protect individuals from exposure to *radiation* and/or hazardous materials.

corrective action — Action to rectify conditions adverse to human health or the environment.

cumulative risk — The evaluation of simultaneous exposure to a receptor across multiple media, pathways, and contaminants to estimate the resulting health and environmental effects.

Curie — Unit of radioactivity defined as the quantity of any radioactive nuclide that has an activity of 3.7×10^{10} disintegrations per second (dps).

data quality assessment — Statistical and scientific evaluation of a data set that establishes whether it is adequate for its intended use.

data quality objective (DQO) — Qualitative and quantitative goals developed before sampling begins. DQOs clarify investigation objectives and identify the type, quantity, and quality of data needed to support decisions.

data validation — Systematic process that applies a defined set of performance-based criteria to a body of data; may result in qualification of the data. The data validation process is performed independently of the analytical laboratory that generates the data set and occurs before conclusions are drawn from the data. The process may comprise a standardized data review (*routine data validation*) and/or a problem-specific data review (*focused data validation*).

data validator — The person who performs *data validation* in accordance with ER Project procedures.

data verification — Process of evaluating the completeness, correctness, consistency, and compliance of a laboratory data package against a specified standard or contract.

- Completeness means all required information is present—both hard copy and electronic.
- Correctness means the reported results are based on properly documented and correctly applied algorithms.
- Consistency means values are the same when they appear in different reports or are transcribed from one report to another.
- Compliance means the data pass numerical *quality control* (QC) tests based on parameters or limits specified in a contract or in an auxiliary document.

decommissioning — Permanent removal from service of facilities and their components, after the discontinued use of structures or buildings deemed no longer useful, in accordance with regulatory requirements and environmental policies.

decontamination — Removal of unwanted material from the surface of or from within another material.

deferred action — The postponement of the selection and implementation of a corrective measure; usually follows *decommissioning* of an active site.

detection limit — Minimum concentration that can be determined by a single measurement by an instrument; implies a specified statistical confidence that the analytical concentration is greater than zero.

dilution attenuation factor — Ratio of *contaminant* concentration in soil *leachate* to the concentration in *groundwater* at the *receptor* point and is used to account for dilution of soil *leachate* in an *aquifer.*

discharge — Accidental or intentional spilling, leaking, pumping, pouring, emitting, emptying, or dumping of *hazardous waste* into or on any land or water. (*RCRA*, 40 CFR 260.10)

disposal — The discharge, deposit, injection, dumping, spilling, leaking, or placing of any *solid waste* or *hazardous waste* into or on any land or water so that such *solid waste* or *hazardous waste* or any constituent thereof may enter the environment or be emitted into the air or *discharged* into any waters, including *groundwaters.* (40 CFR Part 260.10)

DOE — See *US Department of Energy*

dose — Quantity of *radiation* that is *absorbed*, per unit of mass, by the body or by any portion of the body.

dose equivalent — Estimated amount of biological damage (in rems) done by the deposition in tissue of a given unit of *absorbed-radiation dose.*

duplicate analysis — *Analysis* performed on one of a pair of identically prepared *subsamples* taken from the same *sample.*

duplicate measurement — An additional measurement performed on a *prepared sample* under identical conditions to evaluate the variance in the measurement.

ecological screening level (ESL) — An organism's exposure-response threshold for a given *chemical* constituent. The concentration of a substance in a particular *medium* corresponds to a *hazard quotient* (HQ) of 1.0 for a given organism below which no *risk* is indicated.

effluent — Liquid *discharged* as a waste, such as contaminated water from a factory or the outflow from a sewage works; water *discharged* from a storm sewer or from land after irrigation.

environmental assessment (EA) — A report that identifies potentially significant environmental impacts from any federally approved or federally funded project that may change the physical environment. If an EA shows significant impact, an *environmental impact statement (EIS)* is required.

environmental surveillance — Collection and *analysis* of *samples* of air, water, soil, foodstuffs, biota, and other media to determine the environmental quality of an industry or community. Environmental surveillance commonly is performed at sites that contain nuclear facilities.

EPA — See *US Environmental Protection Agency*

ephemeral — Said of a stream or *spring* that flows only during and immediately after periods of rainfall or snowmelt.

ER data — Data derived as a result of *samples* that are collected and paid for by ER Project funding.

error — The quantifiable difference between an observed value and the true value of the parameter being measured.

estimated quantitation limit (EQL) — The lowest concentration that can be reliably achieved within specified limits of *precision* and *accuracy* during routine analytical-laboratory operating conditions. The low point on a *calibration* curve should reflect this quantitation limit. The EQL is not used to establish detection status. *Sample* estimated quantitation limits are highly *matrix*-dependent, and the specified estimated quantitation limits might not always be achievable. See the statement of work (SOW) for analytical services (RFP No. 9-XS1-Q4257) for a more complete definition.

evapotranspiration — The combined *discharge* of water from the earth's surface to the atmosphere by evaporation from lakes, streams, and soil surfaces, and by transpiration from plants.

exposure pathway — Mode by which a *receptor* may be exposed to *contaminants* in environmental media (e.g., drinking water, ingesting food, or inhaling dust).

exposure unit — The bounded area or volume within which a person or other *receptor* may be exposed to *contaminants* that have been *released* to the environment.

external standard — External standard *calibration* involves comparison of instrument responses from the *sample* to the responses from the target compounds in the *calibration standards*. *Sample* peak areas (or peak heights) are compared to peak areas (or heights) of the standards.

Federal Register — The official daily publication for Rules, Proposed Rules, and Notices of federal agencies and organizations, as well as Executive Orders and other Presidential Documents.

field blank (also known as *field reagent blank*) — A *blank sample* either prepared in the field or carried to the sampling site, exposed to sampling conditions (e.g., bottle caps removed, preservatives added), and returned to a laboratory for *analysis* in the same manner in which environmental *samples* are analyzed. Used to identify the presence of contamination potentially added during the sampling and *analysis* process.

field duplicate (replicate) **samples** — Two separate, independent *samples* taken from the same source that are collected in such a manner that they are *collocated samples*, equally representative of the *sample matrix* at a given location and time.

field matrix spike — A known amount of a *field sample* to which a known amount of the *target analyte* has been added. Used to compute the proportion of added *analyte* that is recovered upon *analysis*.

field reagent blank — See *field blank*.

field sample — See *sample*.

field split — A *field sample* that has been homogenized and divided in the field into equally representative portions that are submitted for *analysis* (see also *split sample*).

flood plain — The portion of a river valley that is built of overbank *sediment* deposited when the river floods.

focused data validation — A technically based *analyte*-, *sample*-, and potentially data-use-specific process that extends the qualification of data beyond method or contractual compliance and provides a level of confidence that an *analyte* is present or absent. If the *analyte* is present, the quality of the quantitation may be obtained through focused validation.

gamma radiation — A form of electromagnetic, high-energy *radiation* emitted from a nucleus. Gamma rays are essentially the same as x-rays and require heavy shielding, such as concrete or steel, to be blocked.

geohydrology — The science that applies hydrologic methods to the understanding of geologic phenomena.

groundwater — Water in a subsurface saturated zone; water beneath the regional *water table.*

half-life — The time required for one-half of the radioactive atoms initially present in a *sample* to decay. Each *radionuclide* has a characteristic half-life ranging from a fraction of a second to thousands of years.

hazard index (HI) — The sum of *hazard quotients* for multiple *contaminants* to which a *receptor* (j) is determined to be exposed, i.e., $HI_j = \Sigma_i HQ_{ij}$.

hazard quotient (HQ) — The ratio of a calculated exposure (E) to or *dose* (D) from a given *contaminant* (I) to a given *receptor* (j) over a reference value (TRV) for *contaminant* (I) determined to be protective of *receptor* (j), i.e., $HQ_{ij} = E_{ij}$ [or D_{ij}]TRV_{ij}.

Hazardous and Solid Waste Amendments (HSWA) — The Hazardous and Solid Waste Amendments of 1984 (Public Law No. 98-616, 98 Stat. 3221), which amended the *Resource Conservation and Recovery Act* of 1976, 42 U.S.C. § 6901 et seq.

hazardous constituent — Those constituents listed in Appendix VIII to 40 CFR Part 261.

hazardous waste — Any *solid waste* is generally a hazardous waste if it

- is not excluded from regulation as a hazardous waste,
- is listed in the regulations as a hazardous waste,
- exhibits any of the defined characteristics of hazardous waste (ignitability, corrosivity, reactivity, or toxicity), or
- is a mixture of *solid waste* and hazardous waste.

See 40 CFR 261.3 for a complete definition of hazardous waste.

HSWA module — Module VIII of the Laboratory's Hazardous Waste Facility Permit. This permit allows the Laboratory to operate as a *treatment, storage, and disposal facility.*

hydraulic conductivity — The rate at which water moves through a *medium* in a unit of time under a unit *hydraulic gradient* through a unit area measured perpendicular to the direction of flow.

hydraulic gradient — The rate of change of *hydraulic head* per unit of distance in the direction of *groundwater* flow.

hydraulic head — Elevation of the *water table* or *potentiometric surface* as measured in a well.

Hydrogeologic Workplan — The document that describes activities planned by the Laboratory to characterize the hydrologic setting beneath the Laboratory and to enhance the Laboratory's *groundwater* monitoring program.

hydrogeology — The science that applies geologic methods to the understanding of hydrologic phenomena.

inductively coupled plasma emission spectroscopy (ICPES) — ICPES determines trace elements, including metals, in solutions. The instrument measures characteristic emission spectra by optical spectrometry. Samples are nebulized, and the resulting aerosol is *transported* to the plasma torch. Element-specific emission spectra are produced by a radio-frequency inductively coupled plasma. The spectra are dispersed by a grating spectrometer, and photosensitive devices are used to monitor the intensities of the emission lines.

inductively coupled plasma mass spectroscopy (ICPMS) — ICPMS is applicable to the determination of sub-µg/l concentrations of a large number of elements in water *samples* and in waste extracts or digests. When dissolved constituents are required, *samples* must be filtered and acid preserved before *analysis*. No digestion is required before *analysis* for dissolved elements in water *samples*. The method measures ions produced by a radio-frequency inductively coupled plasma. *Analyte* species originating in a liquid are nebulized, and the resulting aerosol *transported* by argon gas into the plasma torch. The ions produced are entrained in the plasma gas and introduced, by means of an interface, into a mass spectrometer. The ions produced in the plasma are sorted according to their mass-to-change ratios and quantified with a channel electron multiplier.

industrial-use scenario — Industrial use is the scenario in which current Laboratory operations continue. Any necessary *remediation* involves cleanup to standards designed to ensure a safe and healthy work environment for Laboratory workers.

infiltration — Entry of water into the ground.

initial calibration — The process used to establish the relationship between instrument response and *analyte* concentration at several *analyte* concentration values to demonstrate that an instrument is capable of acceptable analytical performance.

institutional controls — Controls that prohibit or limit access to contaminated media: use restrictions, permitting requirements, *standard operating procedures*, Laboratory Implementation Requirements, Laboratory Implementation Guidance, Laboratory Performance Requirements, etc.

instrument detection limit (IDL) — The IDL is defined to be three times the average of the standard deviations obtained on three nonconsecutive days from the *analysis* of a standard solution, with seven consecutive measurements of that solution per day. The standard solution must be prepared at a concentration of three to five times the instrument manufacturer's estimated IDL. This is a measure of instrument *sensitivity* without any consideration for contributions to signal from reagents.

interim measure — Short-term actions taken to respond to immediate threats to human health or to prevent damage or *contaminant migration* to the environment.

interflow — A runoff process that involves lateral subsurface flow in the soil zone.

intermittent stream — A stream that flows only in certain reaches due to losing and gaining characteristics of the channel bed.

internal standards — Compounds added to the *sample* after sample preparation for qualitative and quantitative instrument *analysis*—the compounds serve as a standard of retention time and response, which is invariant from run to run with the instruments. (*Handbook of Environmental Analysis,* by Roy-Keith Smith, 3rd ed.)

laboratory control sample (LCS) — A known *matrix* that has been spiked with compound(s) representative of the *target analytes*. The LCS is used to document laboratory performance. The acceptance criteria for LCSs are method specific.

laboratory duplicate sample — The portions of a *sample* taken from the same sample container, prepared for *analysis* and analyzed independently but under identical conditions; used to assess or demonstrate acceptable laboratory method precision at the time of analysis. Each duplicate *sample* is expected to be equally representative of the original material. Duplicate analyses also are performed to generate data, to determine the long-term precision of an analytical method on various matrices.

laboratory qualifier (or laboratory flag) — Codes applied to the data by the contract analytical laboratory to indicate, on a gross scale, a verifiable or potential data deficiency. These flags are applied using the *Environmental protection Agency (EPA)* contract laboratory program (CLP) guidelines.

land disposal restrictions (LDR) — Requirements in 40 CFR 268 that specify *treatment* standards that are protective of human health and the environment when *hazardous waste* is land disposed.

LANL data validation qualifiers — The data qualifiers defined by the Laboratory (LANL) and used in the ER Project baseline-validation process. For a complete list of data qualifiers applicable to any particu-

lar analytical suite, consult the appropriate ER Project *standard operating procedure* (ER-SOPs 15.01–15.06).

LANL data validation reason codes — The codes applied to the sample data by *data validators* who are independent of the contract laboratory which performed the *sample analysis*. Reason codes provide an in-depth and *analysis*-specific explanation for applying the qualifier with some description of the potential impact on the data use. For a complete list of data qualifiers applicable to any particular analytical suite, consult the appropriate ER Project *standard operating procedure* (ER-SOPs 15.01–15.06).

leachate — Any liquid, including any suspended components in the liquid, that has percolated through or drained from *hazardous waste* (40 CFR 260.10).

leaching — The separation or dissolving out of soluble constituents of a solid material by the natural action of percolating water or by *chemicals*.

medium (environmental) — Any media capable of *absorbing* or *transporting* constituents. Examples of media include *tuffs*, soils and *sediments* derived from these *tuffs*, surface water, *soil water*, *groundwater*, air, structural surfaces, and debris.

medium (geological) — The solid part of the hydrogeological system; may be unsaturated or saturated.

method blank — An *analyte*-free *matrix* to which all reagents are added in the same volumes or proportions as those used in the environmental *sample* processing and which is prepared and analyzed in the same manner as the corresponding environmental *samples*. The method blank is used to assess the potential for contamination to the *sample* during preparation and *analysis*.

migration — The movement of inorganic and organic species through unsaturated or saturated materials.

migration pathway — A route (e.g., a stream or subsurface flow path) that controls the potential movement of *contaminants* to environmental *receptors* (plants, animals, humans).

minimum detectable activity — For the *analysis* of *radionuclides*, the minimum detectable activity is the lowest detectable radioactivity for a given analytical technique. The following equation shall be used to calculate the MDA unless otherwise noted or approved by the Laboratory:

where BKG = the total background counts,

EFF = the fraction detector efficiency,

V = the volume or unit weight,

T_s = the *sample* count duration, and

Y = the fractional *chemical* recovery obtained from the *tracer* recovery.

Depending on the type of *analysis*, other terms may also be required in the denominator (e.g., gamma abundance).

mitigation — (1) Avoiding an impact altogether by not taking a certain action or parts of an action. (2) Minimizing impacts by limiting the degree or magnitude of the action and its implementation. (3) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment. (4) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action. (5) Compensating for the impact by replacing or providing substitute resources or environments.

mixed waste — Waste that contains both *hazardous waste* (as defined by *RCRA*) and *radioactive waste* (as defined by the Atomic Energy Act [AEA] and its amendments).

model — A mathematical approximation of a physical, biological, or social system.

monitoring well — A well or borehole drilled for the purpose of yielding *groundwater samples* for *analysis*.

National Pollutant Discharge Elimination System (NPDES) — The national program for both issuing, modifying, revoking and reissuing, terminating, monitoring, and enforcing permits and imposing requirements under Sections 307, 318, 402, and 405 of the Clean Water Act.

neutralize — To make a toxic *chemical* agent harmless by *chemical* action.

no further action (NFA) — A recommendation that not further investigation or *remediation* is warranted based on specific criteria.

non-ER data — Data derived as a result of *samples* collected and paid for by sources other than the ER Project.

notice of deficiency (NOD) — A notice issued to *DOE* and the Laboratory by the administrative authority which states that some aspect(s) of a plan, report, or application does not meet their requirements or that requires clarification or correction.

operable unit (OU) — At the Laboratory, one of 24 areas originally established for administering the ER Project. Set up as groups of *potential release sites*, the OUs were aggregated based on geographic proximity for the purpose of planning and conducting *RCRA facility assessments* and *RCRA facility investigations*. As the project matured, it became apparent that 24 were too many to allow efficient communication and to ensure consistency in approach. Therefore, in 1994, the 24 OUs were reduced to six administrative "field units."

outfall — The vent or end of a drain, pipe, sewer, ditch, or other conduit that carries wastewater, sewage, storm runoff or other *effluent* into a stream.

out of control — A condition in which a measured *quality control* parameter does not meet specified control or acceptance criteria.

pedogenic calcite (See also *caliche*, also known as *calcrete*) — An accumulation of calcium carbonate formed by the soil-forming process; typically found in the near-surface.

perched groundwater — *Groundwater* that lies above the regional *water table* and is separated from it by one or more *unsaturated zones*.

percolation — Gravity flow of *soil water* through the pore spaces in soil or rock below the ground surface.

perennial stream — A stream or reach that flows continuously throughout the year.

performance-evaluation sample — A *sample* of known composition with respect to selected *analytes* which, upon *analysis*, is expected to yield results that fall within a prescribed range. Performance-evaluation samples are selected to mimic as closely as possible those matrices representative of environmental *samples* from a particular location.

permit modification — A request by either the permittee or the administrative authority to change to change a condition of the Laboratory's Hazardous Waste Facility Permit.

piedmont — Lying or formed at the base of a mountain or mountain range, as a piedmont terrace or piedmont pediment.

piezometer — A tightly cased well drilled for the purpose of measuring *hydraulic head* or water level at a discrete depth; ideally only open at the bottom but usually constructed with a very short screen interval.

piezometric surface — The surface that represents the static head in an *aquifer*. applies to both *confined* and *unconfined aquifers* (also called *potentiometric surface*).

polychlorinated biphenyls (PCBs) — Any *chemical* substance that is limited to the biphenyl molecule that has been chlorinated to varying degrees or any combination of substances which contains such substances. PCBs are colorless, odorless compounds that are chemically, electrically, and thermally stable and have proven to be toxic to both humans and animals.

population (statistical) — A set of units or a continuum in a physical, biological, or social system of interest (e.g., the residents of Los Alamos County, the water in an *alluvial aquifer*, or the plants in Pajarito Canyon).

porosity — The ratio of the volume of interstices in a soil or rock *sample* to its total volume expressed as a percentage or as a fraction.

porphyritic — Said of the texture of an igneous rock in which larger crystals (phenocrysts) are set in a finer ground mass.

potential release site (PRS) — Refers to potentially contaminated sites at the Laboratory that are identified either as *solid waste management units (SWMUs)* or *areas of concern* (AOCs). PRS refers to *SWMUs* and AOCs collectively.

potentiometric surface — See *piezometric surface.*

Precambrian — All geologic time before the beginning of the Paleozoic Era (the Paleozoic began about 600 million years ago [mya]), equivalent to about 90% of all geologic time.

precision — A concept used to describe dispersion of measurements with respect to a measure of location or central tendency. Precision may be represented by the inverse of the standard deviation of a set of measurements.

preliminary assessment — The process of collecting and reviewing available information about a *potential release site.*

preliminary remediation goal (PRG) — Acceptable exposure levels, protective of human health and the environment, that are used as a *risk*-based tool for evaluating remedial alternatives.

preliminary risk assessment — A *risk assessment* conducted using conservative assumptions and scenarios and assuming no mitigating or corrective measures beyond those already in place.

prepared sample — A *sample* treated in such a manner as to render it amenable to *analysis.* May include digestate, distillate, electroplate, extract, filter retentate, filtrate, homogenate, precipitate, pulverized/sieved portion of *sample*, residue, etc.

quality assessment sample — A *sample* submitted for *analysis*, the data from which are used to assess the quality of performance of a sampling or *analysis* process. May include *performance-evaluation samples, field duplicates, field blanks*, etc.

quality assurance — All those planned and systematic actions necessary to provide adequate confidence that a facility, structure, system, or component will perform satisfactorily in service.

quality control (QC) — (1) All those actions necessary to control and verify the features and characteristics of a material, process, product, or service to specified requirements. QC is the process through which actual quality performance is measured and compared with standards. (2) All methods and procedures used to obtain accurate and reliable results from environmental sampling and *analysis.* Includes rules for when, where, and how *samples* are taken; *sample* storage, preservation and *transport*; and the use of *blanks, duplicates*, and *split samples* during the *analysis.*

quality control sample — A *sample* which, upon *analysis*, is intended to provide information useful for adjusting, controlling, or verifying continuing acceptability of sampling and/or *analysis* activities that are in progress.

Quaternary — The second period of the Cenozoic Era, following the Tertiary, and including the last 2–3 million years.

radiation — Energy emitted in the form of rays or particles that are thrown off by disintegrating atoms. The rays or particles emitted may consist of neutrons, positrons, *alpha particles, beta particles*, or *gamma radiation.*

radioactive decay — (1) The process whereby radioactive materials undergo a change from one nuclide, element, or state to another, releasing *radiation* in the process. This action ultimately results in a decrease in the number of radioactive nuclei present in the *sample.* (2) The spontaneous transformation of one nuclide into a different nuclide or into a different isotope of the same nuclide accompanied by either the emission of particles from the nucleus, nuclear capture or ejection of orbital electrons, or fission.

radioactive tracer — A radioactive material added to, or induced in, a *sample* for the purpose of monitoring *chemical* or physical losses of the *target analytes*. The *tracer* is assumed to behave in the same manner as that of the *target analytes*.

radioactive waste — Waste that has been determined to contain added (or concentrated naturally occurring radioactive material [NORM]) radioactive material or activation products by either monitoring or *analysis*, acceptable knowledge of both, or **does not** meet radiological *release* criteria.

radionuclide — A nuclide (species of atom) that exhibits radioactivity.

RCRA facility assessment (RFA) — Usually the first step in the *RCRA corrective action* process, to identify potential and actual *releases* from *solid waste management units* and make preliminary determinations about *releases*, the need for *corrective action*, and *stabilization measures*.

RCRA facility investigation (RFI) — The investigation that determines if a *release* has occurred and the nature and extent of the contamination at a *hazardous waste* facility. The RFI is generally equivalent to the remedial investigation portion of the Comprehensive Environment Response, Compensation, and Liability Act (CERCLA) process.

receptor — A person, plant, animal, or geographical location that is exposed to a *chemical* or physical agent *released* to the environment by human activities.

recharge — The process by which water is added to the zone of saturation, either directly from the overlying *unsaturated zone* or indirectly by way of another material in the saturated zone.

recreational-use scenario — A land use condition under which individuals may be exposed for a limited amount of time as a result of outdoor activities such as hiking, camping, hunting, and fishing.

regulatory standard — Media-specific *contaminant* concentration levels of potential concern that are mandated by federal or state legislation or regulation (e.g., the Safe Drinking Water Act, New Mexico Water Quality Control Commission regulations).

release — Any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, *leaching*, dumping, or disposing of *hazardous waste* or *hazardous constituents* into the environment (including the abandonment or discarding of barrels, containers, and other closed receptacles that contain any *hazardous wastes* or *hazardous constituents*).

remediation — The process of reducing the concentration of a *contaminant* (or *contaminants*) in air, water, or soil media to a level that poses an acceptable *risk* to human health and the environment; the act of restoring a contaminated area to a usable condition based on specified standards.

reporting limit (RL) — The numerical value that an analytical laboratory (in conjunction with its client) selects to determine if a *target analyte* is detected. Results below the RL are considered not detected, while results greater than the RL are considered detected. The RLs are not necessarily based on instrument *sensitivity*. RLs can be established at the *instrument detection limit*, *method detection limit*, *estimated quantitation limit*, and *contract-required detection limit*.

representativeness — The degree to which data accurately and precisely represent a characteristic of a *population* or an environmental condition.

request for supplemental information (RSI) — A request issued to *DOE* and the Laboratory by the administrative authority which states that some aspect(s) of a plan or report does not meet their requirements. The ER Project must respond by providing additional information to address the identified issue or concern.

request number — An identifying number assigned by the ER Project to a group of *samples* that are submitted for *analysis*.

residential-use scenario — The standards for residential use are the most stringent of the three current- and future-use scenarios being considered by the ER Project and is the level of cleanup the *EPA* is currently specifying for *SWMUs* located off the Laboratory site and for those released for non-Laboratory use.

Resource Conservation and Recovery Act (RCRA) — The Solid Waste Disposal Act as amended by the Resource Conservation and Recovery Act of 1976. (40 CFR 270.2)

restricted area — Any area to which access is controlled by the licensee for purposes of protection of individuals from exposure to *radiation* and radioactive materials. "Restricted area" shall not include areas used as residential quarters, although a separate room or rooms in a residential building may be set apart as a restricted area (10 CFR 60.2).

retention time window criteria — The x-axis on a chromatogram represents retention time. A retention time window is a specified time range on this axis. If a *target analyte* is detected within its retention time window, it is considered detected. The retention time window criteria are the exact time windows on the chromatogram defining a given *target analyte* and are method specific. *Absolute retention times* are used for compound identification in all gas chromatograph and high-pressure liquid chromatography methods that do not employ internal standard *calibration*. Retention time windows are crucial to the identification of target compounds. The windows are established to compensate for minor shifts in *absolute retention times* as a result of *sample* loadings and normal chromatographic variability. The width of retention time windows should be carefully established to minimize the occurrence of both false positive and false negative results. Tight retention time windows may result in false negatives and/or may cause unnecessary reanalysis of *samples* when *surrogates* or spiked compounds are erroneously not identified. Overly wide retention time windows may result in false positive results that cannot be confirmed after further *analysis*.

risk — A measure of a negative or undesirable impact associated with an event.

risk assessment — See *baseline risk assessment.*

risk assessment, preliminary — See *preliminary risk assessment.*

risk characterization — The summarization and integration of the results of toxicity and exposure assessments into quantitative and qualitative expressions of *risk*. The major assumptions, scientific judgments, and sources of uncertainty related to the assessment are also presented.

risk management — The integration of *risk characterization* with other nonscientific considerations specified in applicable statutes to make and justify regulatory decisions *(RCRA/CERCLA* Update, June 1992).

rinsate blank — See *equipment blank.*

routine analysis — The *analysis* categories of inorganics, metals, organics, radiochemistry, and high explosives as defined in the current contract laboratory statement of work.

routine data validation — Process of reviewing analytical data relative to quantitative routine acceptance criteria. The objective of routine data validation is two-fold:

- to estimate the technical quality of the data relative to minimum national standards adopted by the ER Project and
- to indicate to data users the technical data quality at a gross level by assigning *LANL qualifiers* to environmental data whose quality indicators do not meet acceptance criteria.

sample — A portion of a material (e.g., rock, soil, water, air), which, alone or in combination with other samples, is expected to be representative of the material or area from which it is taken. Samples are typically sent to a laboratory for *analysis* or inspection or are analyzed in the field. When referring to samples of environmental media, the term *field sample* may be used.

sample matrix — In *chemical analysis*, that portion of a *sample* which is exclusive of the *analytes* of interest. Together, the *matrix* and *analytes* of interest form the *sample.*

screening action level (SAL) — *Medium*-specific concentration level for a *chemical* derived using conservative criteria below for which it is generally assumed that there is no potential for unacceptable *risk* to human health. The derivation of a SAL is based on conservative exposure and land-use assumptions.

However, if an applicable *regulatory standard* exists that is less than the value derived by *risk*-based computations, it will be used for the SAL.

screening assessment — A process designed to determine whether contamination detected in a particular *medium* at a site may present a potentially unacceptable human-health and /or ecological *risk*. The assessment utilizes screening levels that are either human-health or ecologically based concentrations derived by using *chemical*-specific toxicity information and standardized exposure assumptions below which no additional actions are generally warranted.

sediment — (1) A mass of fragmented inorganic solid that comes from the weathering of rock and is carried or dropped by air, water, gravity, or ice; or a mass that is accumulated by any other natural agent and that forms in layers on the earth's surface such as sand, gravel, silt, mud, fill, or loess. (2) A solid material that is not in solution and either is distributed through the liquid or has settled out of the liquid.

sensitivity — An indication of the lowest *analyte* concentration that can be measured with a specified degree of confidence.

serial dilution sample — A requirement of *EPA* Method 6010B (Inductively Coupled Plasma-Atomic Emission Spectrometry). Serial dilutions are made by performing a series of dilutions of an *aliquot* taken from a stock solution for a *target analyte*. The first dilution of the original stock solution serves as the stock solution for the second dilution and the second dilution serves as the stock solution for the third dilution and so on. To meet the requirement of *EPA* Method 6010B, one serial dilution *analysis* must be performed for each *matrix* in every *sample* batch, with a minimum of one serial dilution sample per 20 samples. The serial dilution *analysis* is accomplished by diluting the *sample(s)* by a factor of five and comparing the dilution-corrected results to those of the undiluted parent *sample(s)*. The serial dilution results are required to agree within +/-10% of the undiluted parent *sample* results, where the undiluted results are greater than or equal to the *method detection limit*.

simple random sample — A sampling design where every possible *sample* (sample unit) has an equal probability of being selected.

single blind sample — A *performance-evaluation sample* submitted for *analysis* whose sample identity is known to the analyst and whose composition is known to the submitter but not to the analyst.

site characterization — Defining the pathways and methods of *migration* of the *hazardous waste* or *constituents*, including the *media* affected, the extent, direction and speed of the *contaminants*, complicating factors influencing movement, concentration profiles, etc. (US Environmental Protection Agency, May 1994. "RCRA Corrective Action Plan, Final," Publication EPA-520/R-94/004, Office of Solid Waste and Emergency Response, Washington, DC)

site conceptual model — A qualitative or quantitative description of sources of contamination, environmental *transport* pathways for contamination, and biota that may be impacted by contamination (called *receptors*) and whose relationships describe qualitatively or quantitatively the *release* of contamination from the sources, the movement of contamination along the pathways to the exposure points, and the uptake of *contaminant* by the *receptors*.

soil gas — Those gaseous elements and compounds that occur in the void spaces in unsaturated rock or soil. Such gases can move through or leave the rock or soil, depending on changes in pressure.

soil water — Water in the *unsaturated zone*, regardless of whether it occurs in soil or rock.

solid waste — Any garbage; refuse; sludge from a waste *treatment* plant, water-supply *treatment* plant, or air-pollution-control facility; and other discarded material including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations and from community activities.

solid waste management unit (SWMU) — Any discernible unit at which *solid wastes* have been placed at any time, irrespective of whether the unit was intended for the management of *solid or hazardous waste*. Such units include any area at a facility at which *solid wastes* have been routinely and systematically *released*. This definition includes regulated units (i.e., landfills, surface impoundments, waste

piles, and land *treatment* units) but does not include passive leakage or one-time spills from production areas and units in which wastes have not been managed (e.g., product-storage areas).

split sample — A *sample* that has been subdivided into two or more portions which are expected to be of the same composition. Used to characterize within-sample heterogeneity, *sample* handling, and measurement variability.

spring — The site where *groundwater discharges* to the ground surface.

stakeholder — As used in this document, stakeholder refers to any party or agency, whether inside or outside the Laboratory, interested in or affected by Environmental Restoration Project issues and activities.

standard operating procedure (SOP) — A document that details the method for an operation, *analysis*, or action with thoroughly prescribed techniques and steps, and is officially approved as the method for performing certain routine or repetitive tasks.

stratification — Classification of the target *population* into two or more nonoverlapping and exhaustive categories (strata) on the basis of characteristics which are known *a priori* for the entire *population*.

stratified sample — A *sample* including one or more specimens from each of several subpopulations of the target *population*. (Note: If the specimens are selected from within each subpopulation using *simple random sampling*, then the *sample* is called a stratified random sample.)

stratigraphy — The science dealing with the succession, age, composition, and history of strata.

subsample — See *aliquot*.

surrogate compound or surrogate — An organic compound used in the analyses of organic *target analytes* that is similar in composition and behavior to *target analytes* but is not normally found in *field samples*. *Surrogates* are added to every blank and spike sample to evaluate the efficiency with which *analytes* are recovered during extraction and *analysis*.

target analyte — An element, *chemical*, or parameter, the concentration, mass, or magnitude of which is designed to be quantified by use of a particular test method.

technical area (TA) — The Laboratory established technical areas as administrative units for all its operations. There are currently 49 active TAs spread over 43 square miles.

topography — The physical configuration of the land surface in an area.

total propagated uncertainty (TPU) — The range of concentrations (expressed as plus or minus the measured concentration) that include the theoretical or true concentration of an *analyte* with a specific degree of confidence. Radiochemical results are required to be accompanied by *sample*-specific uncertainty bounds (TPU) that reflect the 67% confidence level (1-sigma TPU). The TPU includes not only the measurement or counting *error* but also the technique-specific *error* term that includes uncertainty values for each contributing measurement process and a sample-specific contribution reflecting specific *chemical* recoveries, detectors used, etc. All radiochemical result uncertainties incorporate terms for technique-related and sample-specific measurement *errors*.

toxic pollutants — The 126 individual priority toxic pollutants contained in 65 toxic compounds or classes of compounds (including organic pollutants and metals) adopted by the *EPA* pursuant to Section 307 (a) (1) of the Clean Water Act (DOE 1991).

tracer — A substance, usually a radioactive isotope, added to a *sample* to determine the efficiency (*chemical* or physical losses) of the *chemical* extraction, reaction, or *analysis*. The tracer is assumed to behave in the same manner as that of the target *radionuclides*. Recovery guidelines for tracer results are 30% to 110% under the current contract laboratory statement of work and will be 40% to 105% under the new statement of work. Correction of the analytical results for the tracer recovery is performed for each *sample*. The concentration of the tracer added needs to be sufficient to result in a maximum of 10% uncertainty at the 95% confidence level in the measured recovery.

transmission loss — Reduction in surface water flow by seepage into the channel bed.

transmissivity — A measure of the rate at which water is transmitted through a cross section of *aquifer* having the dimensions unit width and total saturated thickness as height, under a unit *hydraulic gradient*; also *hydraulic conductivity* times *aquifer* thickness.

transport or transportation — The movement of a *hazardous waste* by air, rail, highway, or water. (40 CFR 260.10)

treatment — Any method, technique, or process, including elementary neutralization, designed to change the physical, *chemical*, or biological character or composition of any *hazardous waste* so as to neutralize such waste; recover energy or material resources from the waste; or so as to render such waste nonhazardous or less hazardous; safer to *transport*, store, or dispose of; or amenable for recovery or storage; or reduced in volume.

treatment, storage, and disposal (TSD) facility — An interim status or permitted facility in which *hazardous waste* is treated, stored, or disposed.

trip blank — A *sample* of *analyte*-free media taken to the sampling site and returned to the analytical laboratory unopened along with *samples* taken in the field. Used to monitor cross contamination of *samples* during handling and storage both in the field and in the analytical laboratory.

tuff — A compacted deposit of volcanic ash and dust that contains rock and mineral fragments accumulated during an eruption.

underground storage tank [as defined in Section 9001(1) of the Solid Waste Disposal Act] — The term "underground storage tank" means any one or combination of tanks (including underground pipes connected thereto) which is used to contain an accumulation of regulated substances, and the volume of which (including the volume of the underground pipes connected thereto) is 10% or more beneath the surface of the ground. Such term does not include any

(a) farm or residential tank of 1,100 gallons or less capacity used for storing motor fuel for noncommercial purposes;

(b) tank used for string heating oil for consumptive use on the premises where stored;

(c) septic tank;

(d) pipeline facility (including gathering lines) regulated under

(i) the Natural Gas Pipeline Safety Act of 1968 (49 USC App. 1671 et seq.),

(ii) the Hazardous Liquid Pipeline Safety Act of 1979 (49 USC App. 2001 et seq.), or

(iii) which is an intrastate pipeline facility regulated under state laws comparable to the provisions of law referred to in Clause (i) or (ii) of this subparagraph;

(e) surface impoundment, pit, pond, or lagoon;

(f) stormwater or wastewater collection system;

(g) flow-through process tank;

(h) liquid trap or associated gathering lines directly related to oil or gas production and gathering operations; or

(i) storage tank situated in an underground area (such as a basement, cellar, mine working, drift, shaft, or tunnel) if the storage tank is situated upon or above the surface of the floor.

US Department of Energy (DOE) — Federal agency that sponsors energy research and regulates nuclear materials for weapons production.

US Environmental Protection Agency (EPA) — Federal agency responsible for enforcing environmental laws. While state regulatory agencies may be authorized to administer some of this responsibility, the EPA retains oversight authority to ensure protection of human health and the environment.

watershed — The region drained by, or contributing waters to, a stream, lake or other body of water and separated from adjacent drainage areas by a divides such as a ridge or summit of high ground.

Appendix B

Site Descriptions

B-1.0 Operational History of PRSs in the TA-35 Subareas

The PRSs addressed in this aggregate SAP are presented below by subarea. Additional information about each PRS site located at TA-35 can be found in the RFI work plan for OU 1129 (LANL 1992, 07666). ER Project RFI samples collected from each PRS and the subsequent analytical results are presented in Appendix C of this aggregate SAP.

B-1.1 Mesa Top Subarea

The TA-35 WWTP spans the boundary of the Mesa Top Subarea and the Pratt Canyon Subarea. The Mesa Top Subarea is made up of 9 single PRSs and 2 PRS consolidation units which include components of the former WWTP, former container storage areas, an abandoned septic system, an area of surface deposition of stack emissions, oil spills, and former oil-handling facilities as categorized below.

- consolidated WWTP components; PRS 35-003(a)-99
- oil/organic chemicals spills/storage/treatment; PRS 35-003(j)-99, 35-004(a,h), 35-014(f), 35-015(a), 35-018(a)
- septic system; 35-009(a)
- underground waste oil storage tank; 35-011(d)
- radionuclide-contaminated soil from stack emissions; 35-014(a)
- soil contamination from reactor; 35-002

The PRSs for the Mesa Top Subarea are presented below in alphanumeric order, except in the case of the WWTP PRSs, which are presented together because they have been consolidated as one unit: PRS 35-003(a)-99.

PRS 35-002, MDA X, lies under 0.05 acres of an asphalt parking lot near the southeast corner of building TA-35-2, a laboratory and office building (DOE, 1987, 8664). MDA X is the burial site of the Los Alamos Power Reactor Experiment No. 2 (LAPRE-II) reactor, which was defueled and decommissioned in 1959 (Harper 1979, 835). Reactor components that were buried in place included the reactor pressure vessel, the fuel reservoir, the connecting pipe, and possibly others (Warren 1974, 910; Roberson 1991, 21577). LAPRE-II and associated structures were removed from MDA X in 1991 (Gonzales 1991, 31992). Soil sampling conducted during a 1990 D&D site characterization effort revealed minimal contamination at a depth of 15 ft on the east side of the reactor. One sample, collected from backfill located 2 ft from the reactor, contained europium-152 as the primary contaminant at 217 pCi/g (Montoya 1990, 877). Cesium-137 was also discovered in the soil in concentrations up to 8 pCi/g (Roberson 1991, 21577). Samples collected from five other boreholes yielded no radioactive contamination. Confirmatory soil sampling was conducted in 1991 by the Laboratory's HSE-8 group to verify the removal of all contaminants of concern (Fresquez 1991, 822).

Consolidated PRS 35-003(a)-99 includes more PRSs than are contained within the Mesa Top Subarea. The PRSs investigated in this aggregate SAP from PRS 35-003(a)-99 are components of the TA-35 WWTP, PRSs 35-003(a, b, c, f, g, h, m, misc., n, o, p). Individual WWTP components or structures not listed here, are addressed within their respective subarea discussion.

The TA-35 WWTP operated from 1951 until 1963. The treatment plant received and processed air and liquid wastes from radiochemistry laboratories and from the operations of the radioactive lanthanum-140 hot cells located in building TA-35-2, where kilocurie sources of lanthanum-140 were prepared during the

1950s. The liquid wastes from the laboratories were acidic, and the radioactivity in the waste came from barium-140, lanthanum-140, strontium-89, strontium-90, and yttrium-90 (Emelity 1958, 793).

From 1951 to 1955 the treated wastewater was stored in four concrete tanks (tank farm TA-35-10) for approximately six months to allow the lanthanum-140 to decay. The water was either allowed to evaporate, or was used to wash air-cleaning filters (Emelity 1958, 793). If the incoming waste volumes were greater than losses through evaporation, the stored water was released to Pratt Canyon. Because the holding tanks did not have a gravity drainline to the canyon, all contents were pumped through TA-35-7 for treatment and discharged through a daylight diversion channel (LASL 1959, 25250; LASL 1952, 25236). Several reports mention that the holding tanks accidentally over-filled and spilled contaminated liquids directly into Pratt Canyon. These occasional spills were probably the only discharges that did not flow through the daylight diversion channel.

The daylight diversion channel was constructed around the west and south sides of the tank farm to collect all surface runoff and the discharge from the floor drains in the pump pit and pipe trench. The daylight diversion channel collected all routine discharges from the wastewater treatment plant. During plant operations, 2000 to 3000 gal. of liquid per day were discharged to the south rim of Pratt Canyon southeast of the tank farm.

In 1953, assays of the storage tanks indicated the presence of waste components with half-lives greater than those expected for the lanthanum-140 and barium-140 (Buckland 1953, 770). These components were primarily strontium-89 and strontium-90, which were present in lanthanum-140 and barium-140 shipments (Meyer 1954, 874). Additional treatment of the wastes was required to ensure that the activity of the treated wastewater discharged to Pratt Canyon did not exceed allowable limits (Meyer 1954, 874). In 1955 an experimental treatment system, consisting of a cation-exchange column, was installed to remove the radioactive strontium and the treated wastewater recirculated. This pilot plant was in operation from January 24, 1956, through March 13, 1957. During this period, more wastewater was recirculated than was discharged to the canyon. Results of this operation were promising, and the system was expanded to include two ion-exchange columns as well as chemical treatment of the wastewater. After additional modifications, the "New Ten Site" wastewater treatment plant went into operation on June 13, 1960, and continued operating in that mode until operation ceased in 1963. TA-35 waste processing operations were transferred to the TA-50 RLWTF in 1963. However, wastes from building TA-35-2 continued to pass through the phase separator pit and were temporarily stored in the concrete holding tanks, TA-35-10.

D&D activities at the TA-35 WWTP were conducted during the 1980s and again during the mid- to late-1990s (Cox 1985, 780; LANL 1996, 59379; and LANL 1997, 58737). WWTP structures associated with Pratt Canyon Subarea PRSs were removed during D&D activities in the 1980s; WWTP structures associated with the Mesa Top Subarea PRSs were removed during D&D activities conducted during the 1980s and 1990s.

PRSs 35-003(a, b, and c) are underground holding tanks associated with PRS 35-003(n), the phase separator pit (PSP). The exhaust from laboratory hoods was routed to the PSP for removal of liquids before being sent to the air filter building (former TA-35-7, PRS 35-003[p]). The liquid wastes from building TA-35 were stored temporarily in one of the three underground holding tanks where the liquid was caustic-treated for acidity before being sent to the large concrete holding tanks (former structure TA-35-10, PRS 35-003[d]) at the east end of TA-35. The PSP and the holding tanks were a closed system in which liquid flowed from building TA-35-2 into the PSP, into the tanks for temporary storage, and at some later time, back into the PSP for treatment. It is not known exactly when the PSP and the three holding tanks were last used—possibly in the mid-1970s or early 1980s. The structures were probably not used after 1985, when the pipeline from structure TA-35-10 to TA-50 was removed. There are no documented intentional or accidental releases from this system. The PSP and the three holding tanks were the subject of D&D and

were removed in 1996. The ER Project performed verification sampling in concert with the D&D activities; the sample results are presented in Appendix C of this aggregate SAP. Actual volume of low-level solid waste removed from the north and south sides of TA-35-2, including soil below the phase separator pit and holding tanks, is approximately 2265 yd^3 of low-level radioactive waste and 20 ft^3 of mixed waste. The bottom of the excavations was 20 to 30 ft below ground surface (bgs) and backfilled with clean soil (LANL 1997, 58737).

PRS 35-003(f) is a former flocculator tank (structure TA-35-37). The flocculator tank was added as part of the wastewater treatment plant in 1956 and used until 1963 when the plant was abandoned. The tank was removed in 1980 to prepare for D&D of the treatment plant's underground liquid waste lines (Cox 1985, 780). ER Project RFI samples were collected from this site as part of consolidated PRS 35-003(e)-99. Results are presented in Appendix C of this aggregate SAP.

PRS 35-003(g) is the former site of an ion exchange column regenerant tank. This tank was added along with the flocculator tank [PRS 35-003(f)] in 1956 and used until 1963 when the plant was abandoned. The regenerant tank was removed in 1980 to prepare for the D&D of the WWTP's underground liquid waste lines (Cox 1985, 780). ER Project RFI samples were collected from this site as part of consolidated PRS 35-003(e)-99. Results are presented in Appendix C of this aggregate SAP.

PRS 35-003(h) is the site of a former concrete retention tank. The tank was constructed in 1961 and added as a component of the WWTP. The tank had dimensions of 8 ft x 12 ft x 10 ft deep and was connected to buildings TA-35-41 and TA-35-10 by 4-in diameter stainless steel underground pipes. The retention tank and associated piping were removed in February 1985 during the Laboratory's RLWLR project (Elder et al. 1986, 3089). The tank and excavated soil were screened for radioactive contamination during the removal. No detection of radionuclides was documented. ER Project RFI samples were collected from this site as part of consolidated PRS 35-003(e)-99. Results are presented in Appendix C of this aggregate SAP.

PRS 35-003(m) is the former site of a 1000-gal. underground sludge tank (structure TA-35-22). The tank was part of a pilot plant scale unit meant to remove strontium-90 from waste sludge. The sludge tank was removed in August 1981. During the removal, the soil surrounding the tank had concentrations of strontium-90 and cesium-137 at levels up to 46,000 dpm/g (the method for this measurement was not documented). Soil from around the tank was excavated laterally until activity could not be detected above background, and below the tank to bedrock—a depth of 10 ft bgs. At this depth, fractures in the rock measured by radiation field-screening instruments had activity levels as high as 5000 pCi/g gross beta (McAtee 1981, 872). The decision was made to stop the excavation to avoid the large enterprise of further soil removal and because the risk of exposure was insignificant. This concrete tank was excavated and removed in one load to TA-54. Contaminated soil was left at 10-ft deep in solid tuff in this excavation. The excavation was backfilled with clean soil material and paved over with asphalt. ER Project RFI samples were collected from this site as part of consolidated PRS 35-003(e)-99. Results are presented in Appendix C of this aggregate SAP.

PRS 35-003(misc.) consists of the network of underground lines connecting the various structures of the TA-35 WWTP. Most of the piping of the waste disposal system was constructed from stainless, black, or galvanized steel with screwed or welded joints (LANL Eng. Drawing C14266). The majority of these lines were removed from 1981 through 1985, during the RLWLR project (see Table B-1.1-1) (Elder et al. 1986, 3089). Releases of radioactive contamination to the environment from these lines were documented (Cox 1985, 780; Cox 1985, 781; Cox 1985, 782; and Cox 1985, 785). The releases typically occurred at depths of 15 to 20 ft bgs in the trenches containing the lines. Extent of contaminant migration from these releases had not been determined (LANL 1996, 54422) until a D&D event occurred in 1996 at which time building TA-35-07 and associated piping were removed, including the lines designated as PRS 35-003(misc.)

(LANL 1997, 58737). The ER Project provided verification sampling during the 1996 D&D; the results are presented in Appendix C.

Table B-1.1-1
RLWLR Project's TA-35 Line Removal Summary

Line Number	Type[a]	Diameter (in.)	Length Removed (ft)	Length Left (ft)	Average Depth (ft)	Waste Volumes Removed (m^3)		Average Activity[b] ($dpm/100\ cm^2$)
						Pipe	Soil	
68	SS	3	24	—	3	0.5	—	Background
69	BS	4	17	—	4	1	—	Background
70	SS/BS	4	268	35	3	7	—	Background
71	VCP	4	48	150	3	0.5	—	Background
72	BS	4	122	—	4	1.5	—	Background
73-89	SS	1-3	289	—	3	5	—	5mR/hr
90	SS	2	138	120	3	1.5	31	3mR/hr
90A	SS	3	50	—	6	1	66	5mR/hr
90B	BS	1	140	—	15	3	157	5mR/hr
90C	BS	1	22	—	—	—	—	—
91	BS	3	139	71	15	—	—	20mR/hr
92	BS	2	137	73	15	—	—	20mR/hr
93	GS	1	100	—	—	—	—	—
94	BS	2	35	—	—	—	—	—
95	DI	2	82	—	—	—	—	—
96	SS	2	12	—	—	—	—	—
97	SS	3	144	—	—	—	—	—
98	SS	2	150	—	—	—	—	—
99	SS	2	150	—	—	—	—	—
114	SS	3	17	—	3	0.5	—	50mR/hr

Source: Table derived from Radioactive Liquid Waste Line Removal Project report, LA-10821-MS

[a] Type symbols: SS = stainless steel, BS = black steel, VCP = vitrified clay pipe, GS = galvanized steel, DI = duriron.

[b] Alpha radiation from plutonium-238 or plutonium-239 unless otherwise noted; dose rates in mR/hr are at contact.

PRS 35-003(o) is the site of a former manhole, structure number TA-35-12. The manhole, subsurface Line 90A, and 86 yd^3 of contaminated soil adjacent to the east wall of the Air Filter Building (TA-35-7) were excavated and removed in January 1985 (Cox 1985, 782). Following the removal, 15 soil samples were collected. These samples contained up to 7145 pCi/g of beta activity. Because further excavation may have compromised the integrity of the excavation walls, the area was backfilled and paved over with asphalt (Cox 1985, 781). ER Project RFI samples were collected from this site as part of consolidated PRS 35-003(e)-99. Results are presented in Appendix C of this aggregate SAP.

PRS 35-003(p) is the former site of the Air Filter Building, TA-35-7. Radioactive air was filtered in this building and the cleaning filters were washed by tap water and/or long-decayed wastewater from the tank farms. This long-decayed wastewater was contaminated with strontium-89 and strontium-90. Build up of strontium in the air filters became a problem and required numerous washings, which produced more radioactive wastewater. The large volumes of water overwhelmed the storage capacity of the system which led to spills, overflows, and unplanned releases to Pratt Canyon (Emelity 1958, 793). The Air Filter Building was first the subject of D&D in 1980. A second D&D event occurred in 1996 at which time the

building and associated piping was removed (LANL 1997, 58737). The ER Project provided verification sampling during the 1996 D&D; the results are presented in Appendix C.

Additional information regarding the TA-35 WWTP operation and releases is presented in the Pratt Canyon Subarea operational history discussion in this appendix and in the work plan for Mortandad Canyon (LANL 1997, 56835).

PRS 35-003(j) is the site of a former aboveground storage tank located east of the north wing of building TA-35-2. This area is a former waste-oil treatment facility. The storage tank was removed in 1988 or 1989 (the actual removal date is not documented). The treatment facility was reported to be leaking dielectric oil in 1988. Subsequently, the leaking equipment was removed, the site backfilled with clean soil material and covered with asphalt to create a parking area (LANL 1996, 54402). ER Project RFI samples were collected from this site as part of consolidated PRS 35-003(j)-99. Results are presented in Appendix C of this aggregate SAP.

PRS 35-003(k) is the site of a former 12-ft-by-33-ft aboveground storage tank (TA-35-97) located 23 ft west of the northwest corner of TA-35-29. The storage tank was installed in 1974 and removed in 1976. This area is a former waste-oil treatment facility [PRS 35-003(j)] which was reported to be leaking dielectric oil in 1988. Subsequently, the leaking equipment was removed and the site was backfilled with clean soil material and covered with asphalt to create a parking area (LANL 1996, 54402). ER Project RFI samples were collected from this site as part of consolidated PRS 35-003(j)-99. Results are presented in Appendix C of this aggregate SAP.

PRS 35-004(a) is made up of outdoor storage areas previously used to store drums of oil and drums containing organic chemicals. The areas are located east and south of TA-35-25, the Sodium Building. Stained soil was observed at the site during a 1988 reconnaissance. Ten ER Phase I RFI samples were collected [for both PRSs 35-004(a) and 35-009(e)] in 1994. No risk-based COPCs were identified from this site. In 1995, contaminated soil was removed from the storage area (to an approximate 8-ft depth) concurrent with the D&D of TA-35-7, the Air Filter Building (LANL 1997, 58737). Four ER Project RFI samples were collected in 1998 from this site. Results are presented in Appendix C of this aggregate SAP

PRS 35-004(h) consists of an area, near the northeast corner of building TA-35-7, which was formerly used to store containers of oils, capacitors, and organic chemicals like freon. The area is no longer used as a storage area and the date of closure is not documented. The disposition of the containers is not documented. Stained soil was observed at the site during a 1988 reconnaissance. Building TA-35-7 was first the subject of D&D in 1980. A second D&D event occurred in 1996 at which time the building and associated piping were removed (LANL 1997, 58737) along with this PRS area. ER Project RFI sample results are presented in Appendix C of this aggregate SAP.

PRS 35-009(a) is a septic system that operated from 1951 to 1975. The structures that make up PRS 35-009(a) are TA-35-14, a 1500-gal septic tank (approximately 10 ft long by 4 ft wide by 5 ft deep) buried about 4 ft bgs; TA-35-15, a dosing chamber; and, TA-35-16, a distribution box. These structures were abandoned in place when new sanitary sewer lines were routed to the sewage lagoons [PRSs 35-010(a-c)] located east of TA-35 in Ten Site Canyon. The septic system discharged to drain fields on the south-facing slope of Ten Site Canyon. The septic system received sanitary wastes and possibly received industrial and radiological wastes from building TA-35-2. Specific waste stream information is not available (LANL 1992, 7666). Historical operations at TA-35-2 involved the use of lanthanum-140. Two nuclear reactors were housed in TA-35-2, as well as plutonium laboratories and lithium titride operations (LANL 1992, 7666). The site was cleaned up during a VCA reported in September 1996 (LANL 1996, 55071). The VCA included removal and disposal of the tank contents and filling the tank with concrete. PRS 35-009(a) is located near the southwest corner of building TA-35-34 in the Mesa Top Subarea; releases from the septic system and

leachfield are hypothesized to span the boundary of the Ten Site Slope Subarea. ER Project RFI and VCA sample results are presented in Appendix C of this aggregate SAP.

PRS 35-011(d) consists of two 6000-gal. USTs formerly located at the southeast corner of the High Voltage Development Laboratory, building TA-35-188. The tanks were installed in 1969 and were used to store contaminated dielectric oil used in building TA-35-188 (LANL 1990, 7511). These tanks were removed in accordance with NMED UST regulations in the summer of 1991. The tanks were inspected and found to be in good condition; samples were collected for TPH only (Carmichael 1991, 14618). An adjacent area of stained soil, PRS 35-014(f), was determined to be from a leaking oil-handling facility formerly located above the tanks and not from the tanks themselves. A description of PRS 35-014(f) is presented in the Mesa Top Subarea discussion in this appendix.

PRS 35-014(a) is a former area of soil contaminated by laboratory radionuclide emissions from a tritium glovebox facility. The area is located on the southwest side of TA-35-2. The facility released several thousand curies of tritium annually to the atmosphere between 1954 and 1979. Analyses of peach and leaf samples from trees located just beneath the exhaust stack indicated slightly elevated concentrations of tritium, strontium-90, total uranium, plutonium-238 and plutonium-239. The ER Project has collected several samples from the area both after the 1980 decommissioning of services from the building and the 1996 D&D, at which time the building and associated piping was removed (LANL 1997, 58737). ER Project sample results are presented in Appendix C of this aggregate SAP.

PRS 35-014(b) is the former site of a leaking barrel of dielectric oil east of building TA-35-2. The oil contained PCBs at a concentration of 50.4 µg/g. The barrel was a 55-gal. drum discovered to be leaking in 1985. The drum was labeled "DIALA AX, S03287, Shell Oil." The drum was removed and Laboratory group HSE-7cleaned the site (LANL 1996, 54402). ER Project RFI samples were collected from this site as part of consolidated PRS 35-003(j)-99. Results are presented in Appendix C of this aggregate SAP.

PRS 35-014(d) is an area of soil stained by oil spills. It is the former location of two oil siege tanks PRSs 35-003(j and k) at the southwest corner of building TA-35-29. The soil at the site may be stained by dielectric oil that leaked from hose connections at the tanks. The volume of the oil leak is not documented. The site was backfilled in 1988 or 1989 with clean soil material and covered with asphalt to create a parking area (LANL 1996, 54402). ER Project RFI samples were collected from this site as part of consolidated PRS 35-003(j)-99. Results are presented in Appendix C of this aggregate SAP.

PRS 35-014(f) consists of an area of soil stained by oil spills. This PRS is located on the east side of the High Voltage Development Laboratory, TA-35-188. The stained soil was located under the base of a compressor that was part of a dielectric oil-handling system that connected a pair of USTs [PRS 35-011(d)] to TA-35-188 (Roberson 1991, 21576). The site was cleaned up during a 1996 ER Project VCA; 45 yd^3 of TPH-contaminated waste was removed (LANL 1996, 53783). Results of the samples collected are presented in Appendix C. A description of PRS 35-011(d) is presented in the Mesa Top Subarea discussion in this appendix.

PRS 35-015(a) is the site of a decommissioned tank farm and waste-oil treatment facility formerly located west of Building TA-35-86. The former waste-oil treatment facility reprocessed used dielectric oil from the Helios CO_2 laser in building TA-35-86 and included oil surge tanks TA-35-149 through TA-35-154, a grease trap, and an oil-treatment unit. When the oil recycling process was complete, separated water was discharged into Ten Site Canyon through a storm sewer (DOE 1987, 8663). Spills from the tank farm were also discharged to a storm sewer and into Ten Site Canyon near TA-35-207 (LANL 1990, 7511). Field notes recorded during a 1988 ER Project environmental survey noted a "bad" oil spill at the surge tanks (Shafer 1988, 41150). This is believed to be the same spill, designated as PRS 35-014(g3), that ran into Ten Site Canyon south of TA-35-207. PRS 35-014(g3) is discussed in the Ten Site Slope Subarea opera-

tional history section of this appendix. The tank farm and treatment facility was decommissioned and removed in late 1988 or 1989 (Roberson 1991, 21576). ER Project RFI sample results are presented in Appendix C of this aggregate SAP.

PRS 35-015(b) is the former site of an oil-handling facility located on the southwest side of building TA-35-29. The facility was used to treat oil from the Gemini gas laser. This facility was found to be leaking dielectric oil in 1988 and was removed during 1989 and 1990 (Shafer 1988, 41150). The volume of the leak is not documented and there is no documentation of a cleanup effort after the leak was discovered. However, the site was backfilled with clean soil material and covered with asphalt to create a parking area (LANL 1996, 54402). ER Project RFI samples were collected from this site as part of consolidated PRS 35-003(j)-99. Results are presented in Appendix C of this aggregate SAP.

PRS 35-018(a) is the former site of a reported leaking transformer. The transformer was documented as leaking onto a porous concrete pad with no spill containment or drip pan. The transformer was added to a daily transformer inspection list (Atencio 1985, 755). The extent of the release to the underlying pad was not documented. The transformer was observed again during a site inspection in August 1991 and no evidence of past or present leakage was documented (Roberson 1991, 21578). The site was cleaned up during a 1996 ER Project VCA; 9 yd^3 of PCB-contaminated waste was removed (LANL 1996, 55063). VCA confirmatory sample analyses are presented in Appendix C.

B-1.2 Ten Site Slope Subarea

Operational releases within the Ten Site Slope Subarea may contain a variety of inorganic, organic, and radiological contaminants as a result of past Laboratory operations. Oil spills contributed a number of organic chemicals; septic systems received both inorganic and organic chemicals from TA-35 laboratory buildings and, in some cases, received radionuclides as well. Outfalls connected to drains inside laboratory buildings possibly received undocumented releases of chemicals in all three categories. Stormwater outfalls discharge water containing chemicals derived from parking lots and roadways. Any or all portions of the Ten Site Slope Subarea probably received radionuclide contamination, including tritium and plutonium, from stack emissions at building TA-35-2 between 1954 and 1979.

The Ten Site Slope PRSs are related primarily to buildings TA-35-86 (carbon dioxide laser building), TA-35-125 (Antares carbon dioxide laser building), TA-35-25 (sodium building), TA-35-67 (warehouse), and TA-35-2 (laboratory and office building). The PRSs are either located on, or adjacent to, the north slope of Ten Site Canyon or are outfalls that discharge onto that slope. The Ten Site Slope Subarea is made up of 6 single PRSs and 4 PRS consolidation units which include container storage areas, abandoned sanitary septic systems, oil spills and stains, and several different kinds of outfalls as categorized below.

- container storage area runoff; 35-004 (g), 35-004(m)
- abandoned sanitary septic system outfalls; 35-009(a), 35-009(b),
- floor drain outfall; 35-009(e)
- former oil-stained asphalt/spills; 35-014(g1), 35-014(g2), 35-014(g3)
- stormwater outfalls and daylight channel/trench; 35-016(j), 35-016(n), 35-016(q)
- inactive outfalls from noncontact cooling water; 35-016(a), 35-016(c), 35-016(d)
- outfall from treated photographic processing effluents; 35-016(b)

- Soil contamination from reactor (steam blow-off line from LAPRE I and II); 35-017

The PRSs for the Ten Site Slope Subarea are presented below in alphanumeric order.

PRS 35-004(g) is an asphalt-paved former storage area for potentially hazardous waste originating throughout TA-35. This PRS was located on the south side of TA-35-67, a warehouse. During a site investigation stained soils were observed and three soil samples were collected. These samples had low alpha and gamma activities; the only chemicals detected were some unspecified metals and acetone. At the time of the 1995 ER Project RFI investigation, no storage containers were present; however, several small oil stains and piles of debris were present which contained electrical cables, pallets, a small spill of what appeared to be iron pellets, and other scrap (LANL 1996, 54763). ER Project RFI sample results are presented in Appendix C of this aggregate SAP.

PRS 35-004(m) is a former storage area [collocated with PRS 35-014(g2)]for containers of organic chemical solutions, freon, oil, and rags. The site is a partially asphalted strip, approximately 5 ft by 25 ft, adjacent to the paved area south of Building TA-35-86. The site is bound to the north by a curb that separates the container storage area from an asphalt-paved road that accesses the south side of TA-35-86. The site is bordered to the south by the TA-35 security fence. A metal chemical storage building and a trash dumpster believed to have originated at the firing sites at TA-15 were present on the site at the time of the Phase I RFI sampling in 1995, but have since been removed (LANL 1996, 54763). The location is no longer used as a container storage area. ER Project RFI sample results are presented in Appendix C of this aggregate SAP.

PRS 35-009(a) is a septic system located near the southwest corner of building TA-35-34 in the Mesa Top Subarea. It operated from 1951 to 1975 and was abandoned in place when new sanitary sewer lines were routed to the sewage lagoons [PRSs 35-010(a-c)] located east of TA-35 in Ten Site Canyon. The septic system discharged to drain fields on the north slope of Ten Site Canyon. The septic system received sanitary wastes and possibly received industrial and radiological wastes from building TA-35-2. Specific waste-stream information is not available (LANL 1992, 7666). The site was cleaned up during an ER Project VCA reported in September 1996 (LANL 1996, 55071). The VCA included removing and disposing of the tank contents and filling the tank with concrete. VCA verification sample results are presented in Appendix C of this aggregate SAP.

PRS 35-009(b) is an abandoned, inactive sanitary septic system located south of building TA-35-67, a warehouse. The septic system operated from 1966 to 1975, during which time it handled sanitary wastes and may have received a variety of industrial wastes including radionuclides. The septic system included a septic tank, dosing chamber, distribution box, and associated leach field (dimensions and depths are not documented). The septic tank was a steel or steel-lined concrete tank, approximately 4 ft x 4 ft x 4 ft, with its base approximately 10 ft bgs. The dosing chamber's dimensions are not documented, but its base was also approximately 10 ft bgs. The distribution box was a 15-ft deep manhole lined with corrugated metal pipe. Specific waste stream and volume of discharge information is not documented. During an ER Project VCA conducted in 1996, 3 ft of water were observed in the dosing chamber; the distribution box was dry at the time of the investigation (LANL 1996, 54107; LANL 1996, 54967). The VCA included removing and disposing of the tank contents and filling the tank with concrete. VCA verification sample results are presented in Appendix C of this aggregate SAP.

PRS 35-009(e) is a 4-in. vitrified clay tile pipe installed in 1956 to service 6 floor drains inside building TA-35-25. The pipe runs 30 ft from the building to daylight near the north rim of Ten Site Canyon; a ditch was dug from the end of the tile pipe to drain into the canyon. The drainline does not pass through a septic tank or leach field. The outfall has not been located to date and may have been covered by asphalt. ER Project RFI sample results are presented in Appendix C of this aggregate SAP.

PRS 35-014(g_1) is the site of a former oil spill on concrete adjacent to an asphalt-paved catchment basin located at the northeast corner of building TA-35-207, an experimental support laboratory. The catchment basin directs stormwater flow to PRS 36-016(n), a CMP outfall and daylight drainage channel. A small oil stain remains visible on the concrete; however, no obvious oil staining is apparent in the catchment basin or the outfall. The origin and date of the spill is unknown. There is currently no visible sign of the spill or any sign of continued releases at the CMP outfall, as it was reportedly cleaned up in the late 1980s (LANL 1996, 54763).

PRS 35-014(g_2) comprises a number of small oil-stained areas within the former container storage area identified as PRS 35-004(m). The stains were reported to have originated from leaking containers that were formerly stored in the area. The volume and timing of any releases from the containers is not documented. The container storage area is no longer active and was reportedly cleaned up in the late 1980s (LANL 1996, 54763).

PRS 35-014(g_3) is an oil-stained area resulting from a major oil spill that occurred near the former tank farm [PRS 35-015(a)] on the west side of TA-35-86. The amount of oil that was released is not specified, but the source of the spill was reportedly an oil tank truck. The spill flowed southward through a culvert under the road on the south side of TA-35-86, across the parking lot west of TA-35-207, and south through a natural drainage pathway into Ten Site Canyon. The spill occurred some time prior to May 9, 1984, the date of documentation photographs. The path of the spill was clearly visible in a 1986 aerial photograph. The stained area was also observed in August of 1991. At that time, all vegetation in the path of the spill was dead and the area still smelled strongly of oil (Roberson 1991, 21576). The tank farm underwent D&D in 1988/1989 (Roberson 1991, 21576). ER Project RFI sample results are presented in Appendix C of this aggregate SAP.

PRS 35-016(a) is an inactive outfall that was established in 1958 to discharge noncontact cooling water from the Sodium Testing Building (TA-35-34). This outfall discharged into Ten Site Canyon. The PRS included an approximately 70-ft-long drainline, of undocumented construction, between TA-35-34 and the outfall. The outfall was included on National Pollution Discharge Elimination System (NPDES) Permit No. 04A089 until 1985 when it was eliminated from that permit. The volume of cooling water discharged through the outfall is not documented. ER Project RFI sample results are presented in Appendix C of this aggregate SAP.

PRS 35-016(b) is an inactive outfall, established in 1977, which discharged photographic processing effluents and stormwater from roof drains of photo laboratory/office building TA-35-87. The outfall was permitted as NPDES outfall No. 06A132. The effluent discharge volume was limited to 3000 gal./day, released to Ten Site Canyon. Formerly photographic fluids were processed through a silver and cyanide recovery process before being released. The six photographic laboratory waste drains (three floor, three sink) routed to this outfall were either plugged (floor) or rerouted (sink) to the sanitary sewer system (Wastewater Stream Characterization for TA-35, LA-UR-96-1781). ER Project RFI sample results are presented in Appendix C of this aggregate SAP.

PRS 35-016(c) consists of two inactive outfalls established in 1964 to discharge noncontact cooling water from warehouse TA-35-67. The outfalls were operated under former NPDES Permit No. 04A088 and Permit No. 04A012. The two outfalls were combined prior to 1985 under Permit No. 04A012 and deactivated in 1987 (LANL 1990, 7511). ER Project sample results are presented in Appendix C of this aggregate SAP.

PRS 35-016(d) is an inactive outfall that was constructed in 1962 to discharge noncontact cooling water from the Reactor Components Development Building, TA-35-46. This outfall was listed as active on NPDES Permit No. 04A087 in 1985. The outfall became inactive on April 10, 1987. ER Project RFI sample results are presented in Appendix C of this aggregate SAP.

PRS 35-016(j) is an active outfall that was constructed in 1975 to discharge rainwater runoff from TA-35-125 (a carbon dioxide laser building for former Antares project) roof drains and from the fire protection system. A Santa Fe Engineering report (LA-UR-96-1781) documents 8 roof drains and 4 fire protection drains that daylight to the storm drain leading to Ten Site Canyon. There are no laboratory sinks or floor drains connected to this outfall. All rooms/laboratories that housed polishing activities were plumbed directly to the sanitary sewer, floor drains were plugged where polishing occurred. ER Project RFI sample results are presented in Appendix C of this aggregate SAP.

PRS 35-016(n) comprises a CMP outfall (10 in. in diameter) and natural daylight drainage channel installed around 1997 to receive stormwater runoff from the roof and paved area south of TA-35-86, a carbon dioxide laser building, and a grassy slope adjacent to building TA-35-207, an experimental support laboratory. The source of the outfall is a daylight drainage channel that leads to an asphalt-paved catchment basin. The outfall receives flow from the catchment basin via an intake grate. ER Project RFI sample results are presented in Appendix C of this aggregate SAP.

PRS 35-016(q) is an active stormwater outfall and associated trench located southeast of TA-35-34, the Sodium Testing Building. Previous DOE investigation of this PRS consisted of the collection of three sediment samples containing detectable quantities of SVOCs, PCBs, metals, and alpha- and gamma-emitting radionuclides (DOE 1987, 21510). No VOCs or beta emitters were detected in these samples (LANL 1990, 7511). ER Project RFI sample results are presented in Appendix C of this aggregate SAP.

PRS 35-017 is comprised of several areas where former soil contamination occurred from the operation of a power reactor (LANL 1959, 12000; LANL 1953, 4689). This particular location is an outfall from a steam blow-off line from the LAPRE-I and -II reactors. In 1954, the Zia Company installed a 2.5-in. schedule 160 steel exhaust pipe from a reactor at the east end of the basement of building TA-35-2 to the north side of Ten Site Canyon. The steam exhaust line was laid in a concrete trough that had expansion joints every 10 ft and was covered with a 1/8-in.-thick steel plate. There was a 9 ft x 4 ft x 1-ft thick concrete pad cast into the upper brow of the canyon wall. This pad was used as a platform to support rollers that allowed the steam line to expand and contract. The concrete pad was designated as TA-35-23, and was removed in 1957 (Francis 2001, ER2001-0582). Health and safety personnel associated with the reactor experiments noted that, in 1956, on the initial run of the LAPRE-I a "substantial quantity" of "enriched uranium soup" was lost through a steam control valve to the blow-off line. The LAPRE-II, also a high-temperature reactor, was designed to dump superheated steam generated in the reactor vessel to the atmosphere through an air radiator (LANL 1992, 7666). No documentary evidence has been found that the soils were contaminated by the operation of LAPRE-II (LANL 1992, 7666). In 1996, 65 ft of the 2.5-in. line and concrete trough were removed during the Phase Separator Pit D&D (LANL 1996, 59379). Because no contamination was found in this line in 1996, the remainder of the line (approximately 200 ft) and trough, leading to the canyon, was left in place. However, from the description of the MDA X D&D in 1991, it appears as if all of the line has been removed (Gonzales 1991, 31992). Soil sampling conducted during a 1990 D&D site-characterization effort revealed minimal contamination at a depth of 15 ft on the east side of the reactor, and samples collected from five other boreholes yielded no radioactive contamination. The 1991 (non-ER Project) confirmatory sampling was conducted by HSE-8 to verify the removal of all contaminants of concern, including radionuclides and hazardous chemicals (Fresquez 1991, 822).

B-1.3 Mortandad Slope Subarea

Operational histories suggest that the Mortandad Slope Subarea may contain a variety of inorganic, organic, and radiological contaminants as a result of Laboratory operations. Oil spills may have contributed a number of organic chemicals, including PAHs, phthalates, PCBs, and TPHs. A septic system is likely to have received both inorganic and organic chemicals from laboratory buildings and may have received radionuclides as well. Outfalls connected to drains inside laboratory buildings have possibly received undocu-

mented releases of chemicals in all three categories. Stormwater outfalls may discharge water containing chemicals derived from parking lots and roadways, such as PAHs and metals contained in gasoline, motor oil, other automotive fluids, and asphalt. Any or all portions of the Mortandad Slope Subarea may have received radionuclide contamination, including tritium and plutonium, from stack emissions at building TA-35-2 between 1954 and 1979 due to prevailing wind direction. The Mortandad Slope Subarea contains 10 PRSs categorized below.

- outfalls from noncontact cooling water; 35-016(e), 35-016(p)
- stormwater outfalls; 35-016(f), 35-016(i), 35-016(o)
- former container storage area, 35-004(b)
- abandoned septic system; 35-009(c)
- canyonside disposal area; 35-008
- oil spills; 35-014(e1), 35-014(e2)

The PRSs for the Mortandad Slope Subarea are presented below in alphanumeric order.

In general, the PRSs progress in age from east to west as TA-35 facility operations expanded from the eastern end of Ten Site Mesa. PRSs located in the eastern portion of the subarea were established in 1951 and 1961 and are associated with the Ten Site Laboratory, building TA-35-2, and a transportable office building, TA-35-253. Subsequent PRSs to the west were established in the mid- to late-1970s as operations were expanded to the Chemical Laser Facility, building TA-35-85, and the Target Fabrication Building, building TA-35-213.

PRS 35-004(b) is a former asphalt-paved container storage area located at the northeast corner of the Chemical Laser Facility, building TA-35-85. The pad is approximately 25 ft wide by 35 ft long, with its northern edge located about 10 ft from the mesa edge. The storage area is asphalt-paved and has been used to store organic chemical solutions, oils, and rags since 1977. No releases of hazardous materials have been documented at this site, but oil stains on the storage pad itself were reported during an ER Project site reconnaissance in 1988. ER Project RFI sample results are presented in Appendix C of this aggregate SAP.

PRS 35-008 is a former canyon-side disposal area for debris, which includes scrap metal and pipe, paint cans, a 55-gal. drum, and miscellaneous building materials. This PRS is located along the Mortandad Canyon rim north of the center portion of TA-35-85. The debris extends from the canyon rim to the canyon floor. No releases of hazardous materials have been documented from this disposal area. ER Project RFI sample results are presented in Appendix C of this aggregate SAP.

PRS 35-009(c) is an inactive sanitary septic system and leach field located north of the northern edge of TA-35-02. The septic system consisted of a 1290-gal. steel-lined reinforced concrete tank, a distribution box, a manhole cleanout, and a leach field. The leach field covers an area of 1600 ft^2 and is located under an east-west dirt access road that lies along the mesa edge, west of trailer TA-35-261. The system began operation in 1961, treating sanitary waste from TA-35-2 and TA-35-253. The system was pumped out, filled with concrete, and abandoned in place following a 1996 VCA (LANL 1996, 54967). ER Project sample results are presented in Appendix C of this aggregate SAP.

PRS 35-014(e_1) is a dielectric oil spill that was bulldozed off the mesa top. The resulting pile of soil is marked by a sign that reads "Do Not Remove Contact Jay Wenzel, HSE-8." The oil spill occurred when a

forklift punctured an aboveground oil storage tank. The storage tank was removed in 1992 (LANL 1997, 55687). ER Project RFI sample results are presented in Appendix C of this aggregate SAP.

PRS 35-014(e_2) is the site of a former oil spill that originated from overflows of a waste-oil impoundment. The PRS is located about 150 ft northeast of TA-35-85. The impoundment was decommissioned in 1989. Documented releases from this PRS consist of oil spills from the impoundment. Soil samples from oil-stained areas showed detectable PCB concentrations (LANL 1990, 7511). ER Project RFI sample results are presented in Appendix C of this aggregate SAP.

PRS 35-016(e) is an inactive outfall established in 1977 to discharge noncontact cooling water from the Chemical Laser Facility, TA-35-85. This outfall was deleted from NPDES Permit No. 04A090 in April 1987. This PRS is located north of TA-35-85 on the rim of Mortandad Canyon and discharged to the steep slope found there. The volume of water released is not documented, but the erosion that has taken place below the outfall indicates significant amounts of water were released. ER Project RFI sample results are presented in Appendix C of this aggregate SAP.

PRS 35-016(f) is an active storm drain located north of TA-35-85, the Chemical Laser Facility. The outfall consists of a CMP 18 in. in diameter that discharges into a small channel cut into backfill material on the south slope of Mortandad Canyon. Documented releases, consisting of oil spills, have occurred near the source areas for the storm drain. The volume of the spill is not documented. Soil samples from the stained areas had detectable concentrations of PCBs (LANL 1990, 7511). ER Project RFI sample results are presented in Appendix C of this aggregate SAP.

PRS 35-016(i) is an active surface discharge channel that handles stormwater runoff from the area between the east end of TA-35-85 and the main parking lot for TA-35. The outfall is a CMP 18 in. in diameter. Discharge from the outfall has eroded a small channel in the mesa slope to about 3 ft below the outfall and into the tuff bedrock. One ER Project RFI PCB sample result is presented in Appendix C of this aggregate SAP.

PRS 35-016(o) consists of four distinct and active storm drains established in 1951 to handle stormwater runoff from TA-35-02. This PRS also possibly handled TA-35-02 floor drain effluents from the following rooms:

- A10, in which floor drains received leaks and overflow from two 2000-gal. tanks containing low-level radioactive/acid liquid wastes;
- A13, which contained floor drains and four 55-gal. drums of PCB-contaminated waste oil;
- A22, the high-velocity projectile testing room; this room is next to room A23, which is sealed due to high background radiation from the LAPRE-I and LAMPRE reactors that formerly resided in room A23 (LANL 1991, 12451).

The four outfalls comprising PRS 35-016(o) are located on the eastern side of the mesa, on the south slope of Mortandad Canyon, approximately 20 ft. below the mesa edge. The outfalls consist of cast-iron drainpipes (the diameter is not documented). No documented releases of hazardous materials have occurred at these outfalls. ER Project RFI sample results are presented in Appendix C of this aggregate SAP.

PRS 35-016(p) is an unpermitted and active outfall established in 1968 to discharge noncontact cooling water condensate from TA-35-27, the Nuclear Safeguards Research Building (LANL 1990, 7511). A separate reference (Sontag and Jacobson 1996, 54766) states that this outfall discharges only stormwater runoff from the roof of TA-35-27. The outfall is located north and slightly east of TA-35-27 on the south slope of

Mortandad Canyon. No documented releases of hazardous materials have occurred at this outfall. ER Project RFI sample results are presented in Appendix C of this aggregate SAP.

B-1.4 Pratt Canyon Subarea

The TA-35 WWTP spans the boundary of the Mesa Top Subarea and the Pratt Canyon Subarea. The Pratt Canyon Subarea PRSs are primarily structures or releases related to the TA-35 WWTP, which operated from 1951 to 1963. The WWTP components designated as PRSs are

- 35-003(d) holding tank building (TA-35-10)
- 35-003(e) surge tank (TA-35-36)
- 35-003(l) pump pit (TA-35-08)
- 35-003(q) pipe trench (TA-35-09)
- 35-003(r) effluent-receiving canyon

The WWTP PRSs will be presented in this order: the WWTP operational history and then the remaining four PRSs not associated with the WWTP [PRS 35-009(d), an abandoned septic system; PRSs 35-016(k,m), inactive cooling water outfalls; and PRS 35-016(l), a stormwater discharge channel] in alphanumeric order.

The principal activities at TA-35 from the 1950s to the 1970s were associated with development of radioactive lanthanum sources for weapons testing and research involving various radionuclides, particularly plutonium and tritium. Wastewater associated with these activities was processed at the TA-35 WWTP. The liquid wastes originated from the operation of hot cells used to prepare kilocurie sources of radioactive lanthanum-140 and barium-140, waste from experimental reactors (LAPRE-I and -II and LAMPRE), plutonium research laboratories, and a tritium laboratory. It is believed that no releases occurred before September 1951 (Aeby 1954, 742).

During the 12-year operation of the TA-35 WWTP, 130 separate batches of wastewater were processed. Approximately 2,700,000 gal. of water were discharged to Pratt Canyon. The total activity from radionuclides discharged was about 20 Ci gross-beta activity and 1.4 Ci of strontium-89 and strontium-90. The gross-beta activity consisted of a combination of barium-140, lanthanum-140, strontium-89, strontium-90, and trace amounts of cesium-137, ruthenium-106, plutonium, technetium-99, and uranium (Emelity 1958, 793).

Processing wastes at the TA-35 WWTP ended in 1963 when operations were transferred to the TA-50 RLWTF. Wastes from building TA-35-2 continued to flow through the phase separator pit and be temporarily stored in the concrete holding tanks [structure TA-35-10, PRS 35-003(d)] until those structures were removed in 1985.

Previous investigations of the TA-35 WWTP operations have been documented as far as back as 1952 and have included surveys for radioactivity in the soil. D&D activities at the TA-35 WWTP were conducted during the 1981 to 1985 Radioactive Liquid Waste Lines Removal Project, and again during the mid- to late-1990s (Cox 1985, 780; LANL 1996, 59379; LANL 1997, 58737). Several sections of radioactive waste lines and associated soils, many of which were contaminated, were removed.

Sampling and analyses were performed to determine the extent of contamination and the success of contaminant removal (Elder et al. 1986, 3089). In some instances, analyses included hazardous chemical analysis, although the emphasis was usually on radioactive contamination.

Gross-beta contamination as high as 3243 pCi/g (strontium-90 and yttrium-90) were found in the soil at depths of 17 to 20 ft bgs in the trench from which the TA-35 WWTP waste lines were removed at the northeast corner of TA-35-7. The highest levels of contamination were removed and an ALARA decision was made concerning the decontamination of these lines; however, up to 1100 pCi/g beta activity was left in the soil in the backfilled trench near the northeast corner of TA-35-7 (Cox 1985, 785).

After the structures were removed in 1985, the site was backfilled with up to 20 ft of clean fill material and the site became an open field composed of backfill material (indigenous tuff) covered with weeds and grasses. The area slopes gently to the east, and surface runoff from the area flows eastward into Pratt Canyon. A stormwater outlet pipe discharges to the southeast corner of the site, and the stormwater discharge flows across the site into Pratt Canyon. The source of the stormwater is a surface storm drain located at the southwest corner of TA-35-7. An arroyo has formed in the backfill material that transects the site from southwest to northeast. The arroyo is up to 10 ft deep at the eastern edge of the site.

Subsequent runoff events incised the backfill and threatened to re-expose the potentially contaminated horizon. In 1996, the ER Project conducted an IA at the location of PRSs 35-003(d, l, and q) and in Pratt Canyon. The IA activities included replacement of fill into the incised channel, stabilization of the slope using compaction and vegetative matting, and installation of a berm that diverts runoff to a riprap-lined drainage located north of the site and common to inactive outfall PRS 35-016(k) and daylight drainage channel PRS 35-016(l) (LANL 1996, 55809). The action was designed to remove the potential for mobilization of residual contamination by insulating the source from surface water exposure.

PRS 35-003(d) is the site of the former liquid-waste holding tank building, which was a rectangular, reinforced concrete structure composed of four separate 50,000-gal. tanks (TA-35-10). Each tank was 35 ft wide and 85 ft long and was situated mostly below ground level with the top portions exposed. The tanks did not have drain outlets. All liquids were pumped out through a pipe trench and pump house to TA-35-7 for treatment and discharge from the WWTP. The tanks were designed to provide a six-month holding time for liquid wastes to allow for decay of lanthanum-140 and barium-140. In February 1985, the tanks were removed and a total of 86 soil samples were collected from the vicinity. Measurements of beta activities were observed in 37 of the samples, with a maximum of 356 pCi/g. The activity was primarily from strontium-90 and yttrium-90. Most of the samples were collected from depths of 18 and 20 ft. Because of problems with further excavation, Laboratory employees halted further remediation and backfilled the area (Cox 1985, 783). The extent of contamination was not determined. ER Project RFI sample results are presented in Appendix C of this aggregate SAP.

PRS 35-003(e) is the site of a former 25,000-gal. storage tank (TA-35-36) that was added to the WWTP in 1960. The tank was used to store liquid radioactive waste. The tank was connected to the Air Filter Building, TA-35-7, by two lines (3 in. in diameter) totaling 156 ft in length. The drainlines led to the surface diversion channel described below under PRS 35-003(l). The storage tank and waste lines were removed in August 1981. The extent of soil contamination to the diversion channel is not documented (LANL 1992, 7666). ER Project RFI sample results are presented in Appendix C of this aggregate SAP.

PRS 35-003(l) is the site of a former pump pit (TA-35-08) that was adjacent to the pipe trench and the liquid-waste holding tanks. The pump pit was approximately 10 ft wide x 14 ft long and housed two large-capacity electric pumps and associated valves and piping to transfer liquid waste between the holding tanks and to TA-35-7. The pump pit also had floor drains that discharged to a surface diversion channel (LANL 1996, 54422). The pump pit and associated piping were removed in December 1984. No radioactive contamination was detected on these structures (Cox 1985, 780). ER Project RFI sample results are presented in Appendix C of this aggregate SAP.

PRS 35-003(q) is the site of a former pipe trench (TA-35-09) that connected buildings TA-35-2, TA-35-3, and TA-35-7 to the former WWTP and connected the pump pit to the waste holding tanks. The trench contained at least five pipelines that connected the pump pit to each of the four holding tanks. The trench was approximately 60 ft long and 10 ft wide. The pipe trench had floor drains that discharged to the surface diversion channel (LANL 1996, 54422). The pipe trench was removed in December 1984. At least eleven instances of spills or non-operational releases were documented from the piping or holding tanks from 1951 to 1956. ER Project RFI sample results are presented in Appendix C of this aggregate SAP.

PRS 35-003(r) is the site of the canyon disposal area for liquid sludge effluent associated with the former WWTP. This PRS is located in Pratt Canyon and extends from the eastern edge of Ten Site Mesa (the headwall of Pratt Canyon) to the confluence of Pratt and Ten Site Canyons. Pratt Canyon is contaminated by radionuclides (strontium-90, cesium-137, and plutonium-239) (LANL 1990, 7511). The WWTP that released the effluent ceased operation in 1963. ER Project RFI sample results are presented in Appendix C of this aggregate SAP.

PRS 35-009(d) is the site of an abandoned 1600-gal. septic tank and associated leach field. The tank is located at the northeast corner of Ten Site Mesa, and the leach field extends from the tank toward the east. The leach field covers an area of approximately 1800 ft^2 and consists of fine- to coarse-grained sandstone and cobble filter bed material. Consolidated tuff is reached at depths of 8 to 10 ft in the leach field. This septic system served TA-35 from 1966 to 1990 and handled sanitary wastes from building TA-35-27, possibly from other laboratory buildings, and may have received a variety of industrial wastes including radionuclides. The system was pumped out, filled with concrete, and left in place during a 1996 VCA (LANL 1996, 54967). No documented releases of hazardous materials occurred at the septic system. ER Project sample results are presented in Appendix C of this aggregate SAP.

PRS 35-016(k) is the site of an inactive outfall that discharged noncontact cooling water from the Gas Laser Building, TA-35-29. The outfall was included on NPDES Permit No. 04A116 and was operational from 1961 to 1987. The outfall discharges into a steep channel lined with a riprap apron that drains into Pratt Canyon. ER Project RFI sample results are presented in Appendix C of this aggregate SAP.

PRS 35-016(l) is the site of surface discharge channels. The channels were established in 1961 to discharge rainwater runoff from TA-35-29 and water leaks from an ultraviolet water sterilizer in TA-35-29. Stained areas from past dielectric oil spills [PRSs 35-014(c and d)] are present in the source areas for these channels. The concrete catch basin for these drains measured 50% greater than background gamma radiation readings during a 1988 ER Project site visit (LANL 1990, 7511). These daylight drainage areas discharge to the same riprap-lined channel as PRS 35-016(k). ER Project RFI sample results are presented in Appendix C of this aggregate SAP.

PRS 35-016(m) is an inactive noncontact cooling tower outfall. The outfall was included on NPDES Permit No. 03A039 and was intended for discharging treated cooling tower blowdown from two planned reactors in building TA-35-33. The reactors were never installed, the cooling tower never operated, and the outfall never served its intended purpose; instead it discharged stormwater runoff from parking areas at the east end of the TA-35 mesa top. This fact was discovered in July 1996, after Phase I RFI samples were collected from the PRS in October of 1994 (Sontag and Jacobson 1996, 54766). Data results for this PRS are reported in a 1996 RFI report (LANL 1996, 55075). ER Project sample results are presented in Appendix C of this aggregate SAP.

B-1.5 Ten Site Canyon Subarea

The Ten Site Canyon Subarea PRSs are associated with an inactive sanitary WWTP (three lagoons, a sand filter treatment unit, an effluent outfall that collectively operated from 1975 to 1992), an area of concern (AOC) related to the sanitary wastewater treatment facility, and a single septic system that is unre-

lated to the sanitary wastewater treatment facility. The TA-35 WWTP comprises consolidated PRS 35-010(a)-99 which includes PRSs 35-010(a,b,c,d,e).

PRSs 35-010(a,b,c) are three wastewater treatment lagoons located in Ten Site Canyon near the confluence with Pratt Canyon. Because the WWTP was built in stages, the lagoons were not constructed until 1975. The sand filter beds and NPDES-permitted outfall EPA-SSS-10S were later installed in 1983. Prior to construction of the sand filter beds, the lagoons discharged via an unpermitted outfall located at the southeast corner of the southeast lagoon [PRS 35-010(c)]. The three lagoons have concrete sides and are described as having bottoms lined with a mixture of topsoil and bentonite (100 lb of bentonite per 100 ft^2) (Emelity 1974, 55116). However, subsequent site investigations indicate that the liner is no longer present (or is not differentiable from sludge and weathered tuff at the bottom of the lagoons). The Emelity memorandum also states that the planned capacity of the facility was 12,000 gpd. In addition to sanitary waste, these lagoons are reported to have received small quantities of radionuclides, organic chemical solutions, and photographic processing wastes from TA-35, -48, -50, and -55 (LANL 1990, 7511; CEARP 1986, 8657). The facility ceased operations in 1992, when sanitary waste was redirected to the Laboratory's Sanitary Wastewater Consolidation System (SWCS) facility located at TA-46. ER Project RFI sample results are presented in Appendix C of this aggregate SAP.

PRS 35-010(d) includes four sand filter beds that handled wastewater discharged from the sewage treatment lagoons [PRSs 35-010(a,b,c)]. Water was subsequently discharged from the sand filter beds through the discharge headwall [PRS 35-010(e)]. PRS 35-010(e) is formerly permitted NPDES outfall EPA-SSS-10S. The filters began operation in 1983 and were deactivated in 1992. The sand filter beds are constructed of concrete walls that are 3 ft high and 6 in. wide. Each bed measures approximately 50 ft by 50 ft. Polyvinyl chloride distribution pipes (2 in. in diameter) radiate from the center of the sand filter bed to the four corners in three of the four sand filter beds. A riser pipe (8 in. in diameter) in the center of each sand filter bed feeds the effluent to the radial pipelines. The sand filter beds are plastic-lined and contain sands of varying composition and texture (fine- to medium-grained quartzose sands to coarse-grained basaltic and granitic gravel). Approximately 2 ft of filter material is present in each filter, and each successive sand filter bed is 1 in. lower than the previous one to provide a hydraulic flow gradient. A diversion channel, which diverts surface water to the east, is present on the hillside above the sand filter beds. The berm of the diversion channel is composed of tuff material and crushed gravel of 1.5 in. in diameter. A second diversion channel is present west of the sand filter beds and appears to have been constructed by digging a channel 2 ft deep. These two diversion channels are apparently intended to divert surface water away from the sand filter beds. ER Project RFI sample results are presented in Appendix C of this aggregate SAP.

PRS 35-010(e) is the former NPDES-permitted outfall EPA-SSS-10S from the sand filter beds that discharged into Ten Site Canyon. A depth-recording gauge station is located at the outfall and measured the effluent level above a small v-shaped weir discharge point. A rock dissipater apron is present at the discharge point. Compiled flow records of the NPDES outfall from the sand filter beds into Ten Site Canyon were obtained from Laboratory group ESH-18 and Johnson Controls World Services, Inc. The data indicate how much effluent was being discharged during a significant portion of the life of the sewage lagoons and sand filter beds. The average flow rate was approximately 45,000 gpd. In a memorandum, Emelity (1974, 55116) states that the planned capacity of the facility was 12,000 gpd. ER Project RFI sample results are presented in Appendix C of this aggregate SAP.

PRS C-35-007 consists of nonindigenous sand and gravel piles located along an unpaved access road north of the sand filter beds. The sand and gravel material may consist of clean material for use in the sand filters and/or used materials that have been removed from the filters. The filters began operating in 1983 and were deactivated in 1992.

Several 3-ft-high sand and gravel piles are stored on the flat floor of a borrow quarry. Tuff was removed from the quarry, leaving behind a 30-ft-high tuff wall embankment. The piles are composed of varying material sizes, from sand and pea gravel to gravel that is 1 and 2 in. in diameter. Evidence that large gravel piles were previously stored at the quarry site is present near the center of the quarry. A large area of gravel veneer (1.5 in. in diameter) is present on the ground, and thin veneers of gravel are present on the quarry embankment wall approximately 20 ft above the present ground level. This gravel may represent material that was stored for use i n the filter beds. Crushed pea gravel similar to the material in two of the filter beds is found on a roadway at the east end of the filter beds, on the slope above the filter beds, and south of the access road. Two gravel piles in the eastern part of the quarry contain pieces of old weathered red clay tile sewage pipe similar to pieces that are scattered on the road south of the filter beds (LANL 1996, 55075). ER Project RFI sample results are presented in Appendix C of this aggregate SAP.

Appendix C

Existing Data

C-1.0 Introduction

This appendix contains summaries of the data collected to-date at TA-35. The tables in this appendix are of four types: (1) samples-collected tables, with a complete list of all samples collected at each subarea and information about the depth and type of sample, as well as what analytical suites each sample was analyzed for; (2) tables of detected inorganic chemicals above background values; (3) tables of detected organic chemicals; and (4) tables of detected radionuclides above background values or fallout values.

C-1.1 Mesa Top Subarea

Table C-1.1-1 presents the analyte suite and request numbers (numbers are listed below the analyte suites) for each sample collected in the Mesa Top Subarea. Each request number includes a batch of samples sent to a specific off-site analytical laboratory for a specific suite of analyses, and the request numbers can be used to track the original data packages from the analytical laboratories. If the sample was not analyzed for a given analyte suite, the cell in that suite's column contains a dash (—).

Also note that the data in this appendix are not arranged by consolidated unit because all data were collected prior to consolidation efforts. For a crosswalk between consolidated unit numbers and individual PRS numbers, refer to Table 1.0-1 in section 1.0.

Table C-1.1-2 presents the inorganic chemical results (mg/kg) above background values for the Mesa Top Subarea. Non-detected results above LANL background values are also presented in Table C-1.1-2. A dash in the results cell indicates that the result was less than background value or not detected, or that the sample was not analyzed for the corresponding chemical.

Table C-1.1-3 presents the detected organic chemical data for the Mesa Top Subarea.

Table C-1.1-4 presents the radionuclide results (pCi/g) above background values or fallout values for the Mesa Top Subarea. Non-detected results above LANL background values are also presented in Table C-1.1-4. A dash in the results cell indicates that the result was less than background value or not detected, or that the sample was not analyzed for the corresponding radionuclide.

Table C-1.1-1
Samples Taken in Mesa Top Subarea

Sample ID	Location ID	Depth (ft)	Media	Limited- List TAL Metals	Non-TAL Metals	TAL Metals	PCBs	Pesticides/PCBs	SVOCs	TPH DRO	TPH LRO	VOCs	Gamma Spectroscopy	Isotopic Plutonium	Isotopic Uranium	Strontium- 90	Tritium	XRF
PRS 35-015(a)																		
AAC3350	35-02172	0–1	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	21530
AAC3330	35-02173	0–0.5	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	21530
AAC3331	35-02174	0–0.5	Soil	—	—	—	—	—	—	—	—	—	—	21508	21508	—	—	21530
AAC3332	35-02175	0–0.5	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	21530
AAC3351	35-02176	0–1	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	21530
AAC3333	35-02176	2–3	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	21530
AAC3334	35-02177	0–0.5	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	21530
AAC3335	35-02178	0–0.5	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	21530
AAC3336	35-02179	0–1	Soil	—	—	—	21488	—	21488	—	—	—	—	—	—	—	—	21530
AAC3337	35-02179	1–2	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	21530
AAC3338	35-02179	2–3	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	21530
AAC3339	35-02180	0–1	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	21530
AAC3340	35-02180	1–2	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	21530
AAC3341	35-02180	2–3	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	21530
AAC3342	35-02181	0–0.5	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	21530
AAC3344	35-02182	0–1	Soil	—	—	—	—	—	—	—	—	21488	—	—	—	—	—	21530
AAC3345	35-02182	1–2	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	21530
AAC3346	35-02182	2–3	Soil	—	—	21505	—	—	—	—	—	—	—	—	—	—	—	21530
0435-95-0198	35-02285	1–1.8	Soil	—	—	—	—	—	1678	1678	—	—	—	—	—	—	—	—
0435-95-0199	35-02286	1–2	Soil	—	—	1679	—	—	1678	1678	—	—	—	—	—	—	—	—
0435-95-0200	35-02286	2–3	Soil	—	—	—	—	—	1678	1678	—	—	—	—	—	—	—	—
0435-97-0104	35-02496	0–1	Soil	—	—	3276R	—	—	3275R	3275R	3275R	—	3277R	3277R	3277R	—	—	—
0435-97-0105	35-02496	1–2	Soil	—	—	3276R	3275R	—	3275R	3275R	3275R	3275R	3277R	3277R	3277R	—	—	—

Table C-1.1-1
Samples Taken in Mesa Top Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	Limited- List TAL Metals	Non-TAL Metals	TAL Metals	PCBs	Pesticides/PCBs	SVOCs	TPH DRO	TPH LRO	VOCs	Gamma Spectroscopy	Isotopic Plutonium	Isotopic Uranium	Strontium- 90	Tritium	XRF
0435-97-0107	35-02497	0–1	Soil	—	—	3276R	—	—	3275R	3275R	3275R	—	3277R	3277R	3277R	—	—	—
0435-97-0108	35-02497	1–2	Soil	—	—	3276R	3275R	—	3275R	3275R	3275R	3275R	3277R	3277R	3277R	—	—	—
0435-97-0109	35-02497	1–2	Soil	—	—	—	—	—	—	3275R	3275R	—	—	—	—	—	—	—
0435-97-0112	35-02498	0–1	Soil	—	—	3276R	—	—	3275R	3275R	3275R	—	3277R	3277R	3277R	—	—	—
0435-97-0113	35-02498	1–2	Soil	—	—	3276R	3275R	—	3275R	3275R	3275R	3275R	3277R	3277R	3277R	—	—	—
0435-97-0115	35-02499	0–1	Soil	—	—	3279R	—	—	3278R	3278R	3278R	—	3280R	3280R	3280R	—	—	—
0435-97-0116	35-02499	1–2	Soil	—	—	3279R	—	—	3278R	3278R	3278R	—	3280R	3280R	3280R	—	—	—
0435-97-0117	35-02499	2–3	Soil	—	—	3279R	—	—	3278R	3278R	3278R	—	3280R	3280R	3280R	—	—	—
0435-97-0119	35-02500	0–0.83	Soil	—	—	3279R	—	—	3278R	3278R	3278R	—	3280R	3280R	3280R	—	—	—
0435-97-0121	35-02500	0.83–2	Soil	—	—	3279R	3278R	—	3278R	3278R	3278R	3278R	3280R	3280R	3280R	—	—	—
0435-97-0122	35-02501	0–1	Soil	—	—	3279R	—	—	3278R	3278R	3278R	—	3280R	3280R	3280R	—	—	—
0435-97-0123	35-02501	1–2	Soil	—	—	3279R	—	—	3278R	3278R	3278R	—	3280R	3280R	3280R	—	—	—
0435-97-0276	35-02594	0–1	Soil	—	—	3431R	—	—	3430R	3430R	3430R	—	3432R	3432R	3432R	—	—	—
0435-97-0277	35-02594	2–3	Soil	—	—	3431R	3430R	—	3430R	3430R	3430R	3430R	3432R	3432R	3432R	—	—	—
0435-97-0278	35-02594	8.5–10	Soil	—	—	3431R	—	—	3430R	3430R	3430R	—	3432R	3432R	3432R	—	—	—
PRS 35-014(f)																		
AAC1201	35-02150	0–1	Soil	—	—	—	21730	—	—	—	—	—	—	—	—	—	—	—
AAC1202	35-02150	1–2	Soil	—	—	—	21730	—	—	—	—	—	—	—	—	—	—	—
AAC1203	35-02150	2–3	Soil	—	—	—	21730	—	—	—	—	—	—	—	—	—	—	—
AAC1204	35-02151	0–1	Soil	—	—	—	21730	—	—	—	—	—	—	—	—	—	—	—
AAC1205	35-02151	1–2	Soil	—	—	—	21730	—	—	—	—	—	—	—	—	—	—	—
AAC1206	35-02151	2–3	Soil	—	—	—	21730	—	—	—	—	—	—	—	—	—	—	—
0435-96-0080	35-02393	0–1	Soil	—	—	—	—	—	—	2236	—	—	—	—	—	—	—	—
0435-96-0096	35-02405	0–0.5	Soil	—	—	—	—	—	—	2452	—	—	—	—	—	—	—	—

Table C-1.1-1
Samples Taken In Mesa Top Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	Limited- List TAL Metals	Non-TAL Metals	TAL Metals	PCBs	Pesticides/PCBs	SVOCs	TPH DRO	TPH LRO	VOCs	Gamma Spectroscopy	Isotopic Plutonium	Isotopic Uranium	Strontium- 90	Tritium	XRF
0435-96-0143	35-02428	0–0.5	Soil	—	—	—	—	—	—	2578	—	—	—	—	—	—	—	—
0435-96-0144	35-02429	0–0.5	Soil	—	—	—	—	—	—	2578	—	—	—	—	—	—	—	—
0435-96-0145	35-02430	0–0.5	Soil	—	—	—	—	—	—	2578	—	—	—	—	—	—	—	—
0435-96-0146	35-02431	0–0.5	Soil	—	—	—	—	—	—	2578	—	—	—	—	—	—	—	—
PRS 35-014(a)																		
AAA3797	35-02070	0–1	Soil	—	—	—	—	—	—	—	—	—	16386	16386	16386	—	16386	—
AAA3798	35-02070	1–2	Soil	—	—	—	—	—	—	—	—	—	—	16386	16386	—	16386	—
AAA3799	35-02070	2–3	Soil	—	—	—	—	—	—	—	—	—	—	16386	16386	—	16386	—
AAA3800	35-02071	0–1	Soil	—	—	—	—	—	—	—	—	—	—	16386	16386	—	16386	—
AAA3817	35-02071	1–2	Soil	—	—	—	—	—	—	—	—	—	—	16386	16386	—	16386	—
AAA3818	35-02071	2–3	Soil	—	—	—	—	—	—	—	—	—	—	16386	16386	—	16386	—
AAA6353	35-02073	0–1	Soil	—	—	—	—	—	—	—	—	—	16355	16355	16355	—	16355	—
AAA6354	35-02073	1–2	Soil	—	—	—	—	—	—	—	—	—	—	16355	16355	—	16355	—
AAA6355	35-02073	2–3	Soil	—	—	—	—	—	—	—	—	—	—	16355	16355	—	16355	—
AAA6356	35-02074	0–1	Soil	—	—	—	—	—	—	—	—	—	—	16355	16355	—	16355	—
AAA6357	35-02074	1–2	Soil	—	—	—	—	—	—	—	—	—	—	16355	16355	—	16355	—
AAA6358	35-02074	2–3	Soil	—	—	—	—	—	—	—	—	—	—	16355	16355	—	16355	—
AAA6359	35-02075	0–1	Soil	—	—	—	—	—	—	—	—	—	—	16355	16355	—	16355	—
AAA6360	35-02075	1–2	Soil	—	—	—	—	—	—	—	—	—	—	16355	16355	—	16355	—
AAA6361	35-02075	2–3	Soil	—	—	—	—	—	—	—	—	—	—	16355	16355	—	16355	—
AAA6341	35-02076	0–1	Soil	—	—	—	—	—	—	—	—	—	—	16391	16391	—	16391	—
AAA6342	35-02076	1–2	Soil	—	—	—	—	—	—	—	—	—	—	16391	16391	—	16391	—
AAA6343	35-02076	2–3	Soil	—	—	—	—	—	—	—	—	—	—	16391	16391	—	16391	—
AAA6344	35-02077	0–1	Soil	—	—	—	—	—	—	—	—	—	—	16391	16391	—	16391	—

Table C-1.1-1
Samples Taken in Mesa Top Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	Limited- List TAL Metals	Non-TAL Metals	TAL Metals	PCBs	Pesticides/PCBs	SVOCs	TPH DRO	TPH LRO	VOCs	Gamma Spectroscopy	Isotopic Plutonium	Isotopic Uranium	Strontium- 90	Tritium	XRF
AAA6347	35-02078	0–1	Soil	—	—	—	—	—	—	—	—	—	—	16391	16391	—	16391	—
AAA6348	35-02078	1–2	Soil	—	—	—	—	—	—	—	—	—	—	16391	16391	—	16391	—
AAA6349	35-02078	2–3	Soil	—	—	—	—	—	—	—	—	—	—	16391	16391	—	16391	—
AAB1042	35-02210	0–0.5	Soil	—	—	—	17376	—	17376	—	—	—	—	19975	19975	—	19975	19611
AAB1043	35-02211	0–0.5	Soil	—	—	—	17376	—	17376	—	—	—	—	19975	19975	—	19975	19611
AAA6369	35-02220	0–1	Soil	—	—	—	—	—	—	—	—	—	—	16389	16389	—	16389	—
AAA6370	35-02220	1–2	Soil	—	—	—	—	—	—	—	—	—	—	16389	16389	—	16389	—
AAA6371	35-02220	2–3	Soil	—	—	—	—	—	—	—	—	—	—	16389	16389	—	16389	—
0435-97-0408	35-02560	0–1	Soil	—	—	—	—	—	—	—	—	—	3531R	—	—	3531R	—	—
0435-97-0409	35-02560	1–2	Soil	—	—	—	—	—	—	—	—	—	3531R	—	—	3531R	—	—
0435-97-0410	35-02560	2–3	Soil	—	—	—	—	—	—	—	—	—	3531R	—	—	3531R	—	—
0435-97-0411	35-02561	0–1	Soil	—	—	—	—	—	—	—	—	—	3531R	—	—	3531R	—	—
0435-97-0412	35-02561	1–2	Soil	—	—	—	—	—	—	—	—	—	3531R	—	—	3531R	—	—
0435-97-0413	35-02561	2–3	Soil	—	—	—	—	—	—	—	—	—	3531R	—	—	3531R	—	—
0435-97-0414	35-02562	0–1	Soil	—	—	—	—	—	—	—	—	—	3531R	—	—	3531R	—	—
0435-97-0415	35-02562	1–2	Soil	—	—	—	—	—	—	—	—	—	3531R	—	—	3531R	—	—
0435-97-0416	35-02562	2–3	Soil	—	—	—	—	—	—	—	—	—	3531R	—	—	3531R	—	—
0435-97-0417	35-02563	0–1	Soil	—	—	—	—	—	—	—	—	—	3531R	—	—	3531R	—	—
0435-97-0418	35-02563	1–2	Soil	—	—	—	—	—	—	—	—	—	3531R	—	—	3531R	—	—
0435-97-0419	35-02563	2–3	Soil	—	—	—	—	—	—	—	—	—	3531R	—	—	3531R	—	—
0435-97-0420	35-02564	0–1	Soil	—	—	—	—	—	—	—	—	—	3531R	—	—	3531R	—	—
0435-97-0422	35-02564	1–2	Soil	—	—	—	—	—	—	—	—	—	3531R	—	—	3531R	—	—
0435-97-0423	35-02564	2–3	Soil	—	—	—	—	—	—	—	—	—	3531R	—	—	3531R	—	—
0435-97-0425	35-02565	0–1	Soil	—	—	—	—	—	—	—	—	—	3531R	—	—	3531R	—	—

Table C-1.1-1
Samples Taken in Mesa Top Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	Limited- List TAL Metals	Non-TAL Metals	TAL Metals	PCBs	Pesticides/PCBs	SVOCs	TPH DRO	TPH LRO	VOCs	Gamma Spectroscopy	Isotopic Plutonium	Isotopic Uranium	Strontium- 90	Tritium	XRF
0435-97-0426	35-02565	1–2	Soil	—	—	—	—	—	—	—	—	—	3531R	—	—	3531R	—	—
0435-97-0427	35-02565	2–3	Soil	—	—	—	—	—	—	—	—	—	3531R	—	—	3531R	—	—
PRS 35-004(a)																		
AAC1153	35-02097	0–0.5	Soil	—	—	—	—	—	—	—	—	—	—	21468	21468	—	—	—
AAC1154	35-02098	0–0.5	Soil	—	—	—	—	—	—	—	—	—	—	21468	21468	—	—	—
PRS 35-009(a)																		
AAA6417	35-02033	7–8	Soil	—	—	—	—	—	16641	—	—	—	—	16635	16635	—	—	16636
AAA6418	35-02033	12–13	Soil	—	—	—	—	—	16641	—	—	—	—	16635	16635	—	—	16636
AAA6419	35-02033	16–17	Soil	—	—	—	—	—	16641	—	—	—	—	16635	16635	—	—	16636
AAA6420	35-02034	5.5–6.5	Soil	—	—	—	—	—	16641	—	—	—	—	16635	16635	—	—	16636
AAA6421	35-02034	13.5–14.5	Soil	16637	16637	—	—	—	16645	—	—	—	—	16635	16635	—	—	16636
AAA6422	35-02034	19–20	Soil	—	—	—	—	—	16641	—	—	—	—	16635	16635	—	—	16636
0435-96-0051	35-02301	0–8	Soil	—	—	1962	—	—	1961	—	—	—	—	—	—	—	—	—
0435-96-0052	35-02302	0–8	Soil	1962	—	—	—	—	1961	—	—	—	—	—	—	—	—	—
PRS 35-014(b)																		
AAA3819	35-02072	0–1	Soil	—	—	—	16301	—	16301	—	—	—	—	16386	16386	—	16386	—
AAA3820	35-02072	1–2	Soil	—	—	—	16301	—	16301	—	—	—	—	16386	16386	—	16386	—
AAA3821	35-02072	2–3	Soil	—	—	—	16301	—	16301	—	—	—	—	16386	16386	—	16386	—
0435-97-0434	35-02568	0.5–1.5	Soil	—	—	—	3508R	—	3508R	3508R	3508R	—	—	—	—	—	—	—
0435-97-0435	35-02568	1.5–2.5	Soil	—	—	—	3508R	—	3508R	3508R	3508R	—	—	—	—	—	—	—
0435-97-0436	35-02568	2.5–3.5	Soil	—	—	—	3508R	—	3508R	3508R	3508R	—	—	—	—	—	—	—
0435-97-0437	35-02568	2.5–3.5	Soil	—	—	—	—	—	—	3508R	3508R	—	—	—	—	—	—	—
0435-97-0438	35-02569	0.5–1.5	Soil	—	—	—	3508R	—	3508R	3508R	3508R	—	—	—	—	—	—	—
0435-97-0439	35-02569	1.5–2.5	Soil	—	—	—	3508R	—	3508R	3508R	3508R	—	—	—	—	—	—	—

Table C-1.1-1
Samples Taken in Mesa Top Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	Limited- List TAL Metals	Non-TAL Metals	TAL Metals	PCBs	Pesticides/PCBs	SVOCs	TPH DRO	TPH LRO	VOCs	Gamma Spectroscopy	Isotopic Plutonium	Isotopic Uranium	Strontium- 90	Tritium	XRF
0435-97-0440	35-02569	2.5–3.5	Soil	—	—	—	3508R	—	3508R	3508R	3508R	—	—	—	—	—	—	—
0435-97-0441	35-02570	0.5–1.5	Soil	—	—	—	3508R	—	3508R	3508R	3508R	—	—	—	—	—	—	—
0435-97-0442	35-02570	1.5–2.5	Soil	—	—	—	3508R	—	3508R	3508R	3508R	—	—	—	—	—	—	—
0435-97-0443	35-02570	2.5–3.5	Soil	—	—	—	3508R	—	3508R	3508R	3508R	—	—	—	—	—	—	—
PRSs 35-003(j,k), 35-014(d), 35-015(b)																		
AAA6366	35-02081	0–0.5	Soil	—	—	—	16407	—	16407	—	—	16407	—	16400	16400	—	—	—
AAA6367	35-02082	0–0.5	Soil	—	—	—	16407	—	16407	—	—	16407	—	16400	16400	—	—	—
AAA6368	35-02083	0–0.5	Soil	—	—	—	16397	—	16397	—	—	—	—	16389	16389	—	—	—
AAA6373	35-02084	0–0.5	Soil	—	—	—	16397	—	16397	—	—	—	—	16389	16389	—	—	—
AAA6374	35-02085	0–0.5	Soil	—	—	—	16407	—	16407	—	—	16407	—	16400	16400	—	—	—
AAA6375	35-02086	0–0.5	Soil	—	—	—	16397	—	16397	—	—	—	—	16389	16389	—	—	—
AAA6376	35-02087	0–0.5	Soil	—	—	—	16397	—	16397	—	—	—	—	16389	16389	—	—	—
AAA6377	35-02088	0–0.5	Soil	—	—	—	16397	—	16397	—	—	—	—	16389	16389	—	—	—
AAA6385	35-02089	0–1	Soil	—	—	—	16407	—	16407	—	—	16407	—	16400	16400	—	—	—
AAA6386	35-02089	1–2	Soil	—	—	—	16407	—	16407	—	—	16407	—	16400	16400	—	—	—
AAA6387	35-02089	2–3	Soil	—	—	—	16407	—	16407	—	—	16407	—	16400	16400	—	—	—
AAA6388	35-02089	3–4	Soil	—	—	—	16407	—	16407	—	—	16407	—	16400	16400	—	—	—
AAA6389	35-02089	4–5	Soil	—	—	—	16407	—	16407	—	—	16407	—	16400	16400	—	—	—
AAA6390	35-02089	5–6	Soil	—	—	—	16407	—	16407	—	—	16407	—	16400	16400	—	—	—
AAA6391	35-02090	0–1	Soil	—	—	—	16407	—	16407	—	—	16407	—	16400	16400	—	—	—
AAA6392	35-02090	1–2	Soil	—	—	—	16407	—	16407	—	—	16407	—	16400	16400	—	—	—
AAA6393	35-02090	2–3	Soil	—	—	—	16407	—	16407	—	—	16407	—	16400	16400	—	—	—
AAA6394	35-02090	3–4	Soil	—	—	—	16407	—	16407	—	—	16407	—	16400	16400	—	—	—
AAA6395	35-02090	4–5	Soil	—	—	—	16407	—	16407	—	—	16407	—	16400	16400	—	—	—

Table C-1.1-1
Samples Taken in Mesa Top Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	Limited-List TAL Metals	Non-TAL Metals	TAL Metals	PCBs	Pesticides/PCBs	SVOCs	TPH DRO	TPH LRO	VOCs	Gamma Spectroscopy	Isotopic Plutonium	Isotopic Uranium	Strontium-90	Tritium	XRF
AAA6397	35-02090	5–6	Soil	—	—	—	16407	—	16407	—	—	16407	—	16400	16400	—	—	—
0435-95-0211	35-02288	1–2	Soil	—	—	1702	1701	—	1701	1701	—	1701	1703	—	—	—	—	—
0435-95-0212	35-02288	3–4	Soil	—	—	1702	1701	—	1701	1701	—	1701	1703	—	—	—	—	—
0435-95-0213	35-02288	6–7	Soil	—	—	1702	1701	—	1701	1701	—	—	1703	—	—	—	—	—
0435-95-0214	35-02288	9–10	Soil	—	—	1702	1701	—	1701	1701	—	—	1703	—	—	—	—	—
0435-95-0215	35-02289	1–2	Soil	—	—	—	—	—	1701	1701	—	—	—	—	—	—	—	—
0435-95-0216	35-02289	3–4	Soil	—	—	—	—	—	1701	1701	—	—	—	—	—	—	—	—
0435-95-0217	35-02289	6–7	Soil	—	—	—	—	—	1701	1701	—	—	—	—	—	—	—	—
0435-95-0218	35-02289	9–10	Soil	—	—	—	—	—	1701	1701	—	—	—	—	—	—	—	—
0435-95-0231	35-02290	0.3–1	Soil	—	—	—	—	—	1701	1701	—	—	—	—	—	—	—	—
0435-95-0232	35-02290	1–2	Soil	—	—	—	—	—	1701	1701	—	—	—	—	—	—	—	—
0435-95-0233	35-02290	2–3	Soil	—	—	—	—	—	1701	1701	—	—	—	—	—	—	—	—
0435-95-0219	35-02291	1–2	Soil	—	—	1702	1701	—	1701	1701	—	1701	1703	—	—	—	—	—
0435-95-0220	35-02291	3–4	Soil	—	—	1702	1701	—	1701	1701	—	1701	1703	—	—	—	—	—
0435-95-0221	35-02291	6–7	Soil	—	—	1702	1701	—	1701	1701	—	—	1703	—	—	—	—	—
0435-95-0222	35-02291	9–10	Soil	—	—	1702	1701	—	1701	1701	—	—	1703	—	—	—	—	—
0435-95-0223	35-02292	1–2	Soil	—	—	—	—	—	1701	1701	—	—	—	—	—	—	—	—
0435-95-0224	35-02292	4–5	Soil	—	—	—	—	—	1701	1701	—	—	—	—	—	—	—	—
0435-95-0226	35-02292	9–10	Soil	—	—	—	—	—	1701	1701	—	—	—	—	—	—	—	—
0435-95-0227	35-02293	1.5–2.5	Soil	—	—	—	—	—	1701	1701	—	—	—	—	—	—	—	—
0435-95-0228	35-02293	3–4	Soil	—	—	—	—	—	1701	1701	—	—	—	—	—	—	—	—
0435-95-0229	35-02293	6–7	Soil	—	—	—	—	—	1701	1701	—	—	—	—	—	—	—	—
0435-95-0230	35-02293	9–10	Soil	—	—	—	—	—	1701	1701	—	—	—	—	—	—	—	—
0435-97-0377	35-02534	1–2	Soil	—	—	—	3487R	—	3487R	3487R	3487R	3487R	—	—	—	—	—	—

Table C-1.1-1
Samples Taken in Mesa Top Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	Limited- List TAL Metals	Non-TAL Metals	TAL Metals	PCBs	Pesticides/PCBs	SVOCs	TPH DRO	TPH LRO	VOCs	Gamma Spectroscopy	Isotopic Plutonium	Isotopic Uranium	Strontium- 90	Tritium	XRF
0435-97-0378	35-02534	1–2	Soil	—	—	—	—	—	—	3487R	3487R	—	—	—	—	—	—	—
0435-97-0379	35-02534	3–4	Soil	—	—	—	3487R	—	3487R	3487R	3487R	3487R	—	—	—	—	—	—
0435-97-0380	35-02534	5–6	Soil	—	—	—	3487R	—	3487R	3487R	3487R	3487R	—	—	—	—	—	—
0435-97-0381	35-02534	7–7.5	Soil	—	—	—	3487R	—	3487R	3487R	3487R	3487R	—	—	—	—	—	—
0435-97-0382	35-02535	1–2	Soil	—	—	—	3487R	—	3487R	3487R	3487R	3487R	—	—	—	—	—	—
0435-97-0383	35-02535	3–4	Soil	—	—	—	3487R	—	3487R	3487R	3487R	3487R	—	—	—	—	—	—
0435-97-0384	35-02535	5–6	Soil	—	—	—	3487R	—	3487R	3487R	3487R	3487R	—	—	—	—	—	—
0435-97-0385	35-02535	12–12.5	Soil	—	—	—	3487R	—	3487R	3487R	3487R	3487R	—	—	—	—	—	—
PRS 35-018(a)																		
0435-95-0140	35-02262	0–1	Soil	—	—	—	—	—	—	—	—	—	1306	—	—	—	—	—
0435-95-0162	35-02268	0–1	Soil	—	—	—	1304	—	1304	—	—	—	—	—	—	—	—	—
0435-95-0165	35-02268	2–3	Soil	—	—	1305	—	—	—	—	—	—	—	—	—	—	—	—
0435-95-0234	35-02294	0–1	Soil	—	—	—	—	—	1701	1701	—	—	—	—	—	—	—	—
0435-95-0235	35-02294	1–2	Soil	—	—	—	—	—	1701	1701	—	—	—	—	—	—	—	—
0435-95-0236	35-02294	2–3	Soil	—	—	—	—	—	1701	1701	—	—	—	—	—	—	—	—
0435-96-0083	35-02353	0–0.5	Soil	—	—	2308	—	2307	2307	—	—	—	2309	—	—	—	—	—
0435-96-0084	35-02354	0–0.5	Soil	—	—	—	—	2307	2307	—	—	—	—	—	—	—	—	—
0435-96-0085	35-02355	0–0.5	Soil	—	—	2308	—	2307	2307	—	—	—	2309	—	—	—	—	—
0435-96-0086	35-02356	0–0.5	Soil	—	—	—	—	2307	2307	—	—	—	—	—	—	—	—	—
0435-96-0093	35-02402	0–0.5	Soil	—	—	—	2448	—	—	—	—	—	—	—	—	—	—	—
0435-96-0094	35-02403	0–0.5	Soil	—	—	—	2448	—	—	—	—	—	—	—	—	—	—	—
0435-96-0095	35-02404	0–0.5	Soil	—	—	—	2448	—	—	—	—	—	—	—	—	—	—	—
0435-96-0097	35-02406	3–3.5	Soil	—	—	—	2471	—	—	—	—	—	—	—	—	—	—	—
0435-96-0098	35-02407	3–3.5	Soil	—	—	—	2471	—	—	—	—	—	—	—	—	—	—	—

Table C-1.1-1
Samples Taken in Mesa Top Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	Limited- List TAL Metals	Non-TAL Metals	TAL Metals	PCBs	Pesticides/PCBs	SVOCs	TPH DRO	TPH LRO	VOCs	Gamma Spectroscopy	Isotopic Plutonium	Isotopic Uranium	Strontium- 90	Tritium	XRF
PRS 35-003(a,b,c,n)																		
0435-96-0030	35-02295	1.5–2.5	Soil	—	—	2572	—	—	2571	—	—	2571	2573	2573	2573	2573	2573	—
0435-96-0031	35-02295	4–5	Soil	—	—	—	—	—	—	—	—	—	2573	2573	2573	2573	2573	—
0435-96-0034	35-02296	0–1	Soil	—	—	2640	—	—	2639	—	—	2639	2641	2641	2641	2641	2641	—
0435-96-0035	35-02296	3–4	Soil	—	—	—	—	—	—	—	—	—	2641	2641	2641	2641	2641	—
0435-96-0038	35-02297	0–1	Soil	—	—	2640	—	—	2639	—	—	2639	2641	2641	2641	2641	2641	—
0435-96-0039	35-02297	2.5–3.5	Soil	—	—	—	—	—	—	—	—	—	2641	2641	2641	2641	2641	—
0435-96-0042	35-02298	0–1	Soil	—	—	2838	—	—	2837	—	—	2837	2839	2839	2839	2839	2839	—
0435-96-0043	35-02298	4–5	Soil	—	—	—	—	—	—	—	—	—	2839	2839	2839	2839	2839	—
0435-96-0045	35-02299	0–1	Soil	—	—	2838	—	—	2837	—	—	2837	2839	2839	2839	2839	2839	—
0435-96-0046	35-02299	3–4	Soil	—	—	—	—	—	—	—	—	—	2839	2839	2839	2839	2839	—
0435-96-0047	35-02299	3–4	Soil	—	—	—	—	—	—	—	—	—	2839	2839	2839	2839	2839	—
0435-96-0049	35-02300	0–1	Soil	—	—	2838	—	—	2837	—	—	2837	2839	2839	2839	2839	2839	—
0435-96-0050	35-02300	2–3	Soil	—	—	—	—	—	—	—	—	—	2839	2839	2839	2839	2839	—
PRS 35-003(misc)																		
AAB1020	35-02014	0–2	Soil	—	—	—	17376	—	17376	—	—	—	—	19975	19975	—	19975	19611
AAB0949	35-02015	1–2	Soil	—	—	—	17315	—	17315	—	—	—	—	19595	19595	—	19595	17325
AAB0950	35-02015	10–11	Soil	—	—	—	17318	—	17318	—	—	—	—	19595	19595	—	19595	17325
AAB0951	35-02015	19–20	Soil	—	—	—	17318	—	17318	—	—	—	—	19595	19595	—	19595	17325
AAB0952	35-02015	29–30	Soil	—	—	—	17318	—	17318	—	—	—	19595	19595	19595	—	19595	17325
AAA6625	35-02020	1.5–2.5	Soil	—	—	—	17080	—	—	—	—	—	—	17245	17245	—	—	17226
AAA6626	35-02020	7–8	Soil	17217	17217	—	17081	—	17081	—	—	—	—	17245	17245	—	—	17226
AAA6627	35-02020	10–11	Soil	—	—	—	17080	—	—	—	—	—	—	17245	17245	—	—	17226
AAA6628	35-02020	26.5–27.5	Soil	—	—	—	17080	—	17080	—	—	—	17245	17245	17245	—	17245	17226

Table C-1.1-1
Samples Taken in Mesa Top Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	Limited- List TAL Metals	Non-TAL Metals	TAL Metals	PCBs	Pesticides/PCBs	SVOCs	TPH DRO	TPH LRO	VOCs	Gamma Spectroscopy	Isotopic Plutonium	Isotopic Uranium	Strontium- 90	Tritium	XRF
AAA6574	35-02021	3–4	Soil	—	—	—	—	—	—	—	—	—	17360	17360	17360	—	—	16960
AAA6575	35-02021	9–10	Soil	—	—	—	16951	—	16951	—	—	—	—	17360	17360	—	—	16960
AAA6613	35-02025	1–2	Soil	17218	17218	—	17038	—	17038	—	—	—	—	17301	17301	—	—	17224
AAA6614	35-02025	9–10	Soil	—	—	—	17038	—	17038	—	—	—	—	17301	17301	—	—	17224
AAA6615	35-02025	11–12	Soil	—	—	—	17038	—	17038	—	—	—	17301	17301	17301	—	—	17224
AAA6616	35-02025	27.5–28.5	Soil	—	—	—	17038	—	17038	—	—	—	—	17301	17301	—	—	17224
AAA6617	35-02026	2–3	Soil	—	—	—	17269	—	17269	—	—	—	—	17357	17357	—	—	17324
AAA6618	35-02026	9–10	Soil	—	—	—	17269	—	17269	—	—	—	—	17357	17357	—	—	17324
AAA6619	35-02026	24–25	Soil	—	—	—	17269	—	17269	—	—	—	—	17357	17357	—	—	17324
AAA6620	35-02026	28.5–29.5	Soil	—	—	—	17269	—	17269	—	—	—	17357	17357	17357	—	—	17324
AAA6605	35-02027	2–3	Soil	17219	17219	—	17050	—	17050	—	—	—	—	17299	17299	—	—	17230
AAA6606	35-02027	9–10	Soil	—	—	—	17050	—	17050	—	—	—	—	17299	17299	—	—	17230
AAA6608	35-02027	20–21	Soil	—	—	—	17050	—	17050	—	—	—	—	17299	17299	—	—	17230
AAA6609	35-02027	28.5–29.5	Soil	—	—	—	17050	—	17050	—	—	—	—	17299	17299	—	—	17230
AAB1009	35-02215	1–2	Soil	—	—	—	17080	—	17080	—	—	—	—	17245	17245	—	—	17226
AAB1011	35-02215	5–6	Soil	—	—	—	17081	—	17081	—	—	—	17245	17245	17245	—	17245	17226
AAB1012	35-02215	21.7–22.7	Soil	—	—	—	17080	—	17080	—	—	—	—	17245	17245	—	—	17226
AAB1013	35-02215	28–29	Soil	—	—	—	17080	—	17080	—	—	—	—	17245	17245	—	—	17226
0435-95-0168	35-02269	0–1	Soil	—	—	1650	1649	—	1649	—	—	1649	—	1651	1651	—	—	—
0435-96-0003	35-02270	10–10.5	Soil	—	—	2043	2042	—	2042	—	—	2042	—	2044	2044	—	2044	—
0435-96-0006	35-02271	7–7.5	Soil	—	—	1755	1754	—	1754	—	—	1754	—	1756	1756	—	1756	—
0435-96-0010	35-02272	12–12.5	Soil	—	—	2504	—	—	—	—	—	—	—	2505	2505	—	2505	—
0435-96-0013	35-02273	15–16	Soil	—	—	2699	—	2698	2698	—	—	2698	—	2700	2700	—	2700	—
0435-96-0016	35-02274	17–18	Soil	—	—	2731	2730	—	2730	—	—	2730	—	2732	2732	—	2732	—

Table C-1.1-1
Samples Taken in Mesa Top Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	Limited- List TAL Metals	Non-TAL Metals	TAL Metals	PCBs	Pesticides/PCBs	SVOCs	TPH DRO	TPH LRO	VOCs	Gamma Spectroscopy	Isotopic Plutonium	Isotopic Uranium	Strontium- 90	Tritium	XRF
0435-96-0019	35-02275	12–12.5	Soil	—	—	2043	2042	—	2042	—	—	2042	—	2044	2044	—	2044	—
0435-96-0022	35-02276	9–9.5	Soil	—	—	1964	1963	—	1963	—	—	1963	—	1965	1965	—	1965	—
0435-95-0195	35-02280	0–2	Soil	—	—	—	—	—	1678	—	—	—	—	—	—	—	—	—
0435-97-0038	35-02309	2.5–3.5	Soil	—	3079R	3079R	—	—	—	—	—	—	3080R	3080R	3080R	3080R	3080R	—
0435-97-0039	35-02309	4.5–5.5	Soil	—	3079R	3079R	—	—	—	—	—	—	3080R	3080R	3080R	3080R	3080R	—
0435-97-0040	35-02309	8.5–10	Soil	—	3079R	3079R	—	—	—	—	—	—	3080R	3080R	3080R	3080R	3080R	—
PRS 35-003(p)																		
0435-96-0153	35-02437	0–1	Soil	—	—	2678	—	—	2677	—	—	2677	2679	2679	2679	2679	2679	—
0435-96-0154	35-02437	4–5	Soil	—	—	2678	—	—	2677	—	—	2677	2679	2679	2679	2679	2679	—
0435-96-0156	35-02438	4–5	Soil	—	—	2678	—	—	2677	—	—	2677	2679	2679	2679	2679	2679	—
0435-96-0157	35-02438	8–9	Soil	—	—	2678	—	—	2677	—	—	2677	2679	2679	2679	2679	2679	—
0435-96-0158	35-02439	0–1	Soil	—	—	2678	—	—	2677	—	—	2677	2679	2679	2679	2679	2679	—
0435-96-0159	35-02439	4–5	Soil	—	—	2678	—	—	2677	—	—	2677	2679	2679	2679	2679	2679	—
0435-96-0160	35-02440	4–5	Soil	—	—	2678	—	—	2677	—	—	2677	2679	2679	2679	2679	2679	—
0435-96-0161	35-02440	8–9	Soil	—	—	2678	—	—	2677	—	—	2677	2679	2679	2679	2679	2679	—
0435-96-0162	35-02441	0–1	Soil	—	—	2678	—	—	2677	—	—	2677	2679	2679	2679	2679	2679	—
0435-96-0163	35-02441	4–5	Soil	—	—	2678	—	—	2677	—	—	2677	2679	2679	2679	2679	2679	—
0435-96-0165	35-02442	4–5	Soil	—	—	2678	—	—	2677	—	—	2677	2679	2679	2679	2679	2679	—
0435-96-0166	35-02442	8–9	Soil	—	—	2678	—	—	2677	—	—	2677	2679	2679	2679	2679	2679	—
0435-96-0167	35-02443	4–5	Soil	—	—	2678	—	—	2677	—	—	2677	2679	2679	2679	2679	2679	—
0435-96-0168	35-02443	8–9	Soil	—	—	2678	—	—	2677	—	—	2677	2679	2679	2679	2679	2679	—
0435-96-0169	35-02444	0–1	Soil	—	—	2678	—	—	2677	—	—	2677	2679	2679	2679	2679	2679	—
0435-96-0170	35-02444	4–5	Soil	—	—	2678	—	—	2677	—	—	2677	2679	2679	2679	2679	2679	—
0435-96-0171	35-02445	0–1	Soil	—	—	2678	—	—	2677	—	—	2677	2679	2679	2679	2679	2679	—

Table C-1.1-1
Samples Taken in Mesa Top Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	Limited- List TAL Metals	Non-TAL Metals	TAL Metals	PCBs	Pesticides/PCBs	SVOCs	TPH DRO	TPH LRO	VOCs	Gamma Spectroscopy	Isotopic Plutonium	Isotopic Uranium	Strontium- 90	Tritium	XRF
0435-96-0172	35-02445	4.5–5.5	Soil	—	—	2678	—	—	2677	—	—	2677	2679	2679	2679	2679	2679	—
0435-96-0173	35-02446	4–5	Soil	—	—	2678	—	—	2677	—	—	2677	2679	2679	2679	2679	2679	—
0435-96-0174	35-02446	8–9	Soil	—	—	2678	—	—	2677	—	—	2677	2679	2679	2679	2679	2679	—
0435-96-0175	35-02446	8–9	Soil	—	—	2678	—	—	2677	—	—	2677	2679	2679	2679	2679	2679	—
PRS 35-003(g)																		
AAA6537	35-02017	1.3–2.3	Soil	—	—	—	16957	—	16957	—	—	—	—	17360	17360	—	—	16960
AAA6538	35-02017	5–6	Soil	—	—	—	16951	—	16951	—	—	—	—	17360	17360	—	—	16960
AAA6539	35-02017	19–20	Soil	—	—	—	16951	—	16951	—	—	—	—	17360	17360	—	—	16960
AAA6540	35-02017	28.5–29.5	Soil	17215	17215	—	16951	—	16951	—	—	—	—	17360	17360	—	—	16960
PRS 35-003(o)																		
AAA6589	35-02016	1–2	Soil	—	—	—	16975	—	16975	—	—	—	—	17017	17017	—	—	16984
AAA6590	35-02016	8–9	Soil	—	—	—	16975	—	16975	—	—	—	—	17017	17017	—	—	16984
AAA6591	35-02016	13.8–14.8	Soil	—	—	—	—	—	16978	—	—	—	—	17016	17016	—	—	—
AAA6592	35-02016	18.5–19.5	Soil	—	—	—	—	—	16978	—	—	—	—	17016	17016	—	—	—
AAA6581	35-02016	29–30	Soil	—	—	—	16975	—	16975	—	—	—	—	17017	17017	—	—	16984
0435-97-0001	35-02303	3–4.5	Soil	—	3065R	3065R	—	—	—	—	—	—	3066R	3066R	3066R	3066R	3066R	—
0435-97-0002	35-02303	4.5–7	Soil	—	3065R	3065R	—	—	—	—	—	—	3066R	3066R	3066R	3066R	3066R	—
0435-97-0004	35-02303	13.5–15	Soil	—	3065R	3065R	—	—	—	—	—	—	3066R	3066R	3066R	3066R	3066R	—
0435-97-0005	35-02303	17.5–19	Soil	—	3065R	3065R	—	—	—	—	—	—	3066R	3066R	3066R	3066R	3066R	—
0435-97-0007	35-02304	4.5–5.5	Soil	—	3065R	3065R	—	—	—	—	—	—	3066R	3066R	3066R	3066R	3066R	—
0435-97-0008	35-02304	5.5–7	Soil	—	3065R	3065R	—	—	—	—	—	—	3066R	3066R	3066R	3066R	3066R	—
0435-97-0009	35-02304	20–21.5	Soil	—	3065R	3065R	—	—	—	—	—	—	3066R	3066R	3066R	3066R	3066R	—
0435-97-0010	35-02304	24–25	Soil	—	3065R	3065R	—	—	—	—	—	—	3066R	3066R	3066R	3066R	3066R	—
0435-97-0012	35-02305	7–8.4	Soil	—	3067R	3067R	—	—	—	—	—	—	3068R	3068R	3068R	3068R	3068R	—

Table C-1.1-1
Samples Taken in Mesa Top Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	Limited- List TAL Metals	Non-TAL Metals	TAL Metals	PCBs	Pesticides/PCBs	SVOCs	TPH DRO	TPH LRO	VOCs	Gamma Spectroscopy	Isotopic Plutonium	Isotopic Uranium	Strontium- 90	Tritium	XRF
0435-97-0013	35-02305	8.4–10	Soil	—	3067R	3067R	—	—	—	—	—	—	3068R	3068R	3068R	3068R	3068R	—
0435-97-0016	35-02305	14.5–15	Soil	—	3067R	3067R	—	—	—	—	—	—	3068R	3068R	3068R	3068R	3068R	—
0435-97-0014	35-02305	17.5–18.5	Soil	—	3067R	3067R	—	—	—	—	—	—	3068R	3068R	3068R	3068R	3068R	—
0435-97-0015	35-02305	38–39	Soil	—	3067R	3067R	—	—	—	—	—	—	3068R	3068R	3068R	3068R	3068R	—
0435-97-0017	35-02529	5–6	Soil	—	3069R	3069R	—	—	—	—	—	—	3070R	3070R	3070R	3070R	3070R	—
0435-97-0018	35-02529	6–7.5	Soil	—	3069R	3069R	—	—	—	—	—	—	3070R	3070R	3070R	3070R	3070R	—
0435-97-0021	35-02529	10–11	Soil	—	3069R	3069R	—	—	—	—	—	—	3070R	3070R	3070R	3070R	3070R	—
0435-97-0019	35-02529	19.5–20.5	Soil	—	3069R	3069R	—	—	—	—	—	—	3070R	3070R	3070R	3070R	3070R	—
0435-97-0020	35-02529	24–25	Soil	—	3069R	3069R	—	—	—	—	—	—	3070R	3070R	3070R	3070R	3070R	—
PRS 35-003(m)																		
AAA6633	35-02018	1–2	Soil	—	—	—	17041	—	17041	—	—	—	17246	17246	17246	—	17246	17233
AAA6634	35-02018	8.5–9.5	Soil	—	—	—	17041	—	17041	—	—	—	—	17246	17246	—	—	17233
AAA6635	35-02018	14–15	Soil	—	—	—	17041	—	17041	—	—	—	—	17246	17246	—	—	17233
AAA6636	35-02018	20–21	Soil	—	—	—	17042	—	17042	—	—	—	—	—	—	—	—	—
0435-97-0033	35-02306	6.8–7.8	Soil	—	3071R	3071R	—	—	—	—	—	—	3072R	3072R	3072R	3072R	3072R	—
0435-97-0034	35-02306	7.8–8.8	Soil	—	3071R	3071R	—	—	—	—	—	—	3072R	3072R	3072R	3072R	3072R	—
0435-97-0035	35-02306	11.5–12.5	Soil	—	3071R	3071R	—	—	—	—	—	—	3072R	3072R	3072R	3072R	3072R	—
0435-97-0036	35-02306	16.5–17.5	Soil	—	3071R	3071R	—	—	—	—	—	—	3072R	3072R	3072R	3072R	3072R	—
0435-97-0022	35-02307	9–10	Soil	—	3069R	3069R	—	—	—	—	—	—	3070R	3070R	3070R	3070R	3070R	—
0435-97-0023	35-02307	10–12.5	Soil	—	3069R	3069R	—	—	—	—	—	—	3070R	3070R	3070R	3070R	3070R	—
0435-97-0027	35-02307	17–17.5	Soil	—	3069R	3069R	—	—	—	—	—	—	3070R	3070R	3070R	3070R	3070R	—
0435-97-0025	35-02307	21.5–22.5	Soil	—	3069R	3069R	—	—	—	—	—	—	3070R	3070R	3070R	3070R	3070R	—
0435-97-0026	35-02307	26.5–27.5	Soil	—	3069R	3069R	—	—	—	—	—	—	3070R	3070R	3070R	3070R	3070R	—
0435-97-0028	35-02308	8.4–9.4	Soil	—	3079R	3079R	—	—	—	—	—	—	3080R	3080R	3080R	3080R	3080R	—

Table C-1.1-1
Samples Taken in Mesa Top Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	Limited- List TAL Metals	Non-TAL Metals	TAL Metals	PCBs	Pesticides/PCBs	SVOCs	TPH DRO	TPH LRO	VOCs	Gamma Spectroscopy	Isotopic Plutonium	Isotopic Uranium	Strontium- 90	Tritium	XRF
0435-97-0029	35-02308	9.4–10	Soil	—	3079R	3079R	—	—	—	—	—	—	3080R	3080R	3080R	3080R	3080R	—
0435-97-0030	35-02308	11.5–12.5	Soil	—	3079R	3079R	—	—	—	—	—	—	3080R	3080R	3080R	3080R	3080R	—
0435-97-0031	35-02308	19–20	Soil	—	3079R	3079R	—	—	—	—	—	—	3080R	3080R	3080R	3080R	3080R	—
PRS 35-003(h)																		
0435-97-0386	35-02533	0–1	Soil	—	—	—	—	—	—	—	—	—	3497R	—	—	3497R	3497R	—
0435-97-0387	35-02533	9–10	Soil	—	—	—	—	—	—	—	—	—	3497R	—	—	3497R	3497R	—
0435-97-0389	35-02533	20–21	Soil	—	—	—	—	—	—	—	—	—	3497R	—	—	3497R	3497R	—
0435-97-0390	35-02533	29–30	Soil	—	—	—	—	—	—	—	—	—	3497R	—	—	3497R	—	—
PRS 35-003(e)																		
AAB0969	35-02012	1–2	Soil	—	—	—	17075	—	17075	—	—	—	—	17247	17247	—	17247	17232
AAB0970	35-02012	20.5–21.5	Soil	—	—	—	17075	—	17075	—	—	—	—	17247	17247	—	17247	17232
AAB0971	35-02012	25.8–26.8	Soil	—	—	—	17075	—	17075	—	—	—	—	17247	17247	—	17247	17232
AAB0972	35-02012	30–35	Soil	—	—	—	17075	—	17075	—	—	—	—	17247	17247	—	17247	17232
AAB0973	35-02012	99–100	Soil	17153	17153	—	17146	—	17146	—	—	—	17155	17155	17155	—	17155	17151
PRS 35-004(h)																		
AAA6601	35-02024	1–2	Soil	—	—	—	17052	—	17052	—	—	—	—	17293	17293	—	—	17231
AAA6602	35-02024	14–15	Soil	—	—	—	17051	—	17051	—	—	—	—	17293	17293	—	—	17231
AAA6603	35-02024	24–25	Soil	—	—	—	17051	—	17051	—	—	—	—	17293	17293	—	—	17231
AAA6604	35-02024	29–30	Soil	—	—	—	17051	—	17051	—	—	—	—	17293	17293	—	—	17231

Table C-1.1-2
Inorganic Chemicals with Concentrations (mg/kg) or Detection Limits at or Exceeding Background Values in Mesa Top Subarea

Sample ID	Location ID	Depth (ft)	Media	Antimony	Barium	Beryllium	Cadmium	Calcium	Chromium (total)	Copper	Lead	Mercury	Nickel	Silver	Thallium	Zinc
Soil Background Value (mg/kg)				0.83	295	1.83	0.4	6120	19.3	14.7	22.3	0.1	15.4	1	0.73	48.8
PRS 35-015(a)																
AAC3346	35-02182	2.00–3.00	Soil	—	—	—	—	—	—	—	—	—	—	—	1.1(U)[a]	—
0435-95-0199	35-02286	1.00–2.00	Soil	9.7(U)	—	—	0.76(U)	—	—	—	—	—	—	—	—	—
0435-97-0104	35-02496	0.00–1.00	Soil	6.2(UJ)[b]	—	—	0.52(U)	6220	—	—	—	—	—	1.8(U)	—	—
0435-97-0105	35-02496	1.00–2.00	Soil	6.8(UJ)	—	—	0.56(U)	—	—	—	—	—	—	2(U)	—	—
0435-97-0107	35-02497	0.00–1.00	Soil	5.9(UJ)	—	—	0.49(U)	6990	—	—	—	—	—	1.7(U)	—	—
0435-97-0108	35-02497	1.00–2.00	Soil	6.8(UJ)	—	—	0.56(U)	—	—	—	—	—	—	2(U)	—	—
0435-97-0112	35-02498	0.00–1.00	Soil	6.3(UJ)	—	—	0.52(U)	—	—	—	—	—	—	1.8(U)	—	—
0435-97-0113	35-02498	1.00–2.00	Soil	6.2(UJ)	—	—	0.51(U)	14700	193	—	—	—	98.7	1.8(U)	—	—
0435-97-0115	35-02499	0.00–1.00	Soil	6.3(UJ)	—	—	0.52(U)	6280	—	—	—	—	—	1.8(U)	—	—
0435-97-0116	35-02499	1.00–2.00	Soil	6.2(UJ)	—	—	0.52(U)	—	—	—	—	—	—	1.8(U)	—	—
0435-97-0117	35-02499	2.00–3.00	Soil	6.7(UJ)	—	—	0.56(U)	—	36.3	—	—	—	20.8	2(U)	—	—
0435-97-0119	35-02500	0.00–0.83	Soil	7(UJ)	—	—	0.64(J)[c]	—	—	—	—	—	—	2(U)	—	—
0435-97-0121	35-02500	0.83–2.00	Soil	6.5(UJ)	—	—	0.54(U)	—	30.8	—	—	—	17.7	1.9(U)	—	—
0435-97-0122	35-02501	0.00–1.00	Soil	6.2(UJ)	—	—	0.51(U)	—	—	—	—	—	—	1.8(U)	—	—
0435-97-0123	35-02501	1.00–2.00	Soil	6.3(UJ)	—	—	0.52(U)	—	—	—	—	—	—	1.8(U)	—	—
0435-97-0277	35-02594	2.00–3.00	Soil	—	—	—	—	—	22	—	—	—	19.3	—	—	—
PRS 35-009(a)																
AAA6421	35-02034	13.50–14.50	Soil	—	—	—	1(U)	—	—	—	—	—	—	—	—	—
0435-96-0051	35-02301	0.00–8.00	Soil	—	—	—	—	—	—	15.1	—	0.68	—	—	0.88(UJ)	94.6
0435-96-0052	35-02302	0.00–8.00	Soil	—	—	—	—	—	—	24.3	—	—	—	—	0.79(UJ)	—
PRSs 35-003(j,k), 35-014(d), 35-015(b)																
0435-95-0211	35-02288	1.00–2.00	Soil	10.2(U)	—	—	0.63(U)	—	—	—	—	—	—	2(U)	—	—
0435-95-0212	35-02288	3.00–4.00	Soil	10.6(U)	—	—	0.66(U)	—	—	—	—	—	—	2.1(U)	—	—
0435-95-0213	35-02288	6.00–7.00	Soil	9.9(U)	—	—	0.61(U)	—	—	—	—	—	—	2(U)	—	—
0435-95-0214	35-02288	9.00–10.00	Soil	9.6(U)	—	—	0.6(U)	—	—	—	—	—	—	1.9(U)	—	—
0435-95-0219	35-02291	1.00–2.00	Soil	10(U)	—	—	0.62(U)	9440	—	15.5	42.3	0.55	—	2(U)	—	—

Table C-1.1-2

Inorganic Chemicals with Concentrations (mg/kg) or Detection Limits at or Exceeding Background Values in Mesa Top Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Barium	Beryllium	Cadmium	Calcium	Chromium (total)	Copper	Lead	Mercury	Nickel	Silver	Thallium	Zinc
Soil Background Value (mg/kg)				0.83	295	1.83	0.4	6120	19.3	14.7	22.3	0.1	15.4	1	0.73	48.8
0435-95-0220	35-02291	3.00–4.00	Soil	10.6(U)	—	—	0.66(U)	—	—	—	—	—	—	2.1(U)	—	—
0435-95-0221	35-02291	6.00–7.00	Soil	10.9(U)	—	—	0.68(U)	—	—	—	—	—	—	2.2(U)	—	—
0435-95-0222	35-02291	9.00–10.00	Soil	9.6(U)	—	—	0.6(U)	—	—	—	—	—	—	1.9(U)	—	—
PRS 35-018(a)																
0435-95-0165	35-02268	2.00–3.00	Soil	—	—	—	1.1	—	—	—	—	0.41	—	—	—	59.9
PRS 35-003(a,b,c,n)																
0435-96-0030	35-02295	1.50–2.50	Soil	10(U)	—	—	0.52(U)	—	—	—	—	—	—	2.1(U)	1(U)	—
0435-96-0034	35-02296	0.00–1.00	Soil	—	—	—	—	—	—	—	—	—	—	—	1.4(U)	—
0435-96-0038	35-02297	0.00–1.00	Soil	—	—	—	—	—	—	—	—	—	—	—	1.2(U)	—
0435-96-0042	35-02298	0.00–1.00	Soil	11(U)	—	—	0.57(U)	6800	—	—	—	1.4	—	2.3(U)	1.1(U)	—
0435-96-0045	35-02299	0.00–1.00	Soil	11(U)	—	—	0.57(U)	13000	—	—	—	0.11(U)	—	2.3(U)	1.1(U)	—
0435-96-0049	35-02300	0.00–1.00	Soil	11(U)	—	—	0.55(U)	24000	—	—	—	2	—	2.2(U)	1.1(U)	69
PRS 35-003(misc)																
AAA6626	35-02020	7.00–8.00	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—
AAA6613	35-02025	1.00–2.00	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—
AAA6605	35-02027	2.00–3.00	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—
0435-95-0168	35-02269	0.00–1.00	Soil	3.8(UJ)	—	—	0.51(U)	—	219	—	38	0.12(U)	246(J–)	—	—	—
0435-96-0003	35-02270	10.00–10.50	Soil	7.9(UJ)	—	—	0.55(J)	—	—	—	—	—	—	1.4(U)	—	—
0435-96-0006	35-02271	7.00–7.50	Soil	1.4(J-)[d]	—	—	—	—	90.2(J–)	—	—	—	119	—	—	—
0435-96-0010	35-02272	12.00–12.50	Soil	8.2(U)	—	—	1.6	8680	—	19.5	32.3	—	—	1.5(U)	—	204
0435-96-0013	35-02273	15.00–16.00	Soil	—	—	—	—	—	—	—	—	—	—	—	1.7(J)	—
0435-96-0016	35-02274	17.00–18.00	Soil	0.94(U)	—	—	—	—	—	—	81.6	0.16	—	—	—	54.3
0435-96-0019	35-02275	12.00–12.50	Soil	7.4(UJ)	—	—	0.55(J)	—	—	—	—	—	—	1.3(U)	—	—
0435-96-0022	35-02276	9.00–9.50	Soil	—	—	—	—	—	80.1(J–)	—	—	—	57.4(J–)	—	—	—
0435-97-0038	35-02309	2.50–3.50	Soil	2.7(UJ)	—	—	0.41(U)	—	—	—	—	—	—	—	—	—
0435-97-0039	35-02309	4.50–5.50	Soil	3(UJ)	—	—	0.45(U)	—	—	—	—	—	—	—	—	—
0435-97-0040	35-02309	8.50–10.00	Soil	2.8(UJ)	—	—	0.43(U)	—	—	—	—	—	—	—	—	—

Table C-1.1-2
Inorganic Chemicals with Concentrations (mg/kg) or Detection Limits at or Exceeding Background Values in Mesa Top Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Barium	Beryllium	Cadmium	Calcium	Chromium (total)	Copper	Lead	Mercury	Nickel	Silver	Thallium	Zinc
Soil Background Value (mg/kg)				0.83	295	1.83	0.4	6120	19.3	14.7	22.3	0.1	15.4	1	0.73	48.8
PRS 35-003(p)																
0435-96-0153	35-02437	0.00–1.00	Soil	7.7(U)	—	—	0.67(U)	—	—	—	—	—	25.3	1.4(U)	—	—
0435-96-0154	35-02437	4.00–5.00	Soil	8.8(U)	—	—	0.78(U)	—	78.9	128	—	—	47.6	1.6(U)	—	—
0435-96-0156	35-02438	4.00–5.00	Soil	8.7(U)	—	—	0.76(U)	—	—	—	—	0.74	—	1.6(U)	—	—
0435-96-0157	35-02438	8.00–9.00	Soil	7.9(U)	—	—	0.69(U)	—	—	—	—	—	—	1.4(U)	—	—
0435-96-0158	35-02439	0.00–1.00	Soil	8.6 (U)	—	—	0.75 (U)	—	—	—	—	—	—	1.5 (U)	—	—
0435-96-0159	35-02439	4.00–5.00	Soil	8.7(U)	—	—	0.76(U)	—	—	—	—	—	—	1.6(U)	—	—
0435-96-0160	35-02440	4.00–5.00	Soil	9.2(U)	—	—	0.8(U)	—	—	—	—	—	—	2.1(J)	—	—
0435-96-0161	35-02440	8.00–9.00	Soil	8.5(U)	—	—	0.75(U)	—	—	—	—	—	16.1	1.5(U)	—	—
0435-96-0162	35-02441	0.00–1.00	Soil	9(U)	—	—	0.79(U)	10700	—	—	26.7(J-)	—	—	1.6(U)	—	—
0435-96-0163	35-02441	4.00–5.00	Soil	9.1(U)	—	—	0.8(U)	—	—	—	—	—	—	1.6(U)	—	—
0435-96-0165	35-02442	4.00–5.00	Soil	8.6(U)	—	—	0.76(U)	—	—	—	—	—	—	1.6(U)	—	—
0435-96-0166	35-02442	8.00–9.00	Soil	8.4(U)	—	—	0.74(U)	—	—	—	—	—	—	1.5(U)	—	—
0435-96-0167	35-02443	4.00–5.00	Soil	8.6(U)	—	—	0.75(U)	—	—	—	—	—	—	1.6(U)	—	—
0435-96-0168	35-02443	8.00–9.00	Soil	8.1(U)	—	—	0.72(U)	—	—	—	—	—	—	1.5(U)	—	—
0435-96-0169	35-02444	0.00–1.00	Soil	8.8(U)	—	—	0.77(U)	—	—	—	—	—	—	1.6(U)	—	—
0435-96-0170	35-02444	4.00–5.00	Soil	8.8(U)	—	—	0.77(U)	—	—	—	—	0.6(U)	—	1.6(U)	—	—
0435-96-0171	35-02445	0.00–1.00	Soil	9(U)	—	—	0.79(U)	—	—	—	—	0.21	—	1.6(U)	—	—
0435-96-0172	35-02445	4.50–5.50	Soil	8.5(U)	—	—	0.75(U)	—	—	—	—	—	—	1.5(U)	—	—
0435-96-0173	35-02446	4.00–5.00	Soil	9(U)	—	—	0.99(J)	—	—	—	—	—	—	1.6(U)	—	—
0435-96-0174	35-02446	8.00–9.00	Soil	8.4(U)	—	—	0.74(U)	—	—	—	—	—	—	1.5(U)	—	—
0435-96-0175	35-02446	8.00–9.00	Soil	8.4(U)	—	—	0.74(U)	—	—	—	—	—	—	1.9(J)	—	—
PRS 35-003(g)																
AAA6540	35-02017	28.50–29.50	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—
PRS 35-003(o)																
0435-97-0001	35-02303	3.00–4.50	Soil	3.8(U)	—	—	—	—	—	—	—	—	—	—	—	—
0435-97-0002	35-02303	4.50–7.00	Soil	3.2(U)	—	—	—	—	—	—	—	—	—	—	—	—

Table C-1.1-2
Inorganic Chemicals with Concentrations (mg/kg) or Detection Limits at or Exceeding Background Values in Mesa Top Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Barium	Beryllium	Cadmium	Calcium	Chromium (total)	Copper	Lead	Mercury	Nickel	Silver	Thallium	Zinc
Soil Background Value (mg/kg)				0.83	295	1.83	0.4	6120	19.3	14.7	22.3	0.1	15.4	1	0.73	48.8
0435-97-0004	35-02303	13.50–15.00	Soil	3.5(U)	—	—	—	—	—	—	—	—	—	—	—	—
0435-97-0005	35-02303	17.50–19.00	Soil	3.6(J)	—	—	—	—	—	—	—	0.17	—	—	—	—
0435-97-0007	35-02304	4.50–5.50	Soil	3.5(U)	—	—	—	—	—	—	—	—	—	—	—	—
0435-97-0008	35-02304	5.50–7.00	Soil	3.5(U)	—	—	—	—	—	—	—	—	—	—	—	—
0435-97-0009	35-02304	20.00–21.50	Soil	3.3(U)	—	—	—	—	—	—	—	—	—	—	—	—
0435-97-0010	35-02304	24.00–25.00	Soil	3.5(U)	—	—	—	—	—	—	—	—	—	—	—	—
0435-97-0012	35-02305	7.00–8.40	Soil	4.6(U)	392	—	0.45(U)	—	—	—	—	—	—	—	—	—
0435-97-0013	35-02305	8.40–10.00	Soil	2.7(U)	—	—	—	—	—	—	—	—	—	—	—	—
0435-97-0016	35-02305	14.50–15.00	Soil	2.8(UJ)	—	2	0.42(U)	—	—	—	—	—	—	—	—	—
0435-97-0014	35-02305	17.50–18.50	Soil	2.2(U)	—	—	—	—	—	—	—	—	—	—	—	—
0435-97-0015	35-02305	38.00–39.00	Soil	2.8(UJ)	—	—	0.41(U)	—	—	—	—	—	—	—	—	—
0435-97-0017	35-02529	5.00–6.00	Soil	4(U)	—	—	—	—	—	—	—	—	—	—	—	—
0435-97-0018	35-02529	6.00–7.50	Soil	3.7(U)	—	—	—	—	—	—	—	—	—	—	—	—
0435-97-0021	35-02529	10.00–11.00	Soil	3.7(U)	—	—	—	—	—	—	—	—	—	—	—	—
0435-97-0019	35-02529	19.50–20.50	Soil	3.5(U)	—	—	—	—	—	—	—	—	—	—	—	—
0435-97-0020	35-02529	24.00–25.00	Soil	3.5(U)	—	—	—	—	—	—	—	—	—	—	—	—
PRS 35-003(m)																
0435-97-0033	35-02306	6.80–7.80	Soil	3.1(U)	—	—	0.46(U)	—	—	—	—	—	—	—	—	—
0435-97-0034	35-02306	7.80–8.80	Soil	2.9(U)	—	—	0.43(U)	—	—	—	—	—	—	—	—	—
0435-97-0035	35-02306	11.50–12.50	Soil	2.8(U)	—	—	0.42(U)	—	—	—	—	—	—	—	—	—
0435-97-0036	35-02306	16.50–17.50	Soil	2.9(U)	—	—	0.43(U)	—	—	—	—	—	—	—	—	—
0435-97-0022	35-02307	9.00–10.00	Soil	3.8(U)	—	—	—	—	—	—	—	—	—	—	—	—
0435-97-0023	35-02307	10.00–12.50	Soil	3.5(U)	—	—	—	—	—	—	—	—	—	—	—	—
0435-97-0027	35-02307	17.00–17.50	Soil	3.7(U)	—	—	—	—	—	—	—	—	—	—	—	—
0435-97-0025	35-02307	21.50–22.50	Soil	3.2(U)	—	—	—	—	—	—	—	—	—	—	—	—
0435-97-0026	35-02307	26.50–27.50	Soil	3.5(U)	—	—	—	—	—	—	—	0.5	—	—	—	—
0435-97-0028	35-02308	8.40–9.40	Soil	3.1(UJ)	—	—	0.47(U)	—	—	—	—	—	—	—	—	—

Table C-1.1-2
Inorganic Chemicals with Concentrations (mg/kg) or Detection Limits at or Exceeding Background Values in Mesa Top Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Barium	Beryllium	Cadmium	Calcium	Chromium (total)	Copper	Lead	Mercury	Nickel	Silver	Thallium	Zinc
Soil Background Value (mg/kg)				0.83	295	1.83	0.4	6120	19.3	14.7	22.3	0.1	15.4	1	0.73	48.8
0435-97-0029	35-02308	9.40–10.00	Soil	3(UJ)	—	—	0.44(U)	—	—	—	—	—	—	—	—	—
0435-97-0030	35-02308	11.50–12.50	Soil	2.9(UJ)	—	—	0.43(U)	—	—	—	—	—	—	—	—	—
0435-97-0031	35-02308	19.00–20.00	Soil	3.1(UJ)	—	—	0.46(U)	—	—	—	—	—	—	—	—	—
PRS 35-003(e)																
AAB0973	35-02012	99.00–100.00	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—

[a] U = The analyte was analyzed for but not detected.

[b] UJ = The analyte was not positively identified in the sample, and the associated value is an estimate of the sample-specific detection or quantitation limit.

[c] J = The analyte was positively identified, and the associated numerical value is estimated to be more uncertain than would normally be expected for that analysis.

[d] J- = The analyte was positively identified, and the result is likely to be biased low.

Table C-1.1-3
Detected Organic Chemicals in Mesa Top Subarea

Analyte	Location ID	Sample ID	Sample Value (mg/kg)	Media	Depth (ft)
PRS 35-015(a)					
Acetone	35-02182	AAC3344	0.043(J)[a]	Soil	0–1
Anthracene	35-02285	0435-95-0198	0.057(J)	Soil	1–1.8
Benzo(a)anthracene	35-02285	0435-95-0198	0.053(J)	Soil	1–1.8
Benzo(a)pyrene	35-02285	0435-95-0198	0.047(J)	Soil	1–1.8
Benzo(b)fluoranthene	35-02285	0435-95-0198	0.029(J)	Soil	1–1.8
Benzo(k)fluoranthene	35-02285	0435-95-0198	0.043(J)	Soil	1–1.8
Bis(2-ethylhexyl)phthalate	35-02286	0435-95-0199	3(J)	Soil	1–2
	35-02286	0435-95-0200	3.8(J)	Soil	2–3
	35-02499	0435-97-0115	0.092(J)	Soil	0–1
	35-02499	0435-97-0116	0.75(J)	Soil	1–2
	35-02500	0435-97-0121	3.1(J)	Soil	0.83–2
	35-02500	0435-97-0119	2.5(J)	Soil	0–0.83
	35-02501	0435-97-0123	0.55(J)	Soil	1–2
Chrysene	35-02285	0435-95-0198	0.055(J)	Soil	1–1.8
DRO	35-02285	0435-95-0198	55	Soil	1–1.8
	35-02286	0435-95-0199	44000	Soil	1–2
	35-02286	0435-95-0200	43000	Soil	2–3
Dimethyl phthalate	35-02497	0435-97-0107	0.06(J)	Soil	0–1
Fluoranthene	35-02285	0435-95-0198	0.14(J)	Soil	1–1.8
LRO	35-02496	0435-97-0105	2300	Soil	1–2
	35-02497	0435-97-0107	490	Soil	0–1
	35-02497	0435-97-0108	220	Soil	1–2
	35-02497	0435-97-0109	100	Soil	1–2
	35-02498	0435-97-0112	27(J)	Soil	0–1
	35-02498	0435-97-0113	110	Soil	1–2
	35-02499	0435-97-0115	990	Soil	0–1
	35-02499	0435-97-0116	15000	Soil	1–2
	35-02499	0435-97-0117	850	Soil	2–3
	35-02500	0435-97-0121	23000	Soil	0.83–2
	35-02500	0435-97-0119	22000	Soil	0–0.83
	35-02501	0435-97-0123	7600	Soil	1–2
	35-02594	0435-97-0277	280	Soil	2–3
	35-02594	0435-97-0278	130	Soil	8.5–10
Phenanthrene	35-02285	0435-95-0198	0.18(J)	Soil	1–1.8
Pyrene	35-02285	0435-95-0198	0.13(J)	Soil	1–1.8
Toluene	35-02500	0435-97-0121	0.003(J)	Soil	0.83–2
	35-02594	0435-97-0277	0.002(J+)[b]	Soil	2–3
Trichloro-1,2,2-trifluoroethane[1,1,2-]	35-02496	0435-97-0105	0.002(J-)[c]	Soil	1–2
	35-02594	0435-97-0277	0.002(J+)	Soil	2–3
Trichlorofluoromethane	35-02496	0435-97-0105	0.005(J-)	Soil	1–2
	35-02500	0435-97-0121	0.003(J+)	Soil	0.83–2

Table C-1.1-3
Detected Organic Chemicals in Mesa Top Subarea (continued)

Analyte	Location ID	Sample ID	Sample Value (mg/kg)	Media	Depth (ft)
PRS 35-014(f)					
DRO	35-02393	0435-96-0080	6500	Soil	0–1
	35-02405	0435-96-0096	81	Soil	0–0.5
	35-02428	0435-96-0143	5900(J+)	Soil	0–0.5
	35-02429	0435-96-0144	2500(J+)	Soil	0–0.5
	35-02430	0435-96-0145	45	Soil	0–0.5
	35-02431	0435-96-0146	56	Soil	0–0.5
PRS 35-014(a)					
Bis(2-ethylhexyl)phthalate	35-02210	AAB1042	2.8	Soil	0–0.5
	35-02211	AAB1043	2.5	Soil	0–0.5
Di-n-octylphthalate	35-02211	AAB1043	1	Soil	0–0.5
PRS 35-009(a)					
Benzo(a)pyrene	35-02301	0435-96-0051	0.38	Soil	0–8
Chrysene	35-02301	0435-96-0051	0.38	Soil	0–8
PRS 35-014(b)					
Acenaphthene	35-02568	0435-97-0434	8.9	Soil	0.5–1.5
	35-02568	0435-97-0435	0.074(J)	Soil	1.5–2.5
	35-02569	0435-97-0438	0.038(J)	Soil	0.5–1.5
Anthracene	35-02568	0435-97-0434	19	Soil	0.5–1.5
	35-02568	0435-97-0435	0.1(J)	Soil	1.5–2.5
	35-02569	0435-97-0438	0.06(J)	Soil	0.5–1.5
Aroclor-1254	35-02072	AAA3819	0.05	Soil	0–1
	35-02072	AAA3820	0.054	Soil	1–2
	35-02568	0435-97-0434	1.3	Soil	0.5–1.5
Benzo(a)anthracene	35-02568	0435-97-0434	28	Soil	0.5–1.5
	35-02568	0435-97-0435	0.21(J)	Soil	1.5–2.5
	35-02569	0435-97-0438	0.14(J)	Soil	0.5–1.5
Benzo(a)pyrene	35-02568	0435-97-0434	22	Soil	0.5–1.5
	35-02568	0435-97-0435	0.2(J)	Soil	1.5–2.5
	35-02569	0435-97-0438	0.13(J)	Soil	0.5–1.5
Benzo(b)fluoranthene	35-02568	0435-97-0434	18	Soil	0.5–1.5
	35-02568	0435-97-0435	0.16(J)	Soil	1.5–2.5
	35-02569	0435-97-0438	0.097(J)	Soil	0.5–1.5
Benzo(g,h,i)perylene	35-02568	0435-97-0434	13	Soil	0.5–1.5
	35-02568	0435-97-0435	0.13(J)	Soil	1.5–2.5
Benzo(k)fluoranthene	35-02568	0435-97-0434	19	Soil	0.5–1.5
	35-02568	0435-97-0435	0.16(J)	Soil	1.5–2.5
	35-02569	0435-97-0438	0.11(J)	Soil	0.5–1.5
Bis(2-ethylhexyl)phthalate	35-02072	AAA3819	14	Soil	0–1
Chrysene	35-02568	0435-97-0434	27	Soil	0.5–1.5
	35-02568	0435-97-0435	0.2(J)	Soil	1.5–2.5
	35-02569	0435-97-0438	0.16(J)	Soil	0.5–1.5

Table C-1.1-3
Detected Organic Chemicals in Mesa Top Subarea (continued)

Analyte	Location ID	Sample ID	Sample Value (mg/kg)	Media	Depth (ft)
Dibenz(a,h)anthracene	35-02568	0435-97-0434	5.8	Soil	0.5–1.5
Dibenzofuran	35-02568	0435-97-0434	4.7	Soil	0.5–1.5
DRO	35-02568	0435-97-0434	34	Soil	0.5–1.5
Fluoranthene	35-02568	0435-97-0434	65	Soil	0.5–1.5
	35-02568	0435-97-0435	0.43	Soil	1.5–2.5
	35-02569	0435-97-0438	0.29(J)	Soil	0.5–1.5
Fluorene	35-02568	0435-97-0434	7.9	Soil	0.5–1.5
Indeno(1,2,3-cd)pyrene	35-02568	0435-97-0434	13	Soil	0.5–1.5
	35-02568	0435-97-0435	0.11(J)	Soil	1.5–2.5
	35-02569	0435-97-0438	0.077(J)	Soil	0.5–1.5
LRO	35-02568	0435-97-0434	65	Soil	0.5–1.5
Methylnaphthalene[2-]	35-02568	0435-97-0434	1.8(J)	Soil	0.5–1.5
Naphthalene	35-02568	0435-97-0434	5.4	Soil	0.5–1.5
Phenanthrene	35-02568	0435-97-0434	64	Soil	0.5–1.5
	35-02568	0435-97-0435	0.4	Soil	1.5–2.5
	35-02569	0435-97-0438	0.22(J)	Soil	0.5–1.5
Pyrene	35-02568	0435-97-0434	55	Soil	0.5–1.5
	35-02568	0435-97-0435	0.42	Soil	1.5–2.5
	35-02569	0435-97-0438	0.3(J)	Soil	0.5–1.5
PRSs 35-003(j,k), 35-014(d), 35-015(b)					
Acetone	35-02089	AAA6390	0.19	Soil	5–6
	35-02090	AAA6391	0.12	Soil	0–1
	35-02090	AAA6392	0.054	Soil	1–2
	35-02090	AAA6397	0.049	Soil	5–6
	35-02534	0435-97-0381	0.28(J+)	Soil	7–7.5
Anthracene	35-02293	0435-95-0227	0.047(J)	Soil	1.5–2.5
	35-02534	0435-97-0377	0.039(J)	Soil	1–2
Aroclor-1248	35-02535	0435-97-0385	0.29	Soil	12–12.5
	35-02535	0435-97-0383	0.072	Soil	3–4
	35-02535	0435-97-0384	0.062	Soil	5–6
Aroclor-1260	35-02084	AAA6373	0.64	Soil	0–0.5
	35-02288	0435-95-0212	0.095	Soil	3–4
	35-02291	0435-95-0219	2.9	Soil	1–2
Benzo(a)anthracene	35-02293	0435-95-0227	0.045(J)	Soil	1.5–2.5
	35-02534	0435-97-0377	0.084(J)	Soil	1–2
Benzo(a)pyrene	35-02086	AAA6375	4	Soil	0–0.5
	35-02293	0435-95-0227	0.047(J)	Soil	1.5–2.5
Benzo(b)fluoranthene	35-02086	AAA6375	5.6	Soil	0–0.5
	35-02293	0435-95-0227	0.027(J)	Soil	1.5–2.5
Benzo(k)fluoranthene	35-02293	0435-95-0227	0.043(J)	Soil	1.5–2.5

Table C-1.1-3
Detected Organic Chemicals in Mesa Top Subarea (continued)

Analyte	Location ID	Sample ID	Sample Value (mg/kg)	Media	Depth (ft)
Bis(2-ethylhexyl)phthalate	35-02081	AAA6366	2.3	Soil	0–0.5
	35-02089	AAA6388	0.21	Soil	3–4
	35-02090	AAA6391	0.85	Soil	0–1
	35-02291	0435-95-0219	0.77	Soil	1–2
	35-02291	0435-95-0222	0.075(J)	Soil	9–10
Butanone[2-]	35-02534	0435-97-0381	0.095(J-)	Soil	7–7.5
	35-02535	0435-97-0384	0.009(J+)	Soil	5–6
Butylbenzene[sec-]	35-02535	0435-97-0384	0.002(J+)	Soil	5–6
Chrysene	35-02293	0435-95-0227	0.053(J)	Soil	1.5–2.5
	35-02534	0435-97-0377	0.097(J)	Soil	1–2
DRO	35-02288	0435-95-0211	79	Soil	1–2
	35-02291	0435-95-0219	7700	Soil	1–2
	35-02291	0435-95-0220	130	Soil	3–4
	35-02291	0435-95-0222	500	Soil	9–10
	35-02293	0435-95-0227	130	Soil	1.5–2.5
Di-n-butylphthalate	35-02290	0435-95-0232	0.052(J)	Soil	1–2
	35-02534	0435-97-0377	0.15(J)	Soil	1–2
Ethylbenzene	35-02534	0435-97-0381	0.004(J-)	Soil	7–7.5
	35-02535	0435-97-0383	0.002(J+)	Soil	3–4
	35-02535	0435-97-0384	0.006(J+)	Soil	5–6
Fluoranthene	35-02086	AAA6375	6.7	Soil	0–0.5
	35-02293	0435-95-0227	0.11(J)	Soil	1.5–2.5
	35-02534	0435-97-0377	0.17(J)	Soil	1–2
Hexanone[2-]	35-02534	0435-97-0381	0.18(J-)	Soil	7–7.5
Isopropyltoluene[4-]	35-02535	0435-97-0383	0.004(J+)	Soil	3–4
	35-02535	0435-97-0384	0.004(J+)	Soil	5–6
LRO	35-02534	0435-97-0380	29000	Soil	5–6
	35-02534	0435-97-0381	48000	Soil	7–7.5
	35-02535	0435-97-0382	5300	Soil	1–2
	35-02535	0435-97-0385	55000	Soil	12–12.5
	35-02535	0435-97-0383	10000	Soil	3–4
	35-02535	0435-97-0384	12000	Soil	5–6
Methyl-2-pentanone[4-]	35-02534	0435-97-0381	0.02(J-)	Soil	7–7.5
Methylene chloride	35-02288	0435-95-0212	0.013	Soil	3–4
Phenanthrene	35-02086	AAA6375	6.2	Soil	0–0.5
	35-02293	0435-95-0227	0.12(J)	Soil	1.5–2.5
	35-02534	0435-97-0377	0.15(J)	Soil	1–2
	35-02535	0435-97-0383	1.1(J)	Soil	3–4
	35-02535	0435-97-0384	2.2(J)	Soil	5–6
Phenol	35-02534	0435-97-0377	0.048(J)	Soil	1–2

Table C-1.1-3
Detected Organic Chemicals in Mesa Top Subarea (continued)

Analyte	Location ID	Sample ID	Sample Value (mg/kg)	Media	Depth (ft)
Pyrene	35-02086	AAA6375	8.3	Soil	0–0.5
	35-02293	0435-95-0227	0.096(J)	Soil	1.5–2.5
	35-02534	0435-97-0377	0.2(J)	Soil	1–2
Tetrachloroethene	35-02534	0435-97-0381	0.001(J-)	Soil	7–7.5
	35-02535	0435-97-0383	0.002(J+)	Soil	3–4
	35-02535	0435-97-0384	0.004(J+)	Soil	5–6
Toluene	35-02081	AAA6366	0.0067(J)	Soil	0–0.5
	35-02288	0435-95-0212	0.002(J)	Soil	3–4
	35-02291	0435-95-0219	0.007(J+)	Soil	1–2
	35-02534	0435-97-0380	0.004(J+)	Soil	5–6
	35-02534	0435-97-0381	0.028(J-)	Soil	7–7.5
	35-02535	0435-97-0385	0.003(J-)	Soil	12–12.5
	35-02535	0435-97-0383	0.007(J+)	Soil	3–4
	35-02535	0435-97-0384	0.016(J+)	Soil	5–6
Trichloroethene	35-02534	0435-97-0381	0.004(J-)	Soil	7–7.5
	35-02535	0435-97-0385	0.001(J-)	Soil	12–12.5
	35-02535	0435-97-0383	0.002(J+)	Soil	3–4
Trichlorofluoromethane	35-02534	0435-97-0380	0.002(J+)	Soil	5–6
	35-02534	0435-97-0381	0.003(J-)	Soil	7–7.5
	35-02535	0435-97-0385	0.002(J-)	Soil	12–12.5
Trimethylbenzene[1,2,4-]	35-02535	0435-97-0383	0.005(J+)	Soil	3–4
	35-02535	0435-97-0384	0.01(J+)	Soil	5–6
Trimethylbenzene[1,3,5-]	35-02535	0435-97-0383	0.003(J+)	Soil	3–4
	35-02535	0435-97-0384	0.005(J+)	Soil	5–6
Xylene (total)	35-02534	0435-97-0377	0.001(J)	Soil	1–2
	35-02534	0435-97-0379	0.002(J)	Soil	3–4
	35-02534	0435-97-0380	0.003(J+)	Soil	5–6
	35-02534	0435-97-0381	0.023(J-)	Soil	7–7.5
	35-02535	0435-97-0383	0.013(J)	Soil	3–4
	35-02535	0435-97-0384	0.032(J+)	Soil	5–6
PRS 35-018(a)					
Acenaphthene	35-02294	0435-95-0234	0.14(J)	Soil	0–1
	35-02353	0435-96-0083	1.8	Soil	0–0.5
	35-02354	0435-96-0084	0.27(J)	Soil	0–0.5
	35-02355	0435-96-0085	1.4	Soil	0–0.5
	35-02356	0435-96-0086	0.55	Soil	0–0.5
Anthracene	35-02294	0435-95-0234	0.22(J)	Soil	0–1
	35-02353	0435-96-0083	3.8	Soil	0–0.5
	35-02354	0435-96-0084	0.67	Soil	0–0.5
	35-02355	0435-96-0085	3	Soil	0–0.5
	35-02356	0435-96-0086	0.97	Soil	0–0.5

Table C-1.1-3
Detected Organic Chemicals in Mesa Top Subarea (continued)

Analyte	Location ID	Sample ID	Sample Value (mg/kg)	Media	Depth (ft)
Aroclor-1260	35-02268	0435-95-0162	0.94	Soil	0–1
	35-02353	0435-96-0083	2.7(J+)	Soil	0–0.5
	35-02354	0435-96-0084	4.7(J+)	Soil	0–0.5
	35-02355	0435-96-0085	1.9(J+)	Soil	0–0.5
	35-02356	0435-96-0086	4.9(J+)	Soil	0–0.5
	35-02402	0435-96-0093	0.75	Soil	0–0.5
	35-02403	0435-96-0094	0.098	Soil	0–0.5
	35-02404	0435-96-0095	0.2	Soil	0–0.5
	35-02406	0435-96-0097	12	Soil	3–3.5
	35-02407	0435-96-0098	0.1	Soil	3–3.5
Benzo(a)anthracene	35-02268	0435-95-0162	0.32(J)	Soil	0–1
	35-02294	0435-95-0234	0.26(J)	Soil	0–1
	35-02294	0435-95-0235	0.042(J)	Soil	1–2
	35-02353	0435-96-0083	7	Soil	0–0.5
	35-02354	0435-96-0084	1.1	Soil	0–0.5
	35-02355	0435-96-0085	7.1	Soil	0–0.5
	35-02356	0435-96-0086	1.9	Soil	0–0.5
Benzo(a)pyrene	35-02268	0435-95-0162	0.24(J)	Soil	0–1
	35-02294	0435-95-0234	0.23(J)	Soil	0–1
	35-02353	0435-96-0083	5.9	Soil	0–0.5
	35-02354	0435-96-0084	1	Soil	0–0.5
	35-02355	0435-96-0085	5.4	Soil	0–0.5
	35-02356	0435-96-0086	1.4	Soil	0–0.5
Benzo(b)fluoranthene	35-02268	0435-95-0162	0.21(J)	Soil	0–1
	35-02294	0435-95-0234	0.21(J)	Soil	0–1
	35-02353	0435-96-0083	9.2	Soil	0–0.5
	35-02354	0435-96-0084	1.6	Soil	0–0.5
	35-02355	0435-96-0085	8.9	Soil	0–0.5
	35-02356	0435-96-0086	2.2	Soil	0–0.5
Benzo(g,h,i)perylene	35-02268	0435-95-0162	0.075(J)	Soil	0–1
	35-02294	0435-95-0234	0.1(J)	Soil	0–1
	35-02353	0435-96-0083	4.3	Soil	0–0.5
	35-02354	0435-96-0084	0.74	Soil	0–0.5
	35-02355	0435-96-0085	4	Soil	0–0.5
	35-02356	0435-96-0086	1	Soil	0–0.5
Benzo(k)fluoranthene	35-02294	0435-95-0234	0.2(J)	Soil	0–1
Bis(2-ethylhexyl)phthalate	35-02294	0435-95-0236	0.066(J)	Soil	2–3

Table C-1.1-3
Detected Organic Chemicals in Mesa Top Subarea (continued)

Analyte	Location ID	Sample ID	Sample Value (mg/kg)	Media	Depth (ft)
Chrysene	35-02294	0435-95-0234	0.28(J)	Soil	0–1
	35-02294	0435-95-0235	0.038(J)	Soil	1–2
	35-02353	0435-96-0083	7.2	Soil	0–0.5
	35-02354	0435-96-0084	1.3	Soil	0–0.5
	35-02355	0435-96-0085	6.6	Soil	0–0.5
	35-02356	0435-96-0086	2	Soil	0–0.5
Dibenz(a,h)anthracene	35-02294	0435-95-0234	0.055(J)	Soil	0–1
Dibenzofuran	35-02294	0435-95-0234	0.059(J)	Soil	0–1
	35-02353	0435-96-0083	1(J)	Soil	0–0.5
	35-02354	0435-96-0084	0.13(J)	Soil	0–0.5
	35-02355	0435-96-0085	0.74	Soil	0–0.5
	35-02356	0435-96-0086	0.31(J)	Soil	0–0.5
DRO	35-02294	0435-95-0234	240	Soil	0–1
	35-02294	0435-95-0235	270	Soil	1–2
Fluoranthene	35-02268	0435-95-0162	0.3(J)	Soil	0–1
	35-02294	0435-95-0234	0.68	Soil	0–1
	35-02294	0435-95-0235	0.11(J)	Soil	1–2
	35-02353	0435-96-0083	23	Soil	0–0.5
	35-02354	0435-96-0084	3.4	Soil	0–0.5
	35-02355	0435-96-0085	18	Soil	0–0.5
	35-02356	0435-96-0086	4.6	Soil	0–0.5
Fluorene	35-02294	0435-95-0234	0.13(J)	Soil	0–1
	35-02353	0435-96-0083	1.8	Soil	0–0.5
	35-02354	0435-96-0084	0.27(J)	Soil	0–0.5
	35-02355	0435-96-0085	1.6	Soil	0–0.5
	35-02356	0435-96-0086	0.62	Soil	0–0.5
Indeno(1,2,3-cd)pyrene	35-02268	0435-95-0162	0.056(J)	Soil	0–1
	35-02294	0435-95-0234	0.098(J)	Soil	0–1
	35-02353	0435-96-0083	3.8	Soil	0–0.5
	35-02354	0435-96-0084	0.67	Soil	0–0.5
	35-02355	0435-96-0085	3.6	Soil	0–0.5
	35-02356	0435-96-0086	0.9	Soil	0–0.5
Methylnaphthalene[2-]	35-02353	0435-96-0083	0.33(J)	Soil	0–0.5
	35-02355	0435-96-0085	0.27(J)	Soil	0–0.5
	35-02356	0435-96-0086	0.14(J)	Soil	0–0.5
Naphthalene	35-02294	0435-95-0234	0.08(J)	Soil	0–1
	35-02353	0435-96-0083	0.67(J)	Soil	0–0.5
	35-02355	0435-96-0085	0.68	Soil	0–0.5
	35-02356	0435-96-0086	0.45	Soil	0–0.5

Table C-1.1-3
Detected Organic Chemicals in Mesa Top Subarea (continued)

Analyte	Location ID	Sample ID	Sample Value (mg/kg)	Media	Depth (ft)
Phenanthrene	35-02268	0435-95-0162	0.15(J)	Soil	0–1
	35-02294	0435-95-0234	0.77	Soil	0–1
	35-02294	0435-95-0235	0.076(J)	Soil	1–2
	35-02353	0435-96-0083	17	Soil	0–0.5
	35-02354	0435-96-0084	2.6	Soil	0–0.5
	35-02355	0435-96-0085	14	Soil	0–0.5
	35-02356	0435-96-0086	4.4	Soil	0–0.5
Pyrene	35-02268	0435-95-0162	0.33(J)	Soil	0–1
	35-02294	0435-95-0234	0.5	Soil	0–1
	35-02294	0435-95-0235	0.082(J)	Soil	1–2
	35-02353	0435-96-0083	17	Soil	0–0.5
	35-02354	0435-96-0084	3.2	Soil	0–0.5
	35-02355	0435-96-0085	17	Soil	0–0.5
	35-02356	0435-96-0086	4.7	Soil	0–0.5
PRS 35-003(a,b,c,n)					
Acetone	35-02298	0435-96-0042	0.06(J-)	Soil	0–1
	35-02299	0435-96-0045	0.086(J-)	Soil	0–1
	35-02300	0435-96-0049	0.11(J-)	Soil	0–1
Bis(2-ethylhexyl)phthalate	35-02297	0435-96-0038	0.5	Soil	0–1
Trichloroethene	35-02298	0435-96-0042	0.017(J-)	Soil	0–1
	35-02299	0435-96-0045	0.01(J-)	Soil	0–1
	35-02300	0435-96-0049	0.015(J-)	Soil	0–1
PRS 35-003(misc)					
Aroclor-1016	35-02271	0435-96-0006	0.038	Soil	7–7.5
Aroclor-1221	35-02271	0435-96-0006	0.077	Soil	7–7.5
Aroclor-1232	35-02271	0435-96-0006	0.038	Soil	7–7.5
Aroclor-1242	35-02271	0435-96-0006	0.038	Soil	7–7.5
Aroclor-1248	35-02271	0435-96-0006	0.038	Soil	7–7.5
Aroclor-1254	35-02271	0435-96-0006	0.038	Soil	7–7.5
Aroclor-1260	35-02020	AAA6625	0.9	Soil	1.5–2.5
	35-02026	AAA6617	0.42	Soil	2–3
	35-02215	AAB1009	0.37	Soil	1–2
	35-02270	0435-96-0003	0.48	Soil	10–10.5
	35-02271	0435-96-0006	4.2	Soil	7–7.5
	35-02274	0435-96-0016	0.056	Soil	17–18
	35-02275	0435-96-0019	0.71	Soil	12–12.5
	35-02276	0435-96-0022	14.2	Soil	9–9.5
Benzo(a)anthracene	35-02026	AAA6617	1.095	Soil	2–3
	35-02270	0435-96-0003	0.2(J)	Soil	10–10.5
	35-02280	0435-95-0195	0.027(J)	Soil	0–2
Benzo(a)pyrene	35-02026	AAA6617	0.556	Soil	2–3
	35-02270	0435-96-0003	0.039(J)	Soil	10–10.5

Table C-1.1-3
Detected Organic Chemicals in Mesa Top Subarea (continued)

Analyte	Location ID	Sample ID	Sample Value (mg/kg)	Media	Depth (ft)
Benzo(b)fluoranthene	35-02026	AAA6617	1.278	Soil	2–3
	35-02270	0435-96-0003	0.14(J)	Soil	10–10.5
Bis(2-ethylhexyl)phthalate	35-02026	AAA6617	0.645	Soil	2–3
	35-02269	0435-95-0168	0.137	Soil	0–1
	35-02271	0435-96-0006	0.37(J)	Soil	7–7.5
Chrysene	35-02270	0435-96-0003	0.1(J)	Soil	10–10.5
	35-02280	0435-95-0195	0.039(J)	Soil	0–2
Di-n-butylphthalate	35-02014	AAB1020	1.4	Soil	0–2
	35-02027	AAA6606	1.8	Soil	9–10
Di-n-octylphthalate	35-02275	0435-96-0019	0.04(J)	Soil	12–12.5
Fluoranthene	35-02270	0435-96-0003	0.14(J)	Soil	10–10.5
	35-02280	0435-95-0195	0.056(J)	Soil	0–2
Indeno(1,2,3-cd)pyrene	35-02270	0435-96-0003	0.17(J)	Soil	10–10.5
Methylene chloride	35-02274	0435-96-0016	0.011	Soil	17–18
	35-02276	0435-96-0022	0.005(J)	Soil	9–9.5
Phenanthrene	35-02026	AAA6617	0.458	Soil	2–3
	35-02270	0435-96-0003	0.1(J)	Soil	10–10.5
Pyrene	35-02026	AAA6617	1.991	Soil	2–3
	35-02215	AAB1011	0.37	Soil	5–6
	35-02270	0435-96-0003	0.29(J)	Soil	10–10.5
	35-02280	0435-95-0195	0.055(J)	Soil	0–2
Trichlorofluoromethane	35-02269	0435-95-0168	0.003(J)	Soil	0–1
PRS 35-003(p)					
Anthracene	35-02437	0435-96-0153	0.069(J)	Soil	0–1
Bis(2-ethylhexyl)phthalate	35-02437	0435-96-0153	0.57(J)	Soil	0–1
	35-02437	0435-96-0154	0.1(J)	Soil	4–5
	35-02438	0435-96-0156	0.076(J)	Soil	4–5
	35-02438	0435-96-0157	0.047(J)	Soil	8–9
	35-02439	0435-96-0158	0.059(J)	Soil	0–1
	35-02439	0435-96-0159	0.04(J)	Soil	4–5
	35-02441	0435-96-0162	0.081(J)	Soil	0–1
	35-02442	0435-96-0166	0.036(J-)	Soil	8–9
	35-02443	0435-96-0167	0.071(J)	Soil	4–5
	35-02443	0435-96-0168	0.14(J)	Soil	8–9
	35-02444	0435-96-0169	0.057(J)	Soil	0–1
	35-02445	0435-96-0171	0.066(J)	Soil	0–1
	35-02445	0435-96-0172	0.11(J)	Soil	4.5–5.5
	35-02446	0435-96-0173	0.24(J)	Soil	4–5
	35-02446	0435-96-0174	0.07(J)	Soil	8–9
	35-02446	0435-96-0175	0.21(J)	Soil	8–9
Butanone[2-]	35-02437	0435-96-0153	0.003(J)	Soil	0–1
Fluoranthene	35-02437	0435-96-0153	0.14(J)	Soil	0–1
Hexanone[2-]	35-02437	0435-96-0153	0.006(J)	Soil	0–1

Table C-1.1-3
Detected Organic Chemicals in Mesa Top Subarea (continued)

Analyte	Location ID	Sample ID	Sample Value (mg/kg)	Media	Depth (ft)
Methylene chloride	35-02437	0435-96-0153	0.028	Soil	0–1
	35-02437	0435-96-0154	0.027	Soil	4–5
	35-02438	0435-96-0156	0.024	Soil	4–5
	35-02438	0435-96-0157	0.007	Soil	8–9
	35-02439	0435-96-0158	0.011	Soil	0–1
	35-02440	0435-96-0160	0.015	Soil	4–5
Pyrene	35-02437	0435-96-0153	0.12(J)	Soil	0–1
Trichlorofluoromethane	35-02437	0435-96-0153	0.006	Soil	0–1
	35-02437	0435-96-0154	0.005(J)	Soil	4–5
	35-02438	0435-96-0156	0.005(J)	Soil	4–5
	35-02439	0435-96-0158	0.003(J)	Soil	0–1
	35-02441	0435-96-0162	0.017	Soil	0–1
PRS 35-003(g)					
Di-n-butylphthalate	35-02017	AAA6539	0.6	Soil	19–20
PRS 35-003(o)					
Di-n-butylphthalate	35-02016	AAA6589	2.1	Soil	1–2
	35-02016	AAA6581	2	Soil	29–30
PRS 35-004(h)					
Butylbenzylphthalate	35-02024	AAA6601	1.6	Soil	1–2
Di-n-butylphthalate	35-02024	AAA6601	1.8	Soil	1–2

[a] J = The analyte was positively identified, and the associated numerical value is estimated to be more uncertain than would normally be expected for that analysis.

[b] J+ = The analyte was positively identified, and the result is likely to be biased high.

[c] J- = The analyte was positively identified, and the result is likely to be biased low.

Table C-1.1-4

Samples with Radionuclides Detected (pCi/g) Above Background Values or Fallout Values in Mesa Top Subarea

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Cobalt-60	Europium-152	Plutonium-238	Plutonium-239	Strontium-90	Tritium	Uranium-234	Uranium-235	Uranium-238
Soil Background Value/Fallout Value				1.65	na[a]	na	0.023	0.054	1.31	0.766	2.59	0.2	2.29
PRS 35-015(a)													
0435-97-0104	35-02496	0.00–1.00	Soil	—	—	—	—	0.028	—	—	—	—	—
0435-97-0107	35-02497	0.00–1.00	Soil	—	—	—	—	—	—	—	—	—	—
0435-97-0108	35-02497	1.00–2.00	Soil	—	—	0.336	—	—	—	—	—	—	—
0435-97-0113	35-02498	1.00–2.00	Soil	—	—	—	—	—	—	—	—	—	—
0435-97-0115	35-02499	0.00–1.00	Soil	—	—	—	—	—	—	—	—	—	—
0435-97-0117	35-02499	2.00–3.00	Soil	—	—	—	—	—	—	—	—	—	—
0435-97-0121	35-02500	0.83–2.00	Soil	—	—	—	—	—	—	—	—	—	—
0435-97-0122	35-02501	0.00–1.00	Soil	—	—	—	—	—	—	—	—	—	—
0435-97-0123	35-02501	1.00–2.00	Soil	—	—	—	—	—	—	—	—	—	—
0435-97-0277	35-02594	2.00–3.00	Soil	—	—	—	—	—	—	—	—	—	—
PRS 35-014(a)													
AAA3797	35-02070	0.00–1.00	Soil	—	—	—	—	—	—	0.336	—	—	—
AAA3798	35-02070	1.00–2.00	Soil	—	—	—	—	—	—	0.563	—	—	—
AAA3799	35-02070	2.00–3.00	Soil	—	—	—	—	—	—	0.580	—	—	—
AAA3800	35-02071	0.00–1.00	Soil	—	—	—	—	—	—	0.156	—	—	—
AAA3818	35-02071	2.00–3.00	Soil	—	—	—	—	0.069(U)[b]	—	—	—	—	—
AAA6353	35-02073	0.00–1.00	Soil	—	—	—	—	—	—	0.143	—	—	—
AAA6354	35-02073	1.00–2.00	Soil	—	—	—	—	0.569	—	0.142	—	—	—
AAA6356	35-02074	0.00–1.00	Soil	—	—	—	—	—	—	0.25	—	0.238(U)	—
AAA6357	35-02074	1.00–2.00	Soil	—	—	—	0.096(U)	—	—	0.457	—	—	—
AAA6358	35-02074	2.00–3.00	Soil	—	—	—	—	—	—	0.505	—	—	—
AAA6359	35-02075	0.00–1.00	Soil	—	—	—	—	—	—	0.049	—	—	—
AAA6360	35-02075	1.00–2.00	Soil	—	—	—	—	—	—	—	—	0.629(U)	—
AAA6341	35-02076	0.00–1.00	Soil	—	—	—	—	0.102(U)	—	—	—	0.221(U)	—
AAA6342	35-02076	1.00–2.00	Soil	—	—	—	0.092(U)	0.09(U)	—	—	—	0.293	—
AAA6343	35-02076	2.00–3.00	Soil	—	—	—	—	—	—	0.116	—	—	—

Table C-1.1-4
Samples with Radionuclides Detected (pCi/g) Above Background Values or Fallout Values in Mesa Top Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Cobalt-60	Europium-152	Plutonium-238	Plutonium-239	Strontium-90	Tritium	Uranium-234	Uranium-235	Uranium-238
Soil Background Value/Fallout Value				1.65	na[a]	na	0.023	0.054	1.31	0.766	2.59	0.2	2.29
AAA6344	35-02077	0.00–1.00	Soil	—	—	—	—	—	—	—	2.97	0.609	—
AAA6347	35-02078	0.00–1.00	Soil	—	—	—	0.029(U)	—	—	—	—	—	—
AAA6348	35-02078	1.00–2.00	Soil	—	—	—	—	1.63	—	—	—	0.28(U)	—
AAA6349	35-02078	2.00–3.00	Soil	—	—	—	—	—	—	0.049	—	—	—
AAA6370	35-02220	1.00–2.00	Soil	—	—	—	0.0641(U)	—	—	—	—	—	—
0435-97-0408	35-02560	0.00–1.00	Soil	0.201	—	—	—	—	—	—	—	—	—
0435-97-0409	35-02560	1.00–2.00	Soil	—	—	—	—	—	—	—	—	—	—
0435-97-0412	35-02561	1.00–2.00	Soil	—	—	—	—	—	—	—	—	—	—
0435-97-0413	35-02561	2.00–3.00	Soil	—	—	—	—	—	—	—	—	—	—
0435-97-0414	35-02562	0.00–1.00	Soil	0.14	—	—	—	—	—	—	—	—	—
0435-97-0415	35-02562	1.00–2.00	Soil	—	—	—	—	—	—	—	—	—	—
0435-97-0416	35-02562	2.00–3.00	Soil	—	—	—	—	—	—	—	—	—	—
0435-97-0417	35-02563	0.00–1.00	Soil	—	—	0.361	—	—	—	—	—	—	—
0435-97-0418	35-02563	1.00–2.00	Soil	—	—	—	—	—	—	—	—	—	—
0435-97-0419	35-02563	2.00–3.00	Soil	—	—	—	—	—	—	—	—	—	—
0435-97-0420	35-02564	0.00–1.00	Soil	0.12	—	—	—	—	—	—	—	—	—
0435-97-0422	35-02564	1.00–2.00	Soil	—	0.1	—	—	—	—	—	—	—	—
0435-97-0423	35-02564	2.00–3.00	Soil	—	—	—	—	—	—	—	—	—	—
0435-97-0425	35-02565	0.00–1.00	Soil	—	—	—	—	—	—	—	—	—	—
0435-97-0427	35-02565	2.00–3.00	Soil	—	—	—	—	—	—	—	—	—	—
PRS 35-009(a)													
AAA6421	35-02034	13.50–14.50	Soil	—	—	—	0.018	—	—	—	—	—	—
PRS 35-014(b)													
AAA3820	35-02072	1.00–2.00	Soil	—	—	—	—	—	—	—	—	0.248(U)	—
PRSs 003(j,k), 35-014(d), 35-015(b)													
AAA6366	35-02081	0.00–0.50	Soil	—	—	—	0.092(U)	0.153(U)	—	—	—	—	—
AAA6375	35-02086	0.00–0.50	Soil	—	—	—	—	—	—	—	3.98	0.616	2.64

Table C-1.1-4
Samples with Radionuclides Detected (pCi/g) Above Background Values or Fallout Values in Mesa Top Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Cobalt-60	Europium-152	Plutonium-238	Plutonium-239	Strontium-90	Tritium	Uranium-234	Uranium-235	Uranium-238
Soil Background Value/Fallout Value				1.65	na[a]	na	0.023	0.054	1.31	0.766	2.59	0.2	2.29
AAA6376	35-02087	0.00–0.50	Soil	—	—	—	—	0.063(U)	—	—	—	—	—
AAA6386	35-02089	1.00–2.00	Soil	—	—	—	—	—	—	—	—	0.243(U)	—
AAA6387	35-02089	2.00–3.00	Soil	—	—	—	0.062(U)	—	—	—	—	—	—
AAA6389	35-02089	4.00–5.00	Soil	—	—	—	0.138(U)	—	—	—	—	—	—
AAA6390	35-02089	5.00–6.00	Soil	—	—	—	—	—	—	—	—	0.282	—
AAA6391	35-02090	0.00–1.00	Soil	—	—	—	—	—	—	—	—	0.201(U)	—
AAA6393	35-02090	2.00–3.00	Soil	—	—	—	—	—	—	—	—	0.207(U)	—
AAA6394	35-02090	3.00–4.00	Soil	—	—	—	—	—	—	—	—	0.651	—
AAA6395	35-02090	4.00–5.00	Soil	—	—	—	0.228(U)	6.61	—	—	—	0.209(U)	—
PRS 35-018(a)													
0435-95-0140	35-02262	0.00–1.00	Soil	—	—	—	—	—	—	—	—	—	—
0435-96-0083	35-02353	0.00–0.50	Soil	—	—	—	—	—	—	—	—	0.63(U)	—
0435-96-0085	35-02355	0.00–0.50	Soil	—	—	—	—	—	—	—	—	0.82(U)	—
PRS 35-003(a,b,c,n)													
0435-96-0030	35-02295	1.50–2.50	Soil	—	—	—	—	—	1.06	—	—	—	—
0435-96-0031	35-02295	4.00–5.00	Soil	—	—	—	—	—	0.93	—	—	—	—
0435-96-0034	35-02296	0.00–1.00	Soil	—	—	—	0.035(U)	—	—	—	—	—	—
0435-96-0042	35-02298	0.00–1.00	Soil	—	—	—	—	—	2.7	—	—	—	—
0435-96-0043	35-02298	4.00–5.00	Soil	—	—	—	—	—	1.13	—	—	—	—
0435-96-0045	35-02299	0.00–1.00	Soil	—	—	—	—	0.024	2.09	0.416	—	—	—
0435-96-0046	35-02299	3.00–4.00	Soil	—	—	—	—	—	0.93	0.313	—	—	—
0435-96-0047	35-02299	3.00–4.00	Soil	—	—	—	—	—	—	0.246	—	—	—
0435-96-0049	35-02300	0.00–1.00	Soil	—	—	—	—	—	1.22	0.34	—	—	—
0435-96-0050	35-02300	2.00–3.00	Soil	—	—	—	—	—	—	0.303	—	—	—
PRS 35-003(misc)													
AAB0950	35-02015	10.00–11.00	Soil	—	—	—	—	0.37	—	—	—	—	—
AAA6626	35-02020	7.00–8.00	Soil	—	—	—	—	0.14	—	—	—	—	—

Table C-1.1-4
Samples with Radionuclides Detected (pCi/g) Above Background Values or Fallout Values In Mesa Top Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Cobalt-60	Europium-152	Plutonium-238	Plutonium-239	Strontium-90	Tritium	Uranium-234	Uranium-235	Uranium-238
Soil Background Value/Fallout Value				1.65	na[a]	na	0.023	0.054	1.31	0.766	2.59	0.2	2.29
AAA6628	35-02020	26.50–27.50	Soil	—	—	0.39	—	—	—	0.14101	—	—	—
AAA6574	35-02021	3.00–4.00	Soil	0.184	—	—	—	0.086	—	—	—	—	—
AAA6575	35-02021	9.00–10.00	Soil	—	—	—	0.088	—	—	—	—	—	—
AAA6615	35-02025	11.00–12.00	Soil	—	—	—	—	—	—	—	—	—	—
AAA6617	35-02026	2.00–3.00	Soil	—	—	—	0.014	0.07	—	—	9.75	1.124	55.327
AAA6618	35-02026	9.00–10.00	Soil	—	—	—	0.034	—	—	—	—	—	—
AAA6620	35-02026	28.50–29.50	Soil	—	—	—	—	0.014	—	—	—	—	—
AAA6608	35-02027	20.00–21.00	Soil	—	—	—	—	0.034	—	—	—	—	—
AAB1011	35-02215	5.00–6.00	Soil	0.307	—	—	—	0.038	—	0.179	—	—	—
0435-96-0003	35-02270	10.00–10.50	Soil	—	—	—	—	—	—	0.25	—	—	—
0435-96-0006	35-02271	7.00–7.50	Soil	—	—	—	0.042	—	—	—	—	—	—
0435-96-0010	35-02272	12.00–12.50	Soil	—	—	—	—	0.024	—	0.07	3.51	—	—
0435-96-0016	35-02274	17.00–18.00	Soil	—	—	—	—	0.124	—	—	—	—	—
0435-96-0022	35-02276	9.00–9.50	Soil	—	—	—	—	—	—	0.094	—	—	—
0435-97-0038	35-02309	2.50–3.50	Soil	—	—	—	—	—	2.23	0.07	—	—	—
0435-97-0039	35-02309	4.50–5.50	Soil	—	—	—	—	—	—	0.153	—	—	—
0435-97-0040	35-02309	8.50–10.00	Soil	—	—	—	—	—	—	0.061	—	—	—
PRS 35-003(p)													
0435-96-0153	35-02437	0.00–1.00	Soil	2.94	0.63	—	—	0.017	904	—	—	—	—
0435-96-0154	35-02437	4.00–5.00	Soil	1.07	—	0.506	—	0.027	372	—	—	—	—
0435-96-0156	35-02438	4.00–5.00	Soil	—	—	—	—	—	24.4	—	—	—	—
0435-96-0157	35-02438	8.00–9.00	Soil	0.692	0.368	—	—	—	—	9.73	—	—	—
0435-96-0158	35-02439	0.00–1.00	Soil	0.206	0.102	—	—	—	112	4.71	—	—	—
0435-96-0159	35-02439	4.00–5.00	Soil	0.206	0.102	—	—	0.013	112	4.71	—	—	—
0435-96-0160	35-02440	4.00–5.00	Soil	—	0.211	—	—	—	368	—	—	—	—
0435-96-0161	35-02440	8.00–9.00	Soil	1.15	0.654	—	—	0.054	760	—	—	—	—

Table C-1.1-4
Samples with Radionuclides Detected (pCi/g) Above Background Values or Fallout Values in Mesa Top Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Cobalt-60	Europium-152	Plutonium-238	Plutonium-239	Strontium-90	Tritium	Uranium-234	Uranium-235	Uranium-238
Soil Background Value/Fallout Value				1.65	na[a]	na	0.023	0.054	1.31	0.766	2.59	0.2	2.29
0435-96-0162	35-02441	0.00–1.00	Soil	1.09	0.301	—	—	—	146	—	—	—	—
0435-96-0163	35-02441	4.00–5.00	Soil	—	—	—	—	—	12.1	—	—	—	—
0435-96-0165	35-02442	4.00–5.00	Soil	—	—	—	—	—	3.02	—	—	—	—
0435-96-0166	35-02442	8.00–9.00	Soil	—	—	—	—	—	3.5	—	—	—	—
0435-96-0167	35-02443	4.00–5.00	Soil	—	—	—	—	—	4.95	0.58	—	—	—
0435-96-0168	35-02443	8.00–9.00	Soil	—	—	—	—	0.026	0.72	5.49	—	—	—
0435-96-0169	35-02444	0.00–1.00	Soil	—	—	—	—	—	6.12	—	—	—	—
0435-96-0170	35-02444	4.00–5.00	Soil	—	—	—	—	—	7.53	—	—	—	—
0435-96-0171	35-02445	0.00–1.00	Soil	—	—	—	—	—	26.8	0.785	—	—	—
0435-96-0172	35-02445	4.50–5.50	Soil	—	—	—	—	—	15.8	0.426	—	—	—
0435-96-0173	35-02446	4.00–5.00	Soil	0.094	—	—	—	0.007	25.9	—	—	—	—
0435-96-0174	35-02446	8.00–9.00	Soil	—	—	—	—	—	10.9	—	—	—	—
0435-96-0175	35-02446	8.00–9.00	Soil	—	—	—	—	0.013	12.9	—	—	—	—
PRS 35-003(g)													
AAA6537	35-02017	1.30–2.30	Soil	—	—	—	—	0.023	—	—	—	—	—
PRS 35-003(o)													
AAA6589	35-02016	1.00–2.00	Soil	—	—	—	—	0.018	—	—	—	—	—
AAA6590	35-02016	8.00–9.00	Soil	—	—	—	—	0.02	—	—	—	—	—
AAA6591	35-02016	13.80–14.80	Soil	—	—	—	0.047(U)	0.116	—	—	—	—	—
AAA6592	35-02016	18.50–19.50	Soil	—	—	—	0.036(U)	0.087	—	—	—	—	—
0435-97-0001	35-02303	3.00–4.50	Soil	—	—	—	—	—	0.953	0.081	—	—	—
0435-97-0002	35-02303	4.50–7.00	Soil	—	—	—	—	—	0.667	0.066	—	—	—
0435-97-0004	35-02303	13.50–15.00	Soil	—	—	—	—	—	349	0.081	—	—	—
0435-97-0005	35-02303	17.50–19.00	Soil	—	—	—	—	—	2.28	0.077	—	—	—
0435-97-0007	35-02304	4.50–5.50	Soil	—	—	—	—	—	—	0.468	—	—	—
0435-97-0008	35-02304	5.50–7.00	Soil	—	—	—	—	—	—	0.217	—	—	—
0435-97-0009	35-02304	20.00–21.50	Soil	—	—	—	—	—	—	0.165	—	—	—

Table C-1.1-4
Samples with Radionuclides Detected (pCi/g) Above Background Values or Fallout Values in Mesa Top Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Cobalt-60	Europium-152	Plutonium-238	Plutonium-239	Strontium-90	Tritium	Uranium-234	Uranium-235	Uranium-238
Soil Background Value/Fallout Value				1.65	na[a]	na	0.023	0.054	1.31	0.766	2.59	0.2	2.29
0435-97-0010	35-02304	24.00–25.00	Soil	—	—	—	0.027(U)	—	—	0.135	—	—	—
0435-97-0012	35-02305	7.00–8.40	Soil	—	—	—	—	—	68.4	0.099	—	—	—
0435-97-0013	35-02305	8.40–10.00	Soil	—	—	—	—	—	116	0.053	—	—	—
0435-97-0016	35-02305	14.50–15.00	Soil	—	—	—	—	—	710	—	—	—	—
0435-97-0014	35-02305	17.50–18.50	Soil	—	—	—	—	—	270	—	—	—	—
0435-97-0015	35-02305	38.00–39.00	Soil	—	—	—	—	—	—	0.069	—	—	—
0435-97-0017	35-02529	5.00–6.00	Soil	—	—	—	—	—	3.97	0.237	—	—	—
0435-97-0018	35-02529	6.00–7.50	Soil	—	—	—	0.041(U)	—	14.4	—	—	—	—
0435-97-0021	35-02529	10.00–11.00	Soil	—	—	—	—	—	27.3	—	—	—	—
PRS 35-003(m)													
AAA6633	35-02018	1.00–2.00	Soil	0.399	—	—	—	—	—	0.001	—	—	—
0435-97-0033	35-02306	6.80–7.80	Soil	—	—	—	—	—	2.44	0.097	—	—	—
0435-97-0034	35-02306	7.80–8.80	Soil	—	—	—	—	—	—	0.062	—	—	—
0435-97-0035	35-02306	11.50–12.50	Soil	—	—	—	—	—	—	0.063	—	—	—
0435-97-0036	35-02306	16.50–17.50	Soil	—	—	—	—	—	—	0.092	—	—	—
0435-97-0022	35-02307	9.00–10.00	Soil	0.924	—	—	0.074	0.239	4.4	0.172	—	—	—
0435-97-0023	35-02307	10.00–12.50	Soil	—	—	—	—	—	640	0.289	—	—	—
0435-97-0027	35-02307	17.00–17.50	Soil	—	—	—	—	—	1140	0.384	—	—	—
0435-97-0025	35-02307	21.50–22.50	Soil	—	—	—	—	—	26	0.336	—	—	—
0435-97-0026	35-02307	26.50–27.50	Soil	—	—	—	—	—	1.58	0.339	—	—	—
0435-97-0028	35-02308	8.40–9.40	Soil	2.58	—	—	—	—	10.2	1.182	—	—	—
0435-97-0029	35-02308	9.40–10.00	Soil	—	—	—	—	—	5.8	1.164	—	—	—
0435-97-0030	35-02308	11.50–12.50	Soil	—	—	—	—	—	2.42	0.252	—	—	—
0435-97-0031	35-02308	19.00–20.00	Soil	—	—	—	—	—	6	0.11	—	—	—
PRS 35-003(h)													
0435-97-0386	35-02533	0.00–1.00	Soil	0.738	—	—	—	—	2.6	—	—	—	—
0435-97-0387	35-02533	9.00–10.00	Soil	—	—	—	—	—	—	—	—	—	—

Table C-1.1-4
Samples with Radionuclides Detected (pCi/g) Above Background Values or Fallout Values in Mesa Top Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Cobalt-60	Europium-152	Plutonium-238	Plutonium-239	Strontium-90	Tritium	Uranium-234	Uranium-235	Uranium-238
Soil Background Value/Fallout Value				1.65	na[a]	na	0.023	0.054	1.31	0.766	2.59	0.2	2.29
PRS 35-003(e)													
AAB0969	35-02012	1.00–2.00	Soil	—	—	—	—	—	—	0.001	—	—	—
AAB0970	35-02012	20.50–21.50	Soil	—	—	—	—	—	—	0.001	—	—	—
AAB0971	35-02012	25.80–26.80	Soil	—	—	—	—	—	—	0.002	—	—	—
AAB0972	35-02012	30.00–35.00	Soil	—	—	—	0.045	—	—	0.002	—	—	—
AAB0973	35-02012	99.00–100.00	Soil	—	—	—	—	—	—	0.172	—	—	—

[a] na = not available.

[b] U = The analyte was analyzed for but not detected.

C-1.2 Ten Site Slope Subarea

Table C-1.2-1 presents the analyte suite and request numbers (numbers are listed below the analyte suites) for each sample collected in the Ten Site Slope Subarea. Each request number includes a batch of samples sent to a specific off-site analytical laboratory for a specific suite of analyses, and the request numbers can be used to track the original data packages from the analytical laboratories. If the sample was not analyzed for a given analyte suite, the cell in that suite's column contains a dash (—).

Also note that the data in this appendix are not arranged by consolidated unit because all data were collected prior to consolidation efforts. For a crosswalk between consolidated unit numbers and individual PRS numbers, refer to Table 1.0-1 in section 1.0.

Table C-1.2-2 presents the inorganic chemical results (mg/kg) above background values for the Ten Site Slope Subarea. Non-detected results above LANL background values are also presented in Table C-1.2-2. A dash in the results cell indicates that the result was less than background value or not detected, or that the sample was not analyzed for the corresponding chemical.

Table C-1.2-3 presents the detected organic chemical data for the Ten Site Slope Subarea.

Table C-1.2-4 presents the radionuclide results (pCi/g) above background values or fallout values for the Ten Site Slope Subarea. Non-detected results above LANL background values are also presented in Table C-1.2-4. A dash in the results cell indicates that the result was less than background value or not detected, or that the sample was not analyzed for the corresponding radionuclide.

Table C-1.2-1
Samples Taken in Ten Site Slope Subarea

Sample ID	Location ID	Depth (ft)	Media	Limited- List TAL Metals	Non-TAL Metals	TAL Metals	PCBs	Pesticides/PCBs	SVOCs	TPH DRO	TPH LRO	VOCs	Gamma Spectroscopy	Isotopic Plutonium	Isotopic Uranium	Strontium-90	Tritium	XRF
PRS 35-016(n)																		
0435-95-0021	35-02169	0–0.5	Soil	—	—	—	—	—	—	—	—	—	—	51	51	—	—	—
RE35-98-0024	35-02169	0–0.25	Soil	—	—	4330R	4329R	—	4329R	—	—	—	4331R	4331R	4331R	—	—	—
0435-95-0023	35-02170	0–0.5	Soil	—	—	49	34	34	34	—	—	—	—	—	—	—	—	—
0435-95-0028	35-02171	1–2	Soil	—	—	—	—	—	—	—	—	—	51	—	—	—	—	—
0435-95-0030	35-02171	2–3	Soil	—	—	—	—	—	—	—	—	34	—	—	—	—	—	—
0435-95-0201	35-02287	1–2	Soil	—	—	1679	—	—	—	—	—	—	—	—	—	—	—	—
0435-97-0463	35-02577	0–0.5	Soil	—	—	—	—	—	—	—	—	—	3557R	3557R	3557R	—	—	—
0435-97-0466	35-02577	0.5–1.5	Soil	—	—	—	—	—	—	—	—	—	3557R	3557R	3557R	—	—	—
0435-97-0467	35-02578	0–0.5	Soil	—	—	—	—	—	—	—	—	—	3557R	3557R	3557R	—	—	—
0435-97-0471	35-02578	0.5–1.5	Soil	—	—	—	—	—	—	—	—	—	3557R	3557R	3557R	—	—	—
RE35-98-0028	35-02596	0–0.5	Soil	—	—	4375R	4374R	—	4374R	—	—	—	4376R	4376R	4376R	—	—	—
RE35-98-0029	35-02596	0.5–1.5	Soil	—	—	4375R	4374R	—	4374R	—	—	—	4376R	4376R	4376R	—	—	—
RE35-98-0030	35-02596	1.5–2.5	Soil	—	—	4375R	4374R	—	4374R	—	—	—	4376R	4376R	4376R	—	—	—
RE35-98-0031	35-02596	2.5–3.5	Soil	—	—	4375R	4374R	—	4374R	—	—	—	4376R	4376R	4376R	—	—	—
RE35-98-0032	35-02597	0–0.5	Soil	—	—	4375R	4374R	—	4374R	—	—	—	4376R	4376R	4376R	—	—	—
RE35-98-0036	35-02598	0–0.5	Sediment	—	—	4375R	4374R	—	4374R	—	—	—	4376R	4376R	4376R	—	—	—
RE35-98-0040	35-02599	0–0.5	Sediment	—	—	4375R	4374R	—	4374R	—	—	—	4376R	4376R	4376R	—	—	—
PRS 35-016(j)																		
0435-95-0056	35-02191	0–0.5	Soil	—	—	—	—	—	43	—	—	43	—	62	62	—	—	—
0435-95-0063	35-02192	2–3	Soil	—	—	59	—	—	—	—	—	—	—	—	—	—	—	—
0435-97-0477	35-02580	0–0.66	Soil	—	—	—	—	—	—	—	—	—	3570R	3570R	3570R	—	—	—
0435-97-0481	35-02580	0.66–1.66	Soil	—	—	—	—	—	—	—	—	—	3570R	3570R	3570R	—	—	—

Table C-1.2-1
Samples Taken In Ten Site Slope Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	Limited- List TAL Metals	Non-TAL Metals	TAL Metals	PCBs	Pesticides/PCBs	SVOCs	TPH DRO	TPH LRO	VOCs	Gamma Spectroscopy	Isotopic Plutonium	Isotopic Uranium	Strontium-90	Tritium	XRF
PRS 35-014(g3)																		
0435-95-0033	35-02183	2–3	Soil	—	—	54	—	39	—	—	—	—	—	—	—	—	—	—
0435-95-0040	35-02185	0–1	Soil	—	—	—	—	—	—	—	—	39	—	56	55	—	—	—
0435-95-0043	35-02185	2–3	Soil	—	—	—	—	—	39	—	—	—	—	55	55	—	—	—
0435-95-0048	35-02187	0–1	Soil	—	—	54	—	—	—	—	—	—	—	—	—	—	—	—
0435-95-0050	35-02187	2–3	Soil	—	—	—	—	—	—	—	—	39	—	—	—	—	—	—
0435-95-0052	35-02188	0–1	Soil	—	—	—	—	42	—	—	—	—	—	—	—	—	—	—
0435-95-0054	35-02188	2–3	Soil	—	—	—	—	—	42	—	—	—	—	—	—	—	—	—
0435-97-0173	35-02487	0–1	Soil	—	—	—	—	—	3349R	3349R	3349R	—	3350R	—	—	—	—	—
0435-97-0174	35-02487	1–2	Soil	—	—	—	—	—	3349R	3349R	3349R	3349R	3350R	—	—	—	—	—
0435-97-0176	35-02488	0–1	Soil	—	—	—	—	—	3349R	3349R	3349R	—	3350R	—	—	—	—	—
0435-97-0177	35-02488	0–1	Soil	—	—	—	—	—	—	3349R	3349R	—	—	—	—	—	—	—
0435-97-0178	35-02488	1–2	Soil	—	—	—	—	—	3349R	3349R	3349R	3349R	3350R	—	—	—	—	—
0435-97-0181	35-02489	0–0.5	Soil	—	—	—	—	—	3349R	3349R	3349R	—	3350R	—	—	—	—	—
0435-97-0182	35-02489	0.5–1	Soil	—	—	—	—	—	3349R	3349R	3349R	3349R	3350R	—	—	—	—	—
0435-97-0183	35-02489	1–1.5	Soil	—	—	—	—	—	3349R	3349R	3349R	3349R	3350R	—	—	—	—	—
0435-97-0184	35-02490	0–0.08	Soil	—	—	—	—	—	3349R	3349R	3349R	—	3350R	—	—	—	—	—
0435-97-0185	35-02490	1–2	Soil	—	—	—	—	—	3349R	3349R	3349R	3349R	3350R	—	—	—	—	—
0435-97-0187	35-02491	0–0.5	Soil	—	—	—	—	—	3349R	3349R	3349R	—	3350R	—	—	—	—	—
0435-97-0188	35-02491	0.5–1	Soil	—	—	—	—	—	3349R	3349R	3349R	3349R	3350R	—	—	—	—	—
0435-97-0189	35-02491	1–2	Soil	—	—	—	—	—	3349R	3349R	3349R	3349R	3350R	—	—	—	—	—
0435-97-0190	35-02492	0–0.83	Soil	—	—	—	—	—	3349R	3349R	3349R	—	3350R	—	—	—	—	—
0435-97-0191	35-02492	0.83–1.5	Soil	—	—	—	—	—	3349R	3349R	3349R	3349R	3350R	—	—	—	—	—

Table C-1.2-1
Samples Taken in Ten Site Slope Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	Limited- List TAL Metals	Non-TAL Metals	TAL Metals	PCBs	Pesticides/PCBs	SVOCs	TPH DRO	TPH LRO	VOCs	Gamma Spectroscopy	Isotopic Plutonium	Isotopic Uranium	Strontium-90	Tritium	XRF
PRS 35-004(m)																		
0435-95-0011	35-02167	0–0.5	Soil	—	—	—	—	—	—	—	—	—	—	51	51	—	—	—
0435-95-0013	35-02168	0–1	Soil	—	—	—	—	—	—	—	—	—	51	—	—	—	—	—
0435-95-0015	35-02168	1–2	Soil	—	—	49	—	—	34	—	—	34	—	—	—	—	—	—
0435-95-0019	35-02168	2–3	Soil	—	—	—	34	—	—	—	—	—	—	—	—	—	—	—
0435-97-0444	35-02571	0–1	Soil	—	—	—	—	—	—	—	—	—	3562R	—	3562R	—	—	—
0435-97-0445	35-02571	2–3	Soil	—	—	—	—	—	—	—	—	—	3562R	—	3562R	—	—	—
0435-97-0446	35-02571	4–5	Soil	—	—	—	—	—	—	—	—	—	3562R	—	3562R	—	—	—
0435-97-0447	35-02572	0–1	Soil	—	—	—	—	—	—	—	—	—	3562R	—	3562R	—	—	—
0435-97-0448	35-02572	3–4	Soil	—	—	—	—	—	—	—	—	—	3562R	—	3562R	—	—	—
0435-97-0449	35-02572	5–6	Soil	—	—	—	—	—	—	—	—	—	3562R	—	3562R	—	—	—
0435-97-0450	35-02573	0–1	Soil	—	—	—	—	—	—	—	—	—	3562R	—	3562R	—	—	—
0435-97-0452	35-02573	2–3	Soil	—	—	—	—	—	—	—	—	—	3562R	—	3562R	—	—	—
0435-97-0453	35-02573	5–6	Soil	—	—	—	—	—	—	—	—	—	3562R	—	3562R	—	—	—
0435-97-0454	35-02574	0–1	Soil	—	—	—	—	—	—	—	—	—	3562R	—	3562R	—	—	—
0435-97-0455	35-02574	3–4	Soil	—	—	—	—	—	—	—	—	—	3562R	—	3562R	—	—	—
0435-97-0456	35-02574	5–6	Soil	—	—	—	—	—	—	—	—	—	3562R	—	3562R	—	—	—
0435-97-0457	35-02575	0–1	Soil	—	—	—	—	—	—	—	—	—	3562R	—	3562R	—	—	—
0435-97-0458	35-02575	2–3	Soil	—	—	—	—	—	—	—	—	—	3562R	—	3562R	—	—	—
0435-97-0459	35-02575	4–5	Soil	—	—	—	—	—	—	—	—	—	3562R	—	3562R	—	—	—
0435-97-0460	35-02576	0–1	Soil	—	—	—	—	—	—	—	—	—	3562R	—	3562R	—	—	—
0435-97-0461	35-02576	4–5	Soil	—	—	—	—	—	—	—	—	—	3562R	—	3562R	—	—	—
0435-97-0462	35-02576	8.5–9.5	Soil	—	—	—	—	—	—	—	—	—	3562R	—	3562R	—	—	—
0435-97-0495	35-02595	0–0.5	Soil	—	—	—	—	—	—	—	—	—	3562R	—	3562R	—	—	—

Table C-1.2-1
Samples Taken in Ten Site Slope Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	Limited- List TAL Metals	Non-TAL Metals	TAL Metals	PCBs	Pesticides/PCBs	SVOCs	TPH DRO	TPH LRO	VOCs	Gamma Spectroscopy	Isotopic Plutonium	Isotopic Uranium	Strontium-90	Tritium	XRF
PRS 35-016(b)																		
0435-95-0002	35-02189	0–0.5	Soil	—	—	—	—	—	—	—	—	43	—	62	62	—	—	—
0435-95-0005	35-02190	0–1	Soil	—	—	—	—	—	43	—	—	—	—	—	—	—	—	—
0435-95-0009	35-02190	2–3	Soil	—	—	59	—	—	—	—	—	—	—	—	—	—	—	—
0435-97-0346	35-02549	0–1	Soil	—	—	—	—	—	—	—	—	—	3557R	—	3557R	—	—	—
0435-97-0349	35-02549	1–2	Soil	—	—	—	—	—	—	—	—	—	3557R	—	3557R	—	—	—
0435-97-0350	35-02550	0–0.5	Soil	—	—	—	—	—	—	—	—	—	3557R	—	3557R	—	—	—
0435-97-0353	35-02550	0.5–1.5	Soil	—	—	—	—	—	—	—	—	—	3557R	—	3557R	—	—	—
0435-97-0472	35-02579	0–0.5	Soil	—	—	—	—	—	—	—	—	—	3557R	3557R	3557R	—	—	—
0435-97-0475	35-02579	0.5–1.5	Soil	—	—	—	—	—	—	—	—	—	3557R	3557R	3557R	—	—	—
PRS 35-004(g)																		
AAC1177	35-02100	0–0.5	Soil	—	—	—	21500	—	—	—	—	21476	21478	21478	21478	—	—	21503
AAC1178	35-02101	0–0.5	Soil	—	—	—	21500	—	—	—	—	—	—	21478	21478	—	—	21503
AAC1179	35-02102	0–1	Soil	—	—	21477	—	21500	21476	—	—	—	—	—	—	—	—	21503
AAC1180	35-02102	1–2	Soil	—	—	—	21500	—	—	—	—	—	—	—	—	—	—	21503
AAC1181	35-02102	2–3	Soil	—	—	—	21500	—	—	—	—	—	—	—	—	—	—	21503
PRS 35-009(b)																		
AAA6461	35-02041	4–5	Soil	—	—	—	—	—	16641	—	—	—	—	16635	16635	—	—	16640
AAA6462	35-02041	9–10	Soil	—	—	—	—	—	16645	—	—	—	—	16635	16635	—	—	16640
AAA6463	35-02041	14–15	Soil	—	—	—	—	—	16645	—	—	—	—	16635	16635	—	—	16640
AAA6474	35-02041	19–20	Soil	—	—	—	16951	—	16951	—	—	—	—	16635	16635	—	—	16640
AAA6464	35-02042	4–5	Soil	—	—	—	—	—	16645	—	—	—	—	16635	16635	—	—	16640
AAA6465	35-02042	6–7	Soil	16637	16637	—	—	—	16641	—	—	—	—	16635	16635	—	—	16640
AAA6466	35-02042	14–15	Soil	—	—	—	—	—	16645	—	—	—	—	16635	16635	—	—	16640

Table C-1.2-1
Samples Taken in Ten Site Slope Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	Limited- List TAL Metals	Non-TAL Metals	TAL Metals	PCBs	Pesticides/PCBs	SVOCs	TPH DRO	TPH LRO	VOCs	Gamma Spectroscopy	Isotopic Plutonium	Isotopic Uranium	Strontium-90	Tritium	XRF
AAA6467	35-02042	19–20	Soil	—	—	—	—	—	16645	—	—	—	—	16635	16635	—	—	16640
0435-95-0197	35-02278	5–6	Soil	—	—	—	—	—	1678	—	—	—	—	—	—	—	—	—
0435-97-0329	35-02545	0.5–1.5	Soil	—	—	—	—	—	—	—	—	—	3496R	—	3496R	—	—	—
0435-97-0330	35-02545	5–6	Soil	—	—	—	—	—	—	—	—	—	3496R	—	3496R	—	—	—
0435-97-0331	35-02545	6.4–7.5	Qbt 3	—	—	—	—	—	—	—	—	—	3496R	—	3496R	—	—	—
0435-97-0332	35-02545	11.5–12.5	Qbt 3	—	—	—	—	—	—	—	—	—	3496R	—	3496R	—	—	—
0435-97-0333	35-02546	0.5–1.5	Soil	—	—	—	—	—	—	—	—	—	3496R	—	3496R	—	—	—
0435-97-0334	35-02546	8.5–9.5	Qbt 3	—	—	—	—	—	—	—	—	—	3496R	—	3496R	—	—	—
0435-97-0335	35-02546	9.5–10.5	Qbt 3	—	—	—	—	—	—	—	—	—	3496R	—	3496R	—	—	—
0435-97-0336	35-02546	9.5–10.5	Qbt 3	—	—	—	—	—	—	—	—	—	3496R	—	3496R	—	—	—
0435-97-0337	35-02546	14–15	Qbt 3	—	—	—	—	—	—	—	—	—	3496R	—	3496R	—	—	—
0435-97-0338	35-02547	0–0.5	Soil	—	—	—	—	—	—	—	—	—	3546R	—	3546R	—	—	—
0435-97-0341	35-02547	0.5–1.5	Soil	—	—	—	—	—	—	—	—	—	3546R	—	3546R	—	—	—
0435-97-0342	35-02548	0–1	Soil	—	—	—	—	—	—	—	—	—	3546R	—	3546R	—	—	—
0435-97-0345	35-02548	1–2	Soil	—	—	—	—	—	—	—	—	—	3546R	—	3546R	—	—	—
PRS 35-016(d)																		
AAC1169	35-02110	0–0.5	Soil	—	—	—	—	—	—	—	—	—	—	21478	21478	—	—	21503
AAC1170	35-02111	0–1	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	21503
AAC1171	35-02111	1–2	Soil	—	—	21477	—	—	—	—	—	—	—	—	—	—	—	21503
AAC1173	35-02111	2–3	Soil	—	—	—	—	—	21476	—	—	—	—	—	—	—	—	21503
0435-96-0062	35-02398	0–0.5	Soil	—	—	2207	—	—	2206	—	—	—	2208	2208	2208	—	—	—
0435-96-0063	35-02398	0.5–1.5	Qbt 3	—	—	2207	—	—	2206	—	—	—	2208	2208	2208	—	—	—
0435-96-0064	35-02399	0–0.5	Soil	—	—	2207	—	—	2206	—	—	—	2208	2208	2208	—	—	—
0435-96-0065	35-02399	0.5–1.5	Qbt 3	—	—	2207	—	—	2206	—	—	—	2208	2208	2208	—	—	—

Table C-1.2-1
Samples Taken in Ten Site Slope Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	Limited- List TAL Metals	Non-TAL Metals	TAL Metals	PCBs	Pesticides/PCBs	SVOCs	TPH DRO	TPH LRO	VOCs	Gamma Spectroscopy	Isotopic Plutonium	Isotopic Uranium	Strontium-90	Tritium	XRF
0435-96-0067	35-02400	0–0.66	Soil	—	—	2207	—	—	2206	—	—	—	2208	2208	2208	—	—	—
0435-96-0068	35-02400	2–3	Qbt 3	—	—	2207	—	—	2206	—	—	—	2208	2208	2208	—	—	—
0435-96-0069	35-02401	0–0.83	Soil	—	—	2207	—	—	2206	—	—	—	2208	2208	2208	—	—	—
0435-96-0070	35-02401	2.5–3.5	Qbt 3	—	—	2207	—	—	2206	—	—	—	2208	2208	2208	—	—	—
PRS 35-016(c)																		
AAC1165	35-02108	0–0.5	Soil	—	—	—	—	—	—	—	—	21476	21478	21478	21478	—	—	21503
AAC1168	35-02109	0–1	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	21503
AAC1167	35-02109	1–2	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	21503
AAC1166	35-02109	2–3	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	21503
0435-96-0058	35-02396	0–0.66	Soil	—	—	2207	—	—	2206	—	—	—	2208	2208	2208	—	—	—
0435-96-0059	35-02396	0.66–1.5	Qbt 3	—	—	2207	—	—	2206	—	—	—	2208	2208	2208	—	—	—
0435-96-0060	35-02397	0–0.08	Soil	—	—	2207	—	—	2206	—	—	—	2208	2208	2208	—	—	—
0435-96-0061	35-02397	1–2	Qbt 3	—	—	2207	—	—	2206	—	—	—	2208	2208	2208	—	—	—
PRS 35-009(e)																		
AAA3826	35-02079	0–1	Soil	—	—	—	—	—	—	—	—	—	—	16391	16391	—	16391	—
AAA3827	35-02079	1–2	Soil	—	—	—	—	—	—	—	—	—	—	16391	16391	—	16391	—
AAA3828	35-02079	2–3	Soil	—	—	—	—	—	—	—	—	—	—	16391	16391	—	16391	—
AAC1158	35-02103	0–0.5	Soil	—	—	—	—	—	—	—	—	21466	21468	21468	21468	—	—	—
AAC1159	35-02104	0–0.5	Soil	—	—	—	—	—	—	—	—	—	—	21468	21468	—	—	—
AAC1160	35-02105	0–1	Soil	—	—	21467	—	—	—	—	—	—	—	—	—	—	—	—
AAC1162	35-02105	2–3	Soil	—	—	—	—	21466	21466	—	—	—	—	—	—	—	—	—
0435-97-0428	35-02566	0–1	Soil	—	—	—	—	—	—	—	—	—	3531R	—	—	3531R	—	—
0435-97-0429	35-02566	1–2	Soil	—	—	—	—	—	—	—	—	—	3531R	—	—	3531R	—	—
0435-97-0430	35-02566	2–3	Soil	—	—	—	—	—	—	—	—	—	3531R	—	—	3531R	—	—

Table C-1.2-1
Samples Taken in Ten Site Slope Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	Limited- List TAL Metals	Non-TAL Metals	TAL Metals	PCBs	Pesticides/PCBs	SVOCs	TPH DRO	TPH LRO	VOCs	Gamma Spectroscopy	Isotopic Plutonium	Isotopic Uranium	Strontium-90	Tritium	XRF
PRS 35-009(a)																		
AAA6381	35-02035	1.5–2.5	Soil	16518	16518	—	—	—	16470	—	—	—	—	16522	16522	—	—	—
AAA6382	35-02035	8.8–9.8	Soil	16518	16518	—	—	—	16470	—	—	—	—	16522	16522	—	—	—
AAA6383	35-02035	14–15	Soil	16518	16518	—	—	—	16470	—	—	—	—	16522	16522	—	—	—
AAA6384	35-02035	17.5–18.7	Soil	16518	16518	—	—	—	16470	—	—	—	16522	16522	16522	—	16522	—
AAA6401	35-02036	0–1.1	Soil	16518	16518	—	—	—	16470	—	—	—	—	16522	16522	—	—	—
AAA6402	35-02036	7.4–8.4	Soil	16518	16518	—	—	—	16470	—	—	—	—	16522	16522	—	—	—
AAA6403	35-02036	14.2–15	Soil	16518	16518	—	—	—	16470	—	—	—	—	16522	16522	—	—	—
AAA6404	35-02036	19–20	Soil	16518	16518	—	—	—	16470	—	—	—	—	16522	16522	—	—	—
AAA6429	35-02037	3–4	Soil	16518	16518	—	—	—	16470	—	—	—	—	16522	16522	—	—	—
AAA6430	35-02037	9–10	Soil	16518	16518	—	—	—	16470	—	—	—	—	16522	16522	—	—	—
AAA6431	35-02037	13–14	Soil	16518	16518	—	—	—	16470	—	—	—	—	16522	16522	—	—	—
AAA6432	35-02037	19–20	Soil	16518	16518	—	—	—	16470	—	—	—	—	16522	16522	—	—	—
AAA6437	35-02038	2.5–3.5	Soil	16519	16519	—	—	—	16471	—	—	—	—	16532	16532	—	—	—
AAA6438	35-02038	9–10	Soil	16519	16519	—	—	—	16471	—	—	—	—	16532	16532	—	—	—
AAA6439	35-02038	14–15	Soil	16519	16519	—	—	—	16471	—	—	—	—	16532	16532	—	—	—
AAA6440	35-02038	19–20	Soil	16519	16519	—	—	—	16471	—	—	—	16532	16532	16532	—	16532	—
AAA6409	35-02039	5–6	Soil	—	—	—	—	—	16641	—	—	—	—	16635	16635	—	—	16640
AAA6410	35-02039	11–12	Soil	—	—	—	—	—	16645	—	—	—	—	16635	16635	—	—	16640
AAA6411	35-02039	19–20	Soil	—	—	—	—	—	16641	—	—	—	—	16635	16635	—	—	16640
AAA6412	35-02040	6.5–7.5	Soil	16637	16637	—	—	—	16641	—	—	—	—	16635	16635	—	—	16640
AAA6413	35-02040	14–15	Soil	—	—	—	—	—	16641	—	—	—	—	16635	16635	—	—	16640
AAA6414	35-02040	19–20	Soil	—	—	—	—	—	16641	—	—	—	—	16635	16635	—	—	16640
AAA6441	35-02221	4–5	Soil	16519	16519	—	—	—	16471	—	—	—	—	16532	16532	—	—	—

Table C-1.2-1
Samples Taken in Ten Site Slope Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	Limited- List TAL Metals	Non-TAL Metals	TAL Metals	PCBs	Pesticides/PCBs	SVOCs	TPH DRO	TPH LRO	VOCs	Gamma Spectroscopy	Isotopic Plutonium	Isotopic Uranium	Strontium-90	Tritium	XRF
AAA6442	35-02221	8.8–10	Soil	16519	16519	—	—	—	16471	—	—	—	—	16532	16532	—	—	—
AAA6443	35-02221	14–15	Soil	16519	16519	—	—	—	16471	—	—	—	16532	16532	16532	—	16532	—
AAA6444	35-02221	19–20	Soil	16519	16519	—	—	—	16471	—	—	—	—	16532	16532	—	—	—
AAA6446	35-02222	3–4	Soil	16519	16519	—	—	—	16471	—	—	—	—	16532	16532	—	—	—
AAA6447	35-02222	9–10	Soil	16519	16519	—	—	—	16471	—	—	—	—	16532	16532	—	—	—
AAA6448	35-02222	14–15	Soil	16519	16519	—	—	—	16471	—	—	—	—	16532	16532	—	—	—
AAA6449	35-02222	19–20	Soil	16519	16519	—	—	—	16471	—	—	—	—	16532	16532	—	—	—
AAA6453	35-02223	0–0.5	Soil	16637	16637	—	—	—	16641	—	—	—	—	16635	16635	—	—	16640
AAA6454	35-02224	0–0.5	Soil	—	—	—	—	—	16645	—	—	—	—	16635	16635	—	—	16640
0435-97-0284	35-02536	0–0.5	Soil	—	—	—	—	—	—	—	—	—	3477R	—	—	3477R	—	—
0435-97-0286	35-02536	1.5–2.5	Soil	—	—	—	—	—	—	—	—	—	3477R	—	—	3477R	3477R	—
0435-97-0287	35-02536	5.5–6.5	Soil	—	—	—	—	—	—	—	—	—	3477R	—	—	3477R	3477R	—
0435-97-0289	35-02536	19–20	Soil	—	—	—	—	—	—	—	—	—	3477R	—	—	3477R	3477R	—
0435-97-0290	35-02536	29–30	Soil	—	—	—	—	—	—	—	—	—	3477R	—	—	3477R	3477R	—
0435-97-0291	35-02537	0–1	Soil	—	—	—	—	—	—	—	—	—	3477R	—	—	3477R	—	—
0435-97-0292	35-02537	1–2	Soil	—	—	—	—	—	—	—	—	—	3477R	—	—	3477R	3477R	—
0435-97-0293	35-02537	2–3	Soil	—	—	—	—	—	—	—	—	—	3477R	—	—	3477R	3477R	—
0435-97-0294	35-02537	6.5–7.5	Soil	—	—	—	—	—	—	—	—	—	3477R	—	—	3477R	3477R	—
0435-97-0301	35-02538	0–1	Soil	—	—	—	—	—	—	—	—	—	3486R	—	—	3486R	—	—
0435-97-0303	35-02538	1–2	Soil	—	—	—	—	—	—	—	—	—	3486R	—	—	3486R	3486R	—
0435-97-0305	35-02538	6–7	Soil	—	—	—	—	—	—	—	—	—	3486R	—	—	3486R	3486R	—
0435-97-0306	35-02538	19–20	Soil	—	—	—	—	—	—	—	—	—	3486R	—	—	3486R	3486R	—
0435-97-0307	35-02538	29–30	Soil	—	—	—	—	—	—	—	—	—	3486R	—	—	3486R	3486R	—
0435-97-0308	35-02539	0–8	Soil	—	—	—	—	—	—	—	—	—	3486R	—	—	3486R	—	—

Table C-1.2-1
Samples Taken in Ten Site Slope Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	Limited- List TAL Metals	Non-TAL Metals	TAL Metals	PCBs	Pesticides/PCBs	SVOCs	TPH DRO	TPH LRO	VOCs	Gamma Spectroscopy	Isotopic Plutonium	Isotopic Uranium	Strontium-90	Tritium	XRF
0435-97-0310	35-02539	1–2	Soil	—	—	—	—	—	—	—	—	—	3486R	—	—	3486R	3486R	—
0435-97-0311	35-02539	6–7	Soil	—	—	—	—	—	—	—	—	—	3486R	—	—	3486R	3486R	—
0435-97-0295	35-02540	0–0.5	Soil	—	—	—	—	—	—	—	—	—	3477R	—	—	3477R	—	—
0435-97-0297	35-02540	0.5–1.5	Soil	—	—	—	—	—	—	—	—	—	3477R	—	—	3477R	3477R	—
0435-97-0298	35-02540	5–6	Soil	—	—	—	—	—	—	—	—	—	3477R	—	—	3477R	3477R	—
0435-97-0299	35-02540	19–20	Soil	—	—	—	—	—	—	—	—	—	3477R	—	—	3477R	3477R	—
0435-97-0300	35-02540	29–30	Soil	—	—	—	—	—	—	—	—	—	3477R	—	—	3477R	3477R	—
0435-97-0312	35-02541	0–1	Soil	—	—	—	—	—	—	—	—	—	3486R	—	—	3486R	—	—
0435-97-0314	35-02541	1.5–2	Soil	—	—	—	—	—	—	—	—	—	3486R	—	—	3486R	3486R	—
0435-97-0315	35-02541	6.5–7.5	Soil	—	—	—	—	—	—	—	—	—	3486R	—	—	3486R	3486R	—
0435-97-0316	35-02542	0–1	Soil	—	—	—	—	—	—	—	—	—	3546R	3546R	3546R	3546R	—	—
0435-97-0317	35-02542	1–1.5	Soil	—	—	—	—	—	—	—	—	—	3546R	3546R	3546R	3546R	3546R	—
0435-97-0319	35-02542	1.5–2.5	Soil	—	—	—	—	—	—	—	—	—	3546R	3546R	3546R	3546R	3546R	—
0435-97-0320	35-02543	0–1	Soil	—	—	—	—	—	—	—	—	—	3546R	3546R	3546R	3546R	—	—
0435-97-0321	35-02543	1–2	Soil	—	—	—	—	—	—	—	—	—	3546R	3546R	3546R	3546R	3546R	—
0435-97-0323	35-02543	2–3	Soil	—	—	—	—	—	—	—	—	—	3546R	3546R	3546R	3546R	3546R	—
0435-97-0324	35-02544	0–1	Soil	—	—	—	—	—	—	—	—	—	3546R	3546R	3546R	3546R	—	—
0435-97-0325	35-02544	1–1.5	Soil	—	—	—	—	—	—	—	—	—	3546R	3546R	3546R	3546R	3546R	—
0435-97-0327	35-02544	1.5–2.5	Soil	—	—	—	—	—	—	—	—	—	3546R	3546R	3546R	3546R	3546R	—
PRS 35-016(a)																		
AAA4445	35-02080	0–1	Soil	—	—	—	—	—	—	—	—	—	—	16391	16391	—	16391	—
AAA4446	35-02080	1–2	Soil	—	—	—	—	—	—	—	—	—	—	16391	16391	—	16391	—
AAA4447	35-02080	2–3	Soil	—	—	—	—	—	—	—	—	—	—	16391	16391	—	16391	—
AAC1141	35-02106	0–0.5	Soil	—	—	—	—	—	21473	—	—	—	—	21457	21457	—	—	—

Table C-1.2-1
Samples Taken in Ten Site Slope Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	Limited- List TAL Metals	Non-TAL Metals	TAL Metals	PCBs	Pesticides/PCBs	SVOCs	TPH DRO	TPH LRO	VOCs	Gamma Spectroscopy	Isotopic Plutonium	Isotopic Uranium	Strontium-90	Tritium	XRF
AAC1142	35-02107	0–1	Soil	—	—	—	—	—	21455	—	—	—	—	—	—	—	—	—
AAC1143	35-02107	1–2	Qbt 3	—	—	—	—	—	21473	—	—	—	—	—	—	—	—	—
AAC1144	35-02107	2–3	Qbt 3	—	—	21456	—	—	21473	—	—	21455	—	—	—	—	—	—
0435-96-0054	35-02394	0–0.5	Soil	—	—	2207	—	—	2206	—	—	—	2208	2208	2208	—	—	—
0435-96-0055	35-02394	0.5–1	Qbt 3	—	—	2207	—	—	2206	—	—	—	2208	2208	2208	—	—	—
0435-96-0056	35-02395	0–2	Soil	—	—	2207	—	—	2206	—	—	—	2208	2208	2208	—	—	—
0435-96-0057	35-02395	2–3	Soil	—	—	2207	—	—	2206	—	—	—	2208	2208	2208	—	—	—
0435-97-0431	35-02567	0–1	Soil	—	—	—	—	—	—	—	—	—	3531R	—	—	3531R	—	—
0435-97-0432	35-02567	1–2	Soil	—	—	—	—	—	—	—	—	—	3531R	—	—	3531R	—	—
0435-97-0433	35-02567	2–3	Soil	—	—	—	—	—	—	—	—	—	3531R	—	—	3531R	—	—
PRS 35-016(q)																		
AAC1137	35-02114	0–1	Soil	—	—	—	21473	—	21473	—	—	21455	—	21457	21457	—	—	—
AAC1138	35-02114	1–2	Soil	—	—	—	21473	—	21473	—	—	—	—	21457	21457	—	—	—
AAC1139	35-02114	2–3	Soil	—	—	—	21473	—	21473	—	—	—	—	21457	21457	—	—	—
AAC1146	35-02115	0–0.5	Soil	—	—	—	21473	—	21473	—	—	—	21457	21457	21457	—	—	—
AAC1147	35-02116	0–0.5	Soil	—	—	—	21473	—	21473	—	—	—	—	21457	21457	—	—	—
AAC1148	35-02117	0–0.5	Soil	—	—	—	21473	—	21473	—	—	—	—	21457	21457	—	—	—
0435-97-0482	35-02581	0–1	Soil	—	—	—	—	—	—	—	—	—	3556R	—	—	—	—	—
0435-97-0483	35-02581	1–1.83	Soil	—	—	—	—	—	—	—	—	—	3556R	—	—	—	—	—
0435-97-0485	35-02581	1.83–2.5	Soil	—	—	—	—	—	—	—	—	—	3556R	—	—	—	—	—
0435-97-0486	35-02582	0–0.83	Soil	—	—	—	—	—	—	—	—	—	3556R	—	—	—	—	—
0435-97-0490	35-02582	0.83–1.5	Soil	—	—	—	—	—	—	—	—	—	3556R	—	—	—	—	—
0435-97-0491	35-02583	0–1	Soil	—	—	—	—	—	—	—	—	—	3556R	—	—	—	—	—
0435-97-0494	35-02583	1–2	Soil	—	—	—	—	—	—	—	—	—	3556R	—	—	—	—	—

Table C-1.2-2
Inorganic Chemicals with Concentrations (mg/kg) or Detection Limits at or Exceeding Background Values in Ten Site Slope Subarea

Sample ID	Location ID	Depth (ft)	Media	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Zinc
Soil Background Value				**0.83**	**8.17**	**295**	**1.83**	**0.4**	**19.3**	**8.64**	**14.7**	**22.3**	**0.1**	**15.4**	**1.52**	**1**	**0.73**	**48.8**
Qbt 2,3,4 Background Value				**0.5**	**2.79**	**46**	**1.21**	**1.63**	**7.14**	**3.14**	**4.66**	**11.2**	**0.1**	**6.58**	**0.3**	**1**	**1.10**	**63.5**
Sediment Background Value				**0.83**	**3.98**	**127**	**1.31**	**0.4**	**10.5**	**4.73**	**11.2**	**19.7**	**0.1**	**9.38**	**0.3**	**1**	**0.73**	**60.2**
PRS 35-016(j)																		
0435-95-0063	35-02192	2.00–3.00	Soil	—	—	—	—	—	—	—	—	—	0.11(U)[a]	—	—	1.4(U)	1.4(U)	—
PRS 35-014(g3)																		
0435-95-0033	35-02183	2.00–3.00	Soil	—	—	—	—	—	—	—	—	—	0.11(UJ)[b]	—	—	1.4(U)	1.5(U)	—
0435-95-0048	35-02187	0.00–1.00	Soil	—	—	—	—	—	—	—	—	—	0.11(UJ)	—	—	1.4(U)	1.4(U)	—
PRS 35-004(m)																		
0435-95-0015	35-02168	1.00–2.00	Soil	—	—	—	—	—	—	—	—	—	0.11(U)	—	—	1.5(U)	1.5(U)	—
PRS 35-016(n)																		
RE35-98-0024	35-02169	0.00–0.25	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	163
0435-95-0023	35-02170	0.00–0.50	Soil	1.2(J-)[c]	—	—	—	2.3	25.7	11(J)[d]	88.3	92	—	—	—	1.4(U)	1.4(U)	752
0435-95-0201	35-02287	1.00–2.00	Soil	10.4(U)	—	—	—	0.82(U)	—	—	—	—	—	—	3.4(UJ)	1.1(U)	—	—
RE35-98-0028	35-02596	0.00–0.50	Soil	—	—	—	—	—	—	—	—	—	0.11(U)	—	—	—	—	83
RE35-98-0029	35-02596	0.50–1.50	Soil	—	—	—	—	—	—	—	—	—	0.11(U)	—	—	—	—	—
RE35-98-0030	35-02596	1.50–2.50	Soil	—	—	—	—	—	—	—	—	—	0.12(U)	—	—	—	—	—
RE35-98-0031	35-02596	2.50–3.50	Soil	—	—	—	—	—	—	—	—	—	0.11(U)	—	—	—	—	—
RE35-98-0036	35-02598	0.00–0.50	Sediment	—	—	—	—	—	—	—	—	—	—	—	1(U)	—	—	—
RE35-98-0040	35-02599	0.00–0.50	Sediment	—	—	—	—	—	—	—	—	—	—	—	1(U)	—	—	—
PRS 35-016(b)																		
0435-95-0009	35-02190	2.00–3.00	Soil	—	—	—	—	—	—	—	—	67.1	0.12(U)	—	—	1.5(U)	1.5(U)	—
PRS 35-004(g)																		
AAC1179	35-02102	0.00–1.00	Soil	—	—	—	—	—	—	—	—	—	0.11(U)	—	—	—	1.1(U)	68.5
PRS 35-009(b)																		
AAA6465	35-02042	6.00–7.00	Soil	—	—	—	—	1(U)	—	—	—	—	—	—	—	—	—	—
PRS 35-016(d)																		
AAC1171	35-02111	1.00–2.00	Soil	—	—	—	—	—	—	—	—	—	—	—	—	3.1	1(U)	—
0435-96-0062	35-02398	0.00–0.50	Soil	8.2(J-)	—	—	—	0.65(U)	—	—	31.8	58.6	1.3	—	—	—	—	104

Table C-1.2-2
Inorganic Chemicals with Concentrations (mg/kg) or Detection Limits at or Exceeding Background Values in Ten Site Slope Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Zinc
Soil Background Value				**0.83**	**8.17**	**295**	**1.83**	**0.4**	**19.3**	**8.64**	**14.7**	**22.3**	**0.1**	**15.4**	**1.52**	**1**	**0.73**	**48.8**
Qbt 2,3,4 Background Value				**0.5**	**2.79**	**46**	**1.21**	**1.63**	**7.14**	**3.14**	**4.66**	**11.2**	**0.1**	**6.58**	**0.3**	**1**	**1.10**	**63.5**
Sediment Background Value				**0.83**	**3.98**	**127**	**1.31**	**0.4**	**10.5**	**4.73**	**11.2**	**19.7**	**0.1**	**9.38**	**0.3**	**1**	**0.73**	**60.2**
0435-96-0063	35-02398	0.50–1.50	Qbt 3	—	—	51	—	—	56.6	3.7(U)	36	26.7	2.7	27.9	0.41(U)	—	—	92.9
0435-96-0064	35-02399	0.00–0.50	Soil	—	—	—	—	0.77(U)	—	—	28.8	28.6	1	—	—	—	—	110
0435-96-0065	35-02399	0.50–1.50	Qbt 3	—	—	—	—	—	11.5	—	—	19.7	0.14	—	0.31(U)	—	—	—
0435-96-0067	35-02400	0.00–0.67	Soil	—	—	—	—	—	—	—	—	—	0.13	—	—	—	—	—
0435-96-0068	35-02400	2.00–3.00	Qbt 3	—	3.1(U)	59.7	—	—	25.1	3.5(U)	—	—	—	13.9	0.7(U)	—	—	—
0435-96-0069	35-02401	0.00–0.83	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	56.7
PRS 35-016(c)																		
0435-96-0059	35-02396	0.67–1.50	Qbt 3	—	—	—	—	—	41.3	—	—	14.9	—	21.1	0.4(U)	—	—	—
0435-96-0060	35-02397	0.00–0.08	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	83.7
PRS 35-009(e)																		
AAC1160	35-02105	0.00–1.00	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	1.1(U)	—
PRS 35-009(a)																		
AAA6381	35-02035	1.50–2.50	Soil	1.1(U)	—	—	—	0.63(U)	—	—	—	—	—	—	—	—	—	—
AAA6382	35-02035	8.80–9.80	Soil	1.1(U)	—	—	1.9	1.2	—	—	—	35.3	—	—	—	13.7	—	—
AAA6383	35-02035	14.00–15.00	Soil	1.1(U)	—	—	—	0.63(U)	—	—	—	71.2	—	—	—	—	—	—
AAA6384	35-02035	17.50–18.70	Soil	1.5(U)	—	—	—	0.65(U)	—	—	—	—	—	—	—	—	—	—
AAA6401	35-02036	0.00–1.10	Soil	1.1(U)	—	—	—	0.64(U)	—	—	—	—	—	—	—	—	—	—
AAA6402	35-02036	7.40–8.40	Soil	1.1(U)	—	—	—	0.65(U)	—	—	—	—	—	—	—	—	—	—
AAA6403	35-02036	14.20–15.00	Soil	1.1(U)	—	—	—	0.63(U)	—	—	—	—	—	—	—	—	—	—
AAA6404	35-02036	19.00–20.00	Soil	1.1(U)	—	—	—	0.64(U)	—	—	—	—	—	—	—	—	—	—
AAA6429	35-02037	3.00–4.00	Soil	1(U)	—	—	—	0.61(U)	—	—	—	—	—	—	—	—	—	—
AAA6430	35-02037	9.00–10.00	Soil	1(U)	—	—	—	0.61(U)	—	—	—	—	—	—	—	—	—	—
AAA6431	35-02037	13.00–14.00	Soil	1(U)	—	—	—	0.62(U)	—	—	—	—	—	—	—	—	—	—
AAA6432	35-02037	19.00–20.00	Soil	1(U)	—	—	—	0.63(U)	—	—	—	—	—	—	—	—	—	—
AAA6437	35-02038	2.50–3.50	Soil	1(U)	—	—	—	0.87(U)	—	—	—	—	—	—	—	—	—	—
AAA6438	35-02038	9.00–10.00	Soil	1(U)	—	—	—	0.61(U)	—	—	—	—	—	—	—	—	—	—

Table C-1.2-2
Inorganic Chemicals with Concentrations (mg/kg) or Detection Limits at or Exceeding Background Values in Ten Site Slope Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Zinc
Soil Background Value				**0.83**	**8.17**	**295**	**1.83**	**0.4**	**19.3**	**8.64**	**14.7**	**22.3**	**0.1**	**15.4**	**1.52**	**1**	**0.73**	**48.8**
Qbt 2,3,4 Background Value				**0.5**	**2.79**	**46**	**1.21**	**1.63**	**7.14**	**3.14**	**4.66**	**11.2**	**0.1**	**6.58**	**0.3**	**1**	**1.10**	**63.5**
Sediment Background Value				**0.83**	**3.98**	**127**	**1.31**	**0.4**	**10.5**	**4.73**	**11.2**	**19.7**	**0.1**	**9.38**	**0.3**	**1**	**0.73**	**60.2**
AAA6439	35-02038	14.00–15.00	Soil	1(U)	—	—	—	0.61(U)	—	—	—	—	—	—	—	—	—	—
AAA6440	35-02038	19.00–20.00	Soil	1(U)	—	—	—	0.61(U)	—	—	—	—	—	—	—	—	—	—
AAA6412	35-02040	6.50–7.50	Soil	—	—	—	—	1(U)	—	—	—	—	—	—	—	—	—	—
AAA6441	35-02221	4.00–5.00	Soil	1(U)	—	—	—	0.62(U)	—	—	—	—	—	—	—	—	—	—
AAA6442	35-02221	8.80–10.00	Soil	1.1(U)	—	—	—	0.63(U)	—	—	—	—	—	—	—	—	—	—
AAA6443	35-02221	14.00–15.00	Soil	1.1(U)	—	—	—	0.66(U)	—	—	—	—	—	—	—	—	—	—
AAA6444	35-02221	19.00–20.00	Soil	1.1(U)	—	—	—	0.63(U)	—	—	—	—	—	—	—	—	—	—
AAA6446	35-02222	3.00–4.00	Soil	1(U)	—	—	—	0.61(U)	—	—	39.1	—	—	—	—	1.3(U)	—	—
AAA6447	35-02222	9.00–10.00	Soil	1(U)	—	—	—	0.61(U)	—	—	—	—	—	—	—	—	—	—
AAA6448	35-02222	14.00–15.00	Soil	1(U)	—	—	—	0.61(U)	—	—	—	—	—	—	—	—	—	—
AAA6449	35-02222	19.00–20.00	Soil	1(U)	—	—	—	0.62(U)	—	—	—	—	—	—	—	—	—	—
AAA6453	35-02223	0.00–0.50	Soil	—	—	—	—	1(U)	—	—	—	—	—	—	—	—	—	—
PRS 35-016(a)																		
AAC1144	35-02107	2.00–3.00	Qbt 3	—	—	—	—	—	—	—	—	—	0.11(U)	—	1.1(U)	—	—	—
0435-96-0054	35-02394	0.00–0.50	Soil	—	—	—	—	0.48(U)	—	—	84.1	—	—	—	—	—	—	387
0435-96-0055	35-02394	0.50–1.00	Qbt 3	—	—	—	—	—	23.8	—	44.8	—	—	13.1	0.32(U)	—	—	194
0435-96-0056	35-02395	0.00–2.00	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	85.2

[a] U = The analyte was analyzed for but not detected.

[b] UJ = The analyte was not positively identified in the sample, and the associated value is an estimate of the sample-specific detection or quantitation limit.

[c] J- = The analyte was positively identified, and the result is likely to be biased low.

[d] J = The analyte was positively identified, and the associated numerical value is estimated to be more uncertain than would normally be expected for that analysis.

Table C-1.2-3
Detected Organic Chemicals in Ten Site Slope Subarea

Analyte	Location ID	Sample ID	Sample Value (mg/kg)	Media	Depth (ft)
PRS 35-016(j)					
Benzo(a)pyrene	35-02191	0435-95-0056	0.15(J)[a]	Soil	0–0.5
Benzo(b)fluoranthene	35-02191	0435-95-0056	0.11(J)	Soil	0–0.5
Benzo(k)fluoranthene	35-02191	0435-95-0056	0.15(J)	Soil	0–0.5
Bis(2-ethylhexyl)phthalate	35-02191	0435-95-0056	0.38	Soil	0–0.5
Chrysene	35-02191	0435-95-0056	0.18(J)	Soil	0–0.5
Fluoranthene	35-02191	0435-95-0056	0.24(J)	Soil	0–0.5
Pyrene	35-02191	0435-95-0056	0.26(J)	Soil	0–0.5
PRS 35-014(g3)					
Acenaphthene	35-02490	0435-97-0184	0.075(J)	Soil	0–0.08
Acetone	35-02187	0435-95-0050	0.027(J)	Soil	2–3
Acetone	35-02487	0435-97-0174	0.61(J+)[b]	Soil	1–2
Aldrin	35-02183	0435-95-0033	0.011	Soil	2–3
	35-02188	0435-95-0052	0.003(J-)[c]	Soil	0–1
Anthracene	35-02490	0435-97-0184	0.083(J)	Soil	0–0.08
Benzo(a)anthracene	35-02490	0435-97-0185	0.084(J)	Soil	1–2
	35-02490	0435-97-0184	0.65	Soil	0–0.08
Benzo(a)pyrene	35-02490	0435-97-0185	0.14(J)	Soil	1–2
	35-02490	0435-97-0184	1.6	Soil	0–0.08
Benzo(b)fluoranthene	35-02490	0435-97-0185	0.11(J)	Soil	1–2
	35-02490	0435-97-0184	1.2	Soil	0–0.08
Benzo(g,h,i)perylene	35-02490	0435-97-0185	0.12(J)	Soil	1–2
	35-02490	0435-97-0184	1.2	Soil	0–0.08
Benzo(k)fluoranthene	35-02490	0435-97-0185	0.12(J)	Soil	1–2
	35-02490	0435-97-0184	1.3	Soil	0–0.08
Bis(2-ethylhexyl)phthalate	35-02185	0435-95-0043	2.5(J)	Soil	2–3
	35-02188	0435-95-0054	0.8(J)	Soil	2–3
	35-02487	0435-97-0174	0.056(J)	Soil	1–2
	35-02487	0435-97-0173	1(J)	Soil	0–1
	35-02488	0435-97-0178	0.23(J)	Soil	1–2
	35-02490	0435-97-0184	0.046(J)	Soil	0–0.08
	35-02491	0435-97-0189	2.2(J)	Soil	1–2
	35-02491	0435-97-0188	3.2(J)	Soil	0.5–1
	35-02491	0435-97-0187	2.6(J)	Soil	0–0.5
	35-02492	0435-97-0191	2.1(J)	Soil	0.83–1.5
	35-02492	0435-97-0190	4.2(J)	Soil	0–0.83
Butanone[2-]	35-02487	0435-97-0174	0.009(J+)	Soil	1–2
	35-02491	0435-97-0189	0.004(J+)	Soil	1–2
Chrysene	35-02490	0435-97-0185	0.14(J)	Soil	1–2
	35-02490	0435-97-0184	0.84	Soil	0–0.08
DDD[4,4'-]	35-02183	0435-95-0033	0.009	Soil	2–3
DDT[4,4'-]	35-02183	0435-95-0033	0.007	Soil	2–3

Table C-1.2-3
Detected Organic Chemicals in Ten Site Slope Subarea (continued)

Analyte	Location ID	Sample ID	Sample Value (mg/kg)	Media	Depth (ft)
Dibenz(a,h)anthracene	35-02490	0435-97-0185	0.047(J)	Soil	1–2
	35-02490	0435-97-0184	0.27(J)	Soil	0–0.08
Dieldrin	35-02183	0435-95-0033	0.0196	Soil	2–3
Di-n-butylphthalate	35-02488	0435-97-0178	0.1(J)	Soil	1–2
	35-02489	0435-97-0181	0.16(J)	Soil	0–0.5
	35-02489	0435-97-0183	0.45	Soil	1–1.5
	35-02490	0435-97-0184	0.052(J)	Soil	0–0.08
	35-02491	0435-97-0188	0.74(J)	Soil	0.5–1
	35-02491	0435-97-0187	0.88(J)	Soil	0–0.5
Endosulfan I	35-02183	0435-95-0033	0.0074	Soil	2–3
Endrin	35-02183	0435-95-0033	0.016	Soil	2–3
Ethylbenzene	35-02491	0435-97-0189	0.002(J+)	Soil	1–2
Fluoranthene	35-02490	0435-97-0185	0.19(J)	Soil	1–2
	35-02490	0435-97-0184	1.4	Soil	0–0.08
Indeno(1,2,3-cd)pyrene	35-02490	0435-97-0185	0.098(J)	Soil	1–2
	35-02490	0435-97-0184	1	Soil	0–0.08
Isopropyltoluene[4-]	35-02487	0435-97-0174	0.025(J+)	Soil	1–2
LRO	35-02487	0435-97-0174	470	Soil	1–2
	35-02487	0435-97-0173	3700	Soil	0–1
	35-02488	0435-97-0178	2300	Soil	1–2
	35-02488	0435-97-0176	33(J)	Soil	0–1
	35-02488	0435-97-0177	38(J)	Soil	0–1
	35-02490	0435-97-0185	99	Soil	1–2
	35-02490	0435-97-0184	150	Soil	0–0.08
	35-02491	0435-97-0189	19000	Soil	1–2
	35-02491	0435-97-0188	18000	Soil	0.5–1
	35-02491	0435-97-0187	15000	Soil	0–0.5
	35-02492	0435-97-0191	20000	Soil	0.83–1.5
	35-02492	0435-97-0190	20000	Soil	0–0.83
Phenanthrene	35-02185	0435-95-0043	2.4(J)	Soil	2–3
	35-02490	0435-97-0185	0.078(J)	Soil	1–2
	35-02490	0435-97-0184	0.5	Soil	0–0.083
Phenol	35-02489	0435-97-0183	0.041(J)	Soil	1–1.5
Pyrene	35-02490	0435-97-0185	0.22(J)	Soil	1–2
	35-02490	0435-97-0184	1.5	Soil	0–0.08
Tetrachloroethene	35-02491	0435-97-0189	0.005(J+)	Soil	1–2
Toluene	35-02187	0435-95-0050	0.004(J)	Soil	2–3
	35-02487	0435-97-0174	0.012(J+)	Soil	1–2
	35-02491	0435-97-0189	0.073(J+)	Soil	1–2
	35-02491	0435-97-0188	0.002(J+)	Soil	0.5–1
	35-02492	0435-97-0191	0.003(J+)	Soil	0.83–1.5
Trichloro-1,2,2-trifluoroethane[1,1,2-]	35-02491	0435-97-0188	0.002(J+)	Soil	0.5–1
Trichloroethene	35-02491	0435-97-0189	0.003(J+)	Soil	1–2

Table C-1.2-3
Detected Organic Chemicals in Ten Site Slope Subarea (continued)

Analyte	Location ID	Sample ID	Sample Value (mg/kg)	Media	Depth (ft)
Trichlorofluoromethane	35-02491	0435-97-0188	0.002(J+)	Soil	0.5–1
	35-02492	0435-97-0191	0.001(J+)	Soil	0.83–1.5
Trimethylbenzene[1,2,4-]	35-02491	0435-97-0189	0.003(J+)	Soil	1–2
Xylene (total)	35-02491	0435-97-0189	0.009(J+)	Soil	1–2
	35-02492	0435-97-0191	0.002(J+)	Soil	0.83–1.5
PRS 35-016(n)					
Benzo(a)anthracene	35-02169	RE35-98-0024	0.026(J)	Soil	0–0.25
Benzo(a)pyrene	35-02169	RE35-98-0024	0.03(J)	Soil	0–0.25
	35-02170	0435-95-0023	0.17(J)	Soil	0–0.5
Benzo(b)fluoranthene	35-02169	RE35-98-0024	0.03(J)	Soil	0–0.25
	35-02170	0435-95-0023	0.21(J)	Soil	0–0.5
Benzo(g,h,i)perylene	35-02169	RE35-98-0024	0.021(J)	Soil	0–0.25
Benzo(k)fluoranthene	35-02169	RE35-98-0024	0.029(J)	Soil	0–0.25
	35-02170	0435-95-0023	0.23(J)	Soil	0–0.5
Bis(2-ethylhexyl)phthalate	35-02169	RE35-98-0024	0.051(J)	Soil	0–0.25
	35-02170	0435-95-0023	0.45	Soil	0–0.5
Chloroaniline[4-]	35-02596	RE35-98-0031	1.5	Soil	2.5–3.5
Chrysene	35-02169	RE35-98-0024	0.037(J)	Soil	0–0.25
	35-02170	0435-95-0023	0.18(J)	Soil	0–0.5
Dibenz(a,h)anthracene	35-02598	RE35-98-0036	0.33	Sediment	0–0.5
Di-n-butylphthalate	35-02169	RE35-98-0024	0.018(J)	Soil	0–0.25
Di-n-octylphthalate	35-02169	RE35-98-0024	0.018(J)	Soil	0–0.25
Fluoranthene	35-02169	RE35-98-0024	0.05(J)	Soil	0–0.25
Phenanthrene	35-02169	RE35-98-0024	0.038(J)	Soil	0–0.25
Pyrene	35-02169	RE35-98-0024	0.056(J)	Soil	0–0.25
	35-02170	0435-95-0023	0.17(J)	Soil	0–0.5
PRS 35-004(g)					
Aroclor-1254	35-02100	AAC1177	0.132	Soil	0–0.5
Aroclor-1260	35-02101	AAC1178	0.053	Soil	0–0.5
PRS 35-016(d)					
Anthracene	35-02111	AAC1173	0.69	Soil	2–3
Benzo(a)anthracene	35-02111	AAC1173	1.8	Soil	2–3
	35-02401	0435-96-0069	0.066(J)	Soil	0–0.83
Benzo(a)pyrene	35-02111	AAC1173	1.3	Soil	2–3
Benzo(b)fluoranthene	35-02111	AAC1173	1.5	Soil	2–3
	35-02401	0435-96-0069	0.066(J)	Soil	0–0.83
Benzo(g,h,i)perylene	35-02111	AAC1173	0.51	Soil	2–3
Benzo(k)fluoranthene	35-02111	AAC1173	0.96	Soil	2–3
Butylbenzylphthalate	35-02401	0435-96-0069	0.27(J)	Soil	0–0.83
Chrysene	35-02111	AAC1173	1.9	Soil	2–3
	35-02401	0435-96-0069	0.066(J)	Soil	0–0.83
Dibenz(a,h)anthracene	35-02111	AAC1173	0.46	Soil	2–3

Table C-1.2-3
Detected Organic Chemicals in Ten Site Slope Subarea (continued)

Analyte	Location ID	Sample ID	Sample Value (mg/kg)	Media	Depth (ft)
Fluoranthene	35-02111	AAC1173	3	Soil	2–3
	35-02399	0435-96-0064	0.14(J)	Soil	0–0.5
	35-02400	0435-96-0067	0.067(J)	Soil	0–0.67
	35-02401	0435-96-0069	0.066(J)	Soil	0–0.83
Indeno(1,2,3-cd)pyrene	35-02111	AAC1173	0.77	Soil	2–3
Phenanthrene	35-02111	AAC1173	2.3	Soil	2–3
	35-02398	0435-96-0062	0.13(J)	Soil	0–0.5
Pyrene	35-02111	AAC1173	2.4	Soil	2–3
	35-02399	0435-96-0064	0.069(J)	Soil	0–0.5
	35-02400	0435-96-0067	0.034(J)	Soil	0–0.67
	35-02401	0435-96-0069	0.066(J)	Soil	0–0.83
PRS 35-016(c)					
Fluoranthene	35-02397	0435-96-0060	0.035(J)	Soil	0–0.08
Pyrene	35-02397	0435-96-0060	0.035(J)	Soil	0–0.08
PRS 35-009(a)					
Bis(2-ethylhexyl)phthalate	35-02035	AAA6381	4.8(J)	Soil	1.5–2.5
Diethylphthalate	35-02039	AAA6410	0.41	Soil	11–12
	35-02222	AAA6448	0.18	Soil	14–15
PRS 35-016(a)					
Benzo(a)anthracene	35-02107	AAC1143	0.109	Qbt 3	1–2
	35-02107	AAC1144	0.117	Qbt 3	2–3
Benzo(g,h,i)perylene	35-02107	AAC1143	0.738	Qbt 3	1–2
Bis(2-ethylhexyl)phthalate	35-02107	AAC1142	0.98	Soil	0–1
Chrysene	35-02107	AAC1143	0.23	Qbt 3	1–2
Di-n-butylphthalate	35-02394	0435-96-0055	0.035(J)	Qbt 3	0.5–1
	35-02394	0435-96-0054	0.035(J)	Soil	0–0.5
	35-02395	0435-96-0056	0.036(J)	Soil	0–2
PRS 35-016(q)					
Aroclor-1260	35-02114	AAC1138	0.077	Soil	1–2
	35-02114	AAC1137	0.071	Soil	0–1
Benzo(a)anthracene	35-02114	AAC1139	0.155	Soil	2–3
	35-02116	AAC1147	0.137	Soil	0–0.5
	35-02117	AAC1148	0.12	Soil	0–0.5
Benzo(a)pyrene	35-02117	AAC1148	0.237	Soil	0–0.5
Benzo(g,h,i)perylene	35-02115	AAC1146	0.1	Soil	0–0.5
	35-02116	AAC1147	0.169	Soil	0–0.5
Benzo(k)fluoranthene	35-02116	AAC1147	0.254	Soil	0–0.5
Chrysene	35-02115	AAC1146	0.104	Soil	0–0.5
Dibenz(a,h)anthracene	35-02116	AAC1147	0.114	Soil	0–0.5

[a] J = The analyte was positively identified, and the associated numerical value is estimated to be more uncertain than would normally be expected for that analysis.

[b] J+ = The analyte was positively identified, and the result is likely to be biased high.

[c] J- = The analyte was positively identified, and the result is likely to be biased low.

Table C-1.2-4
Samples with Radionuclides Detected (pCi/g) Above Background Values or Fallout Values in Ten Site Slope Subarea

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Europium-152	Plutonium-238	Plutonium-239	Strontium-90	Tritium	Uranium-234	Uranium-235	Uranium-238
Soil Background Value/Fallout Value				1.65	na[a]	0.023	0.054	1.31	0.766	2.59	0.2	2.29
Qbt 2,3,4 Background Value				0.1	na	0.05	0.05	1	0.3	1.98	0.09	1.93
Sediment Background Value				0.9	na	0.05	0.068	1	0.3	2.59	0.20	2.29
PRS 35-016(n)												
0435-97-0463	35-02577	0.00–0.50	Soil	—	—	—	0.347	—	—	—	—	—
0435-97-0467	35-02578	0.00–0.50	Soil	—	—	—	0.338	—	—	—	—	—
0435-97-0471	35-02578	0.50–1.50	Soil	—	—	—	—	—	—	—	—	—
RE35-98-0028	35-02596	0.00–0.50	Soil	—	—	—	—	—	—	—	—	—
RE35-98-0029	35-02596	0.50–1.50	Soil	—	—	—	—	—	—	—	—	—
RE35-98-0030	35-02596	1.50–2.50	Soil	—	—	—	0.073	—	—	—	—	—
RE35-98-0031	35-02596	2.50–3.50	Soil	—	—	—	—	—	—	—	—	—
RE35-98-0032	35-02597	0.00–0.50	Soil	—	—	—	—	—	—	—	—	—
RE35-98-0036	35-02598	0.00–0.50	Sediment	0.96	—	—	0.164	—	—	—	—	—
RE35-98-0040	35-02599	0.00–0.50	Sediment	—	—	—	0.173	—	—	—	—	—
PRS 35-016(j)												
0435-97-0477	35-02580	0.00–0.67	Soil	—	—	—	—	—	—	—	—	—
0435-97-0481	35-02580	0.67–1.67	Soil	—	—	—	0.077	—	—	—	—	—
PRS 35-014(g3)												
0435-95-0040	35-02185	0.00–1.00	Soil	—	—	—	0.031	—	—	—	—	—
0435-97-0173	35-02487	0.00–1.00	Soil	—	—	—	—	—	—	—	—	—
0435-97-0174	35-02487	1.00–2.00	Soil	0.239	—	—	—	—	—	—	—	—
0435-97-0176	35-02488	0.00–1.00	Soil	—	—	—	—	—	—	—	—	—
0435-97-0178	35-02488	1.00–2.00	Soil	—	—	—	—	—	—	—	—	—
0435-97-0181	35-02489	0.00–0.50	Soil	—	—	—	—	—	—	—	—	—
0435-97-0182	35-02489	0.50–1.00	Soil	—	—	—	—	—	—	—	—	—
0435-97-0183	35-02489	1.00–1.50	Soil	—	0.569	—	—	—	—	—	—	—
0435-97-0185	35-02490	1.00–2.00	Soil	—	—	—	—	—	—	—	—	—
0435-97-0188	35-02491	0.50–1.00	Soil	0.098	—	—	—	—	—	—	—	—

Table C-1.2-4
Samples with Radionuclides Detected (pCi/g) Above Background Values or Fallout Values in Ten Site Slope Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Europium-152	Plutonium-238	Plutonium-239	Strontium-90	Tritium	Uranium-234	Uranium-235	Uranium-238
Soil Background Value/Fallout Value				1.65	na[a]	0.023	0.054	1.31	0.766	2.59	0.2	2.29
Qbt 2,3,4 Background Value				0.1	na	0.05	0.05	1	0.3	1.98	0.09	1.93
Sediment Background Value				0.9	na	0.05	0.068	1	0.3	2.59	0.20	2.29
0435-97-0189	35-02491	1.00–2.00	Soil	—	—	—	—	—	—	—	—	—
0435-97-0191	35-02492	0.83–1.50	Soil	—	—	—	—	—	—	—	—	—
PRS 35-004(m)												
0435-95-0011	35-02167	0.00–0.50	Soil	—	—	—	0.075	—	—	96.29	5.941	—
0435-97-0444	35-02571	0.00–1.00	Soil	—	—	—	—	—	—	—	—	—
0435-97-0447	35-02572	0.00–1.00	Soil	—	0.412	—	—	—	—	—	—	—
0435-97-0448	35-02572	3.00–4.00	Soil	—	—	—	—	—	—	—	—	—
0435-97-0454	35-02574	0.00–1.00	Soil	—	—	—	—	—	—	—	—	—
0435-97-0457	35-02575	0.00–1.00	Soil	—	—	—	—	—	—	—	—	—
0435-97-0458	35-02575	2.00–3.00	Soil	—	—	—	—	—	—	—	—	—
0435-97-0461	35-02576	4.00–5.00	Soil	—	—	—	—	—	—	—	—	—
0435-97-0495	35-02595	0.00–0.50	Soil	—	—	—	—	—	—	35.6(J)[b]	1.04	—
PRS 35-016(b)												
0435-97-0349	35-02549	1.00–2.00	Soil	—	—	—	—	—	—	—	—	2.54
0435-97-0353	35-02550	0.50–1.50	Soil	—	—	—	—	—	—	—	—	—
0435-97-0475	35-02579	0.50–1.50	Soil	—	—	—	—	—	—	—	—	—
PRS 35-004(g)												
AAC1177	35-02100	0.00–0.50	Soil	—	—	—	—	—	—	—	—	—
PRS 35-009(b)												
AAA6462	35-02041	9.00–10.00	Soil	—	—	0.032	—	—	—	—	—	—
AAA6474	35-02041	19.00–20.00	Soil	—	—	0.079	—	—	—	—	—	—
AAA6464	35-02042	4.00–5.00	Soil	—	—	—	—	—	—	5.099	0.212	5.05
0435-97-0330	35-02545	5.00–6.00	Soil	—	—	—	—	—	—	3.66	—	3.59
0435-97-0338	35-02547	0.00–0.50	Soil	—	—	—	—	—	—	—	—	—
0435-97-0342	35-02548	0.00–1.00	Soil	—	—	—	—	—	—	—	—	—

Table C-1.2-4
Samples with Radionuclides Detected (pCi/g) Above Background Values or Fallout Values In Ten Site Slope Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Europium-152	Plutonium-238	Plutonium-239	Strontium-90	Tritium	Uranium-234	Uranium-235	Uranium-238
Soil Background Value/Fallout Value				1.65	na[a]	0.023	0.054	1.31	0.766	2.59	0.2	2.29
Qbt 2,3,4 Background Value				0.1	na	0.05	0.05	1	0.3	1.98	0.09	1.93
Sediment Background Value				0.9	na	0.05	0.068	1	0.3	2.59	0.20	2.29
PRS 35-016(d)												
0435-96-0062	35-02398	0.00–0.50	Soil	—	—	—	—	—	—	—	—	—
0435-96-0064	35-02399	0.00–0.50	Soil	—	—	—	—	—	—	—	—	—
0435-96-0067	35-02400	0.00–0.67	Soil	0.23	—	—	—	—	—	—	—	—
0435-96-0068	35-02400	2.00–3.00	Qbt 3	—	—	—	—	—	—	—	0.1	—
0435-96-0069	35-02401	0.00–0.83	Soil	—	—	—	—	—	—	—	—	—
PRS 35-016(c)												
AAC1165	35-02108	0.00–0.50	Soil	—	0.474	—	—	—	—	—	—	—
0435-96-0058	35-02396	0.00–0.67	Soil	0.52	—	—	—	—	—	—	—	—
0435-96-0060	35-02397	0.00–0.08	Soil	—	—	—	0.079	—	—	—	—	—
PRS 35-009(e)												
AAA3826	35-02079	0.00–1.00	Soil	—	—	0.080(U)[c]	—	—	0.073	—	—	—
AAA3827	35-02079	1.00–2.00	Soil	—	—	—	—	—	0.052	2.64	0.47	2.48
AAA3828	35-02079	2.00–3.00	Soil	—	—	—	1.59	—	0.025	—	0.227(U)	—
AAC1159	35-02104	0.00–0.50	Soil	—	—	—	0.06	—	—	—	—	—
0435-97-0428	35-02566	0.00–1.00	Soil	0.228	—	—	—	—	—	—	—	—
0435-97-0430	35-02566	2.00–3.00	Soil	—	—	—	—	—	—	—	—	—
PRS 35-009(a)												
AAA6384	35-02035	17.50–18.70	Soil	—	—	0.005	—	—	1.74	—	—	—
AAA6401	35-02036	0.00–1.10	Soil	—	—	—	—	—	—	—	—	—
AAA6440	35-02038	19.00–20.00	Soil	—	—	—	—	—	1.161	—	—	—
AAA6411	35-02039	19.00–20.00	Soil	—	—	0.043	—	—	—	—	—	—
AAA6443	35-02221	14.00–15.00	Soil	—	—	—	—	—	0.693	—	—	—
AAA6446	35-02222	3.00–4.00	Soil	—	—	0.029	1.189	—	—	—	—	—
AAA6453	35-02223	0.00–0.50	Soil	—	—	—	0.059	—	—	—	—	—

Table C-1.2-4
Samples with Radionuclides Detected (pCi/g) Above Background Values or Fallout Values in Ten Site Slope Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Europium-152	Plutonium-238	Plutonium-239	Strontium-90	Tritium	Uranium-234	Uranium-235	Uranium-238
Soil Background Value/Fallout Value				1.65	na[a]	0.023	0.054	1.31	0.766	2.59	0.2	2.29
Qbt 2,3,4 Background Value				0.1	na	0.05	0.05	1	0.3	1.98	0.09	1.93
Sediment Background Value				0.9	na	0.05	0.068	1	0.3	2.59	0.20	2.29
AAA6454	35-02224	0.00–0.50	Soil	—	—	0.025(U)	0.365	—	—	—	—	—
0435-97-0284	35-02536	0.00–0.50	Soil	—	—	—	—	—	—	—	—	—
0435-97-0287	35-02536	5.50–6.50	Soil	—	—	—	—	—	0.09	—	—	—
0435-97-0289	35-02536	19.00–20.00	Soil	—	—	—	—	—	0.07	—	—	—
0435-97-0290	35-02536	29.00–30.00	Soil	—	—	—	—	—	0.22	—	—	—
0435-97-0292	35-02537	1.00–2.00	Soil	—	—	—	—	—	0.07	—	—	—
0435-97-0293	35-02537	2.00–3.00	Soil	—	—	—	—	—	0.04	—	—	—
0435-97-0294	35-02537	6.50–7.50	Soil	—	—	—	—	—	0.06	—	—	—
0435-97-0301	35-02538	0.00–1.00	Soil	—	—	—	—	—	—	—	—	—
0435-97-0303	35-02538	1.00–2.00	Soil	—	—	—	—	—	0.87	—	—	—
0435-97-0305	35-02538	6.00–7.00	Soil	—	—	—	—	—	0.14	—	—	—
0435-97-0306	35-02538	19.00–20.00	Soil	—	—	—	—	—	0.2	—	—	—
0435-97-0307	35-02538	29.00–30.00	Soil	—	—	—	—	0.78	0.21	—	—	—
0435-97-0310	35-02539	1.00–2.00	Soil	—	—	—	—	—	0.06	—	—	—
0435-97-0297	35-02540	0.50–1.50	Soil	—	—	—	—	—	0.2	—	—	—
0435-97-0298	35-02540	5.00–6.00	Soil	—	—	—	—	—	0.37	—	—	—
0435-97-0299	35-02540	19.00–20.00	Soil	—	—	—	—	—	0.31	—	—	—
0435-97-0300	35-02540	29.00–30.00	Soil	—	—	—	—	—	0.32	—	—	—
0435-97-0312	35-02541	0.00–1.00	Soil	—	—	—	—	—	—	—	—	—
0435-97-0314	35-02541	1.50–2.00	Soil	—	—	—	—	—	—	—	—	—
0435-97-0315	35-02541	6.50–7.50	Soil	—	—	—	—	—	—	—	—	—
0435-97-0316	35-02542	0.00–1.00	Soil	—	—	—	0.069	—	—	—	—	—
0435-97-0317	35-02542	1.00–1.50	Soil	—	—	—	0.034	—	0.04	—	—	—
0435-97-0319	35-02542	1.50–2.50	Soil	—	—	—	0.041	—	0.05	—	—	—
0435-97-0320	35-02543	0.00–1.00	Soil	—	—	—	0.134	—	—	—	—	—

Table C-1.2-4
Samples with Radionuclides Detected (pCi/g) Above Background Values or Fallout Values in Ten Site Slope Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Europium-152	Plutonium-238	Plutonium-239	Strontium-90	Tritium	Uranium-234	Uranium-235	Uranium-238
Soil Background Value/Fallout Value				1.65	na[a]	0.023	0.054	1.31	0.766	2.59	0.2	2.29
Qbt 2,3,4 Background Value				0.1	na	0.05	0.05	1	0.3	1.98	0.09	1.93
Sediment Background Value				0.9	na	0.05	0.068	1	0.3	2.59	0.20	2.29
0435-97-0321	35-02543	1.00–2.00	Soil	—	—	—	0.084	—	0.07	—	—	—
0435-97-0323	35-02543	2.00–3.00	Soil	—	—	—	0.047	—	0.05	—	—	—
0435-97-0324	35-02544	0.00–1.00	Soil	—	—	—	0.062	—	—	—	—	—
0435-97-0325	35-02544	1.00–1.50	Soil	—	—	—	0.028	—	—	—	—	—
PRS 35-016(a)												
AAA4445	35-02080	0.00–1.00	Soil	—	—	—	0.058(U)	—	0.068	—	0.487	—
AAA4446	35-02080	1.00–2.00	Soil	—	—	0.064(U)	—	—	0.035	—	0.589	—
0435-96-0054	35-02394	0.00–0.50	Soil	—	—	—	—	—	—	—	—	—
0435-96-0055	35-02394	0.50–1.00	Qbt 3	—	—	—	—	—	—	—	0.57(U)	—
0435-96-0056	35-02395	0.00–2.00	Soil	0.44	—	—	0.1	—	—	—	—	—
0435-96-0057	35-02395	2.00–3.00	Soil	—	—	—	0.061(U)	—	—	—	—	—
0435-97-0431	35-02567	0.00–1.00	Soil	—	—	—	—	—	—	—	—	—
PRS 35-016(q)												
AAC1137	35-02114	0.00–1.00	Soil	—	—	—	0.043	—	—	—	—	—
AAC1138	35-02114	1.00–2.00	Soil	—	—	—	0.007	—	—	—	—	—
AAC1139	35-02114	2.00–3.00	Soil	—	—	0.009	0.007	—	—	—	—	—
AAC1146	35-02115	0.00–0.50	Soil	—	—	—	—	—	—	—	—	—
0435-97-0491	35-02583	0.00–1.00	Soil	—	—	—	—	—	—	—	—	—

[a] na = not available.

[b] J = The analyte was positively identified, and the associated numerical value is estimated to be more uncertain than would normally be expected for that analysis.

[c] U = The analyte was analyzed for but not detected.

C-1.3 Mortandad Slope Subarea

Table C-1.3-1 presents the analyte suite and request numbers (numbers are listed below the analyte suites) for each sample collected in the Mortandad Slope Subarea. Each request number includes a batch of samples sent to a specific off-site analytical laboratory for a specific suite of analyses, and the request numbers can be used to track the original data packages from the analytical laboratories. If the sample was not analyzed for a given analyte suite, the cell in that suite's column contains a dash (—).

Also note that the data in this appendix are not arranged by consolidated unit because all data were collected prior to consolidation efforts. For a crosswalk between consolidated unit numbers and individual PRS numbers, refer to Table 1.0-1 in section 1.0.

Table C-1.3-2 presents the inorganic chemical results (mg/kg) above background values for the Mortandad Slope Subarea. Non-detected results above LANL background values are also presented in Table C-1.3-2. A dash in the results cell indicates that the result was less than background value or not detected, or that the sample was not analyzed for the corresponding chemical.

Table C-1.3-3 presents the detected organic chemical data for the Mortandad Slope Subarea.

Table C-1.3-4 presents the radionuclide results (pCi/g) above background values or fallout values for the Mortandad Slope Subarea. Non-detected results above LANL background values are also presented in Table C-1.3-4. A dash in the results cell indicates that the result was less than background value or not detected, or that the sample was not analyzed for the corresponding radionuclide.

Table C-1.3-1
Samples Taken in Mortandad Slope Subarea

Sample ID	Location ID	Depth (ft)	Media	Limited- List TAL Metals	Non-TAL Metals	TAL Metals	PCBs	Pesticides/PCBs	SVOCs	TPH DRO	TPH LRO	VOCs	Gamma Spectroscopy	Isotopic-Plutonium	Isotopic-Uranium	Strontium-90	Tritium	XRF
PRS 35-016(f)																		
AAC1207	35-02154	0–0.5	Soil	—	—	—	21598	—	—	—	—	21576	—	—	—	—	—	21600
AAC1208	35-02155	0–1	Soil	—	—	21579	21598	—	—	—	—	—	—	—	—	—	—	21600
AAC1209	35-02155	1–2	Soil	—	—	—	—	21598	21576	—	—	—	—	—	—	—	—	21600
AAC1210	35-02155	2–3	Soil	—	—	—	21598	—	—	—	—	—	—	—	—	—	—	—
0435-95-0205	35-02284	0–1	Soil	—	—	—	—	—	1678	—	—	—	—	—	—	—	—	—
PRS 35-014(e1)																		
AAC1216	35-02123	0–1	Soil	—	—	—	21747	—	—	—	—	—	—	—	—	—	—	—
AAC1217	35-02123	1–2	Soil	—	—	—	21747	—	—	—	—	—	—	—	—	—	—	—
AAC1218	35-02123	2–3	Soil	—	—	—	21747	—	—	—	—	—	—	—	—	—	—	—
AAC1219	35-02124	0–1	Soil	—	—	—	21747	—	—	—	—	—	—	—	—	—	—	—
AAC1220	35-02124	1–2	Soil	—	—	—	21747	—	—	—	—	—	—	—	—	—	—	—
AAC1221	35-02124	2–3	Soil	—	—	—	21747	—	—	—	—	—	—	—	—	—	—	—
AAC1226	35-02126	1–2	Soil	—	—	—	21598	—	—	—	—	—	—	—	—	—	—	—
AAC1227	35-02126	2–3	Soil	—	—	—	—	21598	21576	—	—	21576	—	—	—	—	—	—
AAC1232	35-02128	0–1	Soil	—	—	—	21598	—	—	—	—	21576	—	—	—	—	—	—
AAC1240	35-02130	1–2	Soil	—	—	—	—	21598	21576	—	—	—	—	—	—	—	—	—
AAC1245	35-02132	0–1	Soil	—	—	—	21747	—	—	—	—	—	—	—	—	—	—	—
AAC1246	35-02132	1–2	Soil	—	—	—	21747	—	—	—	—	—	—	—	—	—	—	—
AAC1247	35-02132	2–3	Soil	—	—	—	21747	—	—	—	—	—	—	—	—	—	—	—
AAC1249	35-02133	0–1	Soil	—	—	—	21747	—	—	—	—	—	—	—	—	—	—	—
AAC1250	35-02133	1–2	Soil	—	—	—	21747	—	—	—	—	—	—	—	—	—	—	—
AAC1251	35-02133	2–3	Soil	—	—	—	21747	—	—	—	—	—	—	—	—	—	—	—
AAC1252	35-02134	0–1	Soil	—	—	—	21747	—	—	—	—	—	—	—	—	—	—	—

Table C-1.3-1
Samples Taken in Mortandad Slope Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	Limited- List TAL Metals	Non-TAL Metals	TAL Metals	PCBs	Pesticides/PCBs	SVOCs	TPH DRO	TPH LRO	VOCs	Gamma Spectroscopy	Isotopic-Plutonium	Isotopic-Uranium	Strontium-90	Tritium	XRF
AAC1253	35-02134	1–2	Soil	—	—	—	21747	—	—	—	—	—	—	—	—	—	—	—
AAC1254	35-02134	2–3	Soil	—	—	—	21747	—	—	—	—	—	—	—	—	—	—	—
AAC1255	35-02135	0–1	Soil	—	—	—	21747	—	—	—	—	—	—	—	—	—	—	—
AAC1256	35-02135	1–2	Soil	—	—	—	21747	—	—	—	—	—	—	—	—	—	—	—
AAC1257	35-02135	2–3	Soil	—	—	—	21747	—	—	—	—	—	—	—	—	—	—	—
AAC1258	35-02136	0–1	Soil	—	—	—	—	21602	—	—	—	—	—	—	—	—	—	—
AAC1259	35-02136	1–2	Soil	—	—	—	—	—	—	—	—	21602	—	—	—	—	—	—
AAC1266	35-02138	2–3	Soil	—	—	—	21610	—	—	—	—	21595	—	—	—	—	—	—
AAC1270	35-02140	0–1	Soil	—	—	—	21610	—	—	—	—	—	—	—	—	—	—	—
AAC1272	35-02140	1–2	Soil	—	—	—	—	21595	—	—	—	—	—	—	—	—	—	—
AAC1277	35-02142	0–1	Soil	—	—	—	—	21602	—	—	—	—	—	—	—	—	—	—
0435-97-0221	35-02461	0–1	Soil	—	—	—	—	—	—	3341R	3341R	—	—	—	—	—	—	—
0435-97-0222	35-02462	0–1	Soil	—	—	—	—	—	—	3341R	3341R	—	—	—	—	—	—	—
PRS 35-008																		
AAB4269	35-02032	0–0.5	Soil	19653	19653	—	—	—	—	—	—	—	—	19551	19551	—	—	19541
AAB4270	35-02032	1–2	Soil	—	—	—	—	—	—	—	—	—	—	19551	19551	—	—	19541
AAB4271	35-02032	2–3	Soil	—	—	—	—	—	—	—	—	—	—	19551	19551	—	—	19541
AAB4272	35-02213	0–0.5	Soil	—	—	—	—	—	—	—	—	—	—	19551	19551	—	—	19541
AAB4274	35-02213	1–2	Soil	—	—	—	—	—	—	—	—	—	—	19551	19551	—	—	19541
AAB4275	35-02213	2–3	Soil	—	—	—	—	—	—	—	—	—	—	19551	19551	—	—	19541
AAB4276	35-02250	0–0.5	Soil	—	—	—	17890	—	17890	—	—	17890	—	18791	18791	—	—	18537
AAB4277	35-02250	1–2	Soil	—	—	—	17894	—	17894	—	—	17894	18791	18791	18791	—	—	18537
AAB4278	35-02250	2–3	Soil	—	—	—	17894	—	17894	—	—	17894	—	18791	18791	—	—	18537
XAAB4257	35-02251	0–0.5	Soil	19653	19653	—	—	—	—	—	—	—	—	19551	19551	—	—	—

Table C-1.3-1
Samples Taken in Mortandad Slope Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	Limited- List TAL Metals	Non-TAL Metals	TAL Metals	PCBs	Pesticides/PCBs	SVOCs	TPH DRO	TPH LRO	VOCs	Gamma Spectroscopy	Isotopic-Plutonium	Isotopic-Uranium	Strontium-90	Tritium	XRF
XAAB4258	35-02251	1–2	Soil	—	—	—	—	—	—	—	—	—	—	19551	19551	—	—	—
XAAB4259	35-02251	2–3	Soil	—	—	—	—	—	—	—	—	17859	—	19551	19551	—	—	—
XAAB4260	35-02252	0–0.5	Soil	—	—	—	17894	—	17894	—	—	17894	—	18791	18791	—	—	18537
XAAB4261	35-02252	1–2	Soil	—	—	—	17894	—	17894	—	—	17894	—	18791	18791	—	—	18537
XAAB4262	35-02252	2–3	Soil	—	—	—	17894	—	17894	—	—	17894	—	18791	18791	—	—	18537
XAAB4263	35-02253	0–0.5	Soil	—	—	—	17890	—	17890	—	—	17894	—	18791	18791	—	—	18537
XAAB4264	35-02253	1–2	Soil	—	—	—	17894	—	17894	—	—	17894	—	18791	18791	—	—	18537
XAAB4265	35-02253	2–3	Soil	—	—	—	17894	—	17894	—	—	17894	—	18791	18791	—	—	18537
0435-95-0202	35-02282	0–0.5	Soil	—	—	—	—	—	1678	1678	—	—	—	—	—	—	—	—
0435-95-0203	35-02282	1–2	Soil	—	—	1679	—	—	—	1678	—	—	—	—	—	—	—	—
0435-95-0204	35-02283	1–2	Soil	—	—	—	1678	—	1678	1678	—	—	—	—	—	—	—	—
0435-97-0193	35-02453	0–1	Soil	—	—	3342R	—	—	3341R	3341R	3341R	—	3343R	—	—	—	—	—
0435-97-0194	35-02453	1–2	Soil	—	—	3342R	—	—	3341R	3341R	3341R	3341R	3343R	—	—	—	—	—
0435-97-0195	35-02453	2–3.4	Soil	—	—	3342R	—	—	3341R	3341R	3341R	3341R	3343R	—	—	—	—	—
0435-97-0196	35-02453	2–3.4	Soil	—	—	—	—	—	—	3341R	3341R	—	—	—	—	—	—	—
0435-97-0198	35-02454	0–1	Soil	—	—	3342R	—	—	3341R	3341R	3341R	—	3343R	—	—	—	—	—
0435-97-0199	35-02454	1–2	Soil	—	—	3342R	—	—	3341R	3341R	3341R	3341R	3343R	—	—	—	—	—
0435-97-0200	35-02454	2–3	Soil	—	—	3342R	—	—	3341R	3341R	3341R	3341R	3343R	—	—	—	—	—
0435-97-0201	35-02455	0–1	Soil	—	—	3342R	—	—	3341R	3341R	3341R	—	3343R	—	—	—	—	—
0435-97-0202	35-02455	1–2	Soil	—	—	3342R	—	—	3341R	3341R	3341R	3341R	3343R	—	—	—	—	—
0435-97-0203	35-02455	2–3	Soil	—	—	3342R	—	—	3341R	3341R	3341R	3341R	3343R	—	—	—	—	—
0435-97-0204	35-02456	0–1	Soil	—	—	3328R	—	—	3327R	3327R	3327R	—	3329R	—	—	—	—	—
0435-97-0205	35-02456	1–2	Soil	—	—	3328R	—	—	3327R	3327R	3327R	3327R	3329R	—	—	—	—	—
0435-97-0206	35-02456	2–3	Soil	—	—	3328R	—	—	3327R	3327R	3327R	3327R	3329R	—	—	—	—	—

Table C-1.3-1
Samples Taken in Mortandad Slope Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	Limited- List TAL Metals	Non-TAL Metals	TAL Metals	PCBs	Pesticides/PCBs	SVOCs	TPH DRO	TPH LRO	VOCs	Gamma Spectroscopy	Isotopic-Plutonium	Isotopic-Uranium	Strontium-90	Tritium	XRF
0435-97-0208	35-02457	0–1	Soil	—	—	—	—	—	3327R	3327R	3327R	—	3329R	—	—	—	—	—
0435-97-0209	35-02457	1–2	Soil	—	—	—	—	—	3327R	3327R	3327R	3327R	3329R	—	—	—	—	—
0435-97-0210	35-02457	2–3	Soil	—	—	—	—	—	3327R	3327R	3327R	3327R	3329R	—	—	—	—	—
0435-97-0211	35-02458	0–1	Soil	—	—	—	—	—	3327R	3327R	3327R	—	—	—	—	—	—	—
0435-97-0212	35-02458	1–2	Soil	—	—	—	—	—	3327R	3327R	3327R	—	—	—	—	—	—	—
0435-97-0213	35-02458	2–3	Soil	—	—	—	—	—	3327R	3327R	3327R	—	—	—	—	—	—	—
0435-97-0214	35-02459	0–0.5	Soil	—	—	—	—	—	3341R	3341R	3341R	—	—	—	—	—	—	—
0435-97-0215	35-02459	0.5–1	Soil	—	—	—	—	—	3341R	3341R	3341R	—	—	—	—	—	—	—
0435-97-0216	35-02459	1–2	Soil	—	—	—	—	—	3341R	3341R	3341R	—	—	—	—	—	—	—
0435-97-0217	35-02460	0–0.83	Soil	—	—	—	—	—	3341R	3341R	3341R	—	—	—	—	—	—	—
0435-97-0218	35-02460	0.83–1.5	Soil	—	—	—	—	—	3341R	3341R	3341R	—	—	—	—	—	—	—
0435-97-0219	35-02460	0.83–1.54	Soil	—	—	—	—	—	—	3341R	3341R	—	—	—	—	—	—	—
PRS 35-016(e)																		
AAC1291	35-02152	0–0.5	Soil	—	—	—	21665	—	—	—	—	—	—	—	—	—	—	—
AAC1292	35-02153	0–1	Soil	—	—	—	21665	—	—	—	—	—	—	—	—	—	—	21666
AAC1293	35-02153	1–2	Soil	—	—	—	21665	—	—	—	—	—	—	—	—	—	—	21666
AAC1294	35-02153	2–3	Soil	—	—	—	21665	—	—	—	—	21659	—	—	—	—	—	21666
PRS 35-004(b)																		
AAC1285	35-02120	0–1	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	21691
AAC1286	35-02120	1–2	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	21691
AAC1287	35-02120	2–3	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	21691
AAC1288	35-02121	0–1	Soil	—	—	21675	—	—	—	—	—	—	—	—	—	—	—	21691
AAC1289	35-02121	1–2	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	21691
AAC1290	35-02121	2–3	Soil	—	—	—	—	21673	21673	—	—	—	—	—	—	—	—	—

Table C-1.3-1
Samples Taken in Mortandad Slope Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	Limited-List TAL Metals	Non-TAL Metals	TAL Metals	PCBs	Pesticides/PCBs	SVOCs	TPH DRO	TPH LRO	VOCs	Gamma Spectroscopy	Isotopic-Plutonium	Isotopic-Uranium	Strontium-90	Tritium	XRF
PRS 35-014(e2)																		
AAC1311	35-02144	2–3	Soil	—	—	—	—	—	—	—	—	21673	—	—	—	—	—	—
AAC1187	35-02146	0–1	Soil	—	—	—	—	21673	21673	—	—	—	—	—	—	—	—	—
PRS 35-016(i)																		
AAC1295	35-02165	0–0.5	Soil	—	—	—	21665	—	—	—	—	—	—	—	—	—	—	21666
AAC1296	35-02166	0–1	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	21691
AAC1297	35-02166	1–2	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	21691
AAC1298	35-02166	2–3	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	21691
PRS 35-009(c)																		
AAA6495	35-02049	8–9	Soil	—	—	—	16672	—	16672	—	—	16670	—	16669	16669	—	—	16706
AAA6496	35-02049	12–13	Soil	16704	16704	—	—	—	16670	—	—	16670	—	16669	16669	—	—	16706
AAA6497	35-02049	19–20	Soil	—	—	—	—	—	16670	—	—	16672	—	16669	16669	—	—	16706
AAA6498	35-02050	9–10	Soil	—	—	—	—	—	16670	—	—	16670	—	16669	16669	—	—	16706
AAA6499	35-02050	11.5–12.5	Soil	—	—	—	—	—	16670	—	—	16670	—	16669	16669	—	—	16706
AAA6500	35-02050	19–20	Soil	—	—	—	—	—	16670	—	—	16670	16669	16669	16669	—	—	16706
AAA6525	35-02051	3.5–4.5	Soil	—	—	—	—	—	16674	—	—	16674	—	16683	16683	—	—	16681
AAA6526	35-02051	9–10	Soil	—	—	—	—	—	16674	—	—	16674	—	16683	16683	—	—	16681
AAA6527	35-02051	14–15	Soil	—	—	—	—	—	16674	—	—	16674	—	16683	16683	—	—	16681
AAA6528	35-02051	17–18	Soil	—	—	—	—	—	16674	—	—	16674	—	16683	16683	—	—	16681
AAA6529	35-02052	4–5	Soil	—	—	—	—	—	16674	—	—	16674	—	16683	16683	—	—	16681
AAA6530	35-02052	9–10	Soil	—	—	—	—	—	16674	—	—	16674	16683	16683	16683	—	—	16681
AAA6531	35-02052	14–15	Soil	—	—	—	—	—	16674	—	—	16674	—	16683	16683	—	—	16681
AAA6532	35-02052	18.8–20	Soil	16680	16680	—	—	—	16674	—	—	16674	—	16683	16683	—	—	16681
AAA6508	35-02053	3–4	Soil	—	—	—	—	—	16670	—	—	16670	16669	16669	16669	—	—	16706

Table C-1.3-1
Samples Taken in Mortandad Slope Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	Limited- List TAL Metals	Non-TAL Metals	TAL Metals	PCBs	Pesticides/PCBs	SVOCs	TPH DRO	TPH LRO	VOCs	Gamma Spectroscopy	Isotopic-Plutonium	Isotopic-Uranium	Strontium-90	Tritium	XRF
AAA6510	35-02053	9–10	Soil	16704	16704	—	—	—	16670	—	—	16670	—	16669	16669	—	—	16706
AAA6511	35-02053	14–15	Soil	—	—	—	—	—	16670	—	—	16672	—	16669	16669	—	—	16706
AAA6512	35-02053	17.5–18.5	Soil	—	—	—	—	—	16670	—	—	16670	—	16669	16669	—	—	16706
AAA6513	35-02054	4–5	Soil	—	—	—	16672	—	16672	—	—	16670	—	16669	16669	—	—	16706
AAA6514	35-02054	8–9	Soil	—	—	—	—	—	16670	—	—	16670	—	16669	16669	—	—	16706
AAA6515	35-02054	14–15	Soil	—	—	—	—	—	16670	—	—	16670	—	16669	16669	—	—	16706
AAA6516	35-02054	19–20	Soil	—	—	—	—	—	16670	—	—	16670	—	16669	16669	—	—	16706
AAA6480	35-02055	4–5	Soil	—	—	—	—	—	16684	—	—	16684	—	16685	16685	—	—	16699
AAA6481	35-02055	9–10	Soil	—	—	—	—	—	16684	—	—	16684	—	16685	16685	—	—	16699
AAA6482	35-02055	14–15	Soil	—	—	—	—	—	16684	—	—	16684	—	16685	16685	—	—	16699
AAA6483	35-02055	19–20	Soil	—	—	—	—	—	16684	—	—	16684	—	16685	16685	—	—	16699
AAA6484	35-02056	4–5	Soil	16703	16703	—	—	—	16684	—	—	16684	—	16685	16685	—	—	16699
AAA6485	35-02056	6–7	Soil	—	—	—	—	—	16684	—	—	16684	16685	16685	16685	—	—	16699
AAA6486	35-02056	13–14	Soil	—	—	—	—	—	16684	—	—	16684	—	16685	16685	—	—	16699
AAA6487	35-02056	19–20	Soil	—	—	—	—	—	16684	—	—	16684	—	16685	16685	—	—	16699
0435-97-0355	35-02551	0–1	Soil	—	—	—	—	—	—	—	—	—	3488R	—	—	3488R	—	—
0435-97-0356	35-02551	5.5–6.5	Soil	—	—	—	—	—	—	—	—	—	3488R	—	—	3488R	3488R	—
0435-97-0357	35-02551	6.5–7.5	Soil	—	—	—	—	—	—	—	—	—	3488R	—	—	3488R	3488R	—
0435-97-0358	35-02551	11.5–12.5	Soil	—	—	—	—	—	—	—	—	—	3488R	—	—	3488R	3488R	—
0435-97-0359	35-02552	0–1	Soil	—	—	—	—	—	—	—	—	—	3488R	—	—	3488R	—	—
0435-97-0360	35-02552	5–5.5	Soil	—	—	—	—	—	—	—	—	—	3488R	—	—	3488R	3488R	—
0435-97-0361	35-02552	5–5.5	Soil	—	—	—	—	—	—	—	—	—	3488R	—	—	3488R	3488R	—
0435-97-0362	35-02552	5.5–6.5	Soil	—	—	—	—	—	—	—	—	—	3488R	—	—	3488R	3488R	—
0435-97-0363	35-02552	11.5–12.5	Soil	—	—	—	—	—	—	—	—	—	3488R	—	—	3488R	3488R	—

Table C-1.3-1
Samples Taken In Mortandad Slope Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	Limited- List TAL Metals	Non-TAL Metals	TAL Metals	PCBs	Pesticides/PCBs	SVOCs	TPH DRO	TPH LRO	VOCs	Gamma Spectroscopy	Isotopic-Plutonium	Isotopic-Uranium	Strontium-90	Tritium	XRF
0435-97-0364	35-02553	0–1	Soil	—	—	—	—	—	—	—	—	—	3488R	—	—	3488R	—	—
0435-97-0365	35-02553	4.5–5.5	Soil	—	—	—	—	—	—	—	—	—	3488R	—	—	3488R	3488R	—
0435-97-0366	35-02553	5.5–6.5	Soil	—	—	—	—	—	—	—	—	—	3488R	—	—	3488R	3488R	—
0435-97-0367	35-02553	11.5–12.5	Soil	—	—	—	—	—	—	—	—	—	3488R	—	—	3488R	3488R	—
0435-97-0368	35-02554	0–0.83	Soil	—	—	—	—	—	—	—	—	—	3569R	—	—	3569R	—	—
0435-97-0371	35-02554	0.83–2	Soil	—	—	—	—	—	—	—	—	—	3569R	—	—	3569R	3569R	—
0435-97-0372	35-02555	0–1	Soil	—	—	—	—	—	—	—	—	—	3569R	—	—	3569R	—	—
0435-97-0375	35-02555	1–2	Soil	—	—	—	—	—	—	—	—	—	3569R	—	—	3569R	3569R	—
PRS 35-016(o)																		
AAA6489	35-02043	0–0.5	Soil	—	—	—	—	—	16670	—	—	—	—	16669	16669	—	—	16706
AAA6490	35-02044	0–0.5	Soil	—	—	—	16672	—	16672	—	—	—	16669	16669	16669	—	—	16706
AAA6491	35-02045	0–0.5	Soil	—	—	—	—	—	16670	—	—	—	—	16669	16669	—	—	16706
AAB4241	35-02091	0–0.5	Soil	—	—	—	19803	—	19803	—	—	—	—	20284	20284	—	—	20587
AAB4242	35-02092	0–1	Soil	—	—	—	19803	—	19803	—	—	—	—	—	—	—	—	20587
AAB4243	35-02092	1–2	Soil	—	—	20292	19803	—	19803	—	—	—	—	—	—	—	—	20587
AAB4244	35-02092	2–3	Soil	—	—	—	19803	—	19803	—	—	—	20284	—	—	—	—	20587
AAB4257	35-02254	0–0.5	Soil	—	—	—	19803	—	19803	—	—	—	—	20284	20284	—	—	19541
AAB4258	35-02255	0–1	Soil	—	—	—	19803	—	19803	—	—	—	—	—	—	—	—	19541
AAB4259	35-02255	1–2	Soil	—	—	—	19803	—	19803	—	—	—	20284	—	—	—	—	19541
AAB4260	35-02255	2–3	Soil	—	—	—	19803	—	19803	—	—	—	—	—	—	—	—	20587
AAB4261	35-02256	0–0.5	Soil	—	—	—	—	—	19803	—	—	—	—	20284	20284	—	—	20587
AAB4262	35-02257	0–1	Soil	—	—	20292	—	—	19803	—	—	—	—	—	—	—	—	20587
AAB4263	35-02257	1–2	Soil	—	—	—	—	—	19803	—	—	—	—	—	—	—	—	20587
AAB4264	35-02257	2–3	Soil	—	—	—	—	—	19803	—	—	—	—	—	—	—	—	20587

Table C-1.3-1
Samples Taken in Mortandad Slope Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	Limited- List TAL Metals	Non-TAL Metals	TAL Metals	PCBs	Pesticides/PCBs	SVOCs	TPH DRO	TPH LRO	VOCs	Gamma Spectroscopy	Isotopic-Plutonium	Isotopic-Uranium	Strontium-90	Tritium	XRF
0435-97-0144	35-02505	0–1	Soil	—	—	3310R	3309R	—	3309R	3309R	3309R	—	3311R	3311R	3311R	3311R	3311R	—
0435-97-0145	35-02505	1–2	Soil	—	—	3310R	3309R	—	3309R	3309R	3309R	—	3311R	3311R	3311R	3311R	3311R	—
0435-97-0154	35-02506	0–1	Soil	—	—	3328R	—	—	—	—	—	—	3329R	3329R	3329R	3329R	3329R	—
0435-97-0155	35-02506	0–1	Soil	—	—	—	—	—	—	3327R	3327R	—	—	—	—	—	—	—
0435-97-0274	35-02506	0–0.5	Soil	—	—	—	3430R	—	3430R	3430R	3430R	—	—	—	—	—	—	—
0435-97-0156	35-02506	1–2	Soil	—	—	3328R	3327R	—	3327R	3327R	3327R	—	3329R	3329R	3329R	3329R	3329R	—
0435-97-0158	35-02507	0–1	Soil	—	—	3328R	3327R	—	3327R	3327R	3327R	—	3329R	3329R	3329R	3329R	3329R	—
0435-97-0159	35-02507	1–2	Soil	—	—	3328R	3327R	—	3327R	3327R	3327R	—	3329R	3329R	3329R	3329R	3329R	—
0435-97-0147	35-02508	0–1	Soil	—	—	3310R	3309R	—	3309R	3309R	3309R	—	3311R	3311R	3311R	3311R	3311R	—
0435-97-0148	35-02508	1–2	Soil	—	—	3310R	3309R	—	3309R	3309R	3309R	—	3311R	3311R	3311R	3311R	3311R	—
0435-97-0150	35-02509	0–1	Soil	—	—	3310R	3309R	—	3309R	3309R	3309R	—	3311R	3311R	3311R	3311R	3311R	—
0435-97-0151	35-02509	1–1.8	Soil	—	—	3310R	3309R	—	3309R	3309R	3309R	—	3311R	3311R	3311R	3311R	3311R	—
0435-97-0161	35-02510	0–1	Soil	—	—	3328R	3327R	—	3327R	3327R	3327R	—	3329R	3329R	3329R	3329R	3329R	—
0435-97-0162	35-02510	1–2.2	Soil	—	—	3328R	3327R	—	3327R	3327R	3327R	—	3329R	3329R	3329R	3329R	3329R	—
0435-97-0164	35-02511	0–1	Soil	—	—	3310R	3309R	—	3309R	3309R	3309R	—	3311R	3311R	3311R	3311R	3311R	—
0435-97-0165	35-02511	1–1.8	Soil	—	—	3310R	3309R	—	3309R	3309R	3309R	—	3311R	3311R	3311R	3311R	3311R	—
0435-97-0167	35-02512	0–1	Soil	—	—	3310R	3309R	—	3309R	3309R	3309R	—	3311R	3311R	3311R	3311R	3311R	—
0435-97-0168	35-02512	1–2	Soil	—	—	3310R	3309R	—	3309R	3309R	3309R	—	3311R	3311R	3311R	3311R	3311R	—
0435-97-0170	35-02513	0–0.5	Soil	—	—	3310R	3309R	—	3309R	3309R	3309R	—	3311R	3311R	3311R	3311R	3311R	—
0435-97-0171	35-02513	0.5–1.5	Soil	—	—	3310R	3309R	—	3309R	3309R	3309R	—	3311R	3311R	3311R	3311R	3311R	—
PRS 35-016(p)																		
AAB4253	35-02095	0–0.5	Soil	—	—	—	—	—	19803	—	—	—	—	20284	20284	—	—	20587
AAB4254	35-02096	0–1	Soil	—	—	—	—	—	19803	—	—	—	—	—	—	—	—	20587
AAB4255	35-02096	1–2	Qbt 3	—	—	—	—	—	19803	—	—	—	—	—	—	—	—	20587

Table C-1.3-1
Samples Taken in Mortandad Slope Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	Limited- List TAL Metals	Non-TAL Metals	TAL Metals	PCBs	Pesticides/PCBs	SVOCs	TPH DRO	TPH LRO	VOCs	Gamma Spectroscopy	Isotopic-Plutonium	Isotopic-Uranium	Strontium-90	Tritium	XRF
AAB4256	35-02096	2–3	Qbt 3	—	—	—	—	—	19803	—	—	—	—	—	—	—	—	20587
0435-97-0279	35-02584	0–1	Soil	—	—	—	—	—	—	—	—	—	3475R	3475R	3475R	—	—	—
0435-97-0283	35-02584	1–2	Qbt 3	—	—	—	—	—	—	—	—	—	3475R	3475R	3475R	—	—	—

Table C-1.3-2
Inorganic Chemicals with Concentrations (mg/kg) or Detection Limits at or Exceeding Background Values in Mortandad Slope Subarea

Sample ID	Location ID	Depth (ft)	Media	Antimony	Beryllium	Cadmium	Chromium (total)	Copper	Lead	Manganese	Mercury	Nickel	Selenium	Silver	Thallium	Zinc
Soil Background Value				0.83	1.83	0.4	19.3	14.7	22.3	671	0.1	15.4	1.52	1	0.73	48.8
PRS 35-016(f)																
AAC1208	35-02155	0.00–1.00	Soil	—	—	—	—	—	—	—	0.12(U)[a]	—	—	—	1.2(U)	—
PRS 35-008																
AAB4269	35-02032	0.00–0.50	Soil	5.4(U)	—	0.44(U)	—	—	—	—	—	—	8.5(U)	—	30.1(U)	—
XAAB4257	35-02251	0.00–0.50	Soil	5.5(U)	—	2.1	—	25.2	—	—	—	—	8.6(U)	—	30.6(U)	—
0435-95-0203	35-02282	1.00–2.00	Soil	10.8(U)	—	0.85(U)	—	—	—	822	—	—	3.5(UJ)[b]	1.1(U)	—	—
0435-97-0193	35-02453	0.00–1.00	Soil	7.4(UJ)	—	0.64(U)	—	—	—	—	—	—	—	—	—	—
0435-97-0194	35-02453	1.00–2.00	Soil	7.2(UJ)	—	0.63(U)	—	—	—	—	—	—	—	—	—	—
0435-97-0195	35-02453	2.00–3.40	Soil	8.6(J-)[c]	—	0.68(U)	—	—	—	—	—	—	—	—	—	—
0435-97-0198	35-02454	0.00–1.00	Soil	7.4(UJ)	—	0.64(U)	—	—	—	—	—	—	—	—	—	—
0435-97-0199	35-02454	1.00–2.00	Soil	7.4(UJ)	—	0.64(U)	—	—	—	—	—	—	—	—	—	—
0435-97-0200	35-02454	2.00–3.00	Soil	7.2(UJ)	—	0.62(U)	—	—	—	—	—	—	—	—	—	—

Table C-1.3-2
Inorganic Chemicals with Concentrations (mg/kg) or Detection Limits at or Exceeding Background Values in Mortandad Slope Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Beryllium	Cadmium	Chromium (total)	Copper	Lead	Manganese	Mercury	Nickel	Selenium	Silver	Thallium	Zinc
Soil Background Value				0.83	1.83	0.4	19.3	14.7	22.3	671	0.1	15.4	1.52	1	0.73	48.8
0435-97-0201	35-02455	0.00–1.00	Soil	7.3(UJ)	—	0.63(U)	—	—	—	—	—	—	—	—	—	—
0435-97-0202	35-02455	1.00–2.00	Soil	7.7(UJ)	2.1	0.67(U)	—	—	—	—	—	—	—	—	4.8	—
0435-97-0203	35-02455	2.00–3.00	Soil	7.7(UJ)	2.6	0.67(U)	—	—	—	—	—	—	—	—	—	—
0435-97-0204	35-02456	0.00–1.00	Soil	5.15(U)	—	0.515(U)	—	—	—	—	—	—	—	—	—	—
0435-97-0205	35-02456	1.00–2.00	Soil	4.78(U)	—	0.478(U)	—	—	—	—	—	—	—	—	—	—
0435-97-0206	35-02456	2.00–3.00	Soil	5(U)	—	0.5(U)	34	—	—	—	—	17.5	—	—	—	—
PRS 35-004(b)																
AAC1288	35-02121	0.00–1.00	Soil	—	—	—	—	—	—	—	0.12(U)	—	—	—	1.1(U)	—
PRS 35-009(c)																
AAA6496	35-02049	12.00–13.00	Soil	1(U)	—	0.63(U)	—	—	—	—	—	—	—	—	—	—
AAA6532	35-02052	18.80–20.00	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—
AAA6510	35-02053	9.00–10.00	Soil	1.6(U)	—	0.96(U)	—	—	—	—	—	—	—	—	—	—
AAA6484	35-02056	4.00–5.00	Soil	1.1(U)	—	0.83(U)	—	—	—	—	—	—	—	—	—	—
PRS 35-016(o)																
AAB4243	35-02092	1.00–2.00	Soil	—	—	0.87(U)	—	—	—	—	—	—	—	—	0.92(U)	55.7
AAB4262	35-02257	0.00–1.00	Soil	—	—	0.83(U)	—	—	—	—	—	—	—	—	1.3(U)	—
0435-97-0144	35-02505	0.00–1.00	Soil	4.4(U)	—	0.44(U)	—	23	33.5	—	0.36	—	—	—	—	58.6
0435-97-0145	35-02505	1.00–2.00	Soil	5.4(U)	—	0.54(U)	—	—	—	—	—	—	—	—	—	—
0435-97-0154	35-02506	0.00–1.00	Soil	4.24(U)	—	0.424(U)	—	—	—	—	—	—	—	—	—	—
0435-97-0156	35-02506	1.00–2.00	Soil	4.93(U)	—	0.493(U)	—	—	—	—	—	—	—	—	—	—
0435-97-0158	35-02507	0.00–1.00	Soil	4.67(U)	—	0.467(U)	—	—	—	—	—	—	—	—	—	—
0435-97-0159	35-02507	1.00–2.00	Soil	4.7(U)	—	0.47(U)	47.8	—	—	—	—	23.5	—	—	—	—
0435-97-0147	35-02508	0.00–1.00	Soil	4.7(U)	—	0.47(U)	—	18.3	—	—	—	—	—	—	—	146
0435-97-0148	35-02508	1.00–2.00	Soil	5.3(U)	—	0.53(U)	23.4	—	—	—	—	—	—	—	—	—

Table C-1.3-2
Inorganic Chemicals with Concentrations (mg/kg) or Detection Limits at or Exceeding Background Values in Mortandad Slope Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Beryllium	Cadmium	Chromium (total)	Copper	Lead	Manganese	Mercury	Nickel	Selenium	Silver	Thallium	Zinc
Soil Background Value				0.83	1.83	0.4	19.3	14.7	22.3	671	0.1	15.4	1.52	1	0.73	48.8
0435-97-0150	35-02509	0.00–1.00	Soil	4.7(U)	—	0.47(U)	—	20.8	—	—	—	—	—	—	—	—
0435-97-0151	35-02509	1.00–1.80	Soil	4.3(U)	—	0.43(U)	197	—	—	—	—	110	—	—	—	—
0435-97-0161	35-02510	0.00–1.00	Soil	4.97(U)	—	0.497(U)	—	—	—	—	—	—	—	—	—	—
0435-97-0162	35-02510	1.00–2.20	Soil	3.99(U)	—	—	23.9	—	—	—	—	—	—	—	—	—
0435-97-0164	35-02511	0.00–1.00	Soil	4.1(U)	—	0.41(U)	—	—	—	—	—	—	—	—	—	—
0435-97-0165	35-02511	1.00–1.80	Soil	4.4(U)	—	0.44(U)	—	—	—	—	—	—	—	—	—	—
0435-97-0167	35-02512	0.00–1.00	Soil	4.9(U)	—	0.49(U)	—	—	—	—	—	—	—	—	—	—
0435-97-0168	35-02512	1.00–2.00	Soil	5.2(U)	—	0.52(U)	23.5	—	—	—	—	—	—	—	—	—
0435-97-0170	35-02513	0.00–0.50	Soil	5(U)	—	0.5(U)	—	—	—	—	—	—	—	—	—	—
0435-97-0171	35-02513	0.50–1.50	Soil	5.1(U)	—	0.51(U)	—	—	—	—	—	—	—	—	—	—

[a] U = The analyte was analyzed for but not detected.

[b] UJ = The analyte was not positively identified in the sample, and the associated value is an estimate of the sample-specific detection or quantitation limit.

[c] J- = The analyte was positively identified, and the result is likely to be biased low.

Table C-1.3-3
Detected Organic Chemicals in Mortandad Slope Subarea

Analyte	Location ID	Sample ID	Sample Value (mg/kg)	Media	Depth (ft)
PRS 35-016(f)					
Benzo(a)anthracene	35-02284	0435-95-0205	0.026(J)[a]	Soil	0–1
Benzo(a)pyrene	35-02284	0435-95-0205	0.04(J)	Soil	0–1
Benzo(b)fluoranthene	35-02284	0435-95-0205	0.036(J)	Soil	0–1
Benzo(k)fluoranthene	35-02284	0435-95-0205	0.027(J)	Soil	0–1
Bis(2-ethylhexyl)phthalate	35-02284	0435-95-0205	0.066(J)	Soil	0–1
Chrysene	35-02284	0435-95-0205	0.039(J)	Soil	0–1
Fluoranthene	35-02284	0435-95-0205	0.058(J)	Soil	0–1
Pyrene	35-02284	0435-95-0205	0.05(J)	Soil	0–1
PRS 35-014(e1)					
DRO	35-02461	0435-97-0221	18	Soil	0–1
LRO	35-02461	0435-97-0221	49	Soil	0–1
	35-02462	0435-97-0222	7100	Soil	0–1
PRS 35-008					
Anthracene	35-02252	XAAB4260	2.76	Soil	0–0.5
	35-02252	XAAB4261	3.9	Soil	1–2
	35-02253	XAAB4264	1.15	Soil	1–2
	35-02253	XAAB4265	3.3	Soil	2–3
Azobenzene	35-02252	XAAB4260	11.1	Soil	0–0.5
	35-02252	XAAB4261	7.2	Soil	1–2
	35-02253	XAAB4264	0.645	Soil	1–2
	35-02253	XAAB4265	4.5	Soil	2–3
Benzoic acid	35-02454	0435-97-0199	0.039(J)	Soil	1–2
	35-02455	0435-97-0201	0.058(J)	Soil	0–1
	35-02460	0435-97-0218	0.043(J)	Soil	0.83–1.5
	35-02460	0435-97-0217	0.1(J)	Soil	0–0.83
Bis(2-ethylhexyl)phthalate	35-02282	0435-95-0202	8.2	Soil	0–0.5
	35-02283	0435-95-0204	4.1(J)	Soil	1–2
	35-02453	0435-97-0194	0.083(J)	Soil	1–2
	35-02456	0435-97-0204	0.059(J)	Soil	0–1
	35-02458	0435-97-0211	2.1(J)	Soil	0–1
	35-02458	0435-97-0212	1.3(J)	Soil	1–2
	35-02458	0435-97-0213	2.4(J)	Soil	2–3
	35-02459	0435-97-0215	5.9(J)	Soil	0.5–1
	35-02459	0435-97-0214	8.6(J)	Soil	0–0.5
	35-02459	0435-97-0216	6.1(J)	Soil	1–2
	35-02460	0435-97-0217	0.069(J)	Soil	0–0.83

Table C-1.3-3
Detected Organic Chemicals in Mortandad Slope Subarea (continued)

Analyte	Location ID	Sample ID	Sample Value (mg/kg)	Media	Depth (ft)
DRO	35-02282	0435-95-0202	25000	Soil	0–0.5
	35-02282	0435-95-0203	15000	Soil	1–2
	35-02283	0435-95-0204	27000	Soil	1–2
	35-02453	0435-97-0193	11	Soil	0–1
	35-02453	0435-97-0194	14	Soil	1–2
	35-02453	0435-97-0195	4.6	Soil	2–3.4
	35-02453	0435-97-0196	5.6	Soil	2–3.4
	35-02454	0435-97-0198	4.9	Soil	0–1
	35-02454	0435-97-0199	4.5	Soil	1–2
	35-02454	0435-97-0200	7.1	Soil	2–3
	35-02455	0435-97-0201	27	Soil	0–1
	35-02455	0435-97-0202	21	Soil	1–2
	35-02455	0435-97-0203	11	Soil	2–3
	35-02457	0435-97-0208	12	Soil	0–1
	35-02457	0435-97-0209	16	Soil	1–2
	35-02457	0435-97-0210	7.3	Soil	2–3
Di-n-butylphthalate	35-02455	0435-97-0202	0.24(J)	Soil	1–2
	35-02456	0435-97-0204	0.047(J)	Soil	0–1
	35-02458	0435-97-0211	0.45(J)	Soil	0–1
	35-02458	0435-97-0213	0.48(J)	Soil	2–3
Fluoranthene	35-02252	XAAB4260	0.84	Soil	0–0.5
LRO	35-02453	0435-97-0193	44	Soil	0–1
	35-02453	0435-97-0194	46	Soil	1–2
	35-02455	0435-97-0201	67	Soil	0–1
	35-02455	0435-97-0202	80	Soil	1–2
	35-02455	0435-97-0203	33(J)	Soil	2–3
	35-02456	0435-97-0204	2500	Soil	0–1
	35-02456	0435-97-0205	240	Soil	1–2
	35-02456	0435-97-0206	50	Soil	2–3
	35-02457	0435-97-0208	54	Soil	0–1
	35-02457	0435-97-0209	85	Soil	1–2
	35-02457	0435-97-0210	37(J)	Soil	2–3
	35-02458	0435-97-0211	41000	Soil	0–1
	35-02458	0435-97-0212	24000	Soil	1–2
	35-02458	0435-97-0213	48000	Soil	2–3
	35-02459	0435-97-0215	110000	Soil	0.5–1
	35-02459	0435-97-0214	140000	Soil	0–0.5
	35-02459	0435-97-0216	110000	Soil	1–2
	35-02460	0435-97-0219	250	Soil	0.83–1.54
	35-02460	0435-97-0217	1900	Soil	0–0.83

Table C-1.3-3
Detected Organic Chemicals in Mortandad Slope Subarea (continued)

Analyte	Location ID	Sample ID	Sample Value (mg/kg)	Media	Depth (ft)
Phenanthrene	35-02252	XAAB4260	2.43	Soil	0–0.5
	35-02252	XAAB4261	1.86	Soil	1–2
	35-02253	XAAB4264	0.641	Soil	1–2
	35-02253	XAAB4265	1.83	Soil	2–3
Phenol	35-02455	0435-97-0202	0.057(J)	Soil	1–2
Toluene	35-02453	0435-97-0194	0.006(J+)[b]	Soil	1–2
	35-02454	0435-97-0199	0.004(J+)	Soil	1–2
	35-02454	0435-97-0200	0.001(J)	Soil	2–3
	35-02455	0435-97-0202	0.008(J+)	Soil	1–2
	35-02456	0435-97-0205	0.002(J)	Soil	1–2
	35-02457	0435-97-0210	0.002(J)	Soil	2–3
Trichlorofluoromethane	35-02456	0435-97-0205	0.002(J)	Soil	1–2
	35-02456	0435-97-0206	0.001(J)	Soil	2–3
	35-02457	0435-97-0209	0.001(J)	Soil	1–2
	35-02457	0435-97-0210	0.001(J)	Soil	2–3
PRS 35-014(e2)					
Aroclor-1260	35-02146	AAC1187	0.0568	Soil	0–1
PRS 35-009(c)					
Acetone	35-02049	AAA6496	0.05	Soil	12–13
	35-02049	AAA6497	0.053	Soil	19–20
	35-02049	AAA6495	0.086	Soil	8–9
	35-02050	AAA6499	0.06	Soil	11.5–12.5
	35-02050	AAA6500	0.079	Soil	19–20
	35-02050	AAA6498	0.053	Soil	9–10
	35-02051	AAA6527	0.37	Soil	14–15
	35-02051	AAA6528	0.25	Soil	17–18
	35-02051	AAA6525	0.14	Soil	3.5–4.5
	35-02051	AAA6526	0.51	Soil	9–10
	35-02052	AAA6531	0.15	Soil	14–15
	35-02052	AAA6532	0.2	Soil	18.8–20
	35-02052	AAA6529	0.35	Soil	4–5
	35-02052	AAA6530	0.25	Soil	9–10
	35-02053	AAA6511	0.068	Soil	14–15
	35-02053	AAA6512	0.045	Soil	17.5–18.5

Table C-1.3-3
Detected Organic Chemicals in Mortandad Slope Subarea (continued)

Analyte	Location ID	Sample ID	Sample Value (mg/kg)	Media	Depth (ft)
Acetone (continued)	35-02053	AAA6508	0.02	Soil	3–4
	35-02053	AAA6510	0.042	Soil	9–10
	35-02054	AAA6515	0.054	Soil	14–15
	35-02054	AAA6516	0.06	Soil	19–20
	35-02054	AAA6513	0.047	Soil	4–5
	35-02054	AAA6514	0.059	Soil	8–9
	35-02055	AAA6482	0.032	Soil	14–15
	35-02055	AAA6483	0.053	Soil	19–20
	35-02055	AAA6481	0.21	Soil	9–10
	35-02056	AAA6486	0.11	Soil	13–14
	35-02056	AAA6487	0.094	Soil	19–20
Aroclor-1254	35-02054	AAA6513	0.93(J)	Soil	4–5
Butanone[2-]	35-02053	AAA6511	0.066	Soil	14–15
Diethylphthalate	35-02049	AAA6497	7.9	Soil	19–20
Isopropyltoluene[4-]	35-02053	AAA6511	0.005	Soil	14–15
Methyl-2-pentanone[4-]	35-02053	AAA6511	0.022	Soil	14–15
Trichloropropane[1,2,3-]	35-02051	AAA6527	0.012	Soil	14–15
	35-02051	AAA6528	0.012	Soil	17–18
	35-02051	AAA6525	0.017	Soil	3.5–4.5
	35-02051	AAA6526	0.017	Soil	9–10
	35-02052	AAA6532	0.007	Soil	18.8–20
	35-02052	AAA6529	0.013	Soil	4–5
	35-02052	AAA6530	0.018	Soil	9–10
PRS 35-016(o)					
Acenaphthene	35-02045	AAA6491	2.8	Soil	0–0.5
	35-02092	AAB4242	4.1	Soil	0–1
	35-02254	AAB4257	9.2	Soil	0–0.5
	35-02505	0435-97-0144	3.2	Soil	0–1
	35-02505	0435-97-0145	2.2(J)	Soil	1–2
	35-02508	0435-97-0147	8.2(J)	Soil	0–1
	35-02508	0435-97-0148	2.8	Soil	1–2
	35-02509	0435-97-0150	1.4(J)	Soil	0–1
	35-02509	0435-97-0151	0.053(J)	Soil	1–1.8
	35-02510	0435-97-0161	0.18(J)	Soil	0–1
	35-02511	0435-97-0165	0.042(J)	Soil	1–1.8
Aniline	35-02512	0435-97-0167	0.21(J)	Soil	0–1

Table C-1.3-3
Detected Organic Chemicals in Mortandad Slope Subarea (continued)

Analyte	Location ID	Sample ID	Sample Value (mg/kg)	Media	Depth (ft)
Anthracene	35-02045	AAA6491	3.1	Soil	0–0.5
	35-02092	AAB4242	5.3(J)	Soil	0–1
	35-02254	AAB4257	13(J)	Soil	0–0.5
	35-02505	0435-97-0144	4.1	Soil	0–1
	35-02505	0435-97-0145	3.1(J)	Soil	1–2
	35-02508	0435-97-0147	10	Soil	0–1
	35-02508	0435-97-0148	3.2	Soil	1–2
	35-02509	0435-97-0150	1.4(J)	Soil	0–1
	35-02509	0435-97-0151	0.077(J)	Soil	1–1.8
	35-02510	0435-97-0161	0.21(J)	Soil	0–1
	35-02511	0435-97-0165	0.053(J)	Soil	1–1.8
Aroclor-1254	35-02044	AAA6490	1.1(J)	Soil	0–0.5
	35-02091	AAB4241	0.13	Soil	0–0.5
	35-02254	AAB4257	0.36	Soil	0–0.5
	35-02255	AAB4258	1.88	Soil	0–1
	35-02255	AAB4259	0.39	Soil	1–2
	35-02505	0435-97-0144	1.4	Soil	0–1
	35-02505	0435-97-0145	0.83	Soil	1–2
	35-02508	0435-97-0147	0.15	Soil	0–1
Aroclor-1260	35-02092	AAB4242	0.045	Soil	0–1
	35-02092	AAB4243	0.031	Soil	1–2
	35-02092	AAB4244	0.48	Soil	2–3
Benzo(a)anthracene	35-02091	AAB4241	26	Soil	0–0.5
	35-02092	AAB4242	12	Soil	0–1
	35-02254	AAB4257	18	Soil	0–0.5
	35-02255	AAB4258	17	Soil	0–1
	35-02255	AAB4259	2.2	Soil	1–2
	35-02505	0435-97-0144	11	Soil	0–1
	35-02505	0435-97-0145	6.8(J)	Soil	1–2
	35-02506	0435-97-0274	0.044(J)	Soil	0–0.5
	35-02508	0435-97-0147	37	Soil	0–1
	35-02508	0435-97-0148	9.1	Soil	1–2
	35-02509	0435-97-0150	6	Soil	0–1
	35-02509	0435-97-0151	0.47	Soil	1–1.8
	35-02510	0435-97-0161	0.53	Soil	0–1
	35-02511	0435-97-0164	0.074(J)	Soil	0–1
	35-02511	0435-97-0165	0.16(J)	Soil	1–1.8

Table C-1.3-3
Detected Organic Chemicals in Mortandad Slope Subarea (continued)

Analyte	Location ID	Sample ID	Sample Value (mg/kg)	Media	Depth (ft)
Benzo(a)pyrene	35-02045	AAA6491	6	Soil	0–0.5
	35-02091	AAB4241	41(J)	Soil	0–0.5
	35-02092	AAB4242	14(J)	Soil	0–1
	35-02092	AAB4243	0.6(J)	Soil	1–2
	35-02092	AAB4244	0.53(J)	Soil	2–3
	35-02254	AAB4257	23(J)	Soil	0–0.5
	35-02255	AAB4258	29(J)	Soil	0–1
	35-02255	AAB4259	4.1(J)	Soil	1–2
	35-02505	0435-97-0144	10	Soil	0–1
	35-02505	0435-97-0145	7.8(J)	Soil	1–2
	35-02508	0435-97-0147	48	Soil	0–1
	35-02508	0435-97-0148	12	Soil	1–2
	35-02509	0435-97-0150	7.4	Soil	0–1
	35-02509	0435-97-0151	0.64	Soil	1–1.8
	35-02510	0435-97-0161	0.64	Soil	0–1
	35-02511	0435-97-0164	0.098(J)	Soil	0–1
	35-02511	0435-97-0165	0.17(J)	Soil	1–1.8
Benzo(b)fluoranthene	35-02091	AAB4241	52	Soil	0–0.5
	35-02092	AAB4242	19	Soil	0–1
	35-02092	AAB4243	0.58	Soil	1–2
	35-02092	AAB4244	0.52	Soil	2–3
	35-02254	AAB4257	26	Soil	0–0.5
	35-02255	AAB4258	31	Soil	0–1
	35-02255	AAB4259	4.3	Soil	1–2
	35-02505	0435-97-0144	9.3	Soil	0–1
	35-02505	0435-97-0145	7.2(J)	Soil	1–2
	35-02508	0435-97-0147	45	Soil	0–1
	35-02508	0435-97-0148	8.3	Soil	1–2
	35-02509	0435-97-0150	7.1	Soil	0–1
	35-02509	0435-97-0151	0.48	Soil	1–1.8
	35-02510	0435-97-0161	0.55	Soil	0–1
	35-02511	0435-97-0164	0.076(J)	Soil	0–1
	35-02511	0435-97-0165	0.13(J)	Soil	1–1.8

Table C-1.3-3
Detected Organic Chemicals in Mortandad Slope Subarea (continued)

Analyte	Location ID	Sample ID	Sample Value (mg/kg)	Media	Depth (ft)
Benzo(g,h,i)perylene	35-02045	AAA6491	3.4	Soil	0–0.5
	35-02091	AAB4241	21	Soil	0–0.5
	35-02092	AAB4242	6.6	Soil	0–1
	35-02092	AAB4243	0.41	Soil	1–2
	35-02254	AAB4257	12	Soil	0–0.5
	35-02255	AAB4259	1.9	Soil	1–2
	35-02505	0435-97-0144	6.2	Soil	0–1
	35-02505	0435-97-0145	5(J)	Soil	1–2
	35-02508	0435-97-0147	33	Soil	0–1
	35-02508	0435-97-0148	8.5	Soil	1–2
	35-02509	0435-97-0150	5.5	Soil	0–1
	35-02509	0435-97-0151	0.49	Soil	1–1.8
	35-02510	0435-97-0161	0.54	Soil	0–1
Benzo(k)fluoranthene	35-02045	AAA6491	12.1	Soil	0–0.5
	35-02091	AAB4241	22	Soil	0–0.5
	35-02092	AAB4242	7.3	Soil	0–1
	35-02254	AAB4257	12	Soil	0–0.5
	35-02255	AAB4259	2.4	Soil	1–2
	35-02505	0435-97-0144	11	Soil	0–1
	35-02505	0435-97-0145	7.4(J)	Soil	1–2
	35-02508	0435-97-0147	45	Soil	0–1
	35-02508	0435-97-0148	12	Soil	1–2
	35-02509	0435-97-0150	6.4	Soil	0–1
	35-02509	0435-97-0151	0.56	Soil	1–1.8
	35-02510	0435-97-0161	0.65	Soil	0–1
	35-02511	0435-97-0164	0.076(J)	Soil	0–1
	35-02511	0435-97-0165	0.18(J)	Soil	1–1.8
Benzoic acid	35-02513	0435-97-0170	0.04(J)	Soil	0–0.5
Bis(2-ethylhexyl)phthalate	35-02045	AAA6491	0.52	Soil	0–0.5
	35-02505	0435-97-0144	0.36(J)	Soil	0–1
	35-02505	0435-97-0145	0.26(J)	Soil	1–2
Chloroaniline[4-]	35-02505	0435-97-0144	0.14(J)	Soil	0–1

Table C-1.3-3
Detected Organic Chemicals in Mortandad Slope Subarea (continued)

Analyte	Location ID	Sample ID	Sample Value (mg/kg)	Media	Depth (ft)
Chrysene	35-02045	AAA6491	17.9	Soil	0–0.5
	35-02091	AAB4241	35	Soil	0–0.5
	35-02092	AAB4242	14	Soil	0–1
	35-02092	AAB4243	0.53	Soil	1–2
	35-02092	AAB4244	0.47	Soil	2–3
	35-02254	AAB4257	20	Soil	0–0.5
	35-02255	AAB4258	25	Soil	0–1
	35-02255	AAB4259	3.4	Soil	1–2
	35-02505	0435-97-0144	11	Soil	0–1
	35-02505	0435-97-0145	8.2(J)	Soil	1–2
	35-02506	0435-97-0274	0.055(J)	Soil	0–0.5
	35-02508	0435-97-0147	47	Soil	0–1
	35-02508	0435-97-0148	12	Soil	1–2
	35-02509	0435-97-0150	7.5	Soil	0–1
	35-02509	0435-97-0151	0.54	Soil	1–1.8
	35-02510	0435-97-0161	0.69	Soil	0–1
	35-02511	0435-97-0164	0.085(J)	Soil	0–1
	35-02511	0435-97-0165	0.17(J)	Soil	1–1.8
Dibenz(a,h)anthracene	35-02505	0435-97-0144	2.2	Soil	0–1
	35-02505	0435-97-0145	2(J)	Soil	1–2
	35-02508	0435-97-0147	8.8(J)	Soil	0–1
	35-02508	0435-97-0148	3	Soil	1–2
	35-02509	0435-97-0150	1.6(J)	Soil	0–1
	35-02509	0435-97-0151	0.19(J)	Soil	1–1.8
	35-02510	0435-97-0161	0.17(J)	Soil	0–1
Dibenzofuran	35-02045	AAA6491	1.5	Soil	0–0.5
	35-02505	0435-97-0144	1.3	Soil	0–1
	35-02505	0435-97-0145	1(J)	Soil	1–2
	35-02508	0435-97-0147	3.8(J)	Soil	0–1
	35-02508	0435-97-0148	1.4(J)	Soil	1–2
	35-02509	0435-97-0150	0.59(J)	Soil	0–1
	35-02510	0435-97-0161	0.082(J)	Soil	0–1

Table C-1.3-3
Detected Organic Chemicals in Mortandad Slope Subarea (continued)

Analyte	Location ID	Sample ID	Sample Value (mg/kg)	Media	Depth (ft)
DRO	35-02505	0435-97-0144	170	Soil	0–1
	35-02505	0435-97-0145	96	Soil	1–2
	35-02506	0435-97-0155	22	Soil	0–1
	35-02506	0435-97-0156	20	Soil	1–2
	35-02507	0435-97-0158	17	Soil	0–1
	35-02507	0435-97-0159	8.9	Soil	1–2
	35-02508	0435-97-0147	400	Soil	0–1
	35-02508	0435-97-0148	130	Soil	1–2
	35-02509	0435-97-0150	120	Soil	0–1
	35-02509	0435-97-0151	23	Soil	1–1.8
	35-02510	0435-97-0161	15	Soil	0–1
	35-02510	0435-97-0162	9.3	Soil	1–2.2
	35-02511	0435-97-0164	14	Soil	0–1
	35-02511	0435-97-0165	36	Soil	1–1.8
	35-02512	0435-97-0167	9.7	Soil	0–1
	35-02513	0435-97-0170	20	Soil	0–0.5
Di-n-butylphthalate	35-02505	0435-97-0144	0.21(J)	Soil	0–1
	35-02505	0435-97-0145	0.25(J)	Soil	1–2
	35-02507	0435-97-0158	0.038(J)	Soil	0–1
	35-02507	0435-97-0159	0.043(J)	Soil	1–2
	35-02509	0435-97-0151	0.41	Soil	1–1.8
	35-02510	0435-97-0161	0.096(J)	Soil	0–1
	35-02511	0435-97-0164	0.11(J)	Soil	0–1
Fluoranthene	35-02044	AAA6490	0.72	Soil	0–0.5
	35-02045	AAA6491	10.7	Soil	0–0.5
	35-02091	AAB4241	66	Soil	0–0.5
	35-02092	AAB4242	33	Soil	0–1
	35-02092	AAB4243	1.4	Soil	1–2
	35-02092	AAB4244	1.2	Soil	2–3
	35-02254	AAB4257	53	Soil	0–0.5
	35-02255	AAB4258	61	Soil	0–1
	35-02255	AAB4259	8.2	Soil	1–2
	35-02505	0435-97-0144	21	Soil	0–1
	35-02505	0435-97-0145	13(J)	Soil	1–2
	35-02506	0435-97-0274	0.11(J)	Soil	0–0.5
	35-02508	0435-97-0147	70	Soil	0–1
	35-02508	0435-97-0148	21	Soil	1–2
	35-02509	0435-97-0150	12	Soil	0–1
	35-02509	0435-97-0151	0.97	Soil	1–1.8
	35-02510	0435-97-0161	1.5	Soil	0–1

Table C-1.3-3
Detected Organic Chemicals in Mortandad Slope Subarea (continued)

Analyte	Location ID	Sample ID	Sample Value (mg/kg)	Media	Depth (ft)
Fluoranthene (continued)	35-02510	0435-97-0162	0.064(J)	Soil	1–2.2
	35-02511	0435-97-0164	0.15(J)	Soil	0–1
	35-02511	0435-97-0165	0.28(J)	Soil	1–1.8
Fluorene	35-02045	AAA6491	2.4	Soil	0–0.5
	35-02505	0435-97-0144	2.3	Soil	0–1
	35-02505	0435-97-0145	1.6(J)	Soil	1–2
	35-02508	0435-97-0147	6.4(J)	Soil	0–1
	35-02508	0435-97-0148	2.1	Soil	1–2
	35-02509	0435-97-0150	0.97(J)	Soil	0–1
	35-02509	0435-97-0151	0.042(J)	Soil	1–1.8
	35-02510	0435-97-0161	0.14(J)	Soil	0–1
Indeno(1,2,3-cd)pyrene	35-02045	AAA6491	3.9	Soil	0–0.5
	35-02091	AAB4241	24	Soil	0–0.5
	35-02092	AAB4242	7.4	Soil	0–1
	35-02092	AAB4243	0.4	Soil	1–2
	35-02254	AAB4257	12	Soil	0–0.5
	35-02255	AAB4259	2	Soil	1–2
	35-02505	0435-97-0144	6.5	Soil	0–1
	35-02505	0435-97-0145	4.8(J)	Soil	1–2
	35-02508	0435-97-0147	28	Soil	0–1
	35-02508	0435-97-0148	8.2	Soil	1–2
	35-02509	0435-97-0150	5.4	Soil	0–1
	35-02509	0435-97-0151	0.47	Soil	1–1.8
	35-02510	0435-97-0161	0.45	Soil	0–1
LRO	35-02505	0435-97-0144	610	Soil	0–1
	35-02505	0435-97-0145	300	Soil	1–2
	35-02506	0435-97-0274	310	Soil	0–0.5
	35-02506	0435-97-0155	160	Soil	0–1
	35-02506	0435-97-0156	88	Soil	1–2
	35-02507	0435-97-0158	74	Soil	0–1
	35-02507	0435-97-0159	42(J)	Soil	1–2
	35-02508	0435-97-0147	1200	Soil	0–1
	35-02508	0435-97-0148	460	Soil	1–2
	35-02509	0435-97-0150	510	Soil	0–1
	35-02509	0435-97-0151	130	Soil	1–1.8
	35-02510	0435-97-0161	72	Soil	0–1
	35-02510	0435-97-0162	46	Soil	1–2.2
	35-02511	0435-97-0164	85	Soil	0–1
	35-02511	0435-97-0165	170	Soil	1–1.8
	35-02512	0435-97-0167	60	Soil	0–1
	35-02513	0435-97-0170	99	Soil	0–0.5

Table C-1.3-3
Detected Organic Chemicals in Mortandad Slope Subarea (continued)

Analyte	Location ID	Sample ID	Sample Value (mg/kg)	Media	Depth (ft)
Methylnaphthalene[2-]	35-02045	AAA6491	0.72	Soil	0–0.5
	35-02505	0435-97-0144	0.47(J)	Soil	0–1
	35-02505	0435-97-0145	0.37(J)	Soil	1–2
	35-02508	0435-97-0147	1.5(J)	Soil	0–1
	35-02508	0435-97-0148	0.54(J)	Soil	1–2
	35-02509	0435-97-0150	0.25(J)	Soil	0–1
	35-02510	0435-97-0161	0.035(J)	Soil	0–1
Naphthalene	35-02045	AAA6491	2.1	Soil	0–0.5
	35-02505	0435-97-0144	1.5	Soil	0–1
	35-02505	0435-97-0145	1.3(J)	Soil	1–2
	35-02508	0435-97-0147	4.9(J)	Soil	0–1
	35-02508	0435-97-0148	1.9	Soil	1–2
	35-02509	0435-97-0150	0.89(J)	Soil	0–1
	35-02510	0435-97-0161	0.13(J)	Soil	0–1
Pentachlorophenol	35-02505	0435-97-0144	0.23(J)	Soil	0–1
Phenanthrene	35-02045	AAA6491	11.4	Soil	0–0.5
	35-02091	AAB4241	36	Soil	0–0.5
	35-02092	AAB4242	26	Soil	0–1
	35-02092	AAB4243	1.2	Soil	1–2
	35-02092	AAB4244	1.1	Soil	2–3
	35-02254	AAB4257	48	Soil	0–0.5
	35-02255	AAB4258	44	Soil	0–1
	35-02255	AAB4259	5.3	Soil	1–2
	35-02505	0435-97-0144	19	Soil	0–1
	35-02505	0435-97-0145	16(J)	Soil	1–2
	35-02506	0435-97-0274	0.085(J)	Soil	0–0.5
	35-02508	0435-97-0147	59	Soil	0–1
	35-02508	0435-97-0148	18	Soil	1–2
	35-02509	0435-97-0150	9.6	Soil	0–1
	35-02509	0435-97-0151	0.49	Soil	1–1.8
	35-02510	0435-97-0161	1.1	Soil	0–1
	35-02510	0435-97-0162	0.043(J)	Soil	1–2.2
	35-02511	0435-97-0164	0.08(J)	Soil	0–1
	35-02511	0435-97-0165	0.25(J)	Soil	1–1.8
Phenol	35-02508	0435-97-0148	0.18(J)	Soil	1–2
	35-02509	0435-97-0151	0.13(J)	Soil	1–1.8
	35-02510	0435-97-0161	0.093(J)	Soil	0–1
	35-02511	0435-97-0164	0.058(J)	Soil	0–1

Table C-1.3-3
Detected Organic Chemicals in Mortandad Slope Subarea (continued)

Analyte	Location ID	Sample ID	Sample Value (mg/kg)	Media	Depth (ft)
Pyrene	35-02044	AAA6490	0.76	Soil	0–0.5
	35-02045	AAA6491	9.5	Soil	0–0.5
	35-02091	AAB4241	70	Soil	0–0.5
	35-02092	AAB4242	30	Soil	0–1
	35-02092	AAB4243	1	Soil	1–2
	35-02092	AAB4244	0.95	Soil	2–3
	35-02254	AAB4257	51	Soil	0–0.5
	35-02255	AAB4258	46	Soil	0–1
	35-02255	AAB4259	6.1	Soil	1–2
	35-02505	0435-97-0144	25	Soil	0–1
	35-02505	0435-97-0145	22(J)	Soil	1–2
	35-02506	0435-97-0274	0.12(J)	Soil	0–0.5
	35-02508	0435-97-0147	110	Soil	0–1
	35-02508	0435-97-0148	27	Soil	1–2
	35-02509	0435-97-0150	18	Soil	0–1
	35-02509	0435-97-0151	1.1	Soil	1–1.8
	35-02510	0435-97-0161	1.6	Soil	0–1
	35-02510	0435-97-0162	0.072(J)	Soil	1–2.2
	35-02511	0435-97-0164	0.13(J)	Soil	0–1
	35-02511	0435-97-0165	0.31(J)	Soil	1–1.8
PRS 35-016(p)					
Benzo(a)anthracene	35-02096	AAB4256	0.62	Qbt 3	2–3
Benzo(a)pyrene	35-02096	AAB4256	0.82(J)	Qbt 3	2–3
Benzo(b)fluoranthene	35-02096	AAB4256	0.92	Qbt 3	2–3
Benzo(g,h,i)perylene	35-02096	AAB4256	0.48	Qbt 3	2–3
Benzo(k)fluoranthene	35-02096	AAB4256	0.44	Qbt 3	2–3
Chrysene	35-02096	AAB4256	0.83	Qbt 3	2–3
Fluoranthene	35-02096	AAB4256	1.9	Qbt 3	2–3
Indeno(1,2,3-cd)pyrene	35-02096	AAB4256	0.52	Qbt 3	2–3
Phenanthrene	35-02096	AAB4256	1.5	Qbt 3	2–3
Pyrene	35-02096	AAB4256	1.4	Qbt 3	2–3

[a] J = The analyte was positively identified, and the associated numerical value is estimated to be more uncertain than would normally be expected for that analysis.

[b] J+ = The analyte was positively identified, and the result is likely to be biased high.

Table C-1.3-4
Samples with Radionuclides Detected (pCi/g) Above Background Values or Fallout Values in Mortandad Slope Subarea

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Plutonium-238	Plutonium-239	Ruthenium-106	Thorium-228	Tritium	Uranium-234	Uranium-235	Uranium-238
Soil Background Value/Fallout Value				0.013	1.65	0.023	0.054	na[a]	2.28	0.766	2.59	0.2	2.29
PRS 35-008													
AAB4277	35-02250	1.00–2.00	Soil	0.415(U)[b]	—	—	0.03	—	—	—	—	—	—
XAAB4257	35-02251	0.00–0.50	Soil	—	—	0.034(U)	—	—	—	—	—	—	—
XAAB4260	35-02252	0.00–0.50	Soil	—	—	—	—	—	—	—	3.07	—	3.33
XAAB4265	35-02253	2.00–3.00	Soil	—	—	—	0.024	—	—	—	—	—	—
0435-97-0193	35-02453	0.00–1.00	Soil	0.067(U)	—	—	—	0.561	—	—	—	—	—
0435-97-0194	35-02453	1.00–2.00	Soil	0.333(U)	—	—	—	—	—	—	—	—	—
0435-97-0201	35-02455	0.00–1.00	Soil	—	0.124	—	—	—	—	—	—	—	—
0435-97-0202	35-02455	1.00–2.00	Soil	0.043(U)	—	—	—	—	—	—	—	—	—
0435-97-0206	35-02456	2.00–3.00	Soil	0.124(U)	—	—	—	—	—	—	—	—	—
0435-97-0209	35-02457	1.00–2.00	Soil	0.039(U)	—	—	—	—	—	—	—	—	—
0435-97-0210	35-02457	2.00–3.00	Soil	0.065(U)	—	—	—	—	—	—	—	0.242	—
PRS 35-009(c)													
AAA6496	35-02049	12.00–13.00	Soil	—	—	0.025	—	—	—	—	—	—	—
AAA6500	35-02050	19.00–20.00	Soil	0.053(U)	—	—	—	—	—	—	—	—	—
AAA6530	35-02052	9.00–10.00	Soil	0.029(U)	—	—	—	—	—	—	—	—	—
AAA6508	35-02053	3.00–4.00	Soil	0.051(U)	—	—	—	—	—	—	—	—	—
AAA6513	35-02054	4.00–5.00	Soil	—	—	—	0.153	—	—	—	—	—	—
AAA6480	35-02055	4.00–5.00	Soil	—	—	—	0.014	—	—	—	—	—	—
AAA6483	35-02055	19.00–20.00	Soil	—	—	0.025(U)	—	—	—	—	—	—	—
AAA6484	35-02056	4.00–5.00	Soil	—	—	0.025(U)	—	—	—	—	—	—	—
AAA6485	35-02056	6.00–7.00	Soil	—	—	—	0.025	—	—	—	—	—	—
AAA6486	35-02056	13.00–14.00	Soil	—	—	0.023	—	—	—	—	—	—	—
AAA6487	35-02056	19.00–20.00	Soil	—	—	0.018	0.014	—	—	—	—	—	—
0435-97-0356	35-02551	5.50–6.50	Soil	0.082(U)	—	—	—	—	—	0.32(J-)[c]	—	—	—
0435-97-0357	35-02551	6.50–7.50	Soil	0.281(U)	—	—	—	—	—	0.16(J-)	—	—	—
0435-97-0360	35-02552	5.00–5.50	Soil	0.054(U)	—	—	—	—	—	0.62(J-)	—	—	—

Table C-1.3-4
Samples with Radionuclides Detected (pCi/g) Above Background Values or Fallout Values in Mortandad Slope Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Plutonium-238	Plutonium-239	Ruthenium-106	Thorium-228	Tritium	Uranium-234	Uranium-235	Uranium-238
Soil Background Value/Fallout Value				0.013	1.65	0.023	0.054	na[a]	2.28	0.766	2.59	0.2	2.29
0435-97-0361	35-02552	5.00–5.50	Soil	—	—	—	—	—	—	0.57(J-)	—	—	—
0435-97-0362	35-02552	5.50–6.50	Soil	0.106(U)	—	—	—	—	—	0.63(J-)	—	—	—
0435-97-0363	35-02552	11.50–12.50	Soil	—	—	—	—	—	—	0.09(J-)	—	—	—
0435-97-0364	35-02553	0.00–1.00	Soil	0.047(U)	—	—	—	—	—	—	—	—	—
0435-97-0365	35-02553	4.50–5.50	Soil	—	—	—	—	—	—	0.21(J-)	—	—	—
0435-97-0366	35-02553	5.50–6.50	Soil	0.105(U)	—	—	—	—	—	0.31(J-)	—	—	—
0435-97-0367	35-02553	11.50–12.50	Soil	0.094(U)	—	—	—	—	—	0.3(J-)	—	—	—
0435-97-0371	35-02554	0.83–2.00	Soil	0.406(U)	—	—	—	—	—	0.18	—	—	—
0435-97-0372	35-02555	0.00–1.00	Soil	0.061(U)	—	—	—	—	—	—	—	—	—
0435-97-0375	35-02555	1.00–2.00	Soil	—	—	—	—	—	—	0.14	—	—	—
PRS 35-016(o)													
AAA6490	35-02044	0.00–0.50	Soil	0.292(U)	—	0.032	—	—	—	—	—	—	—
AAB4244	35-02092	2.00–3.00	Soil	—	0.302	—	—	—	3.706(U)	—	—	—	—
0435-97-0144	35-02505	0.00–1.00	Soil	—	—	—	—	—	—	4.71	—	—	—
0435-97-0145	35-02505	1.00–2.00	Soil	—	—	—	0.043	—	—	1.16	—	—	—
0435-97-0154	35-02506	0.00–1.00	Soil	—	—	—	0.03	—	—	0.15	—	—	—
0435-97-0156	35-02506	1.00–2.00	Soil	—	—	—	—	—	—	0.09	—	—	—
0435-97-0158	35-02507	0.00–1.00	Soil	—	—	—	—	—	—	0.08	—	—	—
0435-97-0159	35-02507	1.00–2.00	Soil	—	—	—	—	—	—	0.06	—	—	—
0435-97-0147	35-02508	0.00–1.00	Soil	0.244(U)	0.394	—	0.086	—	—	0.91	—	—	—
0435-97-0148	35-02508	1.00–2.00	Soil	—	—	—	—	—	—	1.19	—	—	—
0435-97-0150	35-02509	0.00–1.00	Soil	0.053(U)	—	—	—	—	—	0.687	—	—	—
0435-97-0151	35-02509	1.00–1.80	Soil	—	—	—	—	—	—	0.682	—	—	—
0435-97-0161	35-02510	0.00–1.00	Soil	—	—	—	—	—	—	0.09	—	—	—
0435-97-0162	35-02510	1.00–2.20	Soil	0.576(U)	—	—	—	—	—	0.08	—	—	—
0435-97-0164	35-02511	0.00–1.00	Soil	—	0.23	—	—	—	—	0.298	—	—	—
0435-97-0165	35-02511	1.00–1.80	Soil	—	—	—	—	—	—	0.235	—	—	—

Table C-1.3-4
Samples with Radionuclides Detected (pCi/g) Above Background Values or Fallout Values in Mortandad Slope Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Plutonium-238	Plutonium-239	Ruthenium-106	Thorium-228	Tritium	Uranium-234	Uranium-235	Uranium-238
Soil Background Value/Fallout Value				0.013	1.65	0.023	0.054	na[a]	2.28	0.766	2.59	0.2	2.29
0435-97-0167	35-02512	0.00–1.00	Soil	—	—	—	—	—	—	0.272	—	—	—
0435-97-0170	35-02513	0.00–0.50	Soil	0.048(U)	—	—	—	—	—	0.293	—	—	—
0435-97-0171	35-02513	0.50–1.50	Soil	0.09(U)	—	—	—	—	—	—	—	—	—
PRS 35-016(p)													
AAB4253	35-02095	0.00–0.50	Soil	—	—	—	0.061	—	—	—	—	—	—
0435-97-0279	35-02584	0.00–1.00	Soil	0.186(U)	0.8	—	—	—	—	—	—	—	—

[a] na = not available.

[b] U = The analyte was analyzed for but not detected.

[c] J- = The analyte was positively identified, and the result is likely to be biased low.

C-1.4 Pratt Canyon Subarea

Table C-1.4-1 presents the analyte suite and request numbers (numbers are listed below the analyte suites) for each sample collected in the Pratt Canyon Subarea. Each request number includes a batch of samples sent to a specific off-site analytical laboratory for a specific suite of analyses, and the request numbers can be used to track the original data packages from the analytical laboratories. If the sample was not analyzed for a given analyte suite, the cell in that suite's column contains a dash (—).

Also note that the data in this appendix are not arranged by consolidated unit because all data were collected prior to consolidation efforts. For a crosswalk between consolidated unit numbers and individual PRS numbers, refer to Table 1.0-1 in section 1.0.

Table C-1.4-2 presents the inorganic chemical results (mg/kg) above background values for the Pratt Canyon Subarea. Non-detected results above LANL background values are also presented in Table C-1.4-2. A dash in the results cell indicates that the result was less than background value or not detected, or that the sample was not analyzed for the corresponding chemical.

Table C-1.4-3 presents the detected organic chemical data for the Pratt Canyon Subarea.

Table C-1.4-4 presents the radionuclide results (pCi/g) above background values or fallout values for the Pratt Canyon Subarea. Non-detected results above LANL background values are also presented in Table C-1.4-4. A dash in the results cell indicates that the result was less than background value or not detected, or that the sample was not analyzed for the corresponding radionuclide.

Table C-1.4-1
Samples Taken in Pratt Canyon Subarea

Sample ID	Location ID	Depth (ft)	Media	CN	Limited-List TAL Metals	Non-TAL Metals	TAL Metals	PCBs	Pesticides/PCBs	SVOCs	TPH DRO	TPH LRO	VOCs	Americium-241	Gamma Spectroscopy	Isotopic-Plutonium	Isotopic-Uranium	Strontium-90	Tritium	XRF
AAA6621	35-02019	1–2	Soil	—	—	—	—	17038	—	17038	—	—	—	—	—	17301	17301	—	—	17224
AAA6622	35-02019	19–20	Soil	—	—	—	—	17038	—	17038	—	—	—	—	—	17301	17301	—	—	17224
AAA6623	35-02019	24–25	Soil	—	—	—	—	17038	—	17038	—	—	—	—	17301	17301	17301	—	—	17224
AAA6624	35-02019	25–30	Soil	—	17218	17218	—	17038	—	17038	—	—	—	—	—	17301	17301	—	—	17224
AAA6637	35-02022	1.5–2.5	Soil	—	—	—	—	17167	—	17167	—	—	—	—	—	17170	17170	—	—	17169
AAA6638	35-02022	19–20	Soil	—	—	—	—	17167	—	17167	—	—	—	—	—	17170	17170	—	—	17169
AAA6639	35-02022	21–22	Soil	—	—	—	—	17168	—	17168	—	—	—	—	—	17170	17170	—	—	17169
AAA6640	35-02022	29–30	Soil	—	—	—	—	17167	—	17167	—	—	—	—	—	17170	17170	—	—	17169
PRS 35-003(d,l,q)																				
AAB0993	35-02004	1–2	Soil	—	—	—	—	17316	—	—	—	—	—	—	—	17373	17373	—	—	17328
AAB0994	35-02004	9–10	Soil	—	—	—	—	17316	—	17316	—	—	—	—	—	17373	17373	—	—	17328
AAB1457	35-02004	16–17	Soil	—	—	—	—	17316	—	17316	—	—	—	—	—	17373	17373	—	—	17328
AAB0995	35-02004	64–65	Qbt 3	—	—	—	—	17316	—	17316	—	—	—	—	—	17373	17373	—	—	17328
AAB0996	35-02004	99–100	Qbt 2	—	19619	19619	—	17319	—	—	—	—	—	—	—	19560	19560	—	—	17326
AAB0989	35-02005	1–2	Soil	—	—	—	—	17307	—	17307	—	—	—	—	—	19582	19582	—	—	17409
AAB1458	35-02005	15–16	Soil	—	—	—	—	17288	—	—	—	—	—	—	—	19582	19582	—	—	17409
AAB0991	35-02005	34–35	Qbt 3	—	—	—	—	17288	—	—	—	—	—	—	—	19582	19582	—	—	17409
AAB0990	35-02005	49–50	Qbt 3	—	—	—	—	17288	—	—	—	—	—	—	—	19582	19582	—	—	17409
AAB0992	35-02005	99–100	Qbt 2	—	—	—	—	17288	—	—	—	—	—	—	19582	19582	19582	—	—	17409
AAB1459	35-02006	2–3	Soil	—	—	—	—	17347	—	17347	—	—	—	—	—	19577	19577	—	—	19683
AAB0997	35-02006	24–25	Soil	—	19606	19606	—	17347	—	17347	—	—	—	—	19577	19577	19577	—	—	19683
AAB0998	35-02006	54–55	Soil	—	—	—	—	17347	—	17347	—	—	—	—	—	19577	19577	—	—	—
AAB0999	35-02006	69–70	Soil	—	—	—	—	17347	—	17347	—	—	—	—	—	19577	19577	—	—	19683
AAB1000	35-02006	99–100	Soil	—	—	—	—	17352	—	17352	—	—	—	—	—	19575	19575	—	—	19614
AAB1037	35-02007	0.5–1.5	Soil	—	17153	17153	—	17146	—	17146	—	—	—	—	—	17155	17155	—	—	17151

Table C-1.4-1
Samples Taken in Pratt Canyon Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	CN	Limited-List TAL Metals	Non-TAL Metals	TAL Metals	PCBs	Pesticides/PCBs	SVOCs	TPH DRO	TPH LRO	VOCs	Americium-241	Gamma Spectroscopy	Isotopic-Plutonium	Isotopic-Uranium	Strontium-90	Tritium	XRF
AAB1038	35-02007	39–40	Soil	—	—	—	—	17146	—	17146	—	—	—	—	—	17155	17155	—	—	17151
AAB1039	35-02007	64–65	Soil	—	—	—	—	17146	—	17146	—	—	—	—	17155	17155	17155	—	—	17151
AAB1040	35-02007	91–92	Soil	—	—	—	—	17148	—	17148	—	—	—	—	—	17155	17155	—	—	17151
AAB1033	35-02008	1–2	Soil	—	—	—	—	17205	—	17205	—	—	—	—	—	17372	17372	—	—	17223
AAB1460	35-02008	13.5–14.5	Soil	—	—	—	—	—	—	17204	—	—	—	—	17372	17372	17372	—	—	17223
AAB1034	35-02008	63.5–64.5	Qbt 3	—	—	—	—	17204	—	17204	—	—	—	—	17372	17372	17372	—	—	17223
AAB1035	35-02008	74–75	Qbt 3	—	—	—	—	17204	—	17204	—	—	—	—	—	17372	17372	—	—	17223
AAB1036	35-02008	99–100	Qbt 2	—	—	—	—	17204	—	17204	—	—	—	—	—	17372	17372	—	—	17223
AAB0977	35-02009	1–2	Soil	—	—	—	—	17194	—	17194	—	—	—	—	—	17295	17295	—	—	17225
AAB0978	35-02009	11–12	Qbt 3	—	—	—	—	17196	—	17196	—	—	—	—	17295	17295	17295	—	—	17225
AAB0979	35-02009	80–81	Qbt 2	—	—	—	—	17194	—	17194	—	—	—	—	—	17295	17295	—	—	17225
AAB0980	35-02009	99–100	Qbt 2	—	—	—	—	17194	—	17194	—	—	—	—	—	17295	17295	—	—	17225
AAB0961	35-02010	1–2	Soil	—	—	—	—	17070	—	17070	—	—	—	—	—	17188	17188	—	17188	17182
AAB0962	35-02010	13.2–14.2	Soil	—	17185	17185	—	17070	—	17070	—	—	—	—	—	17188	17188	—	17188	17182
AAB0963	35-02010	38–39	Qbt 3	—	—	—	—	17070	—	17070	—	—	—	—	—	17188	17188	—	17188	17182
AAB0964	35-02010	90–95	Qbt 3	—	—	—	—	17075	—	17075	—	—	—	—	—	17247	17247	—	17247	17232
AAB0965	35-02010	95–100	Qbt 2	—	—	—	—	17075	—	17075	—	—	—	—	—	17247	17247	—	17247	17232
AAB1001	35-02011	1–2	Soil	—	—	—	—	17319	—	—	—	—	—	—	—	19560	19560	—	19560	17326
AAB1002	35-02011	10–11	Soil	—	—	—	—	17314	—	17314	—	—	—	—	—	19560	19560	—	19560	17326
AAB1003	35-02011	24–25	Qbt 3	—	—	—	—	17319	—	—	—	—	—	—	—	19560	19560	—	19560	17326
AAB1004	35-02011	64–65	Qbt 3	—	—	—	—	17347	—	17347	—	—	—	—	—	19577	19577	—	—	19683
AAB1005	35-02011	99–100	Qbt 2	—	—	—	—	17347	—	17347	—	—	—	—	19577	19577	19577	—	19577	19683
AAB0981	35-02013	1–2	Soil	—	—	—	—	17320	—	17320	—	—	—	—	—	17333	17333	—	17333	17327
AAB0982	35-02013	15–16	Soil	—	—	—	—	17320	—	17320	—	—	—	—	—	17333	17333	—	17333	17327
AAB0984	35-02013	34–35	Qbt 3	—	17437	—	—	17320	—	17320	—	—	—	—	17333	17333	17333	—	17333	17327

Table C-1.4-1
Samples Taken in Pratt Canyon Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	CN	Limited-List TAL Metals	Non-TAL Metals	TAL Metals	PCBs	Pesticides/PCBs	SVOCs	TPH DRO	TPH LRO	VOCs	Americium-241	Gamma Spectroscopy	Isotopic-Plutonium	Isotopic-Uranium	Strontium-90	Tritium	XRF
AAB0985	35-02013	64–65	Qbt 3	—	—	—	—	17320	—	17320	—	—	—	—	—	17333	17333	—	17333	17327
AAB0986	35-02013	99–100	Qbt 2	—	—	—	—	17320	—	17320	—	—	—	—	—	17333	17333	—	17333	17327
AAB1024	35-02208	0–0.5	Soil	—	—	—	—	17376	—	17376	—	—	—	—	—	19975	19975	—	19975	19611
AAB1028	35-02209	0–0.5	Soil	—	—	—	—	17376	—	17376	—	—	—	—	—	19975	19975	—	19975	19611
AAB1044	35-02212	0–0.5	Soil	—	—	—	—	17376	—	17376	—	—	—	—	—	19975	19975	—	19975	19611
0435-95-0196	35-02281	0–2	Soil	—	—	—	—	—	—	1678	—	—	—	—	—	—	—	—	—	—
0435-97-0043	35-02310	13.5–14.5	Soil	—	—	3102R	3102R	—	—	—	—	—	—	—	3103R	3103R	3103R	3103R	3103R	—
0435-97-0044	35-02310	14.5–16.5	Qbt 3	—	—	3102R	3102R	—	—	—	—	—	—	—	3103R	3103R	3103R	3103R	3103R	—
0435-97-0046	35-02310	19–20	Qbt 3	—	—	3102R	3102R	—	—	—	—	—	—	—	3103R	3103R	3103R	3103R	3103R	—
0435-97-0047	35-02310	28.5–30	Qbt 3	—	—	3102R	3102R	—	—	—	—	—	—	—	3103R	3103R	3103R	3103R	3103R	—
0435-97-0049	35-02311	13–14	Soil	—	—	3102R	3102R	—	—	—	—	—	—	—	3103R	3103R	3103R	3103R	3103R	—
0435-97-0050	35-02311	14–15	Qbt 3	—	—	3102R	3102R	—	—	—	—	—	—	—	3103R	3103R	3103R	3103R	3103R	—
0435-97-0051	35-02311	17.5–18.5	Qbt 3	—	—	3102R	3102R	—	—	—	—	—	—	—	3103R	3103R	3103R	3103R	3103R	—
0435-97-0052	35-02311	29–30	Qbt 3	—	—	3102R	3102R	—	—	—	—	—	—	—	3103R	3103R	3103R	3103R	3103R	—
0435-97-0054	35-02312	12.8–13.8	Soil	—	—	3109R	3109R	—	—	—	—	—	—	—	3110R	3110R	3110R	3110R	3110R	—
0435-97-0055	35-02312	13.8–15	Qbt 3	—	—	3109R	3109R	—	—	—	—	—	—	—	3110R	3110R	3110R	3110R	3110R	—
0435-97-0056	35-02312	17.5–18.5	Qbt 3	—	—	3109R	3109R	—	—	—	—	—	—	—	3110R	3110R	3110R	3110R	3110R	—
0435-97-0057	35-02312	29–30	Qbt 3	—	—	3109R	3109R	—	—	—	—	—	—	—	3110R	3110R	3110R	3110R	3110R	—
0435-97-0059	35-02526	18.5–19.9	Soil	—	—	3083R	3083R	—	—	—	—	—	—	—	3084R	3084R	3084R	3084R	3084R	—
0435-97-0060	35-02526	19.9–21	Qbt 3	—	—	3083R	3083R	—	—	—	—	—	—	—	3084R	3084R	3084R	3084R	3084R	—
0435-97-0061	35-02526	22.5–23.5	Qbt 3	—	—	3083R	3083R	—	—	—	—	—	—	—	3084R	3084R	3084R	3084R	3084R	—
0435-97-0062	35-02526	26.5–27.5	Qbt 3	—	—	3083R	3083R	—	—	—	—	—	—	—	3084R	3084R	3084R	3084R	3084R	—
0435-97-0064	35-02527	18.5–19.5	Soil	—	—	3102R	3102R	—	—	—	—	—	—	—	3103R	3103R	3103R	3103R	3103R	—
0435-97-0065	35-02527	19.5–20.5	Qbt 3	—	—	3102R	3102R	—	—	—	—	—	—	—	3103R	3103R	3103R	3103R	3103R	—
0435-97-0066	35-02527	22.5–23.5	Qbt 3	—	—	3102R	3102R	—	—	—	—	—	—	—	3103R	3103R	3103R	3103R	3103R	—

Table C-1.4-1
Samples Taken in Pratt Canyon Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	CN	Limited-List TAL Metals	Non-TAL Metals	TAL Metals	PCBs	Pesticides/PCBs	SVOCs	TPH DRO	TPH LRO	VOCs	Americium-241	Gamma Spectroscopy	Isotopic-Plutonium	Isotopic-Uranium	Strontium-90	Tritium	XRF
0435-97-0067	35-02527	26.5–27.5	Qbt 3	—	—	3102R	3102R	—	—	—	—	—	—	—	3103R	3103R	3103R	3103R	3103R	—
0435-97-0069	35-02528	16.5–19.7	Soil	—	—	3083R	3083R	—	—	—	—	—	—	—	3084R	3084R	3084R	3084R	3084R	—
0435-97-0071	35-02528	19.7–21.5	Qbt 3	—	—	3083R	3083R	—	—	—	—	—	—	—	3084R	3084R	3084R	3084R	3084R	—
0435-97-0072	35-02528	22.5–23.5	Qbt 3	—	—	3083R	3083R	—	—	—	—	—	—	—	3084R	3084R	3084R	3084R	3084R	—
0435-97-0073	35-02528	26.5–27.5	Qbt 3	—	—	3083R	3083R	—	—	—	—	—	—	—	3084R	3084R	3084R	3084R	3084R	—
PRS 35-016(k)																				
AAC1133	35-02112	0–0.5	Soil	—	—	—	21435	—	—	—	—	—	—	—	21436	21436	21436	—	—	—
0435-97-0125	35-02502	0–1	Soil	—	—	—	3325R	3324R	—	3324R	3324R	3324R	—	—	3326R	3326R	3326R	—	—	—
0435-97-0126	35-02502	1–2	Soil	—	—	—	3325R	3324R	—	3324R	3324R	3324R	3324R	—	3326R	3326R	3326R	—	—	—
0435-97-0129	35-02503	0–1	Soil	—	—	—	3325R	3324R	—	3324R	3324R	3324R	—	—	3326R	3326R	3326R	—	—	—
0435-97-0130	35-02503	0–1	Soil	—	—	—	—	—	—	—	3324R	3324R	—	—	—	—	—	—	—	—
0435-97-0131	35-02503	1–2	Soil	—	—	—	3325R	3324R	—	3324R	3324R	3324R	3324R	—	3326R	3326R	3326R	—	—	—
PRS 35-016(l)																				
AAC1140	35-02214	0–1	Soil	—	—	—	—	—	—	21434	—	—	—	—	—	—	—	—	—	—
PRS 35-016(m)																				
AAB4245	35-02093	0–0.5	Soil	—	20292	—	—	—	—	19803	—	—	—	—	—	20284	20284	—	—	20587
AAB4246	35-02094	0–1	Soil	—	20292	—	—	—	—	19803	—	—	—	—	—	—	—	—	—	20587
AAB4247	35-02094	1–2	Soil	—	20292	—	—	—	—	19803	—	—	—	—	—	—	—	—	—	20587
AAB4248	35-02094	2–3	Qbt 3	—	20292	—	—	—	—	19803	—	—	—	—	—	—	—	—	—	20587
PRS 35-009(d)																				
AAA6541	35-02046	0–0.5	Soil	—	—	—	—	—	—	16713	—	—	—	—	—	16721	16721	—	—	16757
AAA6542	35-02047	0–0.5	Soil	—	—	—	—	—	—	16713	—	—	—	—	—	16721	16721	—	—	16757
AAA6543	35-02048	0–0.5	Soil	—	16748	16748	—	—	—	16713	—	—	—	—	—	16721	16721	—	—	16757
AAA6564	35-02057	5–8	Soil	—	16776	16776	—	—	—	16759	—	—	16718	—	—	16754	16754	—	—	16768
AAA6565	35-02057	8–10	Soil	—	—	—	—	—	—	16759	—	—	—	—	16754	16754	16754	—	—	16768

Table C-1.4-1
Samples Taken in Pratt Canyon Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	CN	Limited-List TAL Metals	Non-TAL Metals	TAL Metals	PCBs	Pesticides/PCBs	SVOCs	TPH DRO	TPH LRO	VOCs	Americium-241	Gamma Spectroscopy	Isotopic-Plutonium	Isotopic-Uranium	Strontium-90	Tritium	XRF
AAA6566	35-02057	10–15.2	Soil	—	—	—	—	—	—	16759	—	—	—	—	—	16754	16754	—	—	16768
AAA6567	35-02058	5–8	Soil	—	—	—	—	—	—	16744	—	—	16744	—	—	16755	16755	—	—	16760
AAA6568	35-02058	8–10	Soil	—	—	—	—	—	—	16750	—	—	16744	—	—	16755	16755	—	—	16760
AAA6569	35-02058	10–18.2	Soil	—	—	—	—	—	—	16744	—	—	16744	—	—	16755	16755	—	—	16760
AAA6504	35-02059	1–2	Soil	—	—	—	—	—	—	16713	—	—	16713	—	—	16721	16721	—	—	16757
AAA6517	35-02059	7.5–8.5	Soil	—	16748	16748	—	—	—	16713	—	—	16713	—	16721	16721	16721	—	—	16757
AAA6518	35-02059	14–15	Soil	—	—	—	—	—	—	16713	—	—	16713	—	—	16721	16721	—	—	16757
AAA6519	35-02059	17.5–18.5	Soil	—	—	—	—	—	—	16713	—	—	16713	—	—	16721	16721	—	—	16757
AAA6520	35-02060	4–5	Soil	—	—	—	—	—	—	16715	—	—	16715	—	—	16721	16721	—	—	16757
AAA6534	35-02060	7.5–8.5	Soil	—	—	—	—	—	—	16713	—	—	16713	—	—	16721	16721	—	—	16757
AAA6535	35-02060	14–15	Soil	—	—	—	—	—	—	16713	—	—	16713	—	—	16721	16721	—	—	16757
AAA6536	35-02060	17–18	Soil	—	—	—	—	—	—	16713	—	—	16713	—	—	16721	16721	—	—	16757
AAA6547	35-02061	0.5–2.5	Soil	—	—	—	—	—	—	16713	—	—	16715	—	16721	16721	16721	—	—	16757
AAA6548	35-02061	7.5–8.5	Soil	—	—	—	—	—	—	16713	—	—	16713	—	—	16721	16721	—	—	16757
AAA6549	35-02061	14–15	Soil	—	—	—	—	—	—	16713	—	—	16713	—	—	16721	16721	—	—	16757
AAA6551	35-02061	17–18	Soil	—	—	—	—	—	—	16713	—	—	16713	—	—	16721	16721	—	—	16757
AAA6552	35-02062	1–2.5	Soil	—	—	—	—	—	—	16713	—	—	16713	—	—	16721	16721	—	—	16757
AAA6553	35-02062	9–10	Soil	—	—	—	—	—	—	16715	—	—	16713	—	—	16721	16721	—	—	16757
AAA6554	35-02062	14–15	Soil	—	—	—	—	—	—	16713	—	—	16713	—	—	16721	16721	—	—	16757
AAA6555	35-02062	19–20	Soil	—	16748	16748	—	—	—	16713	—	—	16713	—	—	16721	16721	—	—	16757
0435-95-0191	35-02277	8–10	Soil	—	—	—	—	—	—	—	—	—	1671	—	—	—	—	—	—	—
0435-95-0192	35-02277	10–11	Soil	—	—	—	—	—	—	—	—	—	1671	—	—	—	—	—	—	—
0435-95-0194	35-02279	3–4	Soil	—	—	—	—	—	—	1678	—	—	1671	—	—	—	—	—	—	—
0435-97-0391	35-02556	0–1	Soil	—	—	—	—	—	—	—	—	—	—	—	3509R	—	—	—	—	—
0435-97-0392	35-02556	6.5–7.5	Soil	—	—	—	—	—	—	—	—	—	—	—	3509R	—	—	—	—	—

Table C-1.4-1
Samples Taken in Pratt Canyon Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	CN	Limited-List TAL Metals	Non-TAL Metals	TAL Metals	PCBs	Pesticides/PCBs	SVOCs	TPH DRO	TPH LRO	VOCs	Americium-241	Gamma Spectroscopy	Isotopic-Plutonium	Isotopic-Uranium	Strontium-90	Tritium	XRF
0435-97-0393	35-02556	7.5–8.5	Soil	—	—	—	—	—	—	—	—	—	—	—	3509R	—	—	—	—	—
0435-97-0394	35-02556	11.5–12.5	Soil	—	—	—	—	—	—	—	—	—	—	—	3509R	—	—	—	—	—
0435-97-0395	35-02557	0–1	Soil	—	—	—	—	—	—	—	—	—	—	—	3509R	—	—	—	—	—
0435-97-0397	35-02557	8.5–9.5	Soil	—	—	—	—	—	—	—	—	—	—	—	3509R	—	—	—	—	—
0435-97-0398	35-02557	9.5–10.5	Soil	—	—	—	—	—	—	—	—	—	—	—	3509R	—	—	—	—	—
0435-97-0399	35-02557	14–15	Soil	—	—	—	—	—	—	—	—	—	—	—	3509R	—	—	—	—	—
0435-97-0400	35-02558	0–0.5	Soil	—	—	—	—	—	—	—	—	—	—	—	3510R	—	—	—	—	—
0435-97-0403	35-02558	0.5–1.5	Soil	—	—	—	—	—	—	—	—	—	—	—	3510R	—	—	—	—	—
0435-97-0404	35-02559	0–1	Soil	—	—	—	—	—	—	—	—	—	—	—	3510R	—	—	—	—	—
0435-97-0406	35-02559	1–1.5	Soil	—	—	—	—	—	—	—	—	—	—	—	3510R	—	—	—	—	—
0435-97-0407	35-02559	1.5–2.5	Soil	—	—	—	—	—	—	—	—	—	—	—	3510R	—	—	—	—	—
PRS 35-003(r)																				
AAB4282	35-02028	0–0.5	Soil	—	—	—	—	—	19836	19836	—	—	—	—	—	20163	20163	—	—	—
AAB4283	35-02028	6.5–7.5	Qbt 3	—	—	—	—	—	19836	19836	—	—	—	—	—	20163	20163	—	—	—
0435-95-0208	35-02028	13.3–13.5	Qbt 3	—	—	—	1676	—	—	—	—	—	—	—	—	—	—	—	—	—
AAB4284	35-02028	14–15	Qbt 3	—	—	—	—	—	19836	19836	—	—	—	—	—	20163	20163	—	—	—
AAB4285	35-02028	24–25	Qbt 3	—	—	—	—	—	19836	19836	—	—	—	—	—	20163	20163	—	—	—
0435-95-0209	35-02028	52.5–52.7	Qbt 2	—	—	—	1676	—	—	—	—	—	—	—	—	—	—	—	—	—
XAAB4219	35-02028	54–55	Qbt 2	—	—	—	20046	—	19902	19902	—	—	—	—	—	20160	20160	—	—	—
0435-95-0206	35-02028	133.3–133.5	Qbt 1v	—	—	—	1676	—	—	—	—	—	—	—	—	—	—	—	—	—
XAAB4229	35-02028	133.5–134.5	Qbt 1v	—	—	—	20048	—	19901	19901	—	—	—	—	—	20159	20159	—	20159	—
XAAB4239	35-02028	199–200	Qbt 1g	—	—	—	20050	—	19926	19926	—	—	—	—	20158	20158	20158	—	—	20586
XAAB4273	35-02028	298–299	Qbo	—	—	—	20051	—	—	—	—	—	—	—	—	20155	20155	—	20155	20583
AAB4240	35-02030	0–0.5	Soil	—	—	—	—	—	—	—	—	—	—	—	19594	19594	19594	—	—	19538
XAAB4241	35-02030	1–2	Soil	—	—	—	—	—	—	—	—	—	—	—	—	19594	19594	—	—	19538

Table C-1.4-1
Samples Taken in Pratt Canyon Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	CN	Limited-List TAL Metals	Non-TAL Metals	TAL Metals	PCBs	Pesticides/PCBs	SVOCs	TPH DRO	TPH LRO	VOCs	Americium-241	Gamma Spectroscopy	Isotopic-Plutonium	Isotopic-Uranium	Strontium-90	Tritium	XRF
XAAB4242	35-02030	2–3	Soil	—	—	—	—	—	—	—	—	—	—	—	—	19594	19594	—	—	19538
XAAB4243	35-02031	0–0.5	Soil	—	—	—	—	—	—	—	—	—	—	—	—	19594	19594	—	—	19538
XAAB4244	35-02031	1–2	Soil	—	—	—	—	—	—	—	—	—	—	—	—	19594	19594	—	—	19538
XAAB4245	35-02031	2–3	Soil	—	—	—	—	—	—	—	—	—	—	—	—	19594	19594	—	—	19538
AAB4217	35-02243	0–0.5	Soil	—	—	—	—	17765	—	17765	—	—	—	—	—	19529	19529	—	—	19543
AAB4218	35-02243	1–2	Soil	—	—	—	—	—	—	—	—	—	—	—	—	19529	19529	—	—	19543
AAB4219	35-02243	2–3	Soil	—	—	—	—	—	—	—	—	—	—	—	—	19529	19529	—	—	19543
AAB4220	35-02244	0–0.5	Soil	—	—	—	—	—	—	—	—	—	—	—	—	19529	19529	—	—	19543
AAB4221	35-02244	1–2	Soil	—	19623	19623	—	—	—	—	—	—	—	—	—	19529	19529	—	—	19543
AAB4222	35-02244	2–3	Soil	—	—	—	—	—	—	—	—	—	—	—	—	19529	19529	—	—	19543
AAB4223	35-02245	0–0.5	Soil	—	—	—	—	17765	—	17765	—	—	—	—	—	19529	19529	—	—	19543
AAB4226	35-02245	1–2	Soil	—	—	—	—	—	—	—	—	—	—	—	—	19529	19529	—	—	19543
AAB4225	35-02245	2–3	Soil	—	—	—	—	—	—	—	—	—	—	—	—	19529	19529	—	—	19543
AAB4227	35-02246	0–0.5	Soil	—	—	—	—	—	—	—	—	—	—	—	—	19529	19529	—	—	—
AAB4228	35-02246	1–2	Soil	—	—	—	—	—	—	—	—	—	—	—	—	19529	19529	—	—	19543
AAB4229	35-02246	2–3	Soil	—	—	—	—	—	—	—	—	—	—	—	—	19529	19529	—	—	19543
AAB4233	35-02247	0–0.5	Soil	—	—	—	—	—	—	—	—	—	—	—	—	19594	19594	—	—	19538
AAB4234	35-02247	1–2	Soil	—	—	—	—	—	—	—	—	—	—	—	—	19594	19594	—	—	19538
AAB4235	35-02247	2–3	Soil	—	19649	19649	—	—	—	—	—	—	—	—	—	19594	19594	—	—	19538
AAB4236	35-02248	0–0.5	Soil	—	—	—	—	—	—	—	—	—	—	—	—	19594	19594	—	—	19538
AAB4238	35-02248	1–2	Soil	—	—	—	—	—	—	—	—	—	—	—	—	19594	19594	—	—	19538
AAB4239	35-02248	2–3	Soil	—	—	—	—	—	—	—	—	—	—	—	19594	19594	19594	—	—	19538
XAAB4246	35-02249	0–0.5	Soil	—	—	—	—	—	—	—	—	—	—	—	—	19594	19594	—	—	19538
0435-97-0075	35-02370	3–4	Soil	—	—	3112R	3112R	—	—	—	—	—	—	—	3113R	3113R	3113R	3113R	3113R	—
0435-97-0076	35-02370	6.4–7.4	Soil	—	—	3112R	3112R	—	—	—	—	—	—	—	3113R	3113R	3113R	3113R	3113R	—

Table C-1.4-1
Samples Taken in Pratt Canyon Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	CN	Limited-List TAL Metals	Non-TAL Metals	TAL Metals	PCBs	Pesticides/PCBs	SVOCs	TPH DRO	TPH LRO	VOCs	Americium-241	Gamma Spectroscopy	Isotopic-Plutonium	Isotopic-Uranium	Strontium-90	Tritium	XRF
0435-97-0077	35-02370	7.4–9	Qbt 2	—	—	3112R	3112R	—	—	—	—	—	—	—	3113R	3113R	3113R	3113R	3113R	—
0435-97-0078	35-02370	12.5–15	Qbt 2	—	—	3112R	3112R	—	—	—	—	—	—	—	3113R	3113R	3113R	3113R	3113R	—
0435-97-0080	35-02370	17.5–18.5	Qbt 2	—	—	3112R	3112R	—	—	—	—	—	—	—	3113R	3113R	3113R	3113R	3113R	—
CAMO-98-0037	MO-00030	0–0.82	Sediment	4668R	—	4668R	4668R	—	4667R	4667R	—	—	—	4671R	4671R	4671R	4671R	4671R	4671R	—
CAMO-98-0038	MO-00031	1.67–2.65	Sediment	4668R	—	4668R	4668R	—	4667R	4667R	—	—	—	4671R	4671R	4671R	4671R	4671R	4671R	—
CAMO-98-0039	MO-00031	2.65–2.95	Sediment	4668R	—	4668R	4668R	—	4667R	4667R	—	—	—	4671R	4671R	4671R	4671R	4671R	4671R	—
CAMO-98-0040	MO-00032	0–1.18	Sediment	4668R	—	4668R	4668R	—	4667R	4667R	—	—	—	4671R	4671R	4671R	4671R	4671R	4671R	—
CAMO-98-0041	MO-00032	1.18–2.03	Sediment	4668R	—	4668R	4668R	—	4667R	4667R	—	—	—	4671R	4671R	4671R	4671R	4671R	4671R	—
CAMO-98-0042	MO-00032	2.03–2.88	Sediment	4668R	—	4668R	4668R	—	4667R	4667R	—	—	—	4671R	4671R	4671R	4671R	4671R	4671R	—
CAMO-98-0043	MO-00033	0–0.98	Sediment	4668R	—	4668R	4668R	—	4667R	4667R	—	—	—	4671R	4671R	4671R	4671R	4671R	4671R	—
CAMO-98-0044	MO-00033	1.90–2.88	Sediment	4668R	—	4668R	4668R	—	4667R	4667R	—	—	—	4671R	4671R	4671R	4671R	4671R	4671R	—
CAMO-98-0045	MO-00034	1.73–2.16	Sediment	4668R	—	4668R	4668R	—	4667R	4667R	—	—	—	4671R	4671R	4671R	4671R	4671R	4671R	—

Table C-1.4-2
Inorganic Chemicals with Concentrations (mg/kg) or Detection Limits at or Exceeding Background Values in Pratt Canyon Subarea

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Cadmium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Zinc
Soil Background Value				**29200**	**0.83**	**8.17**	**0.4**	**14.7**	**22.3**	**0.1**	**15.4**	**1.52**	**1**	**0.73**	**48.8**
Qbt 2,3,4 Background Value				**7340**	**0.5**	**2.79**	**1.63**	**4.66**	**11.2**	**0.1**	**6.58**	**0.3**	**1**	**1.1**	**63.5**
Qbt 1v Background Value				**8170**	**0.5**	**1.81**	**0.4**	**3.26**	**18.4**	**0.1**	**2**	**0.3**	**1**	**1.24**	**84.6**
Qbt 1g, Qct, Qbo Background Value				**3560**	**0.5**	**0.56**	**0.4**	**3.96**	**13.5**	**0.1**	**2**	**0.3**	**1**	**1.22**	**40**
Sediment Background Value				**15400**	**0.83**	**3.98**	**0.4**	**11.2**	**19.7**	**0.1**	**9.38**	**0.3**	**1**	**0.73**	**60.2**
PRS 35-003(d,l,q)															
AAB0996	35-02004	99.00–100.00	Qbt 2	—	4.2(U)[a]	3(U)	—	—	—	—	—	6.6(U)	—	23.4(U)	—
AAB0997	35-02006	24.00–25.00	Soil	—	4.2(U)	—	—	—	—	—	—	6.6(U)	—	23.4(U)	—
AAB0984	35-02013	34.00–35.00	Qbt 3	—	2.1(U)	—	—	—	—	—	—	3.6(U)	—	17.9	—
0435-97-0059	35-02526	18.50–19.90	Soil	—	2.8(U)	—	0.42(U)	—	—	—	—	—	—	—	—
0435-97-0069	35-02528	16.50–19.70	Soil	—	2.8(U)	—	0.42(U)	—	—	0.5(U)	—	—	—	—	—
0435-97-0071	35-02528	19.70–21.50	Qbt 3	—	2.8(U)	—	—	—	—	—	—	—	—	—	—
0435-97-0072	35-02528	22.50–23.50	Qbt 3	—	2.7(U)	—	—	—	—	—	—	—	—	—	—
0435-97-0073	35-02528	26.50–27.50	Qbt 3	—	2.7(U)	—	—	—	—	—	—	—	—	—	—
PRS 35-016(k)															
AAC1133	35-02112	0.00–0.50	Soil	—	—	—	1.2(U)	54.1	29.2	0.12(U)	—	—	—	1.2(U)	573
0435-97-0125	35-02502	0.00–1.00	Soil	—	4.9(U)	—	0.49(U)	—	—	—	—	—	—	—	114
0435-97-0126	35-02502	1.00–2.00	Soil	—	5.5(U)	—	0.55(U)	—	—	—	—	—	—	—	83
0435-97-0129	35-02503	0.00–1.00	Soil	—	5.2(U)	—	0.52(U)	—	—	—	—	—	—	—	—
0435-97-0131	35-02503	1.00–2.00	Soil	—	5.7(U)	—	0.57(U)	—	—	—	—	—	—	—	—
PRS 35-009(d)															
AAA6543	35-02048	0.00–0.50	Soil	—	1.1(U)	—	0.65(U)	—	—	—	—	—	—	—	—
AAA6564	35-02057	5.00–8.00	Soil	—	4.2(UJ)[b]	—	1.5	—	—	—	—	—	1.1(UJ)	—	—
AAA6517	35-02059	7.50–8.50	Soil	—	1.1(U)	—	0.64(U)	—	—	—	—	—	—	—	—
AAA6555	35-02062	19.00–20.00	Soil	—	1(U)	—	0.63(U)	—	—	—	—	—	—	—	—
PRS 35-003(r)															
0435-95-0208	35-02028	13.30–13.50	Qbt 3	—	8.7(U)	—	—	—	—	—	—	—	—	—	—
0435-95-0209	35-02028	52.50–52.70	Qbt 2	—	8.7(U)	—	—	—	—	—	—	—	—	—	—
XAAB4219	35-02028	54.00–55.00	Qbt 2	—	—	—	—	—	—	0.11(U)	—	0.92(U)	—	—	—

Table C-1.4-2
Inorganic Chemicals with Concentrations (mg/kg) or Detection Limits at or Exceeding Background Values in Pratt Canyon Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Cadmium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Zinc
			Soil Background Value	29200	0.83	8.17	0.4	14.7	22.3	0.1	15.4	1.52	1	0.73	48.8
			Qbt 2,3,4 Background Value	7340	0.5	2.79	1.63	4.66	11.2	0.1	6.58	0.3	1	1.1	63.5
			Qbt 1v Background Value	8170	0.5	1.81	0.4	3.26	18.4	0.1	2	0.3	1	1.24	84.6
			Qbt 1g, Qct, Qbo Background Value	3560	0.5	0.56	0.4	3.96	13.5	0.1	2	0.3	1	1.22	40
			Sediment Background Value	15400	0.83	3.98	0.4	11.2	19.7	0.1	9.38	0.3	1	0.73	60.2
0435-95-0206	35-02028	133.30–133.50	Qbt 1v	—	8.9(U)	—	0.7(U)	—	—	—	3.1(U)	—	—	—	—
XAAB4229	35-02028	133.50–134.50	Qbt 1v	—	—	—	—	—	—	0.11(U)	—	1(U)	—	—	—
XAAB4239	35-02028	199.00–200.00	Qbt 1g	—	—	—	—	—	—	0.11(U)	—	0.94(U)	—	1.4(U)	—
XAAB4273	35-02028	298.00–299.00	Qbo	3630	—	—	—	—	—	—	—	0.93(U)	—	—	—
AAB4221	35-02244	1.00–2.00	Soil	—	3.3(UJ)	—	0.42(UJ)	—	—	—	—	7.1(UJ)	—	18.5(UJ)	—
AAB4235	35-02247	2.00–3.00	Soil	—	4.5(U)	—	2.1	—	—	—	—	7.1(U)	—	25.2(U)	—
0435-97-0075	35-02370	3.00–4.00	Soil	—	3.4(U)	—	—	—	—	1	—	—	—	—	—
0435-97-0076	35-02370	6.40–7.40	Soil	—	3.6(U)	—	—	—	—	—	—	—	—	—	—
0435-97-0077	35-02370	7.40–9.00	Qbt 2	—	3.3(U)	—	—	—	—	—	—	—	—	—	—
0435-97-0078	35-02370	12.50–15.00	Qbt 2	—	2.8(U)	—	—	—	—	—	—	—	—	—	—
0435-97-0080	35-02370	17.50–18.50	Qbt 2	—	3.1(U)	—	—	—	—	—	—	—	—	—	—
CAMO-98-0037	MO-00030	0.00–0.82	Sediment	—	—	—	—	—	—	0.15	—	0.81(U)	—	—	—
CAMO-98-0038	MO-00031	1.67–2.66	Sediment	—	—	—	—	—	—	0.45	—	0.69(U)	—	—	—
CAMO-98-0039	MO-00031	2.66–2.95	Sediment	—	—	—	—	—	—	0.48	—	0.68(U)	—	—	—
CAMO-98-0040	MO-00032	0.00–1.18	Sediment	—	—	—	—	—	—	—	—	0.59(U)	—	—	—
CAMO-98-0041	MO-00032	1.18–2.03	Sediment	—	—	—	—	—	—	1.6	—	0.6(U)	—	—	—
CAMO-98-0042	MO-00032	2.03–2.89	Sediment	—	—	—	—	—	—	1.3	—	0.6(U)	—	—	—
CAMO-98-0043	MO-00033	0.00–0.98	Sediment	—	—	—	—	—	—	—	—	0.59(U)	—	—	—
CAMO-98-0044	MO-00033	1.90–2.89	Sediment	—	—	—	—	—	—	0.59	—	0.6(U)	—	—	—
CAMO-98-0045	MO-00034	1.74–2.16	Sediment	—	—	—	—	13.2	—	0.32	11.5	0.67(U)	—	—	—

[a] U = The analyte was analyzed for but not detected.

[b] UJ = The analyte was not positively identified in the sample, and the associated value is an estimate of the sample-specific detection or quantitation limit.

Table C-1.4-3
Detected Organic Chemicals in Pratt Canyon Subarea

Analyte	Location ID	Sample ID	Sample Value (mg/kg)	Media	Depth (ft)
PRS 35-003(e)					
Pyrene	35-02019	AAA6621	0.42	Soil	1–2
PRS 35-003(d,l,q)					
Aroclor-1254	35-02004	AAB0993	0.41	Soil	1–2
Benzo(a)anthracene	35-02281	0435-95-0196	0.035(J)[a]	Soil	0–2
Benzo(a)pyrene	35-02281	0435-95-0196	0.044(J)	Soil	0–2
Benzo(b)fluoranthene	35-02281	0435-95-0196	0.032(J)	Soil	0–2
Benzo(k)fluoranthene	35-02281	0435-95-0196	0.038(J)	Soil	0–2
Chrysene	35-02281	0435-95-0196	0.037(J)	Soil	0–2
Di-n-butylphthalate	35-02006	AAB1459	2.2	Soil	2–3
	35-02006	AAB0997	2	Soil	24–25
	35-02006	AAB0998	1.4	Soil	54–55
	35-02006	AAB0999	2	Soil	69–70
	35-02006	AAB1000	1.5	Soil	99–100
	35-02008	AAB1460	0.39	Soil	13.5–14.5
	35-02010	AAB0963	2.1	Qbt 3	38–39
	35-02011	AAB1004	2	Qbt 3	64–65
	35-02011	AAB1005	1.5	Qbt 2	99–100
	35-02208	AAB1024	0.56	Soil	0–0.5
	35-02209	AAB1028	0.9	Soil	0–0.5
	35-02212	AAB1044	0.42	Soil	0–0.5
Fluoranthene	35-02010	AAB0961	0.67	Soil	1–2
	35-02281	0435-95-0196	0.11(J)	Soil	0–2
Phenanthrene	35-02281	0435-95-0196	0.11(J)	Soil	0–2
Pyrene	35-02010	AAB0961	0.69	Soil	1–2
	35-02281	0435-95-0196	0.1(J)	Soil	0–2
PRS 35-016(k)					
Acenaphthene	35-02502	0435-97-0125	1.2	Soil	0–1
	35-02503	0435-97-0129	0.12(J)	Soil	0–1
Acenaphthylene	35-02502	0435-97-0125	0.041(J)	Soil	0–1
Anthracene	35-02502	0435-97-0125	1.9	Soil	0–1
	35-02503	0435-97-0129	0.22(J)	Soil	0–1
Aroclor-1260	35-02502	0435-97-0125	0.31	Soil	0–1
	35-02502	0435-97-0126	0.58(J-)[b]	Soil	1–2
	35-02503	0435-97-0129	0.91(J-)	Soil	0–1
	35-02503	0435-97-0131	0.15	Soil	1–2
Benzo(a)anthracene	35-02502	0435-97-0125	2.9	Soil	0–1
	35-02503	0435-97-0129	0.45	Soil	0–1
Benzo(a)pyrene	35-02502	0435-97-0125	2.5	Soil	0–1
	35-02503	0435-97-0129	0.45	Soil	0–1
Benzo(b)fluoranthene	35-02502	0435-97-0125	2	Soil	0–1
	35-02503	0435-97-0129	0.41	Soil	0–1

Table C-1.4-3
Detected Organic Chemicals in Pratt Canyon Subarea (continued)

Analyte	Location ID	Sample ID	Sample Value (mg/kg)	Media	Depth (ft)
Benzo(g,h,i)perylene	35-02502	0435-97-0125	2.1	Soil	0–1
	35-02502	0435-97-0126	0.56	Soil	1–2
	35-02503	0435-97-0129	0.38	Soil	0–1
Benzo(k)fluoranthene	35-02502	0435-97-0125	2.3	Soil	0–1
	35-02503	0435-97-0129	0.43	Soil	0–1
Bis(2-ethylhexyl)phthalate	35-02502	0435-97-0125	0.15(J)	Soil	0–1
	35-02502	0435-97-0126	1	Soil	1–2
	35-02503	0435-97-0129	0.12(J)	Soil	0–1
	35-02503	0435-97-0131	1.8(J)	Soil	1–2
Chrysene	35-02502	0435-97-0125	3.1	Soil	0–1
	35-02503	0435-97-0129	0.53	Soil	0–1
Dibenz(a,h)anthracene	35-02502	0435-97-0125	0.55	Soil	0–1
	35-02503	0435-97-0129	0.11(J)	Soil	0–1
Dibenzofuran	35-02502	0435-97-0125	0.56	Soil	0–1
	35-02503	0435-97-0129	0.047(J)	Soil	0–1
Fluoranthene	35-02502	0435-97-0125	6.7	Soil	0–1
	35-02503	0435-97-0129	1.2	Soil	0–1
Fluorene	35-02502	0435-97-0125	1	Soil	0–1
	35-02503	0435-97-0129	0.11(J)	Soil	0–1
Indeno(1,2,3-cd)pyrene	35-02502	0435-97-0125	1.8	Soil	0–1
	35-02503	0435-97-0129	0.3(J)	Soil	0–1
LRO	35-02502	0435-97-0125	4000	Soil	0–1
	35-02502	0435-97-0126	38000	Soil	1–2
	35-02503	0435-97-0129	3800	Soil	0–1
	35-02503	0435-97-0130	3800	Soil	0–1
	35-02503	0435-97-0131	12000	Soil	1–2
Methylnaphthalene[2-]	35-02502	0435-97-0125	0.32(J)	Soil	0–1
Methylphenol[4-]	35-02502	0435-97-0125	0.038(J)	Soil	0–1
Naphthalene	35-02502	0435-97-0125	1	Soil	0–1
	35-02503	0435-97-0129	0.057(J)	Soil	0–1
Phenanthrene	35-02502	0435-97-0125	6.9	Soil	0–1
	35-02503	0435-97-0129	0.87	Soil	0–1
Pyrene	35-02502	0435-97-0125	8	Soil	0–1
	35-02502	0435-97-0126	0.45	Soil	1–2
	35-02503	0435-97-0129	1.2	Soil	0–1
Toluene	35-02502	0435-97-0126	0.012(J+)[c]	Soil	1–2
	35-02503	0435-97-0131	0.002(J+)	Soil	1–2
Trichloro-1,2,2-trifluoroethane[1,1,2-]	35-02502	0435-97-0126	0.001(J+)	Soil	1–2
Trichloroethene	35-02502	0435-97-0126	0.002(J+)	Soil	1–2
Trichlorofluoromethane	35-02502	0435-97-0126	0.004(J+)	Soil	1–2

Table C-1.4-3
Detected Organic Chemicals in Pratt Canyon Subarea (continued)

Analyte	Location ID	Sample ID	Sample Value (mg/kg)	Media	Depth (ft)
PRS 35-016(l)					
Acenaphthene	35-02214	AAC1140	1.7	Soil	0–1
Anthracene	35-02214	AAC1140	1.4	Soil	0–1
Benzo(a)anthracene	35-02214	AAC1140	2.4	Soil	0–1
Benzo(a)pyrene	35-02214	AAC1140	2.5	Soil	0–1
Benzo(b)fluoranthene	35-02214	AAC1140	2.6	Soil	0–1
Benzo(g,h,i)perylene	35-02214	AAC1140	1.9	Soil	0–1
Benzo(k)fluoranthene	35-02214	AAC1140	2.2	Soil	0–1
Chrysene	35-02214	AAC1140	2.8	Soil	0–1
Dibenz(a,h)anthracene	35-02214	AAC1140	0.86	Soil	0–1
Dibenzofuran	35-02214	AAC1140	0.8	Soil	0–1
Fluoranthene	35-02214	AAC1140	5.4	Soil	0–1
Fluorene	35-02214	AAC1140	1.2	Soil	0–1
Indeno(1,2,3-cd)pyrene	35-02214	AAC1140	1.9	Soil	0–1
Naphthalene	35-02214	AAC1140	1.2	Soil	0–1
Phenanthrene	35-02214	AAC1140	5.7	Soil	0–1
Pyrene	35-02214	AAC1140	5.3	Soil	0–1
PRS 35-016(m)					
Bis(2-ethylhexyl)phthalate	35-02094	AAB4247	0.54	Soil	1–2
Fluoranthene	35-02094	AAB4246	0.43	Soil	0–1
PRS 35-009(d)					
Acetone	35-02057	AAA6564	0.7	Soil	5–8
	35-02058	AAA6569	0.38(J)	Soil	10–18.2
	35-02058	AAA6567	0.27(J)	Soil	5–8
	35-02058	AAA6568	0.24(J)	Soil	8–10
	35-02059	AAA6504	0.16	Soil	1–2
	35-02059	AAA6518	0.12	Soil	14–15
	35-02059	AAA6519	0.14	Soil	17.5–18.5
	35-02059	AAA6517	0.17	Soil	7.5–8.5
	35-02060	AAA6535	0.21	Soil	14–15
	35-02060	AAA6536	0.17	Soil	17–18
	35-02060	AAA6520	0.069	Soil	4–5
	35-02060	AAA6534	0.21	Soil	7.5–8.5
	35-02061	AAA6547	0.18	Soil	0.5–2.5
	35-02061	AAA6549	0.25	Soil	14–15
	35-02061	AAA6551	0.23	Soil	17–18
	35-02061	AAA6548	0.13	Soil	7.5–8.5
	35-02062	AAA6552	0.076	Soil	1–2.5
	35-02062	AAA6554	0.21	Soil	14–15
	35-02062	AAA6555	0.16	Soil	19–20
	35-02062	AAA6553	0.15	Soil	9–10
	35-02277	0435-95-0191	0.007(J)	Soil	8–10

Table C-1.4-3
Detected Organic Chemicals in Pratt Canyon Subarea (continued)

Analyte	Location ID	Sample ID	Sample Value (mg/kg)	Media	Depth (ft)
Butanone[2-]	35-02061	AAA6551	0.029	Soil	17–18
	35-02062	AAA6554	0.035	Soil	14–15
Carbon disulfide	35-02058	AAA6568	0.006(J)	Soil	8–10
Hexanone[2-]	35-02062	AAA6553	0.029	Soil	9–10
PRS 35-003(r)					
Acenaphthene	35-02028	AAB4282	6.4	Soil	0–0.5
Anthracene	35-02028	AAB4282	5.2	Soil	0–0.5
Aroclor-1260	MO-00030	CAMO-98-0037	0.16	Sediment	0–0.82
	MO-00031	CAMO-98-0038	0.19	Sediment	1.67–2.66
	MO-00031	CAMO-98-0039	0.067	Sediment	2.66–2.95
	MO-00032	CAMO-98-0040	0.082	Sediment	0–1.18
	MO-00032	CAMO-98-0041	0.6	Sediment	1.18–2.03
	MO-00032	CAMO-98-0042	0.053	Sediment	2.03–2.89
	MO-00033	CAMO-98-0043	0.096	Sediment	0–0.98
	MO-00033	CAMO-98-0044	0.38	Sediment	1.90–2.89
	MO-00034	CAMO-98-0045	0.43	Sediment	1.74–2.12
Benzo(a)anthracene	35-02028	AAB4282	8.2	Soil	0–0.5
	MO-00033	CAMO-98-0044	0.37	Sediment	1.90–2.89
Benzo(a)pyrene	35-02028	AAB4282	7.3(J)	Soil	0–0.5
	MO-00033	CAMO-98-0044	0.36	Sediment	1.90–2.89
Benzo(b)fluoranthene	35-02028	AAB4282	7.3(J)	Soil	0–0.5
	MO-00033	CAMO-98-0044	0.35	Sediment	1.90–2.89
Benzo(g,h,i)perylene	35-02028	AAB4282	4.4(J)	Soil	0–0.5
Benzo(k)fluoranthene	35-02028	AAB4282	3.1(J)	Soil	0–0.5
Chrysene	35-02028	AAB4282	7.6	Soil	0–0.5
	MO-00030	CAMO-98-0037	1.1(J-)	Sediment	0–0.82
	MO-00031	CAMO-98-0038	0.54	Sediment	1.67–2.66
	MO-00032	CAMO-98-0041	0.69(J)	Sediment	1.18–2.03
	MO-00033	CAMO-98-0044	0.61	Sediment	1.90–2.89
Dibenz(a,h)anthracene	35-02028	AAB4282	2.2(J)	Soil	0–0.5
Dibenzofuran	35-02028	AAB4282	3.5	Soil	0–0.5
Dieldrin	35-02028	AAB4282	0.006(J)	Soil	0–0.5
Endosulfan II	35-02028	AAB4282	0.016(J)	Soil	0–0.5
Fluoranthene	35-02028	AAB4282	24	Soil	0–0.5
	MO-00030	CAMO-98-0037	1.8(J-)	Sediment	0–0.82
	MO-00031	CAMO-98-0038	0.9	Sediment	1.67–2.66
	MO-00031	CAMO-98-0039	0.39	Sediment	2.66–2.95
	MO-00032	CAMO-98-0040	1(J)	Sediment	0–1.18
	MO-00032	CAMO-98-0041	1.3(J)	Sediment	1.18–2.03
	MO-00033	CAMO-98-0044	1	Sediment	1.90–2.89
	MO-00034	CAMO-98-0045	0.78(J)	Sediment	1.74–2.17
Fluorene	35-02028	AAB4282	4.8	Soil	0–0.5

Table C-1.4-3
Detected Organic Chemicals in Pratt Canyon Subarea (continued)

Analyte	Location ID	Sample ID	Sample Value (mg/kg)	Media	Depth (ft)
Indeno(1,2,3-cd)pyrene	35-02028	AAB4282	4.8(J)	Soil	0–0.5
Methylnaphthalene[2-]	35-02028	AAB4282	1.7	Soil	0–0.5
Naphthalene	35-02028	AAB4282	7	Soil	0–0.5
Phenanthrene	35-02028	AAB4282	30	Soil	0–0.5
	MO-00030	CAMO-98-0037	1(J-)	Sediment	0–0.82
	MO-00031	CAMO-98-0038	0.56	Sediment	1.67–2.66
	MO-00032	CAMO-98-0040	0.72(J)	Sediment	0–1.18
	MO-00032	CAMO-98-0041	0.72(J)	Sediment	1.18–2.03
	MO-00033	CAMO-98-0044	0.64	Sediment	1.90–2.89
Pyrene	35-02028	AAB4282	22	Soil	0–0.5
	MO-00030	CAMO-98-0037	1.7(J-)	Sediment	0–0.82
	MO-00031	CAMO-98-0038	0.82	Sediment	1.67–2.66
	MO-00032	CAMO-98-0040	0.9(J)	Sediment	0–1.18
	MO-00032	CAMO-98-0041	1.1(J)	Sediment	1.18–2.03
	MO-00033	CAMO-98-0044	0.88	Sediment	1.90–2.89

[a] J = The analyte was positively identified, and the associated numerical value is estimated to be more uncertain than would normally be expected for that analysis.

[b] J- = The analyte was positively identified, and the result is likely to be biased low.

[c] J+ = The analyte was positively identified, and the result is likely to be biased high.

Table C-1.4-4
Samples with Radionuclides Detected (pCi/g) Above Background Values or Fallout Values In Pratt Canyon Subarea

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Cobalt-60	Europium-152	Plutonium-238	Plutonium-239	Strontium-90	Tritium	Uranium-234	Uranium-235	Uranium-238
Soil Background Value/Fallout Value				0.013	1.65	na[a]	na	0.023	0.054	1.31	0.766	2.59	0.20	2.29
Qbt 2,3,4 Background Value				0.05	0.1	na	na	0.05	0.05	1	0.3	1.98	0.09	1.93
Qbt 1g, Qct, Qbo Background Value				0.05	0.1	na	na	0.05	0.05	1	0.3	4.0	0.18	3.90
Sediment Background Value				0.04	0.9	na	na	0.006	0.068	1.04	0.093	2.59	0.20	2.29
PRS 35-003(e)														
AAA6622	35-02019	19.00–20.00	Soil	—	—	—	—	—	0.054	—	—	—	—	—
AAA6637	35-02022	1.50–2.50	Soil	—	—	—	—	—	0.034	—	—	—	—	—
PRS 35-003(d,l,q)														
AAB0994	35-02004	9.00–10.00	Soil	—	—	—	—	0.034(U)[b]	0.02	—	—	—	—	—
AAB0995	35-02004	64.00–65.00	Qbt 3	—	—	—	—	0.059	0.029	—	—	—	—	—
AAB0996	35-02004	99.00–100.00	Qbt 2	—	—	—	—	0.002	0.014	—	—	—	—	—
AAB0989	35-02005	1.00–2.00	Soil	—	—	—	—	0.011	0.007	—	—	—	—	—
AAB1458	35-02005	15.00–16.00	Soil	—	—	—	—	—	0.014	—	—	—	—	—
AAB0991	35-02005	34.00–35.00	Qbt 3	—	—	—	—	0.009	—	—	—	—	0.101	—
AAB0990	35-02005	49.00–50.00	Qbt 3	—	—	—	—	0.002	—	—	—	—	—	—
AAB0992	35-02005	99.00–100.00	Qbt 2	—	—	—	0.456	0.023	0.011	—	—	—	—	—
AAB1459	35-02006	2.00–3.00	Soil	—	—	—	—	0.002	0.023	—	—	—	—	—
AAB0997	35-02006	24.00–25.00	Soil	—	—	0.195	—	0.002	0.011	—	—	—	—	—
AAB0998	35-02006	54.00–55.00	Soil	—	—	—	—	0.018	—	—	—	—	—	—
AAB0999	35-02006	69.00–70.00	Soil	—	—	—	—	0.009	—	—	—	—	—	—
AAB1000	35-02006	99.00–100.00	Soil	—	—	—	—	0.007	0.047	—	—	—	—	—
AAB1460	35-02008	13.50–14.50	Soil	0.116(U)	0.837	—	—	—	0.056	—	—	—	—	—
AAB1036	35-02008	99.00–100.00	Qbt 2	—	—	—	—	—	0.072	—	—	—	—	—
AAB0961	35-02010	1.00–2.00	Soil	—	—	—	—	—	—	—	0.116	—	—	—
AAB0962	35-02010	13.20–14.20	Soil	—	—	—	—	0.025(U)	0.099	—	0.573	—	—	—

Table C-1.4-4
Samples with Radionuclides Detected (pCi/g) Above Background Values or Fallout Values in Pratt Canyon Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Cobalt-60	Europium-152	Plutonium-238	Plutonium-239	Strontium-90	Tritium	Uranium-234	Uranium-235	Uranium-238
Soil Background Value/Fallout Value				0.013	1.65	na[a]	na	0.023	0.054	1.31	0.766	2.59	0.20	2.29
Qbt 2,3,4 Background Value				0.05	0.1	na	na	0.05	0.05	1	0.3	1.98	0.09	1.93
Qbt 1g, Qct, Qbo Background Value				0.05	0.1	na	na	0.05	0.05	1	0.3	4.0	0.18	3.90
Sediment Background Value				0.04	0.9	na	na	0.006	0.068	1.04	0.093	2.59	0.20	2.29
AAB0963	35-02010	38.00–39.00	Qbt 3	—	—	—	—	—	—	—	0.196	—	—	—
AAB0964	35-02010	90.00–95.00	Qbt 3	—	—	—	—	—	—	—	0.004	—	—	—
AAB0965	35-02010	95.00–100.00	Qbt 2	—	—	—	—	—	—	—	0.006	—	—	—
AAB1001	35-02011	1.00–2.00	Soil	—	—	—	—	0.004	—	—	0.127	—	—	—
AAB1002	35-02011	10.00–11.00	Soil	—	—	—	—	0.004	—	—	0.193	—	—	—
AAB1003	35-02011	24.00–25.00	Qbt 3	—	—	—	—	0.029	—	—	0.077	—	—	—
AAB1005	35-02011	99.00–100.00	Qbt 2	—	—	—	0.334	0.007	—	—	0.261	—	—	—
AAB0981	35-02013	1.00–2.00	Soil	—	—	—	—	—	—	—	0.186	—	—	—
AAB0982	35-02013	15.00–16.00	Soil	—	—	—	—	—	—	—	0.141	—	—	—
AAB0984	35-02013	34.00–35.00	Qbt 3	—	—	—	—	—	—	—	4.414	—	—	—
AAB0985	35-02013	64.00–65.00	Qbt 3	—	—	—	—	0.106	—	—	1.509	—	—	—
AAB0986	35-02013	99.00–100.00	Qbt 2	—	—	—	—	—	—	—	0.405	—	—	—
AAB1024	35-02208	0.00–0.50	Soil	—	—	—	—	—	—	—	0.168	—	—	—
AAB1028	35-02209	0.00–0.50	Soil	—	—	—	—	—	0.1	—	0.197	—	—	—
AAB1044	35-02212	0.00–0.50	Soil	—	—	—	—	—	—	—	0.139	—	—	—
0435-97-0043	35-02310	13.50–14.50	Soil	—	—	—	—	—	0.121	2.67	0.32	—	—	—
0435-97-0044	35-02310	14.50–16.50	Qbt 3	—	—	—	—	—	—	2.18	0.16	—	0.106(U)	—
0435-97-0046	35-02310	19.00–20.00	Qbt 3	—	—	—	—	—	—	—	0.26	—	0.112(U)	—
0435-97-0047	35-02310	28.50–30.00	Qbt 3	—	—	—	—	—	—	—	1.88	—	—	—
0435-97-0049	35-02311	13.00–14.00	Soil	0.099(U)	—	—	—	0.025(U)	0.578	3.19	0.43	—	—	—
0435-97-0050	35-02311	14.00–15.00	Qbt 3	—	—	—	—	0.025	—	18.6	0.33	—	0.128(U)	—

Table C-1.4-4
Samples with Radionuclides Detected (pCi/g) Above Background Values or Fallout Values in Pratt Canyon Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Cobalt-60	Europium-152	Plutonium-238	Plutonium-239	Strontium-90	Tritium	Uranium-234	Uranium-235	Uranium-238
Soil Background Value/Fallout Value				**0.013**	**1.65**	**na[a]**	**na**	**0.023**	**0.054**	**1.31**	**0.766**	**2.59**	**0.20**	**2.29**
Qbt 2,3,4 Background Value				**0.05**	**0.1**	**na**	**na**	**0.05**	**0.05**	**1**	**0.3**	**1.98**	**0.09**	**1.93**
Qbt 1g, Qct, Qbo Background Value				**0.05**	**0.1**	**na**	**na**	**0.05**	**0.05**	**1**	**0.3**	**4.0**	**0.18**	**3.90**
Sediment Background Value				**0.04**	**0.9**	**na**	**na**	**0.006**	**0.068**	**1.04**	**0.093**	**2.59**	**0.20**	**2.29**
0435-97-0051	35-02311	17.50–18.50	Qbt 3	—	—	—	—	—	—	—	0.23	—	—	—
0435-97-0052	35-02311	29.00–30.00	Qbt 3	—	—	—	—	—	—	—	0.15	—	—	—
0435-97-0054	35-02312	12.80–13.80	Soil	—	—	—	—	—	—	—	2.009	—	—	—
0435-97-0055	35-02312	13.80–15.00	Qbt 3	—	—	—	—	—	—	—	0.366	—	0.112(U)	—
0435-97-0056	35-02312	17.50–18.50	Qbt 3	—	—	—	—	—	—	—	0.386	—	0.101(U)	—
0435-97-0057	35-02312	29.00–30.00	Qbt 3	—	—	—	—	—	—	—	0.418	—	—	—
0435-97-0059	35-02526	18.50–19.90	Soil	0.02(U)	0.484	—	—	0.027(U)	0.068(U)	12.4	0.288	—	—	—
0435-97-0060	35-02526	19.90–21.00	Qbt 3	—	—	—	—	—	—	1.81	0.322	—	—	—
0435-97-0061	35-02526	22.50–23.50	Qbt 3	—	—	—	—	—	—	—	0.284	—	—	—
0435-97-0062	35-02526	26.50–27.50	Qbt 3	—	—	—	—	—	—	—	0.223	—	0.101(U)	—
0435-97-0064	35-02527	18.50–19.50	Soil	0.346(U)	1.0515	—	—	0.03(U)	0.129	5.8	0.31	—	—	—
0435-97-0065	35-02527	19.50–20.50	Qbt 3	—	—	—	—	—	—	2.45	0.21	—	0.116(U)	—
0435-97-0066	35-02527	22.50–23.50	Qbt 3	—	—	—	—	—	—	—	0.19	—	—	—
0435-97-0067	35-02527	26.50–27.50	Qbt 3	—	—	—	—	—	—	—	0.2	—	0.119(U)	—
0435-97-0069	35-02528	16.50–19.70	Soil	—	—	—	—	—	0.104	3.16	0.379	—	—	—
0435-97-0071	35-02528	19.70–21.50	Qbt 3	—	—	—	—	—	—	—	0.195	—	0.14(U)	—
0435-97-0072	35-02528	22.50–23.50	Qbt 3	—	—	—	—	—	—	—	0.261	—	—	—
0435-97-0073	35-02528	26.50–27.50	Qbt 3	—	—	—	—	—	—	—	0.207	—	—	—
PRS 35-016(k)														
AAC1133	35-02112	0.00–0.50	Soil	0.03(U)	—	—	—	—	—	—	—	—	—	—
0435-97-0125	35-02502	0.00–1.00	Soil	0.025(U)	—	—	—	—	0.028	—	—	—	—	—

Table C-1.4-4
Samples with Radionuclides Detected (pCi/g) Above Background Values or Fallout Values in Pratt Canyon Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Cobalt-60	Europium-152	Plutonium-238	Plutonium-239	Strontium-90	Tritium	Uranium-234	Uranium-235	Uranium-238
Soil Background Value/Fallout Value				0.013	1.65	na[a]	na	0.023	0.054	1.31	0.766	2.59	0.20	2.29
Qbt 2,3,4 Background Value				0.05	0.1	na	na	0.05	0.05	1	0.3	1.98	0.09	1.93
Qbt 1g, Qct, Qbo Background Value				0.05	0.1	na	na	0.05	0.05	1	0.3	4.0	0.18	3.90
Sediment Background Value				0.04	0.9	na	na	0.006	0.068	1.04	0.093	2.59	0.20	2.29
0435-97-0126	35-02502	1.00–2.00	Soil	—	—	—	—	0.024(U)	—	—	—	—	—	—
0435-97-0131	35-02503	1.00–2.00	Soil	0.015(U)	—	—	—	—	—	—	—	—	—	—
PRS 35-009(d)														
AAA6565	35-02057	8.00–10.00	Soil	0.039(U)	—	—	—	—	—	—	—	—	—	—
AAA6567	35-02058	5.00–8.00	Soil	—	—	—	—	0.018	—	—	—	—	—	—
AAA6547	35-02061	0.50–2.50	Soil	0.146(U)	—	—	—	—	—	—	—	—	—	—
AAA6552	35-02062	1.00–2.50	Soil	—	—	—	—	0.09	0.011	—	—	—	—	—
0435-97-0391	35-02556	0.00–1.00	Soil	0.025(U)	—	—	—	—	—	—	—	—	—	—
0435-97-0392	35-02556	6.50–7.50	Soil	0.063(U)	—	—	—	—	—	—	—	—	—	—
0435-97-0394	35-02556	11.50–12.50	Soil	0.047(U)	—	—	—	—	—	—	—	—	—	—
0435-97-0395	35-02557	0.00–1.00	Soil	0.014(U)	—	—	—	—	—	—	—	—	—	—
0435-97-0403	35-02558	0.50–1.50	Soil	0.5(U)	—	—	—	—	—	—	—	—	—	—
0435-97-0404	35-02559	0.00–1.00	Soil	—	0.335	—	—	—	—	—	—	—	—	—
0435-97-0406	35-02559	1.00–1.50	Soil	0.068(U)	—	—	—	—	—	—	—	—	—	—
PRS 35-003(r)														
AAB4282	35-02028	0.00–0.50	Soil	—	—	—	—	—	0.090	—	—	—	—	—
XAAB4239	35-02028	199.00–200.00	Qbt 1g	—	—	—	—	—	—	—	—	—	—	—
AAB4240	35-02030	0.00–0.50	Soil	0.087(U)	—	0.108	—	—	0.065	—	—	—	—	—
XAAB4241	35-02030	1.00–2.00	Soil	—	—	—	—	0.023	0.059	—	—	—	—	—
XAAB4242	35-02030	2.00–3.00	Soil	—	—	—	—	0.007	0.029	—	—	—	—	—
XAAB4244	35-02031	1.00–2.00	Soil	—	—	—	—	0.007	0.045	—	—	—	—	—

Table C-1.4-4
Samples with Radionuclides Detected (pCi/g) Above Background Values or Fallout Values In Pratt Canyon Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Cobalt-60	Europium-152	Plutonium-238	Plutonium-239	Strontium-90	Tritium	Uranium-234	Uranium-235	Uranium-238
Soil Background Value/Fallout Value				0.013	1.65	na[a]	na	0.023	0.054	1.31	0.766	2.59	0.20	2.29
Qbt 2,3,4 Background Value				0.05	0.1	na	na	0.05	0.05	1	0.3	1.98	0.09	1.93
Qbt 1g, Qct, Qbo Background Value				0.05	0.1	na	na	0.05	0.05	1	0.3	4.0	0.18	3.90
Sediment Background Value				0.04	0.9	na	na	0.006	0.068	1.04	0.093	2.59	0.20	2.29
XAAB4245	35-02031	2.00–3.00	Soil	—	—	—	—	—	0.023	—	—	—	—	—
AAB4217	35-02243	0.00–0.50	Soil	—	—	—	—	—	0.162	—	—	—	—	—
AAB4218	35-02243	1.00–2.00	Soil	—	—	—	—	—	0.036	—	—	—	—	—
AAB4219	35-02243	2.00–3.00	Soil	—	—	—	—	—	0.018	—	—	—	—	—
AAB4221	35-02244	1.00–2.00	Soil	—	—	—	—	—	0.349	—	—	—	—	—
AAB4222	35-02244	2.00–3.00	Soil	—	—	—	—	—	0.07	—	—	—	—	—
AAB4223	35-02245	0.00–0.50	Soil	—	—	—	—	—	0.673	—	—	—	—	—
AAB4226	35-02245	1.00–2.00	Soil	—	—	—	—	—	1.002	—	—	—	—	—
AAB4225	35-02245	2.00–3.00	Soil	—	—	—	—	—	0.16	—	—	—	—	—
AAB4227	35-02246	0.00–0.50	Soil	—	—	—	—	—	0.545	—	—	—	—	—
AAB4228	35-02246	1.00–2.00	Soil	—	—	—	—	—	0.18	—	—	—	—	—
AAB4229	35-02246	2.00–3.00	Soil	—	—	—	—	—	0.11	—	—	—	—	—
AAB4233	35-02247	0.00–0.50	Soil	—	—	—	—	—	1.73	—	—	—	—	—
AAB4234	35-02247	1.00–2.00	Soil	—	—	—	—	—	0.164	—	—	—	—	—
AAB4235	35-02247	2.00–3.00	Soil	—	—	—	—	0.016	0.124	—	—	—	—	—
AAB4238	35-02248	1.00–2.00	Soil	—	—	—	—	0.02	0.011	—	—	—	—	—
AAB4239	35-02248	2.00–3.00	Soil	—	0.387	—	—	0.002	0.009	—	—	—	—	—
XAAB4246	35-02249	0.00–0.50	Soil	—	—	—	—	—	0.245	—	—	2.761	—	3.64
0435-97-0075	35-02370	3.00–4.00	Soil	—	5.383	—	—	—	0.342	38.4	0.211	—	—	—
0435-97-0076	35-02370	6.40–7.40	Soil	—	—	—	—	—	—	1.57	0.125	—	—	—
0435-97-0077	35-02370	7.40–9.00	Qbt 2	—	—	—	—	—	—	0.933	0.148	—	—	—

Table C-1.4-4
Samples with Radionuclides Detected (pCi/g) Above Background Values or Fallout Values in Pratt Canyon Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Cobalt-60	Europium-152	Plutonium-238	Plutonium-239	Strontium-90	Tritium	Uranium-234	Uranium-235	Uranium-238
Soil Background Value/Fallout Value				0.013	1.65	na[a]	na	0.023	0.054	1.31	0.766	2.59	0.20	2.29
Qbt 2,3,4 Background Value				0.05	0.1	na	na	0.05	0.05	1	0.3	1.98	0.09	1.93
Qbt 1g, Qct, Qbo Background Value				0.05	0.1	na	na	0.05	0.05	1	0.3	4.0	0.18	3.90
Sediment Background Value				0.04	0.9	na	na	0.006	0.068	1.04	0.093	2.59	0.20	2.29
0435-97-0078	35-02370	12.50–15.00	Qbt 2	—	—	—	—	—	—	—	0.142	—	—	—
0435-97-0080	35-02370	17.50–18.50	Qbt 2	—	—	—	—	—	—	—	0.196	—	0.090	—
CAMO-98-0037	MO-00030	0.00–0.82	Sediment	0.047	1.39	—	—	—	0.082	42.8	—	—	—	—
CAMO-98-0038	MO-00031	1.67–2.66	Sediment	0.113	10.6	—	—	0.017(U)	0.377	63	—	—	—	—
CAMO-98-0039	MO-00031	2.66–2.95	Sediment	0.165	7.7	—	—	0.02(U)	0.421	62	—	—	—	—
CAMO-98-0040	MO-00032	0.00–1.18	Sediment	0.046(U)	1	0.151	—	—	—	52.4	—	—	—	—
CAMO-98-0041	MO-00032	1.18–2.03	Sediment	0.312	19.2	—	—	—	1.19	78	—	—	—	—
CAMO-98-0042	MO-00032	2.03–2.89	Sediment	0.321	25	0.17	—	0.047(U)	1.081	45.2	—	—	—	—
CAMO-98-0043	MO-00033	0.00–0.98	Sediment	—	—	—	—	—	—	4.28	—	—	—	—
CAMO-98-0044	MO-00033	1.90–2.89	Sediment	0.198	12.8	—	—	—	0.715	37.6	—	—	—	—
CAMO-98-0045	MO-00034	1.74–2.16	Sediment	0.412	20.9	0.368	—	0.022(U)	1.32	118	—	—	—	—

[a] na = not available.

[b] U = The analyte was analyzed for but not detected.

C-1.5 Ten Site Canyon Subarea

Table C-1.5-1 presents the analyte suite and request numbers (numbers are listed below the analyte suites) for each sample collected in the Ten Site Canyon Subarea. Each request number includes a batch of samples sent to a specific off-site analytical laboratory for a specific suite of analyses, and the request numbers can be used to track the original data packages from the analytical laboratories. If the sample was not analyzed for a given analyte suite, the cell in that suite's column contains a dash (—).

Also note that the data in this appendix are not arranged by consolidated unit because all data were collected prior to consolidation efforts. For a crosswalk between consolidated unit numbers and individual PRS numbers, refer to Table 1.0-1 in section 1.0.

Table C-1.5-2 presents the inorganic chemical results (mg/kg) above background values for the Ten Site Canyon Subarea. Non-detected results above LANL background values are also presented in Table C-1.5-2. A dash in the results cell indicates that the result was less than background value or not detected, or that the sample was not analyzed for the corresponding chemical.

Table C-1.5-3 presents the detected organic chemical data for the Ten Site Canyon Subarea.

Table C-1.5-4 presents the radionuclide results (pCi/g) above background values or fallout values for the Ten Site Canyon Subarea. Non-detected results above LANL background values are also presented in Table C-1.5-4. A dash in the results cell indicates that the result was less than background value or not detected, or that the sample was not analyzed for the corresponding radionuclide.

Table C-1.5-1
Samples Taken in Ten Site Canyon Subarea

Sample ID	Location ID	Depth (ft)	Media	Limited- List TAL Metals	Non-TAL Metals	TAL Metals	PCBs	Pesticides/PCBs	SVOCs	VOCs	Gamma Spectroscopy	Isotopic-Plutonium	Isotopic-Thorium	Isotopic-Uranium	Strontium-90	Tritium	XRF
PRS 35-010(a)																	
AAA6557	35-02063	0.5–1	Soil	—	—	—	17470	—	—	17470	—	19532	—	19532	—	—	19540
AAA6558	35-02063	0.5–1	Soil	—	—	—	17470	—	—	17470	—	19532	—	19532	—	—	19540
AAA6560	35-02064	0.5–1	Soil	—	—	—	—	17470	17468	17468	—	19532	—	19532	—	—	19540
AAA6585	35-02064	0.5–1	Soil	—	—	—	17470	—	—	17470	—	19532	—	19532	—	—	19540
AAB1517	35-02216	8–9	Soil	—	—	—	17556	—	17556	17556	—	19581	—	19581	—	—	19612
AAB1518	35-02216	14–15	Soil	—	—	—	17556	—	17556	17556	—	19581	—	19581	—	—	19612
AAB1519	35-02216	19–20	Qbt 3	—	—	—	17556	—	17556	17556	—	19581	—	19581	—	—	19612
AAB1520	35-02216	24–25	Qbt 3	—	—	—	17556	—	17556	17556	—	19581	—	19581	—	—	19612
AAB1521	35-02216	29–30	Qbt 3	—	—	—	17556	—	17556	17556	—	19581	—	19581	—	—	19612
AAB1523	35-02216	34–35	Qbt 3	—	—	—	17556	—	—	17556	—	19581	—	19581	—	—	19612
AAB1524	35-02216	39–40	Qbt 2	—	—	—	17550	—	17550	17550	—	19554	—	19554	—	—	19544
AAB1525	35-02216	49–50	Qbt 2	—	—	—	17550	—	17550	17550	—	19554	—	19554	—	—	19544
0435-97-0224	35-02466	0–0.33	Soil	—	—	3372R	3371R	—	3371R	—	3373R	—	—	—	3373R	3373R	—
0435-97-0225	35-02466	0.33–0.66	Soil	—	—	3372R	3371R	—	3371R	3371R	3373R	—	—	—	3373R	3373R	—
0435-97-0226	35-02466	4–5	Qbt 3	—	—	3372R	3371R	—	3371R	3371R	3373R	—	—	—	3373R	3373R	—
0435-97-0227	35-02467	0–0.33	Soil	—	—	3372R	3371R	—	3371R	—	3373R	—	—	—	3373R	3373R	—
0435-97-0228	35-02467	0.33–0.66	Soil	—	—	3372R	3371R	—	3371R	3371R	3373R	—	—	—	3373R	3373R	—
0435-97-0229	35-02467	1.5–2.5	Qbt 3	—	—	3372R	3371R	—	3371R	3371R	3373R	—	—	—	3373R	3373R	—
0435-97-0236	35-02470	0–0.25	Soil	—	—	3372R	3371R	—	3371R	—	3373R	—	—	—	3373R	3373R	—
0435-97-0237	35-02470	0.25–0.5	Soil	—	—	3372R	3371R	—	3371R	3371R	3373R	—	—	—	3373R	3373R	—
0435-97-0238	35-02470	1.5–2.5	Qbt 3	—	—	3372R	3371R	—	3371R	3371R	3373R	—	—	—	3373R	3373R	—
PRS 35-010(b)																	
AAB1537	35-02067	0.5–1	Soil	—	—	—	17470	—	—	17468	—	19532	—	19532	—	—	19540

Table C-1.5-1
Samples Taken in Ten Site Canyon Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	Limited- List TAL Metals	Non-TAL Metals	TAL Metals	PCBs	Pesticides/PCBs	SVOCs	VOCs	Gamma Spectroscopy	Isotopic-Plutonium	Isotopic-Thorium	Isotopic-Uranium	Strontium-90	Tritium	XRF
AAB1538	35-02067	0.5–1	Soil	—	—	—	17470	—	—	17470	—	19532	—	19532	—	—	19540
AAB1541	35-02068	0.5–1	Soil	—	—	—	17470	—	—	17470	—	19532	—	19532	—	—	19540
AAB1542	35-02068	0.5–1	Soil	—	—	—	17470	—	—	17470	—	19532	—	19532	—	—	19540
AAB1509	35-02069	9–10	Qbt 3	19617	19617	—	17554	—	17554	17554	—	19585	—	19585	—	—	19613
AAB1510	35-02069	13–14	Qbt 3	—	—	—	17554	—	17554	17554	—	19585	—	19585	—	—	19613
AAB1511	35-02069	19–20	Qbt 3	—	—	—	17554	—	17554	17554	—	19585	—	19585	—	—	19613
AAB1512	35-02069	23–24	Qbt 3	—	—	—	17554	—	17554	17554	19585	19585	—	19585	—	—	19613
AAB1513	35-02069	29–30	Qbt 2	—	—	—	17554	—	17554	17554	—	19585	—	19585	—	—	19613
AAB1515	35-02069	34–35	Qbt 2	—	—	—	17554	—	17554	17554	—	19585	—	19585	—	—	19613
AAB1514	35-02069	39–40	Qbt 2	—	—	—	17554	—	17554	17554	—	19585	—	19585	—	—	19613
AAB1516	35-02069	49–50	Qbt 2	—	—	—	17554	—	17554	17554	—	19585	—	19585	—	—	19613
0435-97-0230	35-02468	0–0.33	Soil	—	—	3372R	3371R	—	3371R	—	3373R	—	—	—	3373R	3373R	—
0435-97-0231	35-02468	0.33–0.83	Soil	—	—	3372R	3371R	—	3371R	3371R	3373R	—	—	—	3373R	3373R	—
0435-97-0232	35-02468	1.5–2.5	Qbt 3	—	—	3372R	3371R	—	3371R	3371R	3373R	—	—	—	3373R	3373R	—
0435-97-0233	35-02469	0–0.33	Soil	—	—	3372R	3371R	—	3371R	—	3373R	—	—	—	3373R	3373R	—
0435-97-0234	35-02469	0.33–1	Soil	—	—	3372R	3371R	—	3371R	3371R	3373R	—	—	—	3373R	3373R	—
0435-97-0235	35-02469	3.8–4.5	Qbt 3	—	—	3372R	3371R	—	3371R	3371R	3373R	—	—	—	3373R	3373R	—
0435-97-0240	35-02471	0–0.33	Soil	—	—	3396R	3395R	—	3395R	—	3397R	—	—	—	3397R	3397R	—
0435-97-0241	35-02471	0.33–0.58	Soil	—	—	3396R	3395R	—	3395R	3395R	3397R	—	—	—	3397R	3397R	—
0435-97-0242	35-02471	4–5	Qbt 3	—	—	3396R	3395R	—	3395R	3395R	3397R	—	—	—	3397R	3397R	—
0435-97-0243	35-02472	0–0.33	Soil	—	—	3396R	3395R	—	3395R	—	3397R	—	—	—	3397R	3397R	—
0435-97-0244	35-02472	0.33–0.83	Soil	—	—	3396R	3395R	—	3395R	3395R	3397R	—	—	—	3397R	3397R	—
0435-97-0245	35-02472	1.5–2.5	Qbt 3	—	—	3396R	3395R	—	3395R	3395R	3397R	—	—	—	3397R	3397R	—
0435-97-0246	35-02472	1.5–2.5	Qbt 3	—	—	3396R	3395R	—	3395R	3395R	3397R	—	—	—	3397R	3397R	—

Table C-1.5-1
Samples Taken in Ten Site Canyon Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	Limited- List TAL Metals	Non-TAL Metals	TAL Metals	PCBs	Pesticides/PCBs	SVOCs	VOCs	Gamma Spectroscopy	Isotopic-Plutonium	Isotopic-Thorium	Isotopic-Uranium	Strontium-90	Tritium	XRF
0435-97-0247	35-02473	0–0.25	Soil	—	—	3396R	3395R	—	3395R	—	3397R	—	—	—	3397R	3397R	—
0435-97-0248	35-02473	0.25–0.58	Soil	—	—	3396R	3395R	—	3395R	3395R	3397R	—	—	—	3397R	3397R	—
0435-97-0249	35-02473	3.2–4.2	Qbt 3	—	—	3396R	3395R	—	3395R	3395R	3397R	—	—	—	3397R	3397R	—
0435-97-0250	35-02474	0–0.33	Soil	—	—	3396R	3395R	—	3395R	—	3397R	—	—	—	3397R	3397R	—
0435-97-0251	35-02474	0–0.33	Soil	—	—	3396R	3395R	—	3395R	—	3397R	—	—	—	3397R	3397R	—
0435-97-0252	35-02474	0.25–0.66	Soil	—	—	3396R	3395R	—	3395R	3395R	3397R	—	—	—	3397R	3397R	—
0435-97-0253	35-02474	1.5–2.7	Qbt 3	—	—	3396R	3395R	—	3395R	3395R	3397R	—	—	—	3397R	3397R	—
0435-97-0255	35-02475	0–0.33	Soil	—	—	3396R	3395R	—	3395R	—	3397R	—	—	—	3397R	3397R	—
0435-97-0256	35-02475	0.33–1	Soil	—	—	3396R	3395R	—	3395R	3395R	3397R	—	—	—	3397R	3397R	—
0435-97-0257	35-02475	5–5.9	Qbt 3	—	—	3396R	3395R	—	3395R	3395R	3397R	—	—	—	3397R	3397R	—
PRS 35-010(c)																	
AAA6588	35-02065	0.5–1	Soil	—	—	—	17501	—	17501	17501	—	19976	—	19976	—	—	20499
AAB1532	35-02065	0.5–1	Soil	—	—	20440	17501	—	17501	17501	—	19976	—	19976	—	—	20499
AAB1534	35-02066	0.5–1	Soil	—	—	—	17501	—	17501	17501	—	19976	—	19976	—	—	20499
AAB1535	35-02066	0.5–1	Soil	—	—	—	17501	—	17501	17501	—	19976	—	19976	—	—	20499
0435-97-0258	35-02476	0–0.25	Soil	—	—	3406R	3405R	—	3405R	—	3407R	—	—	—	3407R	3407R	—
0435-97-0259	35-02476	0.25–0.5	Soil	—	—	3406R	3405R	—	3405R	3405R	3407R	—	—	—	3407R	3407R	—
0435-97-0260	35-02476	0.66–1.5	Qbt 3	—	—	3406R	3405R	—	3405R	3405R	3407R	—	—	—	3407R	—	—
0435-97-0261	35-02477	0–0.33	Soil	—	—	3406R	3405R	—	3405R	—	3407R	—	—	—	3407R	3407R	—
0435-97-0262	35-02477	0.33–0.5	Soil	—	—	3406R	3405R	—	3405R	3405R	3407R	—	—	—	3407R	3407R	—
0435-97-0263	35-02477	0.66–1.5	Qbt 3	—	—	3406R	3405R	—	3405R	3405R	3407R	—	—	—	3407R	3407R	—
0435-97-0264	35-02478	0–0.25	Soil	—	—	3406R	3405R	—	3405R	—	3407R	—	—	—	3407R	3407R	—
0435-97-0265	35-02478	0.25–0.5	Soil	—	—	3406R	3405R	—	3405R	3405R	3407R	—	—	—	3407R	3407R	—
0435-97-0266	35-02478	4–5	Qbt 3	—	—	3406R	3405R	—	3405R	3405R	3407R	—	—	—	3407R	3407R	—

Table C-1.5-1
Samples Taken in Ten Site Canyon Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	Limited- List TAL Metals	Non-TAL Metals	TAL Metals	PCBs	Pesticides/PCBs	SVOCs	VOCs	Gamma Spectroscopy	Isotopic-Plutonium	Isotopic-Thorium	Isotopic-Uranium	Strontium-90	Tritium	XRF
0435-97-0268	35-02479	0–0.25	Soil	—	—	3406R	3405R	—	3405R	—	3407R	—	—	—	3407R	3407R	—
0435-97-0269	35-02479	0.25–0.5	Soil	—	—	3406R	3405R	—	3405R	3405R	3407R	—	—	—	3407R	3407R	—
0435-97-0270	35-02479	1–2	Qbt 3	—	—	3406R	3405R	—	3405R	3405R	3407R	—	—	—	3407R	3407R	—
0435-97-0271	35-02480	0–0.25	Soil	—	—	3406R	3405R	—	3405R	—	3407R	—	—	—	3407R	3407R	—
0435-97-0272	35-02480	0.25–0.5	Soil	—	—	3406R	3405R	—	3405R	3405R	3407R	—	—	—	3407R	3407R	—
0435-97-0273	35-02480	0.75–1.5	Qbt 3	—	—	3406R	3405R	—	3405R	3405R	3407R	—	—	—	3407R	3407R	—
PRS 35-010(d)																	
0435-95-0112	35-02193	0–1	Soil	—	—	—	—	—	—	—	—	73	—	73	—	—	—
0435-95-0113	35-02193	1–2	Soil	—	—	—	—	69	—	—	—	73	—	73	—	—	—
0435-95-0115	35-02193	2–3	Soil	—	—	71	—	—	—	—	73	73	—	73	—	—	—
0435-95-0118	35-02194	0–1	Soil	—	—	—	—	—	69	—	—	73	—	73	—	—	—
0435-95-0120	35-02194	1–2	Soil	—	—	—	—	—	—	69	—	73	—	73	—	—	—
0435-95-0122	35-02194	2–3	Soil	—	—	—	—	—	—	—	—	73	—	73	—	—	—
0435-95-0123	35-02195	0–0.5	Soil	—	—	—	—	—	—	—	—	73	—	73	—	—	—
0435-97-0133	35-02481	0–0.5	Soil	—	—	3325R	3324R	—	3324R	—	3326R	3326R	3326R	3326R	3326R	—	—
0435-97-0134	35-02481	2–2.5	Soil	—	—	3325R	3324R	—	3324R	—	3326R	3326R	3326R	3326R	3326R	—	—
0435-97-0135	35-02482	0–0.33	Soil	—	—	3291R	3290R	—	3290R	—	3292R	3292R	3292R	3292R	3292R	—	—
0435-97-0136	35-02482	2.8–3.2	Soil	—	—	3291R	3290R	—	3290R	—	3292R	3292R	3292R	3292R	3292R	—	—
0435-97-0138	35-02483	0–0.5	Soil	—	—	3291R	3290R	—	3290R	—	3292R	3292R	3292R	3292R	3292R	—	—
0435-97-0139	35-02483	2.3–2.6	Soil	—	—	3291R	3290R	—	3290R	—	3292R	3292R	3292R	3292R	3292R	—	—
0435-97-0140	35-02484	0–0.5	Soil	—	—	3291R	3290R	—	3290R	—	3292R	3292R	3292R	3292R	3292R	—	—
0435-97-0141	35-02484	2–2.5	Soil	—	—	3291R	3290R	—	3290R	—	3292R	3292R	3292R	3292R	3292R	—	—
0435-97-0142	35-02485	0–0.5	Soil	—	—	3325R	3324R	—	3324R	—	3326R	3326R	3326R	3326R	3326R	—	—
0435-97-0143	35-02486	4–4.5	Soil	—	—	3291R	3290R	—	3290R	—	3292R	3292R	3292R	3292R	3292R	—	—

Table C-1.5-1
Samples Taken in Ten Site Canyon Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	Limited- List TAL Metals	Non-TAL Metals	TAL Metals	PCBs	Pesticides/PCBs	SVOCs	VOCs	Gamma Spectroscopy	Isotopic-Plutonium	Isotopic-Thorium	Isotopic-Uranium	Strontium-90	Tritium	XRF
PRS 35-010(e)																	
0435-95-0124	35-02196	0–0.5	Sediment	—	—	—	—	—	—	—	—	73	—	73	—	—	—
0435-95-0127	35-02197	0–1	Sediment	—	—	—	—	—	—	—	—	73	—	73	—	—	—
0435-95-0128	35-02197	1–2	Sediment	—	—	—	—	—	—	—	—	73	—	73	—	—	—
0435-95-0129	35-02197	2–3	Sediment	—	—	—	—	—	—	—	—	73	—	73	—	—	—
0435-95-0106	35-02235	0–0.5	Sediment	—	—	—	—	—	—	—	—	73	—	73	—	—	—
PRS C-35-007																	
0435-95-0091	35-02198	0–0.5	Soil	—	—	—	—	—	—	—	—	73	—	73	—	—	—
0435-95-0093	35-02199	0–0.5	Soil	—	—	—	—	—	—	—	—	73	—	73	—	—	—
0435-95-0094	35-02200	0–0.5	Soil	—	—	—	—	—	—	—	—	73	—	73	—	—	—
0435-95-0095	35-02201	0–0.5	Soil	—	—	—	—	—	—	—	—	73	—	73	—	—	—
0435-95-0096	35-02202	0–0.5	Soil	—	—	—	—	—	—	—	—	73	—	73	—	—	—
0435-95-0097	35-02203	0–0.5	Soil	—	—	—	—	—	—	—	—	73	—	73	—	—	—
0435-95-0098	35-02204	0–0.5	Soil	—	—	—	—	—	—	—	—	73	—	73	—	—	—
RE35-98-0001	35-02204	0–0.5	Soil	—	—	4330R	—	4329R	4329R	—	—	—	—	—	—	—	—
0435-95-0099	35-02205	0–0.5	Soil	—	—	—	—	—	69	—	—	73	—	73	—	—	—
0435-95-0101	35-02206	0–0.5	Soil	—	—	71	—	—	—	—	—	73	—	73	—	—	—
0435-95-0103	35-02207	0–0.5	Soil	—	—	—	—	69	—	—	73	73	—	73	—	—	—
0435-95-0108	35-02236	0–0.5	Soil	—	—	—	—	—	—	—	—	73	—	73	—	—	—
RE35-98-0002	35-02600	0–0.5	Soil	—	—	4327R	—	4326R	4326R	—	—	—	—	—	—	—	—
RE35-98-0003	35-02601	0–0.5	Soil	—	—	4327R	—	4326R	4326R	—	—	—	—	—	—	—	—
RE35-98-0004	35-02602	0–0.5	Soil	—	—	4327R	—	4326R	4326R	—	—	—	—	—	—	—	—
RE35-98-0005	35-02603	0–0.5	Soil	—	—	4327R	—	4326R	4326R	—	—	—	—	—	—	—	—
RE35-98-0006	35-02604	0–0.5	Soil	—	—	4327R	—	4326R	4326R	—	—	—	—	—	—	—	—

Table C-1.5-1
Samples Taken in Ten Site Canyon Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	Limited- List TAL Metals	Non-TAL Metals	TAL Metals	PCBs	Pesticides/PCBs	SVOCs	VOCs	Gamma Spectroscopy	Isotopic-Plutonium	Isotopic-Thorium	Isotopic-Uranium	Strontium-90	Tritium	XRF
RE35-98-0007	35-02605	0–0.5	Soil	—	—	4327R	—	4326R	4326R	—	—	—	—	—	—	—	—
RE35-98-0008	35-02606	0–0.5	Soil	—	—	4330R	—	4329R	4329R	—	—	—	—	—	—	—	—
RE35-98-0009	35-02607	0–0.5	Soil	—	—	4330R	—	4329R	4329R	—	—	—	—	—	—	—	—
RE35-98-0010	35-02608	0–0.5	Soil	—	—	4333R	—	4332R	4332R	—	—	—	—	—	—	—	—
RE35-98-0011	35-02609	0.5–1.5	Soil	—	—	4333R	—	4332R	4332R	—	—	—	—	—	—	—	—
RE35-98-0012	35-02610	0–0.5	Soil	—	—	4327R	—	4326R	4326R	—	4328R	4328R	—	—	4328R	4328R	—
RE35-98-0013	35-02611	0–0.5	Soil	—	—	4327R	—	4326R	4326R	—	4328R	4328R	—	—	4328R	4328R	—
RE35-98-0014	35-02612	0–0.5	Soil	—	—	4327R	—	4326R	4326R	—	4328R	4328R	—	—	4328R	4328R	—
RE35-98-0015	35-02613	0–0.5	Soil	—	—	4327R	—	4326R	4326R	—	4328R	4328R	—	—	4328R	4328R	—
RE35-98-0016	35-02614	0–0.5	Soil	—	—	4327R	—	4326R	4326R	—	4328R	4328R	—	—	4328R	4328R	—
RE35-98-0017	35-02615	0–0.5	Soil	—	—	4327R	—	4326R	4326R	—	4328R	4328R	—	—	4328R	4328R	—
RE35-98-0018	35-02616	0–0.5	Soil	—	—	—	—	—	—	—	4328R	—	—	—	—	—	—
RE35-98-0019	35-02617	0–0.5	Soil	—	—	—	—	—	—	—	4328R	—	—	—	—	—	—
RE35-98-0020	35-02618	0–0.5	Soil	—	—	—	—	—	—	—	4328R	—	—	—	—	—	—
RE35-98-0021	35-02619	0–0.5	Soil	—	—	—	—	—	—	—	4328R	—	—	—	—	—	—

Table C-1.5-2
Inorganic Chemicals with Concentrations (mg/kg) or Detection Limits at or Exceeding Background Values in Ten Site Canyon Subarea

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Lead	Manganese	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Soil Background Value				29200	0.83	8.17	295	1.83	0.4	6120	19.3	8.64	14.7	22.3	671	0.1	15.4	1.52	1	0.73	39.6	48.8
Qbt 2,3,4 Background Value				7340	0.5	2.79	46	1.21	1.63	2200	7.14	3.14	4.66	11.2	482	0.1	6.58	0.3	1	1.1	17	63.5
PRS 35-010(a)																						
0435-97-0224	35-02466	0.00–0.33	Soil	—	—	—	—	—	0.53(U)[a]	—	—	—	26	—	—	0.19	—	—	2.1	1.4(U)	—	72
0435-97-0225	35-02466	0.33–0.67	Soil	—	—	—	—	—	0.54(U)	—	32	—	15	—	—	0.11(U)	—	—	2.2(U)	1.4(U)	—	—
0435-97-0226	35-02466	4.00–5.00	Qbt 3	—	—	—	49	—	—	—	23	—	—	—	—	0.12(U)	13	0.47(UJ)[b]	2.3(U)	1.5(U)	—	—
0435-97-0227	35-02467	0.00–0.33	Soil	—	—	—	—	—	0.75	—	—	—	53	24	—	0.31	—	—	5.4	1.5(U)	—	130
0435-97-0228	35-02467	0.33–0.67	Soil	—	—	—	—	—	0.97	—	20	—	86	32	—	0.4	—	—	8.8	1.5(U)	—	160
0435-97-0229	35-02467	1.50–2.50	Qbt 3	—	—	—	—	—	—	—	9.5	—	—	—	—	0.11(U)	—	0.44(UJ)	2.2(U)	1.4(U)	—	—
0435-97-0236	35-02470	0.00–0.25	Soil	—	—	—	440	—	3.7	—	77	—	430	98	—	4	29	—	56	2.1	69	690
0435-97-0237	35-02470	0.25–0.50	Soil	—	—	—	—	—	0.56(U)	—	—	—	—	—	—	0.11(U)	—	—	2.2(U)	1.5(U)	—	71
0435-97-0238	35-02470	1.50–2.50	Qbt 3	—	—	—	—	—	—	—	—	—	—	—	—	0.11(U)	—	0.44(UJ)	2.2(U)	1.4(U)	—	—
PRS 35-010(b)																						
AAB1509	35-02069	9.00–10.00	Qbt 3	—	4.2(U)	3(U)	—	—	—	—	—	—	—	—	—	—	—	6.6(U)	—	23.4(U)	—	—
0435-97-0230	35-02468	0.00–0.33	Soil	—	—	—	—	—	0.92	—	23	—	96	27	—	0.46	—	—	19	1.3(U)	—	160
0435-97-0231	35-02468	0.33–0.83	Soil	—	—	—	—	—	0.53(U)	—	—	—	—	—	—	0.11(U)	—	—	2.1(U)	1.4(U)	—	—
0435-97-0232	35-02468	1.50–2.50	Qbt 3	—	—	—	—	—	—	—	14	—	—	—	—	0.11(U)	—	0.43(UJ)	2.1(U)	1.4(U)	—	—
0435-97-0233	35-02469	0.00–0.33	Soil	—	—	—	—	—	0.51(U)	—	—	—	16	—	—	—	—	—	2(U)	1.3(U)	—	53
0435-97-0234	35-02469	0.33–1.00	Soil	—	—	—	—	—	0.53(U)	—	—	—	—	—	—	0.11(U)	23	—	2.1(U)	1.4(U)	—	—
0435-97-0235	35-02469	3.80–4.50	Qbt 3	—	—	—	—	—	—	—	39	—	—	—	—	0.11(U)	20	0.43(UJ)	2.2(U)	1.4(U)	—	—
0435-97-0240	35-02471	0.00–0.33	Soil	—	12(UJ)	—	—	—	0.58(U)	—	—	—	69(J-)	27(J-)	—	0.47	—	—	12(J-)[c]	—	—	100
0435-97-0241	35-02471	0.33–0.58	Soil	—	12(UJ)	—	—	—	0.59(U)	—	—	—	—	—	—	0.12	—	—	2.4(UJ)	—	—	54
0435-97-0242	35-02471	4.00–5.00	Qbt 3	—	11(UJ)	—	—	—	—	—	48	—	—	16(J-)	670(J-)	0.11(U)	23	0.44(UJ)	2.2(UJ)	—	—	—
0435-97-0243	35-02472	0.00–0.33	Soil	—	11(UJ)	—	—	—	0.54(U)	—	—	—	68(J-)	27(J-)	—	0.22	—	—	11(J-)	—	—	110
0435-97-0244	35-02472	0.33–0.83	Soil	—	11(UJ)	—	—	—	0.56(U)	—	—	—	—	—	—	0.11	—	—	2.2(UJ)	—	—	—
0435-97-0245	35-02472	1.50–2.50	Qbt 3	—	11(UJ)	—	—	—	—	—	51	—	—	18(J-)	—	0.11(U)	24	0.44(UJ)	2.2(UJ)	—	—	—
0435-97-0246	35-02472	1.50–2.50	Qbt 3	—	11(UJ)	—	—	—	—	—	65	—	—	21(J-)	—	0.11(U)	30	0.45(UJ)	2.2(UJ)	—	—	—

Table C-1.5-2
Inorganic Chemicals with Concentrations (mg/kg) or Detection Limits at or Exceeding Background Values in Ten Site Canyon Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Lead	Manganese	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Soil Background Value				**29200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**22.3**	**671**	**0.1**	**15.4**	**1.52**	**1**	**0.73**	**39.6**	**48.8**
Qbt 2,3,4 Background Value				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**11.2**	**482**	**0.1**	**6.58**	**0.3**	**1**	**1.1**	**17**	**63.5**
0435-97-0247	35-02473	0.00–0.25	Soil	—	11(UJ)	—	—	—	0.78(U)	—	28	—	140(J-)	39(J-)	—	0.87	—	—	25(J-)	0.78	—	160
0435-97-0248	35-02473	0.25–0.58	Soil	—	11(UJ)	—	—	—	0.56(U)	—	—	—	—	—	—	0.11(U)	—	—	2.2(UJ)	—	—	51
0435-97-0249	35-02473	3.20–4.20	Qbt 3	—	11(UJ)	—	—	—	—	—	59	—	—	—	—	0.11(U)	29	0.44(UJ)	2.2(UJ)	—	—	—
0435-97-0250	35-02474	0.00–0.33	Soil	—	11(UJ)	—	—	—	0.62	—	36	—	180(J-)	46(J-)	—	1	—	—	34(J-)	—	—	160
0435-97-0251	35-02474	0.00–0.33	Soil	—	11(UJ)	—	—	—	0.56(U)	—	—	—	90(J-)	29(J-)	—	0.79	—	—	15(J-)	—	—	120
0435-97-0252	35-02474	0.25–0.67	Soil	—	11(UJ)	—	—	—	0.57(U)	—	—	—	16(J-)	—	—	0.11	—	—	2.9(J-)	—	—	59
0435-97-0253	35-02474	1.50–2.70	Qbt 3	—	11(UJ)	—	—	—	—	—	57	—	5.9(J-)	—	—	0.11(U)	26	0.46(UJ)	2.3(UJ)	—	—	—
0435-97-0255	35-02475	0.00–0.33	Soil	—	10(UJ)	—	—	—	0.52(U)	—	—	—	51(J-)	24(J-)	—	0.31	—	—	7.4(UJ)	—	—	86
0435-97-0256	35-02475	0.33–1.00	Soil	—	11(UJ)	—	—	—	0.53(U)	—	38	—	20(J-)	—	—	0.11(U)	20	—	2.8(J-)	—	—	—
0435-97-0257	35-02475	5.00–5.90	Qbt 3	9200	11(UJ)	—	100	1.4	—	2700	34	—	—	—	—	0.11(U)	19	0.44(UJ)	2.2(UJ)	—	—	—
PRS 35-010(c)																						
AAB1532	35-02065	0.50–1.00	Soil	—	4.1(U)	—	—	—	0.51(U)	—	—	—	68.2	—	—	—	—	—	18.6	0.84(U)	—	71
0435-97-0258	35-02476	0.00–0.25	Soil	—	6.5(U)	—	—	—	1.1(J)	—	25.4	—	113(J+)[d]	34.9	—	—	—	—	5.6(J+)	0.81(J)	—	161
0435-97-0259	35-02476	0.25–0.50	Soil	—	7(U)	—	—	—	0.58(U)	—	—	—	28.3(J+)	—	—	—	—	—	4.3(J+)	—	—	90.6
0435-97-0260	35-02476	0.66–1.50	Qbt 3	—	6.8(U)	—	—	—	—	—	—	—	—	—	—	—	—	0.34(U)	2(U)	—	—	—
0435-97-0261	35-02477	0.00–0.33	Soil	—	6.7(U)	—	—	—	0.55(U)	—	—	—	82(J+)	28.3	—	—	—	—	7.5(J+)	—	—	126
0435-97-0262	35-02477	0.33–0.50	Soil	—	7(U)	—	—	—	0.58(U)	—	—	—	19.3(J+)	—	—	1.3	—	—	2(U)	—	—	60
0435-97-0263	35-02477	0.67–1.50	Qbt 3	—	6.9(U)	—	—	—	—	—	—	—	—	—	—	—	—	0.34(U)	2(U)	—	—	—
0435-97-0264	35-02478	0.00–0.25	Soil	—	6.2(U)	—	—	—	0.71(J)	—	27.2	—	125(J+)	32.5	—	—	17.6	—	25.8(J+)	—	—	153
0435-97-0265	35-02478	0.25–0.50	Soil	—	6.4(U)	—	—	—	0.53(U)	—	—	—	—	—	—	1.2	—	—	1.9(U)	—	—	—
0435-97-0266	35-02478	4.00–5.00	Qbt 3	—	6.5(U)	—	—	—	—	—	11.5	—	—	—	—	—	7.5(J)	0.32(U)	1.9(U)	—	—	—
0435-97-0268	35-02479	0.00–0.25	Soil	—	6.1(U)	—	—	—	0.51(U)	—	—	—	16.2(J+)	—	—	—	—	—	1.8(U)	—	—	57.7
0435-97-0269	35-02479	0.25–0.50	Soil	—	6.3(U)	—	—	—	0.52(U)	—	—	8.8(J)	—	—	994	0.55	—	—	1.8(U)	—	—	—
0435-97-0270	35-02479	1.00–2.00	Qbt 3	—	6.6(U)	—	—	—	—	—	12.8	—	—	—	—	—	9.6	0.33(U)	1.9(U)	—	—	—
0435-97-0271	35-02480	0.00–0.25	Soil	—	6(U)	—	—	—	1.4	—	31.9	—	166(J+)	60.1	—	—	24.1	—	13.1(J+)	1.2(J)	—	327

Table C-1.5-2
Inorganic Chemicals with Concentrations (mg/kg) or Detection Limits at or Exceeding Background Values in Ten Site Canyon Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Lead	Manganese	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Soil Background Value				**29200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**22.3**	**671**	**0.1**	**15.4**	**1.52**	**1**	**0.73**	**39.6**	**48.8**
Qbt 2,3,4 Background Value				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**11.2**	**482**	**0.1**	**6.58**	**0.3**	**1**	**1.1**	**17**	**63.5**
0435-97-0272	35-02480	0.25–0.50	Soil	—	6.7(U)	—	—	—	0.55(U)	—	—	—	15(J+)	—	—	1	—	—	1.9(U)	—	—	52.1
0435-97-0273	35-02480	0.75–1.50	Qbt 3	—	6.4(U)	—	—	—	—	—	—	—	—	—	—	—	—	0.32(U)	1.9(U)	—	—	—
PRS 35-010(d)																						
0435-95-0115	35-02193	2.00–3.00	Soil	—	—	—	—	—	—	—	—	—	—	—	—	0.11(U)	—	—	1.5(U)	1.5(UJ)	—	—
0435-97-0133	35-02481	0.00–0.50	Soil	—	4.9(U)	—	—	—	0.49(U)	—	—	—	—	—	—	—	—	—	—	—	—	—
0435-97-0134	35-02481	2.00–2.50	Soil	—	4.6(U)	—	—	—	0.46(U)	—	—	—	—	—	—	—	—	—	—	—	—	—
0435-97-0135	35-02482	0.00–0.33	Soil	—	6(U)	—	—	—	0.5(U)	—	—	—	—	—	—	—	—	—	1.8(U)	—	—	—
0435-97-0136	35-02482	2.80–3.20	Soil	—	6.1(U)	—	—	—	0.5(U)	—	—	—	—	—	—	—	—	—	1.8(U)	—	—	—
0435-97-0138	35-02483	0.00–0.50	Soil	—	5.7(U)	—	—	—	0.47(U)	—	—	—	—	—	—	0.13	—	—	3.3	—	—	—
0435-97-0139	35-02483	2.30–2.60	Soil	—	5.8(U)	—	—	—	0.48(U)	—	—	—	—	—	—	—	—	—	1.7(U)	—	—	—
0435-97-0140	35-02484	0.00–0.50	Soil	—	6.1(U)	—	—	—	0.5(U)	—	—	—	—	—	—	—	—	—	1.8(U)	—	—	—
0435-97-0141	35-02484	2.00–2.50	Soil	—	5.4(U)	—	—	—	0.45(U)	—	—	—	—	—	—	—	—	—	1.6(U)	—	—	—
0435-97-0142	35-02485	0.00–0.50	Soil	—	4.1(U)	—	—	—	0.41(U)	—	—	—	—	—	—	—	—	—	—	—	—	—
0435-97-0143	35-02486	4.00–4.50	Soil	—	5.5(U)	—	—	—	0.45(U)	—	—	—	—	—	—	—	—	—	1.6(U)	—	—	—
PRS C-35-007																						
0435-95-0101	35-02206	0.00–0.50	Soil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.4(U)	1.4(UJ)	—	—
RE35-98-0002	35-02600	0.00–0.50	Soil	—	—	—	—	—	—	9300	—	—	—	—	—	—	—	—	—	—	—	—
RE35-98-0003	35-02601	0.00–0.50	Soil	—	—	—	—	—	—	7300	—	—	—	—	—	—	—	—	—	—	—	—
RE35-98-0005	35-02603	0.00–0.50	Soil	—	—	—	—	—	—	—	—	—	—	—	—	0.11(U)	—	—	—	—	—	—

[a] U = The analyte was analyzed for but not detected.

[b] UJ = The analyte was not positively identified in the sample, and the associated value is an estimate of the sample-specific detection or quantitation limit.

[c] J- = The analyte was positively identified, and the result is likely to be biased low.

[d] J+ = The analyte was positively identified, and the result is likely to be biased high.

Table C-1.5-3
Detected Organic Chemicals in Ten Site Canyon Subarea

Analyte	Location ID	Sample ID	Sample Value (mg/kg)	Media	Depth (ft)
PRS 35-010(a)					
Acetone	35-02063	AAA6557	0.24	Soil	0.5–1
	35-02063	AAA6558	2.6	Soil	0.5–1
Aroclor-1254	35-02064	AAA6560	0.58	Soil	0.5–1
	35-02466	0435-97-0224	0.056	Soil	0–0.33
	35-02467	0435-97-0227	0.091	Soil	0–0.33
	35-02467	0435-97-0228	0.15	Soil	0.33–0.67
	35-02470	0435-97-0236	1.2	Soil	0–0.25
Aroclor-1260	35-02064	AAA6560	0.32(J)[a]	Soil	0.5–1
Benzo(a)anthracene	35-02467	0435-97-0227	0.039(J)	Soil	0–0.33
	35-02467	0435-97-0228	0.043(J)	Soil	0.33–0.67
Bis(2-ethylhexyl)phthalate	35-02064	AAA6560	19	Soil	0.5–1
	35-02466	0435-97-0224	0.46	Soil	0–0.33
	35-02466	0435-97-0225	0.14(J)	Soil	0.33–0.67
	35-02467	0435-97-0227	1	Soil	0–0.33
	35-02467	0435-97-0228	1.5	Soil	0.33–0.67
	35-02470	0435-97-0236	9	Soil	0–0.25
	35-02470	0435-97-0237	0.11(J)	Soil	0.25–0.5
	35-02470	0435-97-0238	0.052(J)	Qbt 3	1.5–2.5
Butanone[2-]	35-02063	AAA6558	0.182	Soil	0.5–1
Butylbenzylphthalate	35-02064	AAA6560	1.7	Soil	0.5–1
	35-02466	0435-97-0224	0.091(J)	Soil	0–0.33
	35-02467	0435-97-0227	0.091(J)	Soil	0–0.33
	35-02467	0435-97-0228	0.17(J)	Soil	0.33–0.67
Carbon disulfide	35-02063	AAA6558	0.007	Soil	0.5–1
	35-02064	AAA6585	0.01	Soil	0.5–1
Chloromethane	35-02467	0435-97-0228	0.008(J)	Soil	0.33–0.67
Chrysene	35-02466	0435-97-0224	0.038(J)	Soil	0–0.33
	35-02467	0435-97-0227	0.044(J)	Soil	0–0.33
	35-02467	0435-97-0228	0.054(J)	Soil	0.33–0.67
	35-02470	0435-97-0236	0.37(J)	Soil	0–0.25
Dichlorobenzene[1,2-]	35-02063	AAA6557	0.03	Soil	0.5–1
	35-02063	AAA6558	0.109	Soil	0.5–1
	35-02064	AAA6585	0.03	Soil	0.5–1
Di-n-butylphthalate	35-02466	0435-97-0224	0.046(J)	Soil	0–0.33
	35-02466	0435-97-0225	0.073(J)	Soil	0.33–0.67
	35-02467	0435-97-0228	0.041(J)	Soil	0.33–0.67
	35-02466	0435-97-0224	0.037(J)	Soil	0–0.33
	35-02467	0435-97-0228	0.094(J)	Soil	0.33–0.67
Ethylbenzene	35-02063	AAA6557	0.006	Soil	0.5–1
	35-02063	AAA6558	0.008	Soil	0.5–1

Table C-1.5-3
Detected Organic Chemicals in Ten Site Canyon Subarea (continued)

Analyte	Location ID	Sample ID	Sample Value (mg/kg)	Media	Depth (ft)
Fluoranthene	35-02466	0435-97-0224	0.046(J)	Soil	0–0.33
	35-02467	0435-97-0227	0.069(J)	Soil	0–0.33
	35-02467	0435-97-0228	0.079(J)	Soil	0.33–0.67
Isopropyltoluene[4-]	35-02063	AAA6557	0.096	Soil	0.5–1
	35-02063	AAA6558	0.284	Soil	0.5–1
	35-02064	AAA6585	0.034	Soil	0.5–1
Pyrene	35-02466	0435-97-0224	0.06(J)	Soil	0–0.33
	35-02467	0435-97-0227	0.054(J)	Soil	0–0.33
	35-02467	0435-97-0228	0.079(J)	Soil	0.33–0.67
	35-02470	0435-97-0236	0.46(J)	Soil	0–0.25
Tetrachloroethene	35-02470	0435-97-0237	0.001(J+)[b]	Soil	0.25–0.5
	35-02470	0435-97-0238	0.001(J+)	Qbt 3	1.5–2.5
Toluene	35-02063	AAA6557	0.16	Soil	0.5–1
	35-02063	AAA6558	0.017	Soil	0.5–1
	35-02064	AAA6560	0.16	Soil	0.5–1
	35-02064	AAA6585	0.012	Soil	0.5–1
	35-02466	0435-97-0225	0.003(J+)	Soil	0.33–0.667
	35-02467	0435-97-0228	0.002(J)	Soil	0.33–0.67
	35-02470	0435-97-0237	0.009(J+)	Soil	0.25–0.5
	35-02470	0435-97-0238	0.004(J+)	Qbt 3	1.5–2.5
Trichloro-1,2,2-trifluoroethane[1,1,2-]	35-02467	0435-97-0228	0.001(J)	Soil	0.33–0.67
Trichloroethene	35-02470	0435-97-0237	0.002(J+)	Soil	0.25–0.5
Trimethylbenzene[1,2,4-]	35-02063	AAA6557	0.008	Soil	0.5–1
	35-02063	AAA6558	0.044	Soil	0.5–1
	35-02064	AAA6560	0.083	Soil	0.5–1
	35-02064	AAA6585	0.129	Soil	0.5–1
Trimethylbenzene[1,3,5-]	35-02063	AAA6557	0.033	Soil	0.5–1
	35-02064	AAA6585	0.014	Soil	0.5–1
Xylene (total)	35-02063	AAA6557	0.027	Soil	0.5–1
	35-02063	AAA6558	0.041	Soil	0.5–1
	35-02064	AAA6585	0.008	Soil	0.5–1
	35-02470	0435-97-0238	0.002(J+)	Qbt 3	1.5–2.5
PRS 35-010(b)					
Acetone	35-02068	AAB1542	0.478	Soil	0.5–1
Aroclor-1254	35-02468	0435-97-0230	0.19	Soil	0–0.33
	35-02471	0435-97-0240	0.077	Soil	0–0.33
	35-02472	0435-97-0243	0.083	Soil	0–0.33
	35-02473	0435-97-0247	0.14	Soil	0–0.25
	35-02474	0435-97-0250	0.14	Soil	0–0.33
	35-02474	0435-97-0251	0.14	Soil	0–0.33
	35-02475	0435-97-0255	0.065	Soil	0–0.33
Aroclor-1260	35-02067	AAB1537	2.8(J)	Soil	0.5–1
	35-02468	0435-97-0231	0.074	Soil	0.33–0.83

Table C-1.5-3
Detected Organic Chemicals in Ten Site Canyon Subarea (continued)

Analyte	Location ID	Sample ID	Sample Value (mg/kg)	Media	Depth (ft)
Benzo(b)fluoranthene	35-02472	0435-97-0243	0.048(J)	Soil	0–0.33
Benzo(g,h,i)perylene	35-02472	0435-97-0243	0.057(J)	Soil	0–0.33
Bis(2-ethylhexyl)phthalate	35-02468	0435-97-0230	0.8(J)	Soil	0–0.33
	35-02468	0435-97-0231	0.041(J)	Soil	0.33–0.83
	35-02469	0435-97-0233	0.18(J)	Soil	0–0.33
	35-02471	0435-97-0240	1.4	Soil	0–0.33
	35-02471	0435-97-0241	0.15(J)	Soil	0.33–0.58
	35-02472	0435-97-0243	2	Soil	0–0.33
	35-02472	0435-97-0244	0.06(J)	Soil	0.33–0.83
	35-02473	0435-97-0247	3.3	Soil	0–0.25
	35-02473	0435-97-0248	0.32(J)	Soil	0.25–0.58
	35-02474	0435-97-0250	3.9	Soil	0–0.33
	35-02474	0435-97-0251	3.3	Soil	0–0.33
	35-02474	0435-97-0252	0.15(J)	Soil	0.25–0.67
	35-02474	0435-97-0253	0.1(J)	Qbt 3	1.5–2.7
	35-02475	0435-97-0255	1.6	Soil	0–0.33
	35-02475	0435-97-0256	0.21(J)	Soil	0.33–1
Fluoranthene	35-02472	0435-97-0243	0.038(J)	Soil	0–0.33
Indeno(1,2,3-cd)pyrene	35-02472	0435-97-0243	0.051(J)	Soil	0–0.33
Pyrene	35-02469	0435-97-0233	0.038(J)	Soil	0–0.33
	35-02472	0435-97-0243	0.036(J)	Soil	0–0.33
Tetrachloroethene	35-02471	0435-97-0241	0.002(J+)	Soil	0.33–0.58
	35-02472	0435-97-0244	0.002(J+)	Soil	0.33–0.83
	35-02474	0435-97-0252	0.001(J)	Soil	0.25–0.67
	35-02475	0435-97-0256	0.001(J)	Soil	0.33–1
Toluene	35-02468	0435-97-0231	0.002(J+)	Soil	0.33–0.83
	35-02469	0435-97-0234	0.002(J+)	Soil	0.33–1
	35-02471	0435-97-0241	0.006(J+)	Soil	0.33–0.583
	35-02472	0435-97-0244	0.008(J+)	Soil	0.33–0.83
	35-02473	0435-97-0248	0.004(J+)	Soil	0.25–0.58
	35-02475	0435-97-0256	0.01(J)	Soil	0.33–1
Trichloroethene	35-02472	0435-97-0244	0.002(J+)	Soil	0.33–0.83
	35-02474	0435-97-0252	0.002(J)	Soil	0.25–0.67
	35-02475	0435-97-0256	0.002(J)	Soil	0.33–1
Trimethylbenzene[1,2,4-]	35-02067	AAB1537	0.032	Soil	0.5–1
Xylene (total)	35-02469	0435-97-0234	0.001(J+)	Soil	0.33–1
	35-02471	0435-97-0241	0.001(J+)	Soil	0.33–0.58
	35-02472	0435-97-0244	0.003(J+)	Soil	0.33–0.83
	35-02474	0435-97-0252	0.002(J)	Soil	0.25–0.67
	35-02475	0435-97-0256	0.002(J)	Soil	0.33–1

Table C-1.5-3
Detected Organic Chemicals in Ten Site Canyon Subarea (continued)

Analyte	Location ID	Sample ID	Sample Value (mg/kg)	Media	Depth (ft)
PRS 35-010(c)					
Aroclor-1254	35-02476	0435-97-0258	0.052	Soil	0–0.25
	35-02477	0435-97-0261	0.034(J)	Soil	0–0.33
	35-02478	0435-97-0264	0.058	Soil	0–0.25
	35-02480	0435-97-0271	0.11	Soil	0–0.25
Aroclor-1260	35-02476	0435-97-0258	0.072	Soil	0–0.25
	35-02477	0435-97-0261	0.045	Soil	0–0.33
	35-02478	0435-97-0264	0.091	Soil	0–0.25
	35-02480	0435-97-0271	0.12	Soil	0–0.25
Toluene	35-02476	0435-97-0259	0.0083	Soil	0.25–0.5
	35-02478	0435-97-0265	0.0087	Soil	0.25–0.5
	35-02479	0435-97-0269	0.0034(J)	Soil	0.25–0.5
	35-02480	0435-97-0272	0.0031(J)	Soil	0.25–0.5
Xylene (total)	35-02476	0435-97-0259	0.002(J)	Soil	0.25–0.5
	35-02478	0435-97-0265	0.004(J)	Soil	0.25–0.5
PRS 35-010(d)					
Bis(2-ethylhexyl)phthalate	35-02482	0435-97-0135	0.049(J)	Soil	0–0.33
	35-02483	0435-97-0139	0.11(J)	Soil	2.3–2.6
Di-n-butylphthalate	35-02481	0435-97-0133	0.036(J)	Soil	0–0.5
PRS C-35-007					
Aroclor-1254	35-02608	RE35-98-0010	0.034	Soil	0–0.5
Benzoic Acid	35-02606	RE35-98-0008	0.023(J)	Soil	0–0.5
Bis(2-ethylhexyl)phthalate	35-02607	RE35-98-0009	0.058(J)	Soil	0–0.5
Di-n-butylphthalate	35-02204	RE35-98-0001	0.017(J)	Soil	0–0.5
	35-02607	RE35-98-0009	0.022(J)	Soil	0–0.5
	35-02609	RE35-98-0011	0.02(J)	Soil	0.5–1.5

[a] J = The analyte was positively identified, and the associated numerical value is estimated to be more uncertain than would normally be expected for that analysis.

[b] J+ = The analyte was positively identified, and the result is likely to be biased high.

Table C-1.5-4
Samples with Radionuclides Detected (pCi/g) Above Background Values or Fallout Values in Ten Site Canyon Subarea

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Europium-152	Plutonium-238	Plutonium-239	Ruthenium-106	Strontium-90	Tritium	Uranium-234	Uranium-238
Soil Background Value/Fallout Value				0.013	1.65	na[a]	0.023	0.054	na	1.31	0.766	2.59	2.29
Qbt 2,3,4 Background Value				0.05	0.1	na	0.05	0.05	na	1	0.3	1.98	1.93
Sediment Background Value				0.04	0.9	na	0.006	0.068	na	1.3	0.093	2.59	2.29
PRS 35-010(a)													
AAA6557	35-02063	0.50-1.00	Soil	—	—	—	0.32	3.46	—	—	—	4.06	2.66
AAA6558	35-02063	0.50-1.00	Soil	—	—	—	0.05	0.39	—	—	—	—	—
AAA6560	35-02064	0.50-1.00	Soil	—	—	—	0.29	2.49	—	—	—	3.4	3.09
AAA6585	35-02064	0.50-1.00	Soil	—	—	—	0.15	1.44	—	—	—	3.09	—
AAB1517	35-02216	8.00-9.00	Soil	—	—	—	0.018	—	—	—	—	—	—
AAB1518	35-02216	14.00-15.00	Soil	—	—	—	0.002	—	—	—	—	—	—
AAB1519	35-02216	19.00-20.00	Qbt 3	—	—	—	—	0.056	—	—	—	—	—
AAB1520	35-02216	24.00-25.00	Qbt 3	—	—	—	0.02	—	—	—	—	—	—
AAB1524	35-02216	39.00-40.00	Qbt 2	—	—	—	0.009	—	—	—	—	—	—
0435-97-0224	35-02466	0.00-0.33	Soil	0.11(U)[b]	—	—	—	—	—	—	1.86	—	—
0435-97-0225	35-02466	0.33-0.67	Soil	—	0.076	—	—	—	—	—	0.721	—	—
0435-97-0227	35-02467	0.00-0.33	Soil	0.089(U)	—	—	—	—	—	—	3.27	—	—
0435-97-0228	35-02467	0.33-0.67	Soil	0.104(U)	0.147	—	—	—	—	—	18.5	—	—
0435-97-0229	35-02467	1.50-2.50	Qbt 3	—	—	—	—	—	—	—	0.307	—	—
0435-97-0236	35-02470	0.00-0.25	Soil	0.536	—	—	—	—	—	—	178	—	—
0435-97-0237	35-02470	0.25-0.50	Soil	—	—	—	—	—	—	—	2.32	—	—
0435-97-0238	35-02470	1.50-2.50	Qbt 3	—	—	—	—	—	—	—	0.388	—	—
PRS 35-010(b)													
AAB1537	35-02067	0.50-1.00	Soil	—	—	—	0.17	1.21	—	—	—	—	—
AAB1538	35-02067	0.50-1.00	Soil	—	—	—	0.02	0.18	—	—	—	—	—
AAB1541	35-02068	0.50-1.00	Soil	—	—	—	0.27	2.15	—	—	—	4.45	3.5

Table C-1.5-4
Samples with Radionuclides Detected (pCi/g) Above Background Values or Fallout Values in Ten Site Canyon Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Europium-152	Plutonium-238	Plutonium-239	Ruthenium-106	Strontium-90	Tritium	Uranium-234	Uranium-238
Soil Background Value/Fallout Value				0.013	1.65	na[a]	0.023	0.054	na	1.31	0.766	2.59	2.29
Qbt 2,3,4 Background Value				0.05	0.1	na	0.05	0.05	na	1	0.3	1.98	1.93
Sediment Background Value				0.04	0.9	na	0.006	0.068	na	1.3	0.093	2.59	2.29
AAB1542	35-02068	0.50-1.00	Soil	—	—	—	0.09	0.8	—	—	—	—	—
AAB1509	35-02069	9.00-10.00	Qbt 3	—	—	—	0.009	0.034	—	—	—	—	—
AAB1510	35-02069	13.00-14.00	Qbt 3	—	—	—	0.007	—	—	—	—	—	—
AAB1511	35-02069	19.00-20.00	Qbt 3	—	—	—	0.011	—	—	—	—	—	—
AAB1512	35-02069	23.00-24.00	Qbt 3	—	—	—	0.007	0.007	—	—	—	—	—
AAB1513	35-02069	29.00-30.00	Qbt 2	—	—	—	0.023	0.011	—	—	—	—	—
AAB1515	35-02069	34.00-35.00	Qbt 2	—	—	—	0.023	0.007	—	—	—	—	—
AAB1514	35-02069	39.00-40.00	Qbt 2	—	—	—	0.004	—	—	—	—	—	—
0435-97-0230	35-02468	0.00-0.33	Soil	—	—	—	—	—	—	—	25.2	—	—
0435-97-0231	35-02468	0.33-0.83	Soil	0.071(U)	—	—	—	—	—	—	0.568	—	—
0435-97-0233	35-02469	0.00-0.33	Soil	0.27(U)	—	—	—	—	—	—	4.07	—	—
0435-97-0235	35-02469	3.80-4.50	Qbt 3	—	—	—	—	—	0.527	—	—	—	—
0435-97-0240	35-02471	0.00-0.33	Soil	0.19(U)	—	—	—	—	—	—	—	—	—
0435-97-0241	35-02471	0.33-0.58	Soil	0.28(U)	—	—	—	—	—	—	—	—	—
0435-97-0242	35-02471	4.00-5.00	Qbt 3	—	—	—	—	—	—	0.77	—	—	—
0435-97-0243	35-02472	0.00-0.33	Soil	0.08(U)	—	—	—	—	—	4.12	—	—	—
0435-97-0245	35-02472	1.50-2.50	Qbt 3	—	—	—	—	—	—	1.41	—	—	—
0435-97-0246	35-02472	1.50-2.50	Qbt 3	—	—	—	—	—	—	0.68	—	—	—
0435-97-0247	35-02473	0.00-0.25	Soil	0.29(U)	—	—	—	—	—	—	—	—	—
0435-97-0248	35-02473	0.25-0.58	Soil	—	—	—	—	—	—	0.73	—	—	—
0435-97-0249	35-02473	3.20-4.20	Qbt 3	—	—	—	—	—	—	—	—	—	—
0435-97-0250	35-02474	0.00-0.33	Soil	0.32(U)	—	—	—	—	—	—	—	—	—

Table C-1.5-4
Samples with Radionuclides Detected (pCi/g) Above Background Values or Fallout Values in Ten Site Canyon Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Europium-152	Plutonium-238	Plutonium-239	Ruthenium-106	Strontium-90	Tritium	Uranium-234	Uranium-238
Soil Background Value/Fallout Value				0.013	1.65	na[a]	0.023	0.054	na	1.31	0.766	2.59	2.29
Qbt 2,3,4 Background Value				0.05	0.1	na	0.05	0.05	na	1	0.3	1.98	1.93
Sediment Background Value				0.04	0.9	na	0.006	0.068	na	1.3	0.093	2.59	2.29
0435-97-0251	35-02474	0.00-0.33	Soil	0.09(U)	—	—	—	—	—	—	—	—	—
0435-97-0252	35-02474	0.25-0.67	Soil	—	—	—	—	—	—	7.86	—	—	—
0435-97-0255	35-02475	0.00-0.33	Soil	0.14(U)	—	—	—	—	—	—	—	—	—
0435-97-0257	35-02475	5.00-5.90	Qbt 3	—	—	—	—	—	—	2.4(J-)	—	—	—
PRS 35-010(c)													
AAA6588	35-02065	0.50-1.00	Soil	—	—	—	0.06	0.6	—	—	—	—	—
AAB1532	35-02065	0.50-1.00	Soil	—	—	—	0.06	0.39	—	—	—	—	—
AAB1534	35-02066	0.50-1.00	Soil	—	—	—	0.06	0.75	—	—	—	—	—
AAB1535	35-02066	0.50-1.00	Soil	—	—	—	0.06	0.8	—	—	—	—	—
0435-97-0258	35-02476	0.00-0.25	Soil	0.071(U)	—	—	—	—	—	—	3.24	—	—
0435-97-0259	35-02476	0.25-0.50	Soil	—	—	—	—	—	—	—	0.75	—	—
0435-97-0261	35-02477	0.00-0.33	Soil	0.078(U)	—	—	—	—	—	—	2.12	—	—
0435-97-0262	35-02477	0.33-0.50	Soil	—	—	—	—	—	—	—	1.21	—	—
0435-97-0264	35-02478	0.00-0.25	Soil	0.078(U)	—	—	—	—	—	—	28.9	—	—
0435-97-0265	35-02478	0.25-0.50	Soil	0.045(U)	—	0.329	—	—	—	—	0.944	—	—
0435-97-0266	35-02478	4.00-5.00	Qbt 3	—	—	—	—	—	—	—	3	—	—
0435-97-0268	35-02479	0.00-0.25	Soil	0.018(U)	—	—	—	—	—	—	5.21	—	—
0435-97-0269	35-02479	0.25-0.50	Soil	0.398(U)	—	—	—	—	—	—	0.731	—	—
0435-97-0271	35-02480	0.00-0.25	Soil	0.097(U)	—	—	—	—	—	—	73.7	—	—
0435-97-0272	35-02480	0.25-0.50	Soil	—	—	0.375	—	—	—	—	3.36	—	—
0435-97-0273	35-02480	0.75-1.50	Qbt 3	—	—	—	—	—	—	—	0.974	—	—

Table C-1.5-4
Samples with Radionuclides Detected (pCi/g) Above Background Values or Fallout Values in Ten Site Canyon Subarea (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Europium-152	Plutonium-238	Plutonium-239	Ruthenium-106	Strontium-90	Tritium	Uranium-234	Uranium-238
Soil Background Value/Fallout Value				0.013	1.65	na[a]	0.023	0.054	na	1.31	0.766	2.59	2.29
Qbt 2,3,4 Background Value				0.05	0.1	na	0.05	0.05	na	1	0.3	1.98	1.93
Sediment Background Value				0.04	0.9	na	0.006	0.068	na	1.3	0.093	2.59	2.29
PRS 35-010(d)													
0435-95-0112	35-02193	0.00-1.00	Soil	—	—	—	—	0.059(U)	—	—	—	—	—
0435-95-0115	35-02193	2.00-3.00	Soil	0.128(U)	—	—	—	—	—	—	—	—	—
0435-97-0133	35-02481	0.00-0.50	Soil	0.023(U)	—	—	—	—	—	—	—	—	—
0435-97-0135	35-02482	0.00-0.33	Soil	0.189(U)	—	—	—	—	—	—	—	—	—
0435-97-0136	35-02482	2.80-3.20	Soil	0.205(U)	—	—	—	—	—	—	—	—	—
0435-97-0141	35-02484	2.00-2.50	Soil	0.154(U)	—	—	—	—	—	—	—	—	—
0435-97-0142	35-02485	0.00-0.50	Soil	0.124(U)	—	—	—	—	—	—	—	—	—
PRS 35-010(e)													
0435-95-0124	35-02196	0.00-0.50	Sediment	—	—	—	0.171	—	—	—	—	—	—
0435-95-0127	35-02197	0.00-1.00	Sediment	—	—	—	0.164	0.083	—	—	—	—	—
0435-95-0128	35-02197	1.00-2.00	Sediment	—	—	—	0.128(U)	—	—	—	—	—	—
0435-95-0129	35-02197	2.00-3.00	Sediment	—	—	—	0.047(U)	—	—	—	—	—	—
0435-95-0106	35-02235	0.00-0.50	Sediment	—	—	—	0.088(U)	—	—	—	—	—	—
PRS C-35-007													
0435-95-0108	35-02236	0.00-0.50	Soil	—	—	—	2.523	0.896	—	—	—	—	—
RE35-98-0016	35-02614	0.00-0.50	Soil	0.02(U)	—	—	—	—	—	—	—	—	—
RE35-98-0017	35-02615	0.00-0.50	Soil	0.08(U)	—	—	—	—	—	—	—	—	—
RE35-98-0021	35-02619	0.00-0.50	Soil	0.14(U)	—	—	—	—	—	—	—	—	—

[a] na = not available.

[b] U = The analyte was analyzed for but not detected.

Appendix D

Ecological Scoping Checklists

PART A—SCOPING MEETING DOCUMENTATION

Site ID	**TA-35 Mesa Top**
Form of site releases (solid, liquid, vapor). Describe all relevant known or suspected mechanisms of release (spills, dumping, material disposal, outfall, explosive testing, etc.) and describe potential areas of release. Reference locations on a map as appropriate.	Releases on the mesa top are surface spills and leaks, subsurface leaks from septic systems and pipes, and areal deposition from facilities on the mesa top and upwind from the technical area. Contaminants include metals, radionuclides, PAHs, PCBs, and other SVOCs. There is one material disposal area on the southern edge of the mesa top containing sodium metal in a concrete structure. Further details on PRSs and releases are presented in the OU 1129 work plan.
List of Primary Impacted Media **(Indicate all that apply.)**	**Surface soil** – The primary recipient of contaminants has been surface media via spills and aerial deposition. **Surface water/sediment –** **Subsurface** – Some subsurface releases have occurred from leaks or leaching from the surface impoundments to the east. **Groundwater –** **Other, explain –**
FIMAD vegetation class based on Arcview vegetation coverage **(Indicate all that apply.)**	**Water** – **Bare Ground/Unvegetated** – **Spruce/fir/aspen/mixed conifer** – **Ponderosa pine –** **Piñon juniper/juniper savannah** – **Grassland/shrubland** – **Developed** – The area is >90% developed; cover consists primarily of asphalt, building and other structure footprints, and gravel. Bare areas consist primarily of fill. There are open areas within the developed area that contain native and non-native grasses, forbs, trees, and shrubs, but these areas provide limited and fragmented habitat.
Is T&E Habitat Present? **If applicable, list species known or suspected to use the site for breeding or foraging.**	The area is nominally within Mexican spotted owl core habitat; but industrial development of the mesa-top limits the value of the area. Landscaped areas may provide some limited foraging opportunities. No nesting habitat is available on the mesa-top itself.
Provide list, of Neighboring/ Contiguous/ Upgradient sites, includes a brief summary of COPCs and the form of releases for relevant sites and reference a map as appropriate. **(Use this information to evaluate the need to aggregate sites for screening.)**	Upgradient from TA-35 lie TAs-50 and -55 although most surface runoff is into the canyons north and south of TA-35. Aerial deposition from airborne release from TA-55 probably contribute to radionuclides found at TA-35. Numerous PRSs are found on the mesa-top and are identified in the OU 1129 work plan.
Surface Water Erosion Potential Information **Summarize information from SOP 2.01, including the run-off subscore (maximum of 46); terminal point of surface water transport; slope; and surface water runon sources.**	Because of the extensive development of the mesa-top, the surface is highly impermeable. Some areas collect water and contribute to relatively large volumes of runoff into the canyons to the north and south. Large amounts of fill required to level the developed area contribute to a high erodibility at the mesa edges. To the north, surface water transport terminates on a bench above the bottom of Mortandad Canyon. To the south, surface water transport terminates in the bottom of Ten-Site Canyon. Erosion matrix scores range from <5 to >90, with about 10% of the sites scoring over 60. Maximum runoff subscores reach 46 for TA-35 sites.
Other Scoping Meeting Notes	

PART B—SITE VISIT DOCUMENTATION

Site ID	**TA-35 Mesa-top**
Date of Site Visit	**02/16/00**
Site Visit Conducted by	**Lars Soholt, Richard Mirenda, Gabriella Lopez Escobeda**

Receptor Information:

Estimate cover	**Relative vegetative cover (high, medium, low, none)** = Low **Relative wetland cover (high, medium, low, none)** = None **Relative structures/asphalt, etc. cover (high, medium, low, none)** = High
Field notes on the FIMAD vegetation class to assist in ground-truthing the Arcview information	This area is highly developed and retains little of its natural character. There are open areas within the developed area that contain native and non-native grasses, forbs, trees, and shrubs, but these areas provide limited and fragmented habitat.
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.	No T&E habitat available on the mesa top.
Are ecological receptors present at the site? **(yes/no/uncertain)** **Describe the general types of receptors present at the site (terrestrial and aquatic), and make notes on the quality of habitat present at the site.**	Yes. Small passerines, ravens, gopher sign in disturbed fill areas. Probably small mammals (e.g., rodents) associated with man-made structures are present. However, the limited amount of habitat present makes this area of poor value. No aquatic habitat is present on the mesa top.

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).**	Because of the large surface area of asphalt and roof tops, runoff collection potential is high; surface transport is the dominant transport pathway for COPCs. Terminal points are in Ten-Site Canyon to the south and a bench above Mortandad Canyon to the north. The mesa edges where large amounts of fill material are expressed at the surface are highly susceptible to erosion and in several places gullies have cut several meters back from the edge.
Are there any off-site transport pathways (surface water, air, or groundwater)? **(yes/no/uncertain)** **Provide explanation**	Surface water provides the main transport offsite. Ground cover provides for minimal potential for aerial entrainment of surface soils.
Interim action needed to limit off-site transport? **(yes/no/uncertain)** **Provide explanation/ recommendation to project lead for IA SMDP.**	Some erosion control practices have been employed at several points along the mesa edges.

Ecological Effects Information:

Physical Disturbance **(Provide list of major types of disturbances, including erosion and construction activities, review historical aerial photos where appropriate.)**	The original habitat has been totally cleared to allow for the industrial development of the area. Erosion along the mesa edge is prevalent in several areas.
Are there obvious ecological effects? **(yes/no/uncertain)** **Provide explanation and apparent cause (e.g., contamination, physical disturbance, other).**	Physical removal of habitat and erosion of mesa ege.
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.**	Some erosion control practices have been employed at several points along the mesa edges.

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. Not applicable

Adequacy of Site Characterization:

Do existing or proposed data provide information on the nature, rate and extent of contamination? **(yes/no/uncertain)** **Provide explanation** **(Consider if the maximum value was captured by existing sample data.)**	Existing data indicate that numerous COPCs occur on the mesa top. Future sampling will focused on canyon slopes to address the data gaps in the transport rates and patterns. These new data will be coupled with data from the channels in Ten-Site, Mortandad, and Pratt canyons to determine whether further action is needed.
Do existing or proposed data for the site address potential transport pathways of site contamination? **(yes/no/uncertain)** **Provide explanation** **(Consider if other sites should aggregated to characterize potential ecological risk.)**	See above.

Additional Field Notes:

Provide additional field notes on the site setting and potential ecological receptors.

PART C—ECOLOGICAL PATHWAYS CONCEPTUAL EXPOSURE MODEL

Provide answers to Questions A to V to develop the Ecological Pathways Conceptual Exposure Model

Question A:

Could soil contaminants reach receptors via vapors?

- **Volatility of the hazardous substance (volatile chemicals generally have Henry's Law constant >10^{-5} atm-m^3/mol and molecular weight <200 g/mol).**

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation:
Most volatiles will have either vaporized from the surface or been washed off by runoff and dispersed.

Question B:

Could the soil contaminants reach receptors through fugitive dust carried in air?

- **Soil contamination would have to be on the actual surface of the soil to become available for dust.**

- **In the case of dust exposures to burrowing animals, the contamination would have to occur in the depth interval where these burrows occur.**

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation:
The surface cover of asphalt and structures restricts the availability of soil particles for aerial entrainment. No burrowing activity occurs in the developed areas, but there is some along the mesa edge where fill material has been inocrporated.

Question C:

Can contaminated soil be transported to aquatic ecological communities (use SOP 2.01 run-off score and terminal point of surface water runoff to help answer this question)?

- **If the SOP 2.01 run-off score* for each PRS included in the site is equal to zero, this suggests that erosion at the site is not a transport pathway. (* note that the runoff score is not the entire erosion potential score, rather it is a subtotal of this score with a maximum value of 46 points).**

- **If erosion is a transport pathway, evaluate the terminal point to see if aquatic receptors could be affected by contamination from this site.**

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation:
Although surface water pathways are likely, there limited to no aquatic systems at the runoff terminal points.

Question D:

Is contaminated groundwater potentially available to biological receptors through seeps or springs or shallow groundwater?

Known or suspected presence of contaminants in groundwater.

- **The potential for contaminants to migrate via groundwater and discharge into habitats and/or surface waters.**
- **Contaminants may be taken up by terrestrial and rooted aquatic plants whose roots are in contact with groundwater present within the root zone (~1 m depth).**
- **Terrestrial wildlife receptors generally will not contact groundwater unless it is discharged to the surface.**

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation:
There are no springs or seeps known in the area.

Question E:

Is infiltration/percolation from contaminated subsurface material a viable transport and exposure pathway?

- **Suspected ability of contaminants to migrate to groundwater.**
- **The potential for contaminants to migrate via groundwater and discharge into habitats and/or surface waters.**
- **Contaminants may be taken up by terrestrial and rooted aquatic plants whose roots are in contact with groundwater present within the root zone (~1 m depth).**
- **Terrestrial wildlife receptors generally will not contact groundwater unless it is discharged to the surface.**

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation:
Contaminants are not likely to migrate to groundwater because of the depth to the regional aquifer (ca. 1000 ft), extensive impermeable cover of structures and asphalt, and the semi-arid climatic conditions in the area.

Question F:

Might erosion or mass wasting events be a potential release mechanism for contaminants from subsurface materials or perched aquifers to the surface?

- **This question is only applicable to release sites located on or near the mesa edge.**
- **Consider the erodability of surficial material and the geologic processes of canyon/mesa edges.**

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation:
Contamination at this site is predominantly surficial.

Question G:

Could airborne contaminants interact with receptors through respiration of vapors?

- **Contaminants must be present as volatiles in the air.**
- **Consider the importance of inhalation of vapors for burrowing animals.**
- **Foliar uptake of organic vapors is typically not a significant exposure pathway.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 1
Terrestrial Animals: 1

Provide explanation:
See question A.

Question H:

Could airborne contaminants interact with plants through deposition of particulates or with animals through inhalation of fugitive dust?

- **Contaminants must be present as particulates in the air or as dust for this exposure pathway to be complete.**
- **Exposure via inhalation of fugitive dust is particularly applicable to ground-dwelling species that would be exposed to dust disturbed by their foraging or burrowing activities or by wind movement.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 1
Terrestrial Animals: 1

Provide explanation:
See question B.

Question I:

Could contaminants interact with plants through root uptake or rain splash from surficial soils?

- **Contaminants in bulk soil may partition into soil solution, making them available to roots.**
- **Exposure of terrestrial plants to contaminants present in particulates deposited on leaf and stem surfaces by rain striking contaminated soils (i.e., rain splash).**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 2

Provide explanation:
Where open soils are present and contaminated this is a possible pathway, but only in limited areas on the mesa top because of the industrial development.

Question J:

Could contaminants interact with receptors through food web transport from surficial soils?

- **The chemicals may bioaccumulate in animals.**
- **Animals may ingest contaminated food items.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 2

Provide explanation:
Potential bioaccumulators have been found among the COPCs on the mesa top and, although foraging habitat is limited here, contaminated food items could be ingested.

Question K:

Could contaminants interact with receptors via incidental ingestion of surficial soils?

- **Incidental ingestion of contaminated soil could occur while animals grub for food resident in the soil, feed on plant matter covered with contaminated soil or while grooming themselves clean of soil.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 2

Provide explanation:
Because releases have been primarily surficial, contaminants are available for incidental ingestion, although bare soil is limited in extent on the mesa top.

Question L:

Could contaminants interact with receptors through dermal contact with surficial soils?

- **Significant exposure via dermal contact would generally be limited to organic contaminants that are lipophilic and can cross epidermal barriers.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 1

Provide explanation:
Although lipophilic COPCs have been found here, fur, f eathers, or ectoskeletons limit the amount of dermal uptake that would occur if receptors were exposed surficially.

Question M:

Could contaminants interact with plants or animals through external irradiation?

- **External irradiation effects are most relevant for gamma emitting radionuclides.**
- **Burial of contamination attenuates radiological exposure.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 2
Terrestrial Animals: 2

Provide explanation:
Gamma emitting COPCs have been found on the mesa top, particularly Cs-137. Considered minor pathway because of limited areas of exposure on the mesa top due to industrial development.

Question N:

Could contaminants interact with plants through direct uptake from water and sediment or sediment rain splash?

- **Contaminants may be taken-up by terrestrial plants whose roots are in contact with surface waters.**
- **Terrestrial plants may be exposed to particulates deposited on leaf and stem surfaces by rain striking contaminated sediments (i.e., rain splash) in an area that is only periodically inundated with water.**
- **Contaminants in sediment may partition into soil solution, making them available to roots.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 0

Provide explanation:
No persistent standing water exists on the mesa top.

Question O:

Could contaminants interact with receptors through food web transport from water and sediment?

- **The chemicals may bioconcentrate in food items.**
- **Animals may ingest contaminated food items.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 0

Provide explanation:
No persistent standing water exists on the mesa top.

Question P:

Could contaminants interact with receptors via ingestion of water and suspended sediments?

- **If sediments are present in an area that is only periodically inundated with water, terrestrial receptors may incidentally ingest sediments.**
- **Terrestrial receptors may ingest water-borne contaminants if contaminated surface waters are used as a drinking water source.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 0

Provide explanation:
No persistent standing water exists on the mesa top.

Question Q:

Could contaminants interact with receptors through dermal contact with water and sediment?

- **If sediments are present in an area that is only periodically inundated with water, terrestrial species may be dermally exposed during dry periods.**
- **Terrestrial organisms may be dermally exposed to water-borne contaminants as a result of wading or swimming in contaminated waters.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 0

Provide explanation:
No persistent standing water exists on the mesa top.

Question R:

Could contaminants interact with aquatic plants or animals through external irradiation?

- **External irradiation effects are most relevant for gamma emitting radionuclides.**
- **Burial of contamination attenuates radiological exposure.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 0
Terrestrial Animals: 0

Provide explanation:
No persistent standing water exists on the mesa top.

Question S:

Could contaminants bioconcentrate in free floating aquatic, attached aquatic plants, or emergent vegetation?

- **Aquatic plants are in direct contact with water.**
- **Contaminants in sediment may partition into pore water, making them available to submerged roots.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Aquatic Plants/Emergent Vegetation: 0

Provide explanation:
No persistent standing water exists on the mesa top.

Question T:

Could contaminants bioconcentrate in sedimentary or water column organisms?

- **Aquatic receptors may actively or incidentally ingest sediment while foraging.**
- **Aquatic receptors may be directly exposed to contaminated sediments or may be exposed to contaminants through osmotic exchange, respiration, or ventilation of sediment pore waters.**
- **Aquatic receptors may be exposed through osmotic exchange, respiration, or ventilation of surface waters.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Aquatic Animals: 0

Provide explanation:
No persistent standing water exists on the mesa top.

Question U:

Could contaminants bioaccumulate in sedimentary or water column organisms?

- **Lipophillic organic contaminants and some metals may concentrate in an organism's tissues**
- **Ingestion of contaminated food items may result in contaminant bioaccumulation through the food web.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Aquatic Animals: 0

Provide explanation:
No persistent standing water exists on the mesa top.

Question V:

Could contaminants interact with aquatic plants or animals through external irradiation?

- **External irradiation effects are most relevant for gamma emitting radionuclides.**
- **The water column acts to absorb radiation, thus external irradiation is typically more important for sediment dwelling organisms.**

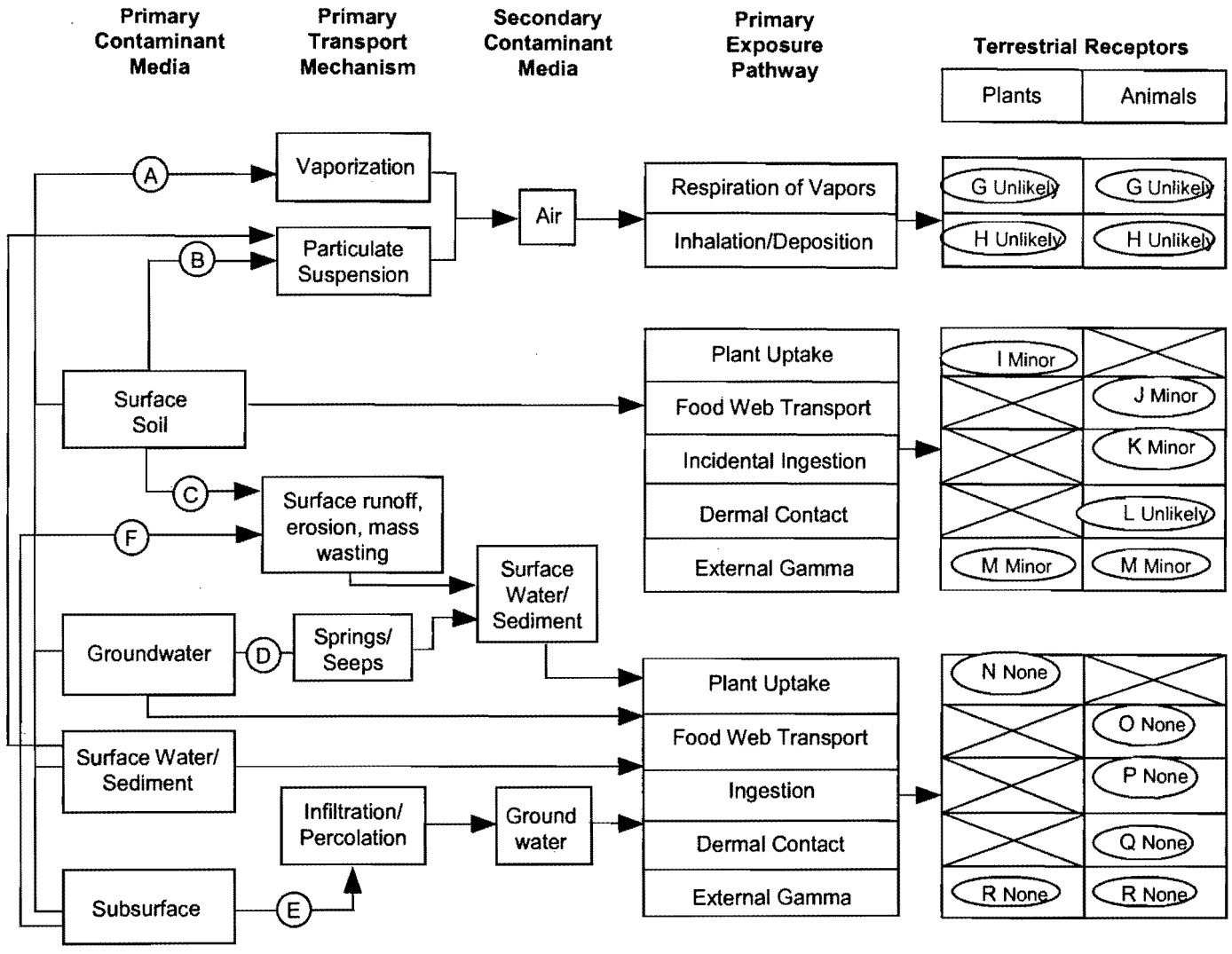
Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Aquatic Plants: 0
Aquatic Animals: 0

Provide explanation:
No persistent standing water exists on the mesa top.

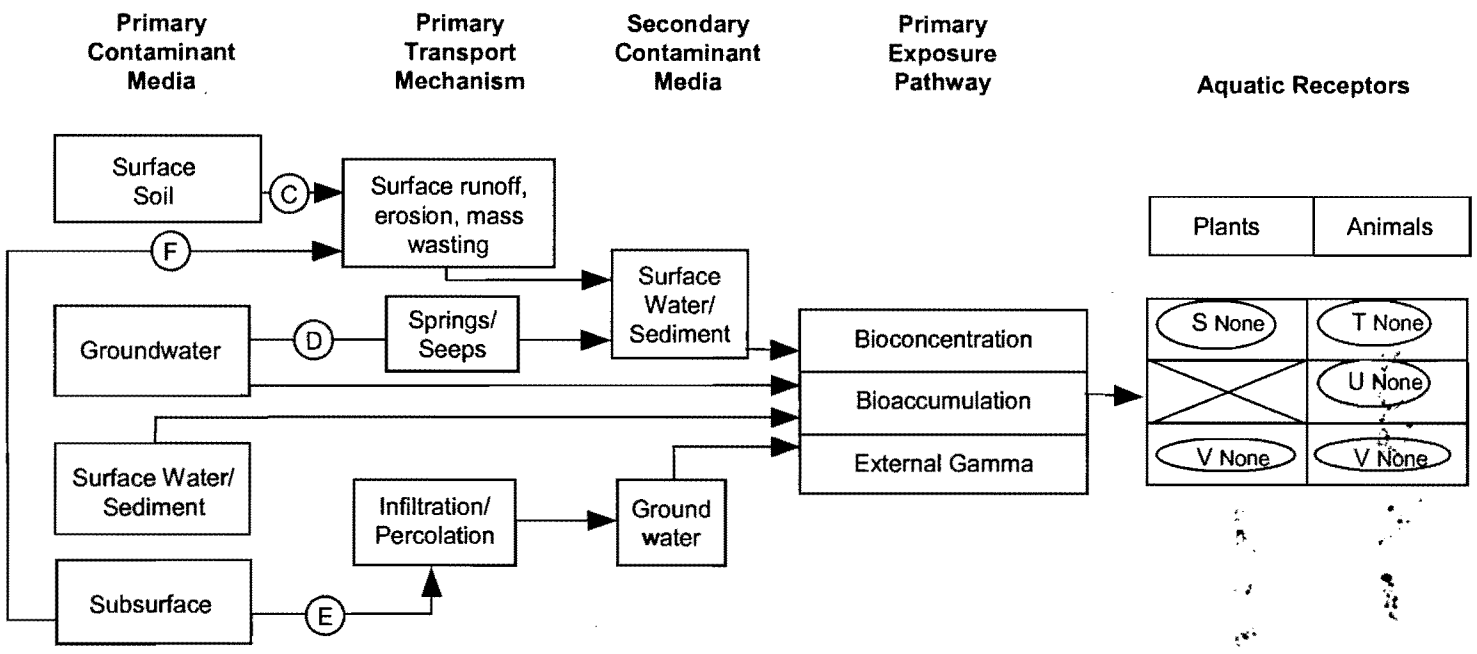
Ecological Scoping Checklist
Terrestrial Receptors
Ecological Pathways Conceptual Exposure Model

NOTE:
Letters in circles refer to questions on the Scoping Checklist



Ecological Scoping Checklist
Aquatic Receptors
Ecological Pathways Conceptual Exposure Model

NOTE:
Letters in circles refer to questions on the Scoping Checklist



Signatures and certifications:

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

Name (printed): Lars F. Soholt, Ph.D.

Name (signature): Lars F. Soholt
Organization: LANL E/ER
Phone number: 505/667-2256

Date completed: 3/7/06

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

Name (printed): Richard Mirenda, Ph.D.

Name (signature): Richard Mirenda
Organization: MK/PMC
Phone number: 505/662-1329

PART A—SCOPING MEETING DOCUMENTATION

Site ID	TA-35 Ten-Site Slope/Canyon
Form of site releases (solid, liquid, vapor). Describe all relevant known or suspected mechanisms of release (spills, dumping, material disposal, outfall, explosive testing, etc.) and describe potential areas of release. Reference locations on a map as appropriate.	Releases on the TA-35 mesa top to the Ten-Site Canyon slope to the south are due to runoff from surface spills and leaks, outfall discharges from septic systems, stormwater discharges, and areal deposition from facilities on the mesa top and upwind from the technical area. Contaminants include metals, radionuclides, PAHs, PCBs, and other SVOCs. There is one material disposal area on the southern edge of the mesa top containing sodium metal in a concrete structure. Further details on PRSs and releases are presented in the OU 1129 work plan.
List of Primary Impacted Media **(Indicate all that apply.)**	**Surface soil –** The primary recipient of contaminants has been surface media via spills, runoff, and aerial deposition. **Surface water/sediment** – Runoff from the spills, discharges, etc. are deposited in the sediment in the drainages leading from the mesa and in the surface water/sediment in the ephemeral stream channel at the bottom of Ten-Site Canyon. **Subsurface –** **Groundwater –** **Other, explain –**
FIMAD vegetation class based on Arcview vegetation coverage **(Indicate all that apply.)**	**Water –** **Bare Ground/Unvegetated** – There are outcroppings of tuff on this weathered, south facing slope; perhaps 10-25% of the slope surface is bare rock or unvegetated fill. **Spruce/fir/aspen/mixed conifer –** **Ponderosa pine –** The principal habitat is ponderosa pine forest. The top of the slope consists of foreign fill that has been added to level out topography for industrial development on the mesa top. Here the pines are younger and non-native trees and shrubs are more common. Downslope, a more natural ponderosa pine forest exists with more mature trees. The canyon bottom consists of an open ponderosa pine forest with an ephemeral stream in the bottom. **Piñon juniper/juniper savannah –** **Grassland/shrubland –** **Developed –**
Is T&E Habitat Present? **If applicable, list species known or suspected to use the site for breeding or foraging.**	The area is within the core habitat for Mexican spotted owl. No known nests occur nearby. The canyon bottom and lower slopes provide foraging habitat for any owls that may occur nearby.
Provide list, of Neighboring/ Contiguous/ Upgradient sites, includes a brief summary of COPCs and the form of releases for relevant sites and reference a map as appropriate. **(Use this information to evaluate the need to aggregate sites for screening.)**	The slope drains into Ten-Site Canyon. Numerous PRSs contribute to contaminants along this slope and in the canyon below. This canyon also receives upstream flow from Area C and TA-50. This flow is fed primarily by stormwater and snowmelt runoff from these areas. Radionuclides in particular may be derived from these sources as well as metals, PCBs, PAHs, and other organic chemicals..
Surface Water Erosion Potential Information **Summarize information from SOP 2.01, including the run-off subscore (maximum of 46); terminal point of surface water transport; slope; and surface water runon sources.**	The slope receives relatively large volumes of stormwater runoff because of the extensive industrial development on the mesa top. The upper slopes show definite signs of heavy erosion, particularly where fill has been placed. Erosion matrix scores range to over 90 for sites that drain onto this slope. Maximum runoff subscores reach 46 for sites draining onto this slope.
Other Scoping Meeting Notes	

PART B—SITE VISIT DOCUMENTATION

Site ID	TA-35 Ten-Site Slope/Canyon
Date of Site Visit	02/16/00
Site Visit Conducted by	Lars Soholt, Rich Mirenda, Gabriella Lopez Escobeda

Receptor Information:

Estimate cover	**Relative vegetative cover (high, medium, low, none)** = high, 75-90% **Relative wetland cover (high, medium, low, none)** = none **Relative structures/asphalt, etc. cover (high, medium, low, none)** = low; some asphalt and concrete rubble among backfill on upper slope.
Field notes on the FIMAD vegetation class to assist in ground-truthing the Arcview information	The area is a south facing, dry slope fairly steep. The vegetation is ponderosa pine forest with a fairly open tree canopy and an understory of forbs, grasses, and shrubs.
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.	No specific T&E habitat noted during field survey.
Are ecological receptors present at the site? **(yes/no/uncertain)** **Describe the general types of receptors present at the site (terrestrial and aquatic), and make notes on the quality of habitat present at the site.**	Yes. Evidence noted of gopher activity, other small mammals, passerines, and ravens. The area supports large mammals and other fauna. Habitat appeared quite healthy, particularly on the canyon floor and lower slope. No persistent aquatic habitat exists.

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).**	Surface water is the dominant transport mechanism here because of the large surface area of asphalt and rooftops that drains from the mesa top onto this slope. Runoff terminates at the floor of Ten-Site Canyon. The upper slopes where fill was accumulated in the development of the industrial mesa top is highly susceptible to erosion.
Are there any off-site transport pathways (surface water, air, or groundwater)? **(yes/no/uncertain)** **Provide explanation**	Surface water is the dominant transport path. Minimal particle entrainment may occur.
Interim action needed to limit off-site transport? **(yes/no/uncertain)** **Provide explanation/ recommendation to project lead for IA SMDP.**	BMPs are in place at about ten sites with the highest erosion matrix scores.

Ecological Effects Information:

Physical Disturbance **(Provide list of major types of disturbances, including erosion and construction activities, review historical aerial photos where appropriate.)**	The upper slopes consist of up to several meters of fill with young trees and shrubs and an occasional buried mature tree. Native and non-native trees, shrubs, forbs, and grasses appear more common on these sections of the slope. Physical disturbance is observed as a result of erosion along the upper slope, less disturbance is evident as one proceeds downslope.
Are there obvious ecological effects? **(yes/no/uncertain)** **Provide explanation and apparent cause (e.g., contamination, physical disturbance, other).**	Yes. Effects appear to be attributable to physical disturbance by erosion of upper slope fill and tuff.
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.**	BMPs are in place at about ten sites with the highest erosion matrix scores.

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. Not applicable

Adequacy of Site Characterization:

Do existing or proposed data provide information on the nature, rate and extent of contamination? **(yes/no/uncertain)** **Provide explanation** **(Consider if the maximum value was captured by existing sample data.)**	The proposed integrated sampling and analysis plan for TA-35 will contain design to fill in data gaps to complete information on the rate contaminant transport from and extent of contaminant distribution upon the slope and eventually this will be analyzed in the context of the transport and distribution of contaminants in Ten-Site Canyon.
Do existing or proposed data for the site address potential transport pathways of site contamination? **(yes/no/uncertain)** **Provide explanation** **(Consider if other sites should aggregated to characterize potential ecological risk.)**	Yes. The existing data provide strong support toward identifying surface water transport as the dominant transport pathway.

Additional Field Notes:

Provide additional field notes on the site setting and potential ecological receptors. Not applicable

PART C—ECOLOGICAL PATHWAYS CONCEPTUAL EXPOSURE MODEL

Provide answers to Questions A to V to develop the Ecological Pathways Conceptual Exposure Model

Question A:

Could soil contaminants reach receptors via vapors?

- **Volatility of the hazardous substance (volatile chemicals generally have Henry's Law constant >10^{-5} atm-m^3/mol and molecular weight <200 g/mol).**

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: The dynamics of transport will have dispersed the more volatile compounds such that the volatile air pathway is very limited. Volatile organic chemicals were not among the COPCs identified from earlier sampling events.

Question B:

Could the soil contaminants reach receptors through fugitive dust carried in air?

- **Soil contamination would have to be on the actual surface of the soil to become available for dust.**
- **In the case of dust exposures to burrowing animals, the contamination would have to occur in the depth interval where these burrows occur.**

Answer (likely/unlikely/uncertain): Likely

Provide explanation: Vegetation cover on the slope tends to reduce the entrainment of particles and the air pathway to surface receptors is minimal. However, extensive activity of gopher burrowing is evident in the fill areas.

Question C:

Can contaminated soil be transported to aquatic ecological communities (use SOP 2.01 run-off score and terminal point of surface water runoff to help answer this question)?

- **If the SOP 2.01 run-off score* for each PRS included in the site is equal to zero, this suggests that erosion at the site is not a transport pathway. (* note that the runoff score is not the entire erosion potential score, rather it is a subtotal of this score with a maximum value of 46 points).**
- **If erosion is a transport pathway, evaluate the terminal point to see if aquatic receptors could be affected by contamination from this site.**

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: Although extensive erosion is occurring, no persistent aquatic habitat exists in Ten-Site Canyon.

Question D:

Is contaminated groundwater potentially available to biological receptors through seeps or springs or shallow groundwater?

Known or suspected presence of contaminants in groundwater.

- **The potential for contaminants to migrate via groundwater and discharge into habitats and/or surface waters.**
- **Contaminants may be taken up by terrestrial and rooted aquatic plants whose roots are in contact with groundwater present within the root zone (~1 m depth).**
- **Terrestrial wildlife receptors generally will not contact groundwater unless it is discharged to the surface.**

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: No seeps or springs are known to occur in this area. The regional aquifer in this area is deep (ca. 1000 ft) and the semi-arid environment of this region provides minimal hydrologic head in this area.

Question E:

Is infiltration/percolation from contaminated subsurface material a viable transport and exposure pathway?

- **Suspected ability of contaminants to migrate to groundwater.**
- **The potential for contaminants to migrate via groundwater and discharge into habitats and/or surface waters.**
- **Contaminants may be taken up by terrestrial and rooted aquatic plants whose roots are in contact with groundwater present within the root zone (~1 m depth).**
- **Terrestrial wildlife receptors generally will not contact groundwater unless it is discharged to the surface.**

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: The regional aquifer in this area is deep (ca. 1000 ft) and the semi-arid environment of this region provides minimal hydrologic head in this area. No intermediate or alluvial groundwaters are known in the immediate area.

Question F:

Might erosion or mass wasting events be a potential release mechanism for contaminants from subsurface materials or perched aquifers to the surface?

- **This question is only applicable to release sites located on or near the mesa edge.**
- **Consider the erodability of surficial material and the geologic processes of canyon/mesa edges.**

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: The contaminants here occur predominantly in surficial materials. There is erosion of surface materials in to the canyon.

Question G:

Could airborne contaminants interact with receptors through respiration of vapors?

- **Contaminants must be present as volatiles in the air.**
- **Consider the importance of inhalation of vapors for burrowing animals.**
- **Foliar uptake of organic vapors is typically not a significant exposure pathway.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 0

Terrestrial Animals: 0

Provide explanation: See question A

Question H:

Could airborne contaminants interact with plants through deposition of particulates or with animals through inhalation of fugitive dust?

- **Contaminants must be present as particulates in the air or as dust for this exposure pathway to be complete.**
- **Exposure via inhalation of fugitive dust is particularly applicable to ground-dwelling species that would be exposed to dust disturbed by their foraging or burrowing activities or by wind movement.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 2

Terrestrial Animals: 2

Provide explanation: See question B

Question I:

Could contaminants interact with plants through root uptake or rain splash from surficial soils?

- **Contaminants in bulk soil may partition into soil solution, making them available to roots.**
- **Exposure of terrestrial plants to contaminants present in particulates deposited on leaf and stem surfaces by rain striking contaminated soils (i.e., rain splash).**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 3

Provide explanation: Because contaminants are in surficial and near surface materials they are available for root uptake and rain splash deposition on plant surfaces.

Question J:

Could contaminants interact with receptors through food web transport from surficial soils?

- **The chemicals may bioaccumulate in animals.**
- **Animals may ingest contaminated food items.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 3

Provide explanation: Contaminants that bioaccumulate and that are taken up by food sources are present and could interact with animal receptors via food web transport.

Question K:

Could contaminants interact with receptors via incidental ingestion of surficial soils?

- **Incidental ingestion of contaminated soil could occur while animals grub for food resident in the soil, feed on plant matter covered with contaminated soil or while grooming themselves clean of soil.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 3

Provide explanation: Because contaminants are present in surfical materials, incidental ingestion of soils in a viable pathway.

Question L:

Could contaminants interact with receptors through dermal contact with surficial soils?

- **Significant exposure via dermal contact would generally be limited to organic contaminants that are lipophilic and can cross epidermal barriers.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 1

Provide explanation: Although lipophilic compounds have been released to the slope, fur, feathers, or ectoskeleton at body surfaces limit dermal absorption of these compounds.

Question M:

Could contaminants interact with plants or animals through external irradiation?

- **External irradiation effects are most relevant for gamma emitting radionuclides.**
- **Burial of contamination attenuates radiological exposure.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 3

Terrestrial Animals: 3

Provide explanation: Gamma-emitting radionuclides have been found on Ten-Site slope (particularly Cs-137).

Question N:

Could contaminants interact with plants through direct uptake from water and sediment or sediment rain splash?

- **Contaminants may be taken-up by terrestrial plants whose roots are in contact with surface waters.**
- **Terrestrial plants may be exposed to particulates deposited on leaf and stem surfaces by rain striking contaminated sediments (i.e., rain splash) in an area that is only periodically inundated with water.**
- **Contaminants in sediment may partition into soil solution, making them available to roots.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 0

Provide explanation: No persistent aquatic habitat exists.

Question O:

Could contaminants interact with receptors through food web transport from water and sediment?

- **The chemicals may bioconcentrate in food items.**
- **Animals may ingest contaminated food items.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 0

Provide explanation: No persistent aquatic habitat exists.

Question P:

Could contaminants interact with receptors via ingestion of water and suspended sediments?

- **If sediments are present in an area that is only periodically inundated with water, terrestrial receptors may incidentally ingest sediments.**
- **Terrestrial receptors may ingest water-borne contaminants if contaminated surface waters are used as a drinking water source.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 0

Provide explanation: No persistent aquatic habitat exists.

Question Q:

Could contaminants interact with receptors through dermal contact with water and sediment?

- **If sediments are present in an area that is only periodically inundated with water, terrestrial species may be dermally exposed during dry periods.**
- **Terrestrial organisms may be dermally exposed to water-borne contaminants as a result of wading or swimming in contaminated waters.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 0

Provide explanation: No persistent aquatic habitat exists.

Question R:

Could contaminants interact with plants or animals through external irradiation from water or sediment?

- **External irradiation effects are most relevant for gamma emitting radionuclides.**
- **Burial of contamination attenuates radiological exposure.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 0

Terrestrial Animals: 0

Provide explanation: No persistent aquatic habitat exists.

Question S:

Could contaminants bioconcentrate in free floating aquatic, attached aquatic plants, or emergent vegetation?

- **Aquatic plants are in direct contact with water.**
- **Contaminants in sediment may partition into pore water, making them available to submerged roots.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Aquatic Plants/Emergent Vegetation: 0

Provide explanation: No persistent aquatic habitat exists.

Question T:

Could contaminants bioconcentrate in sedimentary or water column organisms?

- **Aquatic receptors may actively or incidentally ingest sediment while foraging.**
- **Aquatic receptors may be directly exposed to contaminated sediments or may be exposed to contaminants through osmotic exchange, respiration, or ventilation of sediment pore waters.**
- **Aquatic receptors may be exposed through osmotic exchange, respiration, or ventilation of surface waters.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Aquatic Animals: 0

Provide explanation: No persistent aquatic habitat exists.

Question U:

Could contaminants bioaccumulate in sedimentary or water column organisms?

- **Lipophillic organic contaminants and some metals may concentrate in an organism's tissues**
- **Ingestion of contaminated food items may result in contaminant bioaccumulation through the food web.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Aquatic Animals: 0

Provide explanation: No persistent aquatic habitat exists.

Question V:

Could contaminants interact with aquatic plants or animals through external irradiation?

- **External irradiation effects are most relevant for gamma emitting radionuclides.**
- **The water column acts to absorb radiation, thus external irradiation is typically more important for sediment dwelling organisms.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

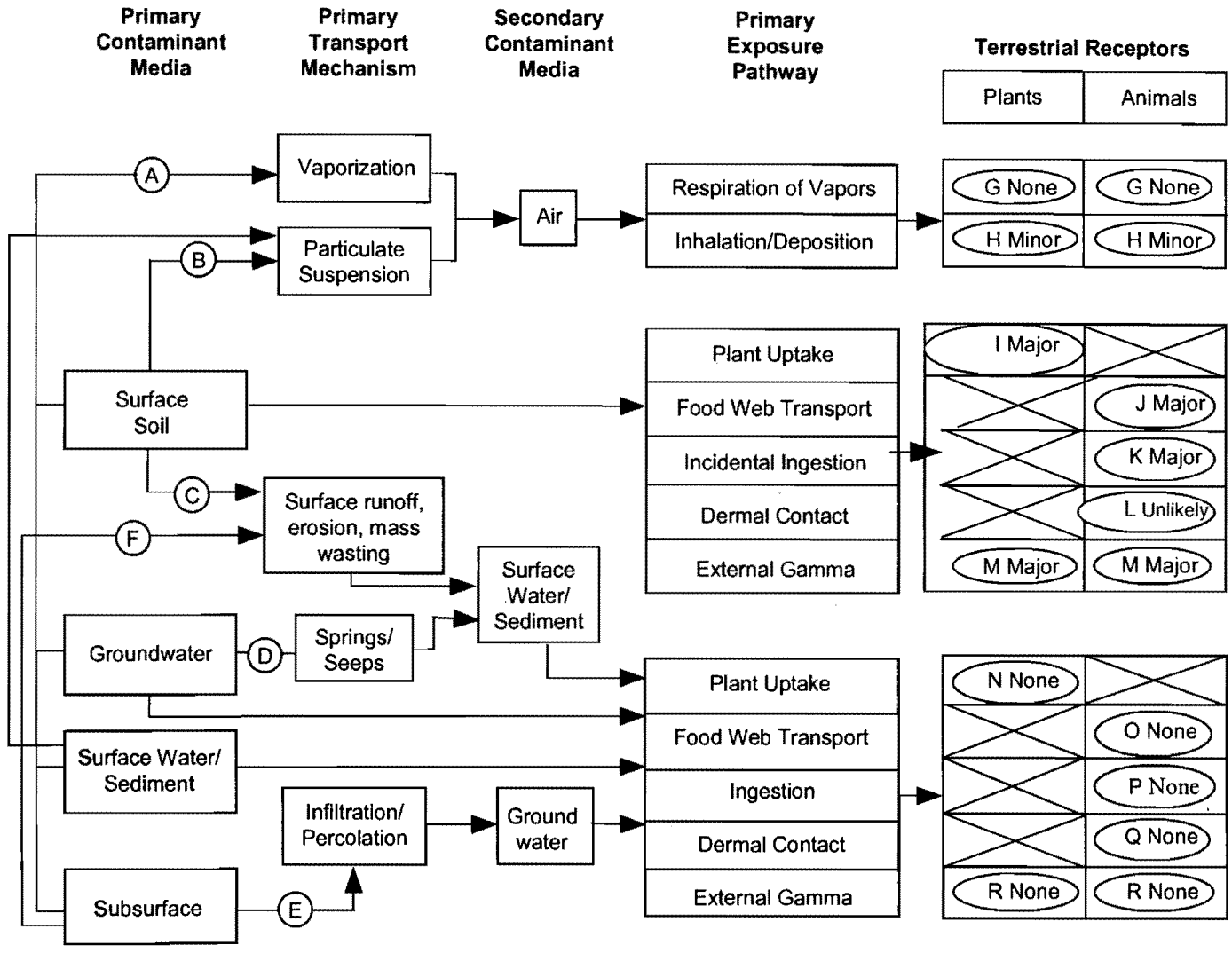
Aquatic Plants: 0

Aquatic Animals: 0

Provide explanation: No persistent aquatic habitat exists.

Ecological Scoping Checklist
Terrestrial Receptors
Ecological Pathways Conceptual Exposure Model

NOTE:
Letters in circles refer to questions on the Scoping Checklist



Ecological Scoping Checklist
Aquatic Receptors
Ecological Pathways Conceptual Exposure Model

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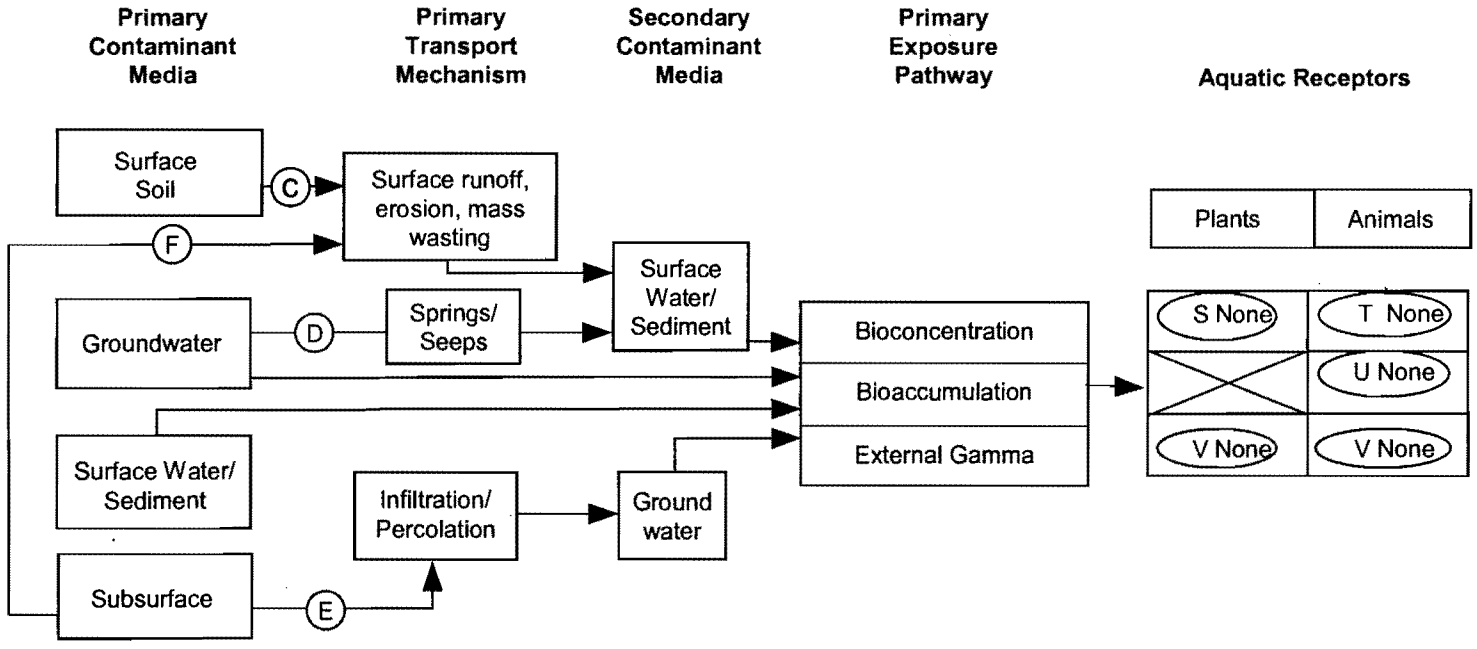


Signatures and certifications:

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

Name (printed): Lars F. Soholt, Ph.D.

Name (signature): Lars F. Soholt

Organization: LANL E/ER

Phone number: 505/667-2256

Date completed: 3/7/00

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

Name (printed): Richard Mirenda, Ph.D.

Name (signature): Richard Mirenda

Organization: MK/PMC

Phone number: 505/662-1329

PART A—SCOPING MEETING DOCUMENTATION

Site ID	Mortandad Canyon Subarea
Form of site releases (solid, liquid, vapor). Describe all relevant known or suspected mechanisms of release (spills, dumping, material disposal, outfall, explosive testing, etc.) and describe potential areas of release. Reference locations on a map as appropriate.	This aggregate is comprised of 12 PRSs along the northern border of TA-35 that resulted in releases of contaminants to Mortandad Canyon. Releases were the result of discharges from outfalls, runoff from the mesa top, leaks and spills from storage/disposal areas, dumping of materials, and oil spills. Areas affected included the north-facing slope of Mortandad Canyon, the bench area below the mesa, and the mesa top along the canyon rim. COPCs from these sources include metals, radionuclides, VOCs, SVOCs, and PCBs.
List of Primary Impacted Media **(Indicate all that apply.)**	**Surface soil – XX –** Primarily affected by releases into the canyon. All discharges, spills, leaks, and dumping were at the surface. **Surface water/sediment – XX –** The discharges were liquid and transported down the canyon by storm water. Also includes fine particulate sediment carried by discharge and storm water. There is a small bench located below the mesa and above the canyon bottom that has received storm water and other discharges/runoff over the years. The canyon bottom probably has not been impacted by discharges/runoff from the PRSs because of this bench area. **Subsurface –** **Groundwater –** **Other, explain –**
FIMAD vegetation class based on Arcview vegetation coverage **(Indicate all that apply.)**	**Water –** The canyon bottom is riparian in nature and has water flowing in it most of the year as a result of discharges from TA-50. It probably also receives some runoff from TA-35 but this is minimal and of much smaller import than the TA-50 input. **Bare Ground/Unvegetated –** **Spruce/fir/aspen/mixed conifer –** Primarily mixed conifer. The upper slope of the canyon near the mesa top is ponderosa pine and douglas fir. This gives way to fir and oak in the canyon bottom where there is more water and less sunlight due to the deeply incised stream channel in the rock walls. **Ponderosa pine –** **Piñon juniper/juniper savannah –** **Grassland/shrubland –** **Developed –**
Is T&E Habitat Present? **If applicable, list species known or suspected to use the site for breeding or foraging.**	Mortandad Canyon is within the core area of the Mexican spotted owl. This would indicate potential foraging and nesting habitat for this animal. The biological assessment indicates that this species is not present and has not been observed in the area.
Provide list, of Neighboring/ Contiguous/ Upgradient sites, includes a brief summary of COPCs and the form of releases for relevant sites and reference a map as appropriate. **(Use this information to evaluate the need to aggregate sites for screening.)**	There are 12 PRSs that make up the aggregate. These include PRSs 35-016(g), (h), (e), (i), (o), (f), and (p), 35-014(e1) and (e2), 35-004(b), 35-008, and 35-009(c). These PRSs are outfalls for stormwater, noncontact cooling water, cooling water, and an NPDES discharge as well as oil spills, chemical/container storage area, canyonside disposal area, and an inactive sanitary septic system. In addition, there are numerous mesa top PRSs at TA-35 that may influence the stormwater runoff into the canyon as well as the TA-50 discharge and PRSs that are upgradient from TA-35 and Mortandad Canyon.

Surface Water Erosion Potential Information **Summarize information from SOP 2.01, including the run-off subscore (maximum of 46); terminal point of surface water transport; slope; and surface water runon sources.**	The Erosion Matrix scores for the PRSs in this aggregate range from 18.3-22.3 for the inactive septic system [35-009(c)] and chemical storage area [35-004(b)] to 45.6-61.0 for the oil spills [35-014(e1) and 35-014(e2)] the stormwater drains [35-016(o)], coolong water outfall [35-016(p)], the canyonside disposal area (35-008), and a stormwater discharge channel [35-016(i)] to 68.3-76.5 the NPDES outfall [35-016(g)], the noncontact cooling water outfall [35-016(e)], stormwater drain [35-016(f)], and stormwater outfalls [35-016(h)]. The first group (18.3-22.3) are on the mesa top, have high cover (<25%), 10-30% slope, a runoff score of 0.0, and a run-on score of 7.0. The second group includes one mesa top PRS and five PRSs within the bench of the canyon with cover of <25% to >75%, slope of <10% to >30%, a runoff score of 24-35, and a run-on score of 7.0. The third group are all PRSs within the bench of the canyon with cover of <25% to >75%, slope >30%, a runoff score of 35-46, and a run-on score of 4-7. The SOP 2.01 indicates that the PRSs terminate in Mortandad Canyon with the latter PRSs showing moderate to severe signs of erosion. Runoff actually terminates on the bench at the toe of the slope and does not reach the deeply incised portion of Mortandad Canyon where an intermittent stream channel flows.
Other Scoping Meeting Notes	

PART B—SITE VISIT DOCUMENTATION

Site ID	**Mortandad Canyon Aggregate**
Date of Site Visit	**3/10/00**
Site Visit Conducted by	**Richard Mirenda and Danny Katzman**

Receptor Information:

Estimate cover	**Relative vegetative cover (high, medium, low, none)** = medium to high; area on the slope is generally well vegetated with ponderosa pine and douglas fir. There are area where the trees have been impacted by stormwater and other discharges. The amount of vegetation decreases along the bench, where it is more open, then incrrases again in the deeply incised portion of Mortandad Canyon where an intermittent stream channel flows. **Relative wetland cover (high, medium, low, none)** = low; the deep ravine of Mortandad Canyon has a stream channel with water present intermittently due to discharge from TA-50. **Relative structures/asphalt, etc. cover (high, medium, low, none)** = low; the area along the mesa edge has some structures and areas of pavement.
Field notes on the FIMAD vegetation class to assist in ground-truthing the Arcview information	Mortandad Canyon is mixed conifer with predominantly ponderosa pine and douglas fir habitat and scattered juniper, oak, shrubs, 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.	No evidence of T&E habitat found during site visit.

Are ecological receptors present at the site? **(yes/no/uncertain)** **Describe the general types of receptors present at the site (terrestrial and aquatic), and make notes on the quality of habitat present at the site.**	Yes. There are a variety of terrestrial receptors that frequent or inhabit the Mortandad Canyon. These include large mammals such as bear, deer, elk, fox, and coyotes as well as small mammals such as mice, voles, shrews, and rabbits. Birds include sparrows, warblers, jays, bluebirds, and robins as well as owls and other birds of prey (falcons and hawks). There are also lizards and snakes present as well as insects present. Included in this latter group are aquatic insects such as caddis flies and blue-green or green algae on the substrates associated with the stream originating from TA-50 discharge.

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 surface water runoff flows directly into Mortandad Canyon from TA-35 on the mesa top. As indicated by the SOP 2.01 scores, the potential for erosion ranges from low to extremely high. BMPs have been implemented at several locations to reduce or mitigate impacts. The terminal point of the runoff is Mortandad Canyon, which joins with Ten Site Canyon a distance from the mesa. There is also a intermittent stream that flows through the bottom of Mortandad Canyon, which is the result of TA-50 discharge.
Are there any off-site transport pathways (surface water, air, or groundwater)? **(yes/no/uncertain)** **Provide explanation**	Surface water is the primary off-site transport pathway. Air transport via particulates or fugitive dust may be a possibility but is minor compared to surface water.
Interim action needed to limit off-site transport? **(yes/no/uncertain)** **Provide explanation/ recommendation to project lead for IA SMDP.**	Yes. BMPs have been put in place along the mesa edge and along the upper slope of Mortandad Canyon to mitigate the runoff into the canyon.

Ecological Effects Information:

Physical Disturbance **(Provide list of major types of disturbances, including erosion and construction activities, review historical aerial photos where appropriate.)**	There has been some physical disturbance of Mortandad Canyon from the runoff that has been discharged into the canyon. This has resulted in erosion of the slopes and the canyon bottom. Some areas at and near the canyon bottom have accumulated sediment, which has resulted in areas of bare ground. In addition, there are several areas of dead ponderosa pine trees along the slope and bottom from the excess water resulting from runoff. There is also an unmaintained dirt service road that descends into the canyon from the mesa and traverses the bench area parallel to TA-35.
Are there obvious ecological effects? **(yes/no/uncertain)** **Provide explanation and apparent cause (e.g., contamination, physical disturbance, other).**	Yes. There are areas of severe erosion, debris in several drainage channels, dead ponderosa pine trees from the surface water runoff. Contamination from radionuclides has been found in the canyon by previous sampling activities. Non-radiological contamination has not been adequately determined.
Interim action needed to limit apparent ecological effects? **(yes/no/uncertain)** **Provide explanation and recommendations to mitigate apparent exposure**	Yes. BMPs have been put in place along the mesa edge and along the upper slope of Mortandad Canyon to mitigate the runoff into the canyon.

pathways to project lead for IA SMDP.	

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. Not applicable

Adequacy of Site Characterization:

Do existing or proposed data provide information on the nature, rate and extent of contamination? **(yes/no/uncertain)** **Provide explanation** **(Consider if the maximum value was captured by existing sample data.)**	No. Existing data has identified radiological contamination and nonradiological contamination in Mortandad Canyon. However, additional sampling is needed to adequately determine the extent of the contamination. The proposed sampling in the Integrated Sampling and Analysis Plan for TA-35 is designed to address these data gaps and provide information on the nature and extent of all contamination associated with TA-35 including Mortandad Canyon.
Do existing or proposed data for the site address potential transport pathways of site contamination? **(yes/no/uncertain)** **Provide explanation** **(Consider if other sites should aggregated to characterize potential ecological risk.)**	Yes. The existing and proposed data will address the surface water runoff from TA-35 that has impacted Mortandad Canyon. The aggregation of sites insures that all TA-35 PRSs impacting the canyon will be addressed together and that any potential ecological risk will be characterized. The sampling and analysis will not address the impacts originating from TA-50 including the discharges that are the primary source of water flowing in the stream channel.

Additional Field Notes:

Provide additional field notes on the site setting and potential ecological receptors.

PART C—ECOLOGICAL PATHWAYS CONCEPTUAL EXPOSURE MODEL

Question A:

Could soil contaminants reach receptors via vapors?

- **Volatility of the hazardous substance (volatile chemicals generally have Henry's Law constant >10^{-5} atm-me/mol and molecular weight <200 g/mol).**

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: Discharges and runoff into the canyon primarily contained radionuclides, metals, and non-volatile organic chemicals (PAHs and PCBs). Unlikely that VOCs would remain after being released into canyon. The dynamics of transport would dispersed the more volatile compounds such that the volatile air pathway is very limited.

Question B:

Could the soil contaminants reach receptors through fugitive dust carried in air?

- **Soil contamination would have to be on the actual surface of the soil to become available for dust.**

- **In the case of dust exposures to burrowing animals, the contamination would have to occur in the depth interval where these burrows occur.**

Answer (likely/unlikely/uncertain): Likely

Provide explanation: Vegetation cover on the slope tends to reduce the entrainment of particles such that the air pathway to terrestrial receptors is minimal. Although this is a minor pathway for exposure, some areas lack or have minimal vegetation that may allow the resuspension of dust/particulates. Whatever is resuspended would be localized. There are also some areas of burrowing along the slope and bench in the canyon as well as along the stream channel banks where sediment has accumulated over time.

Question C:

Can contaminated soil be transported to aquatic ecological communities (use SOP 2.01 run-off score and terminal point of surface water runoff to help answer this question)?

- **If the SOP 2.01 run-off score* for each PRS included in the site is equal to zero, this suggests that erosion at the site is not a transport pathway. (* note that the runoff score is not the entire erosion potential score, rather it is a subtotal of this score with a maximum value of 46 points).**

- **If erosion is a transport pathway, evaluate the terminal point to see if aquatic receptors could be affected by contamination from this site.**

Answer (likely/unlikely/uncertain): Likely

Provide explanation: Runoff scores ranged from 18.3 to 76.5 suggesting that erosion potential is high in some areas. There is evidence of erosion and transport of sediment in the canyon. There is also a stream channel with associated riparian habitat that may receive runoff from above. This stream channel was found to support some aquatic insect populations (e.g., caddis flies). Because these types of aquatic insects are intolerant to contamination, their presence indicates that runoff and TA-50 discharges do not impact some portions of the stream channel.

Question D:

Is contaminated groundwater potentially available to biological receptors through seeps or springs or shallow groundwater?

Known or suspected presence of contaminants in groundwater.

- **The potential for contaminants to migrate via groundwater and discharge into habitats and/or surface waters.**

- **Contaminants may be taken up by terrestrial and rooted aquatic plants whose roots are in contact with groundwater present within the root zone (~1 m depth).**

- **Terrestrial wildlife receptors generally will not contact groundwater unless it is discharged to the surface.**

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: No seeps or springs are known to occur in this area. The semi-arid environment of this region provides minimal hydrologic head in this area.

Question E:

Is infiltration/percolation from contaminated subsurface material a viable transport and exposure pathway?

- **Suspected ability of contaminants to migrate to groundwater.**
- **The potential for contaminants to migrate via groundwater and discharge into habitats and/or surface waters.**
- **Contaminants may be taken up by terrestrial and rooted aquatic plants whose roots are in contact with groundwater present within the root zone (~1 m depth).**
- **Terrestrial wildlife receptors generally will not contact groundwater unless it is discharged to the surface.**

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: Contaminants are not likely to migrate to groundwater because of the semi-arid conditions and lack of standing water along the slope and bench of the canyon. No intermediate or alluvial groundwaters are known in the immediate area.

Question F:

Might erosion or mass wasting events be a potential release mechanism for contaminants from subsurface materials or perched aquifers to the surface?

- **This question is only applicable to release sites located on or near the mesa edge.**
- **Consider the erodability of surficial material and the geologic processes of canyon/mesa edges.**

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: Releases from TA-35 have been and continue to be at the surface. The slopes of the canyon are too steep and rocky to permit accumulation of contaminants in the subsurface.

Question G:

Could airborne contaminants interact with receptors through respiration of vapors?

- **Contaminants must be present as volatiles in the air.**
- **Consider the importance of inhalation of vapors for burrowing animals.**
- **Foliar uptake of organic vapors is typically not a significant exposure pathway.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 0

Terrestrial Animals: 0

Provide explanation: Some volatile organic compounds detected at low levels. VOCs would not remain after being released into canyon. The dynamics of transport would dispersed the more volatile compounds such that the volatile air pathway is very limited.

Question H:

Could airborne contaminants interact with plants through deposition of particulates or with animals through inhalation of fugitive dust?

- **Contaminants must be present as particulates in the air or as dust for this exposure pathway to be complete.**
- **Exposure via inhalation of fugitive dust is particularly applicable to ground-dwelling species that would be exposed to dust disturbed by their foraging or burrowing activities or by wind movement.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 2

Terrestrial Animals: 2

Provide explanation: May be some deposition of particulates although most of the area is well vegetated. Vegetation cover on the slope tends to reduce the entrainment of particles such that the air pathway to terrestrial receptors is minimal. Some burrowing activity was observed where sediment has accumulated in the canyon bottom so inhalation of dust may be a factor.

Question I:

Could contaminants interact with plants through root uptake or rain splash from surficial soils?

- **Contaminants in bulk soil may partition into soil solution, making them available to roots.**
- **Exposure of terrestrial plants to contaminants present in particulates deposited on leaf and stem surfaces by rain striking contaminated soils (i.e., rain splash).**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 2

Provide explanation: Contaminants are primarily in the surface or near surface soils from discharges and runoff. Potential for root uptake and rain splash does exist but is a minor pathway.

Question J:

Could contaminants interact with receptors through food web transport from surficial soils?

- **The chemicals may bioaccumulate in animals.**
- **Animals may ingest contaminated food items.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 3

Provide explanation: Potential non-radiological bioaccumulators (pesticides, PCBs, and metals) have been detected in the canyon. Several potential radiological bioaccumulators (isotopic uranium and plutonium) have also been detected in the canyon. These contaminants are potentially available to terrestrial receptors and may be transported via the food web to higher trophic levels.

Question K:

Could contaminants interact with receptors via incidental ingestion of surficial soils?

- **Incidental ingestion of contaminated soil could occur while animals grub for food resident in the soil, feed on plant matter covered with contaminated soil or while grooming themselves clean of soil.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 3

Provide explanation: Releases have primarily been to the surface and contaminants are available via incidental ingestion of soil.

Question L:

Could contaminants interact with receptors through dermal contact with surficial soils?

- **Significant exposure via dermal contact would generally be limited to organic contaminants that are lipophilic and can cross epidermal barriers.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 1

Provide explanation: Some lipophilic chemicals were detected and may be taken up through the skin. However, this pathway is considered unlikely because of the presence of fur and feathers and because the concentrations are low.

Question M:

Could contaminants interact with plants or animals through external irradiation?

- **External irradiation effects are most relevant for gamma emitting radionuclides.**
- **Burial of contamination attenuates radiological exposure.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 1

Terrestrial Animals: 1

Provide explanation: Some gamma-emitting radionuclides (e.g., cesium-137) have been detected at low levels below or near background. Elevated radionuclide concentrations are primarily alpha-emitting radionuclides.

Question N:

Could contaminants interact with plants through direct uptake from water and sediment or sediment rain splash?

- **Contaminants may be taken-up by terrestrial plants whose roots are in contact with surface waters.**
- **Terrestrial plants may be exposed to particulates deposited on leaf and stem surfaces by rain striking contaminated sediments (i.e., rain splash) in an area that is only periodically inundated with water.**
- **Contaminants in sediment may partition into soil solution, making them available to roots.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 1

Provide explanation: There is no persistent aquatic habitat along the slope and bench in Mortandad Canyon below TA-35. These areas receive most if not all of the sediment and runoff from the mesa top. Little if any contamination from TA-35 reaches the stream channel in the deeply incised portion of Mortandad Canyon. Available sample data indicates that most if not all contamination detected in and along the stream channel originated from TA-50.

Question O:

Could contaminants interact with receptors through food web transport from water and sediment?

- **The chemicals may bioconcentrate in food items.**
- **Animals may ingest contaminated food items.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 1

Provide explanation: There is no persistent aquatic habitat along the slope and bench in Mortandad Canyon below TA-35. These areas receive most if not all of the sediment and runoff from the mesa top. Little if any contamination from TA-35 reaches the stream channel in the deeply incised portion of Mortandad Canyon. Available sample data indicates that most if not all contamination detected in and along the stream channel originated from TA-50.

Question P:

Could contaminants interact with receptors via ingestion of water and suspended sediments?

- **If sediments are present in an area that is only periodically inundated with water, terrestrial receptors may incidentally ingest sediments.**
- **Terrestrial receptors may ingest water-borne contaminants if contaminated surface waters are used as a drinking water source.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 1

Provide explanation: There is no persistent aquatic habitat along the slope and bench in Mortandad Canyon below TA-35. These areas receive most if not all of the sediment and runoff from the mesa top. Little if any contamination from TA-35 reaches the stream channel in the deeply incised portion of Mortandad Canyon. Available sample data indicates that most if not all contamination detected in and along the stream channel originated from TA-50.

Question Q:

Could contaminants interact with receptors through dermal contact with water and sediment?

- **If sediments are present in an area that is only periodically inundated with water, terrestrial species may be dermally exposed during dry periods.**
- **Terrestrial organisms may be dermally exposed to water-borne contaminants as a result of wading or swimming in contaminated waters.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 1

Provide explanation: There is no persistent aquatic habitat along the slope and bench in Mortandad Canyon below TA-35. These areas receive most if not all of the sediment and runoff from the mesa top. Little if any contamination from TA-35 reaches the stream channel in the deeply incised portion of Mortandad Canyon. Available sample data indicates that most if not all contamination detected in and along the stream channel originated from TA-50.

Question R:

Could contaminants interact with plants or animals through external irradiation?

- **External irradiation effects are most relevant for gamma emitting radionuclides.**
- **Burial of contamination attenuates radiological exposure.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 1

Terrestrial Animals: 1

Provide explanation: There is no persistent aquatic habitat along the slope and bench in Mortandad Canyon below TA-35. These areas receive most if not all of the sediment and runoff from the mesa top. Little if any contamination from TA-35 reaches the stream channel in the deeply incised portion of Mortandad Canyon. Available sample data indicates that most if not all contamination detected in and along the stream channel originated from TA-50.

Question S:

Could contaminants bioconcentrate in free floating aquatic, attached aquatic plants, or emergent vegetation?

- **Aquatic plants are in direct contact with water.**
- **Contaminants in sediment may partition into pore water, making them available to submerged roots.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Aquatic Plants/Emergent Vegetation: 1

Provide explanation: Little if any contamination from TA-35 reaches the stream channel in the deeply incised portion of Mortandad Canyon. Available sample data indicates that most if not all contamination detected in and along the stream channel originated from TA-50.

Question T:

Could contaminants bioconcentrate in sedimentary or water column organisms?

- **Aquatic receptors may actively or incidentally ingest sediment while foraging.**
- **Aquatic receptors may be directly exposed to contaminated sediments or may be exposed to contaminants through osmotic exchange, respiration, or ventilation of sediment pore waters.**
- **Aquatic receptors may be exposed through osmotic exchange, respiration, or ventilation of surface waters.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Aquatic Animals: 1

Provide explanation: Little if any contamination from TA-35 reaches the stream channel in the deeply incised portion of Mortandad Canyon. Available sample data indicates that most if not all contamination detected in and along the stream channel originated from TA-50.

Question U:

Could contaminants bioaccumulate in sedimentary or water column organisms?

- **Lipophillic organic contaminants and some metals may concentrate in an organism's tissues**
- **Ingestion of contaminated food items may result in contaminant bioaccumulation through the food web.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Aquatic Animals: 1

Provide explanation: Little if any contamination from TA-35 reaches the stream channel in the deeply incised portion of Mortandad Canyon. Available sample data indicates that most if not all contamination detected in and along the stream channel originated from TA-50.

Question V:

Could contaminants interact with aquatic plants or animals through external irradiation?

- **External irradiation effects are most relevant for gamma emitting radionuclides.**
- **The water column acts to absorb radiation, thus external irradiation is typically more important for sediment dwelling organisms.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

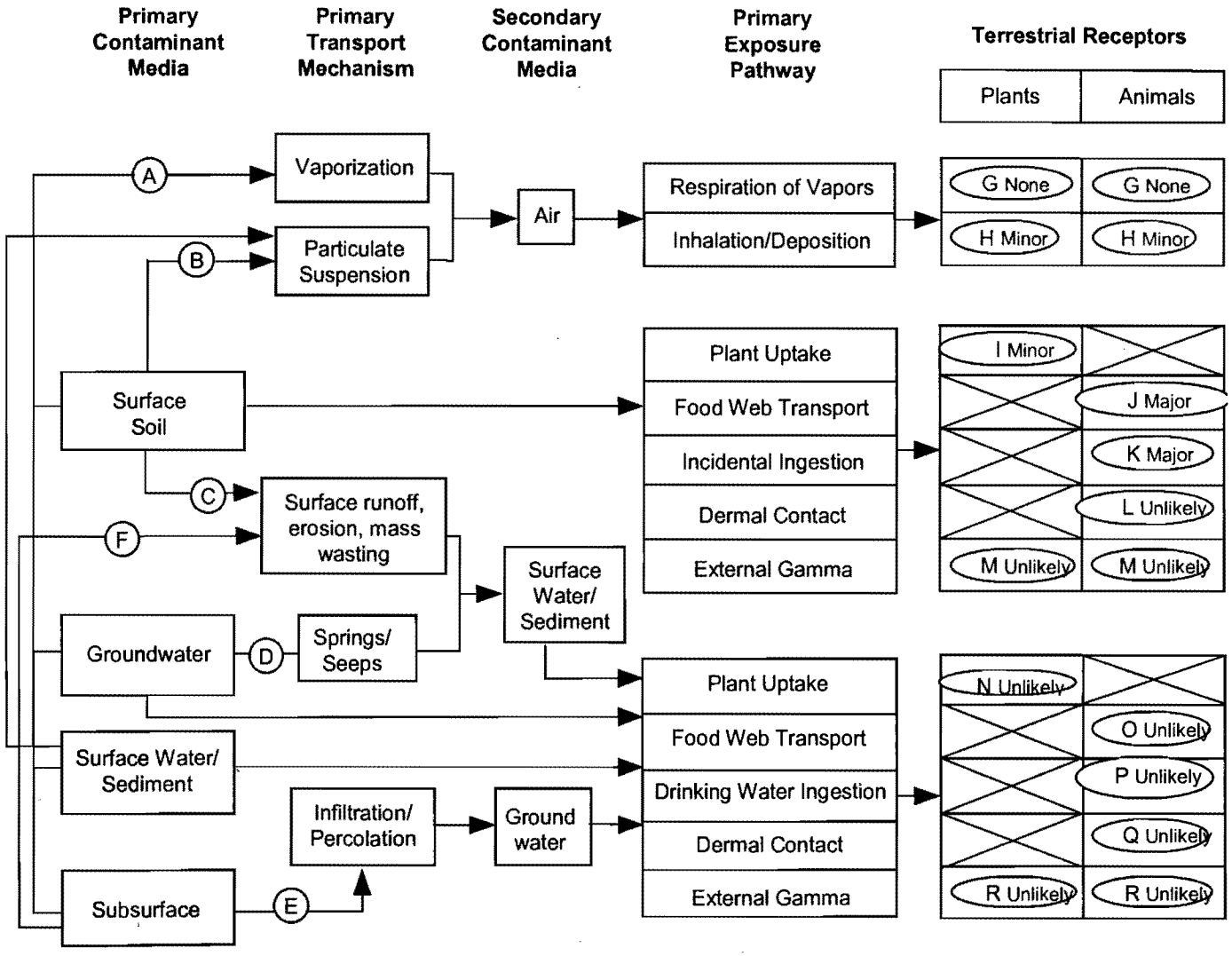
Aquatic Plants: 1

Aquatic Animals: 1

Provide explanation: Little if any contamination from TA-35 reaches the stream channel in the deeply incised portion of Mortandad Canyon. Available sample data indicates that most if not all contamination detected in and along the stream channel originated from TA-50.

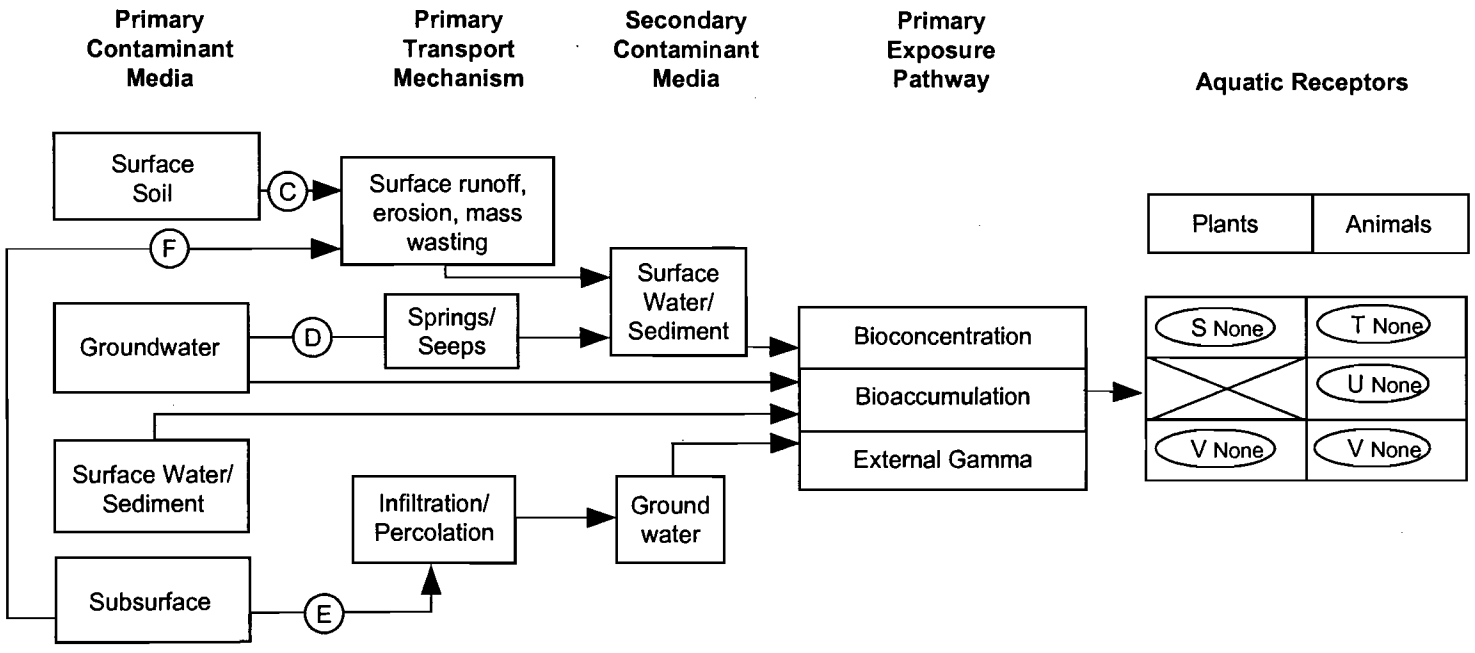
Ecological Scoping Checklist
Terrestrial Receptors
Ecological Pathways Conceptual Exposure Model

NOTE:
Letters in circles refer to questions on the Scoping Checklist



Ecological Scoping Checklist
Aquatic Receptors
Ecological Pathways Conceptual Exposure Model

NOTE:
Letters in circles refer to questions on the Scoping Checklist



Signatures and certifications:

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

Name (printed):	Richard Mirenda, Ph.D.
Name (signature):	Richard Mirenda
Organization:	MK/PMC
Phone number	(505)662-1329

Date completed: 3/16/00

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

Name (printed):	**Lars F. Soholt, Ph.D.**
Name (signature):	Lars F. Soholt
Organization:	**LANL E/ER**
Phone number:	**505/667-2256**

ECOLOGICAL SCOPING CHECKLIST

PART A—SCOPING MEETING DOCUMENTATION

Site ID	Pratt Canyon Aggregate
Form of site releases (solid, liquid, vapor). Describe all relevant known or suspected mechanisms of release (spills, dumping, material disposal, outfall, explosive testing, etc.) and describe potential areas of release. Reference locations on a map as appropriate.	Releases into the canyon were primarily from liquid discharges, spills, and leaks from the Wastewater Treatment Plant at TA-35. The OU 1129 Work Plan provides a brief description of the known releases (both planned and unplanned) that occurred while the plant was in operation. The releases were from the piping as well as directly into the canyon such that the canyon itself is a PRS and is known to contain elevated levels of radionuclides.
List of Primary Impacted Media (Indicate all that apply.)	**Surface soil – XX** – Primarily affected by releases into the canyon. All discharges, spills, and leaks were at the surface. **Surface water/sediment – XX** – The discharges were liquid and transported down the canyon by storm water. Also includes fine particulate sediment carried by discharge and storm water. There is also a small wetland located at the mouth of Pratt Canyon above the confluence with Ten-Site Canyon that has received storm water and effluent discharge over the years. **Subsurface –** **Groundwater –** **Other, explain –**
FIMAD vegetation class based on Arcview vegetation coverage (Indicate all that apply.)	**Water – X** – There is a small area of riparian habitat in the form of cattails as part of a small wetland area at the mouth of the canyon prior to the confluence with Ten-Site Canyon. **Bare Ground/Unvegetated –** Few areas of bare ground where runoff has either accumulated or flowed over the years. This area has fine and coarse sediments at the surface. **Spruce/fir/aspen/mixed conifer –** **Ponderosa pine – XX** – The area of Pratt Canyon is predominantly ponderosa pine habitat with an understory of gambel oak, some juniper and fir on the slopes, with some willow and grasses present in the channel area. **Piñon juniper/juniper savannah** **Grassland/shrubland –** **Developed –**
Is T&E Habitat Present? If applicable, list species known or suspected to use the site for breeding or foraging.	Pratt Canyon is within the core area of the Mexican spotted owl. This would indicate potential foraging and nesting habitat for this animal. The biological assessment indicates that this species is not present and has not been observed in the area.
Provide list, of Neighboring/ Contiguous/ Up-gradient sites, includes a brief summary of COPCs and the form of releases for relevant sites and reference a map as appropriate. (Use this information to evaluate the need to aggregate sites for screening.)	In addition to the canyon itself, there are several other PRSs that make up the aggregate. These include PRSs 35-003(d, e, h, l, and q), which are a waste treatment plant holding tank, a waste treatment plan storage tank, a waste treatment plant retention tank, a waste treatment plant surge tank, and a waste treatment plan pipe trench, respectively. Also, included are PRS 35-009(d), an abandoned inactive septic tank leach field, and PRSs 35-016(k, l, and m), an inactive outfall for cooling water, an active, open-air surface storm water discharge channel, and a cooling water tower outfall, respectively. In addition, down canyon from Pratt Canyon are PRSs 35-010(a-e), which are the lagoons, sand filter, and discharge headwall for the former Wastewater Treatment Plant at TA-35.

Surface Water Erosion Potential Information **Summarize information from SOP 2.01, including the run-off subscore (maximum of 46); terminal point of surface water transport; slope; and surface water runon sources.**	The Erosion Matrix score for this PRS aggregate is 87, with 46 for runoff [visible evidence of runoff discharging (5.0), runoff terminates in a drainage/wetland (19), and runoff in the form of gully flow (22)] and 11.0 for run-on (structures adversely affecting run-on and current operations adversely impacting run-on) scores. The score also reflects it is within the bottom of canyon channel in a watercourse (17.0), ground cover is 25-75% (6.5), and slope is 10-30% (6.5). There is a high potential for soil erosion at this site and BMPs are in place. The runoff terminates in Ten-Site Canyon, which joins with Pratt Canyon.

Part B—Site Visit Documentation

Site ID	**Pratt Canyon Aggregate**
Date of Site Visit	**2/22/00**
Site Visit Conducted by	**Steve Reneau, Gabriela Lopez Escobedo, Richard Mirenda**

Receptor Information:

Estimate cover	**Relative vegetative cover (high, medium, low, none)** = high; slopes and canyon bottom well vegetated with ponderosa pine, gambel oak, juniper, fir, miscellaneous shrubs, and grasses. **Relative wetland cover (high, medium, low, none)** = low; small cattail area at mouth of canyon above confluence with Ten Site Canyon. **Relative structures/asphalt, etc. cover (high, medium, low, none)** = none
Field notes on the FIMAD vegetation class to assist in ground-truthing the Arcview information	Pratt Canyon is predominantly ponderosa pine habitat with scattered juniper and fir on the slopes and an understory of gambel oak, shrubs, 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.	No evidence of T&E habitat found during site visit.
Are ecological receptors present at the site? (yes/no/uncertain) Describe the general types of receptors present at the site (terrestrial and aquatic), and make notes on the quality of habitat present at the site.	Yes. There are a variety of terrestrial receptors that frequent or inhabit the Pratt Canyon area. These include large mammals such as bear, deer, elk, fox, and coyotes as well as small mammals such as mice, voles, shrews, and rabbits. Birds include sparrows, warblers, jays, bluebirds, and robins as well as owls and other birds of prey (falcons and hawks). There are also lizards and snakes present as well as amphibians due to the small wetland area. Insects are also present and may include some aquatic, emerging insects due to the small wetland area.

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 surface water runoff flows directly into Pratt Canyon from TA-35 on the mesa top. As indicated by the high SOP 2.01 score, the potential for erosion is extremely high and requires BMPs to reduce or mitigate impacts. The terminal point of the runoff is Ten Site Canyon, which joins with Pratt Canyon a short distance from the bottom of the drainage. There is also a small cattail/wetland area above the confluence of the canyons, which receives runoff from above.
Are there any off-site transport pathways (surface water, air, or groundwater)? (yes/no/uncertain) Provide explanation	Surface water is the primary off-site transport pathway. Air transport via particulates or fugitive dust may be a possibility if contaminants have been deposited. There are several areas of bare ground where runoff ahas been discharged over the years. This pathway however is minor compared to the surface water runoff into the canyon.

Interim action needed to limit off-site transport? (yes/no/uncertain) Provide explanation/ recommendation to project lead for IA SMDP.	Yes. BMPs have been put in place along the channel in Pratt Canyon above the cattail area to mitigate the runoff into the canyon and beyond.

Ecological Effects Information:

Physical Disturbance (Provide list of major types of disturbances, including erosion and construction activities, review historical aerial photos where appropriate.)	There has been some physical disturbance of Pratt Canyon from the runoff that has been discharged into the canyon. This has resulted in erosion of the slopes and the canyon bottom. Some areas at and near the canyon bottom have accumulated sediment, which has resulted in areas of bare ground. In addition, there are several dead ponderosa pine trees along the slope and bottom from the excess water resulting from runoff. There is also a dirt road that descends into the canyon from the mesa along the northern rim of the canyon.
Are there obvious ecological effects? (yes/no/uncertain) Provide explanation and apparent cause (e.g., contamination, physical disturbance, other).	Yes. Contamination with radionuclides has been found in the canyon by previous sampling activities. Non-radiological contamination has not been adequately determined. There is some physical disturbances from the runoff and erosion as well as from the dirt road.
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.	Yes. BMPs have been put in place along the channel in Pratt Canyon above the cattail area to mitigate the runoff into the canyon and beyond.

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. Not applicable.

Adequacy of Site Characterization:

Do existing or proposed data provide information on the nature, rate and extent of contamination? (yes/no/uncertain) Provide explanation (Consider if the maximum value was captured by existing sample data.)	No. Existing data identified radiological contamination in Pratt canyon. However, additional sampling is needed to adequately address the extent of the contamination as well as determine if there is any nonradiological contamination and its extent. The proposed sampling in the Integrated Sampling and Analysis Plan for TA-35 is designed to address these data gaps and provide information on the nature and extent of all contamination associated with TA-35 including Pratt Canyon.

Do existing or proposed data for the site address potential transport pathways of site contamination? (yes/no/uncertain) Provide explanation (Consider if other sites should aggregated to characterize potential ecological risk.)	Yes. The existing and proposed data will address the surface water runoff that has impacted Pratt Canyon. The aggregation of sites insures that all PRSs impacting the canyon will be addressed together and that any potential ecological risk will be characterized.

Additional Field Notes:

Provide additional field notes on the site setting and potential ecological receptors.

Part C—Ecological Pathways Conceptual Exposure Model

Question A:

Could soil contaminants reach receptors via vapors?

Volatility of the hazardous substance (volatile chemicals generally have Henry's Law constant >10^{-5} atm-me/mol and molecular weight <200 g/mol).

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: Discharges and runoff into the canyon primarily contained radionuclides. Unlikely that VOCs would remain after being released into canyon.

Question B:

Could the soil contaminants reach receptors through fugitive dust carried in air?

Soil contamination would have to be on the actual surface of the soil to become available for dust.

In the case of dust exposures to burrowing animals, the contamination would have to occur in the depth interval where these burrows occur.

Answer (likely/unlikely/uncertain): Likely

Provide explanation: Although this would be a minor pathway for exposure because the area is well vegetated and protected from the wind, some areas lack vegetation and may be result in resuspension of dust/particulates. Whatever is resuspended would be localized. There are areas of burrowing in the canyon where sediment has accumulated over time.

Question C:

Can contaminated soil be transported to aquatic ecological communities (use SOP 2.01 run-off score and terminal point of surface water runoff to help answer this question)?

If the SOP 2.01 run-off score* for each PRS included in the site is equal to zero, this suggests that erosion at the site is not a transport pathway. (* Note that the runoff score is not the entire erosion potential score, rather it is a subtotal of this score with a maximum value of 46 points).

If erosion is a transport pathway, evaluate the terminal point to see if aquatic receptors could be affected by contamination from this site.

Answer (likely/unlikely/uncertain): Likely

Provide explanation: Runoff score is 46 suggesting that erosion potential is high. There is evidence of erosion and transport of sediment in the canyon. There is also a small cattail/wetland area that receives runoff from above.

Question D:

Is contaminated groundwater potentially available to biological receptors through seeps or springs or shallow groundwater?

Known or suspected presence of contaminants in groundwater.

The potential for contaminants to migrate via groundwater and discharge into habitats and/or surface waters.

Contaminants may be taken up by terrestrial and rooted aquatic plants whose roots are in contact with groundwater present within the root zone (~1 m depth).

Terrestrial wildlife receptors generally will not contact groundwater unless it is discharged to the surface.

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: No seeps or springs are present in this area or in the area Ten-Site Canyon below the confluence with Pratt Canyon.

Question E:

Is infiltration/percolation from contaminated subsurface material a viable transport and exposure pathway?

Suspected ability of contaminants to migrate to groundwater.

The potential for contaminants to migrate via groundwater and discharge into habitats and/or surface waters.

Contaminants may be taken up by terrestrial and rooted aquatic plants whose roots are in contact with groundwater present within the root zone (~1 m depth).

Terrestrial wildlife receptors generally will not contact groundwater unless it is discharged to the surface.

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: Contaminants are not likely to migrate to groundwater because of the semi-arid conditions and lack of standing water in the canyon.

Question F:

Might erosion or mass wasting events be a potential release mechanism for contaminants from subsurface materials or perched aquifers to the surface?

This question is only applicable to release sites located on or near the mesa edge.

Consider the erodability of surficial material and the geologic processes of canyon/mesa edges.

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: Releases from TA-35 have been and continue to be at the surface. The slopes of the canyon are too steep and rocky to permit accumulation of contaminants in the subsurface.

Question G:

Could airborne contaminants interact with receptors through respiration of vapors?

Contaminants must be present as volatiles in the air.

Consider the importance of inhalation of vapors for burrowing animals.

Foliar uptake of organic vapors is typically not a significant exposure pathway.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 0

Terrestrial Animals: 0

Provide explanation: No VOCs have been detected in previous sampling events and are not suspected of being present based on site activities.

Question H:

Could airborne contaminants interact with plants through deposition of particulates or with animals through inhalation of fugitive dust?

Contaminants must be present as particulates in the air or as dust for this exposure pathway to be complete.

Exposure via inhalation of fugitive dust is particularly applicable to ground-dwelling species that would be exposed to dust disturbed by their foraging or burrowing activities or by wind movement.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 2

Terrestrial Animals: 2

Provide explanation: May be some deposition of particulates although most of the area is well vegetated. Some burrowing activity was observed where sediment has accumulated in the canyon bottom so inhalation of dust may be a factor.

Question I:

Could contaminants interact with plants through root uptake or rain splash from surficial soils?

Contaminants in bulk soil may partition into soil solution, making them available to roots.

Exposure of terrestrial plants to contaminants present in particulates deposited on leaf and stem surfaces by rain striking contaminated soils (i.e., rain splash).

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 2

Provide explanation: Contaminants are primarily in the surface or near surface soils from discharges and runoff. Potential for root uptake and rain splash does exist but is a minor pathway.

Question J:

Could contaminants interact with receptors through food web transport from surficial soils?

The chemicals may bioaccumulate in animals.

Animals may ingest contaminated food items.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 3

Provide explanation: Some potential radiological bioaccumulators (pesticides, PCBs, and metals) have been detected in the canyon. Several potential radiological bioaccumulators (isotopic uranium and plutonium) have also been detected in the canyon.

Question K:

Could contaminants interact with receptors via incidental ingestion of surficial soils?

Incidental ingestion of contaminated soil could occur while animals grub for food resident in the soil, feed on plant matter covered with contaminated soil or while grooming themselves clean of soil.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 3

Provide explanation: Releases have primarily been to the surface and contaminants are available via incidental ingestion of soil.

Question L:

Could contaminants interact with receptors through dermal contact with surficial soils?

Significant exposure via dermal contact would generally be limited to organic contaminants that are lipophilic and can cross epidermal barriers.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 1

Provide explanation: Some lipophilic chemicals were detected and may be taken up through the skin. However, this pathway is considered unlikely because of the presence of fur and feathers and because the concentrations are low.

Question M:

Could contaminants interact with plants or animals through external irradiation?

External irradiation effects are most relevant for gamma emitting radionuclides.

Burial of contamination attenuates radiological exposure.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 0

Terrestrial Animals: 0

Provide explanation: Radionuclides detected in the canyon are primarily alpha emitters.

Question N:

Could contaminants interact with plants through direct uptake from water and sediment or sediment rain splash?

Contaminants may be taken-up by terrestrial plants whose roots are in contact with surface waters.

Terrestrial plants may be exposed to particulates deposited on leaf and stem surfaces by rain striking contaminated sediments (i.e., rain splash) in an area that is only periodically inundated with water.

Contaminants in sediment may partition into soil solution, making them available to roots.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 2

Provide explanation: Small area of cattails receives runoff from above. Plants have been found to contain elevated levels of radionuclides.

Question O:

Could contaminants interact with receptors through food web transport from water and sediment?

The chemicals may bioconcentrate in food items.

Animals may ingest contaminated food items.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 2

Provide explanation: Although potential bioaccumulating chemicals have been detected in the canyon, sampling has not identified such contaminants in the cattail area.

Question P:

Could contaminants interact with receptors via ingestion of water and suspended sediments?

If sediments are present in an area that is only periodically inundated with water, terrestrial receptors may incidentally ingest sediments.

Terrestrial receptors may ingest water-borne contaminants if contaminated surface waters are used as a drinking water source.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 2

Provide explanation: Small area of cattails receives runoff from above. Not large enough to be considered a major source of contaminated water/sediment.

Question Q:

Could contaminants interact with receptors through dermal contact with water and sediment?

If sediments are present in an area that is only periodically inundated with water, terrestrial species may be dermally exposed during dry periods.

Terrestrial organisms may be dermally exposed to water-borne contaminants as a result of wading or swimming in contaminated waters.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 1

Provide explanation: Small area of cattails receives runoff from above. Not large enough to be considered a major source of contaminated water/sediment. This pathway is also considered unlikely because of the presence of fur and feathers and because the concentrations are low.

Question R:

Could contaminants interact with plants or animals through external irradiation?

External irradiation effects are most relevant for gamma emitting radionuclides.

Burial of contamination attenuates radiological exposure.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 0

Terrestrial Animals: 0

Provide explanation: Radionuclides detected in the canyon are primarily alpha emitters.

Question S:

Could contaminants bioconcentrate in free floating aquatic, attached aquatic plants, or emergent vegetation?

Aquatic plants are in direct contact with water.

Contaminants in sediment may partition into pore water, making them available to submerged roots.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Aquatic Plants/Emergent Vegetation: 0

Provide explanation: No aquatic communities are present due to lack of standing water.

Question T:

Could contaminants bioconcentrate in sedimentary or water column organisms?

Aquatic receptors may actively or incidentally ingest sediment while foraging.

Aquatic receptors may be directly exposed to contaminated sediments or may be exposed to contaminants through osmotic exchange, respiration, or ventilation of sediment pore waters.

Aquatic receptors may be exposed through osmotic exchange, respiration, or ventilation of surface waters.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Aquatic Animals: 0

Provide explanation: No aquatic communities are present due to lack of standing water.

Question U:

Could contaminants bioaccumulate in sedimentary or water column organisms?

Lipophillic organic contaminants and some metals may concentrate in an organism's tissues

Ingestion of contaminated food items may result in contaminant bioaccumulation through the food web.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Aquatic Animals: 0

Provide explanation: No aquatic communities are present due to lack of standing water.

Question V:

Could contaminants interact with aquatic plants or animals through external irradiation?

External irradiation effects are most relevant for gamma emitting radionuclides.

The water column acts to absorb radiation, thus external irradiation is typically more important for sediment dwelling organisms.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

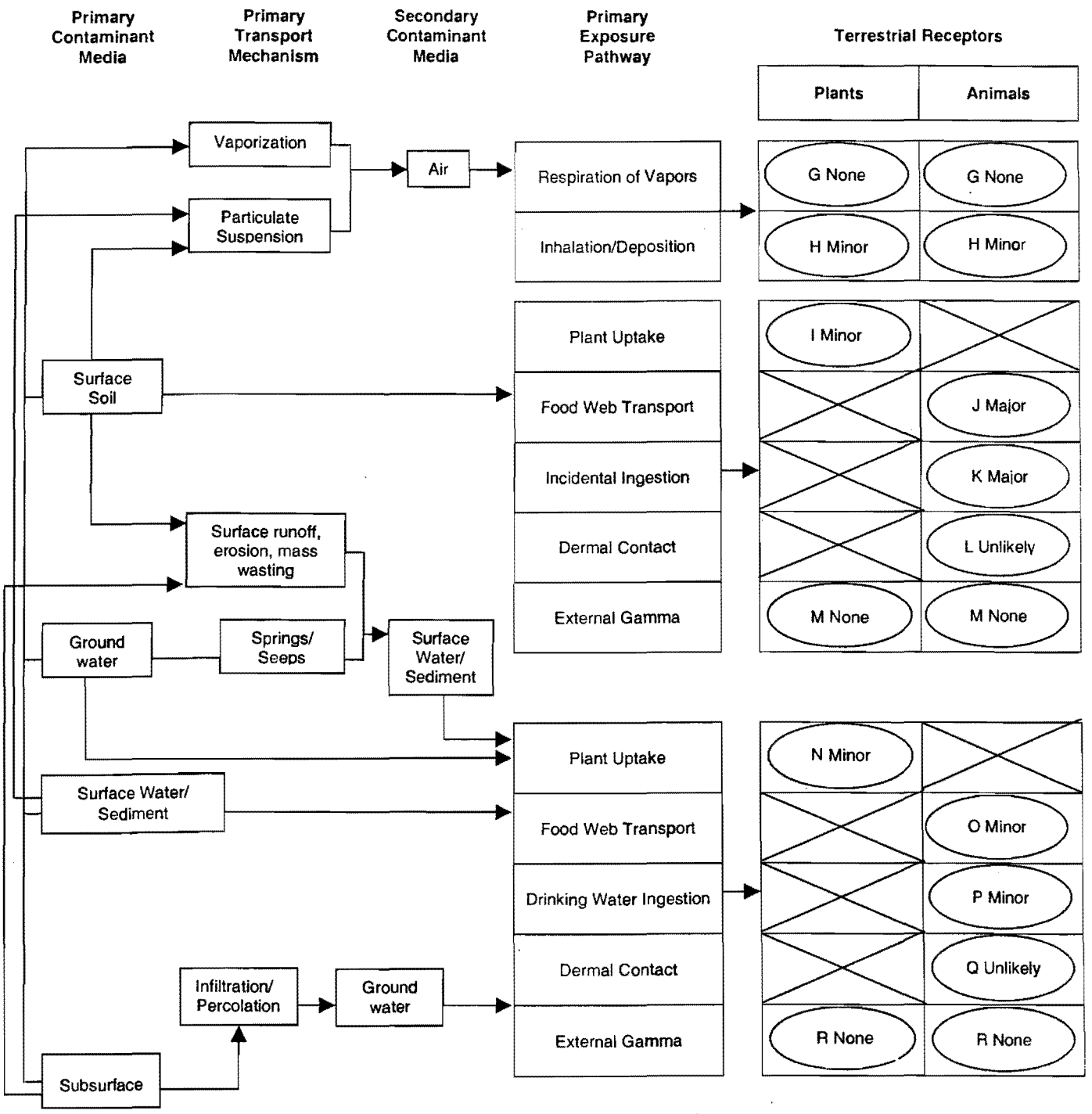
Aquatic Plants: 0

Aquatic Animals: 0

Provide explanation: No aquatic communities are present due to lack of standing water.

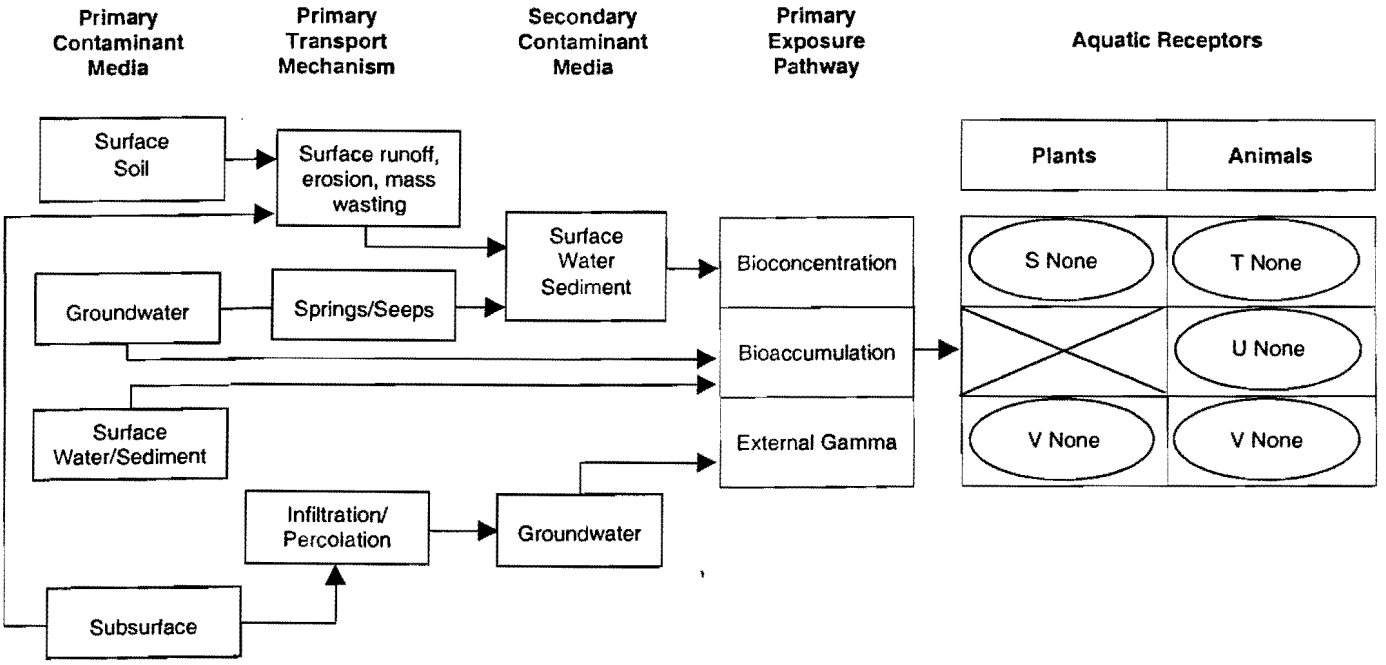
Ecological Scoping Checklist
Terrestrial Receptors
Ecological Pathways Conceptual Exposure Model

NOTE:
Letters in circles refer to questions on the Scoping Checklist



NOTE:
Letters in circles refer to questions on the Scoping Checklist

Ecological Scoping Checklist
Aquatic Receptors
Ecological Pathways Conceptual Exposure Model



Signatures and certifications:

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

Name (printed): Richard Mirenda, Ph.D.
Name (signature): Richard Mirenda
Organization: MK/PMC
Phone number: (505)662-1329

Date Completed: 2/28/00

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

Name (printed): Lars F. Soholt, Ph.D.
Name (signature): Lars F. Soholt
Organization: E/ER
Phone number: (505)667-2256

Appendix E

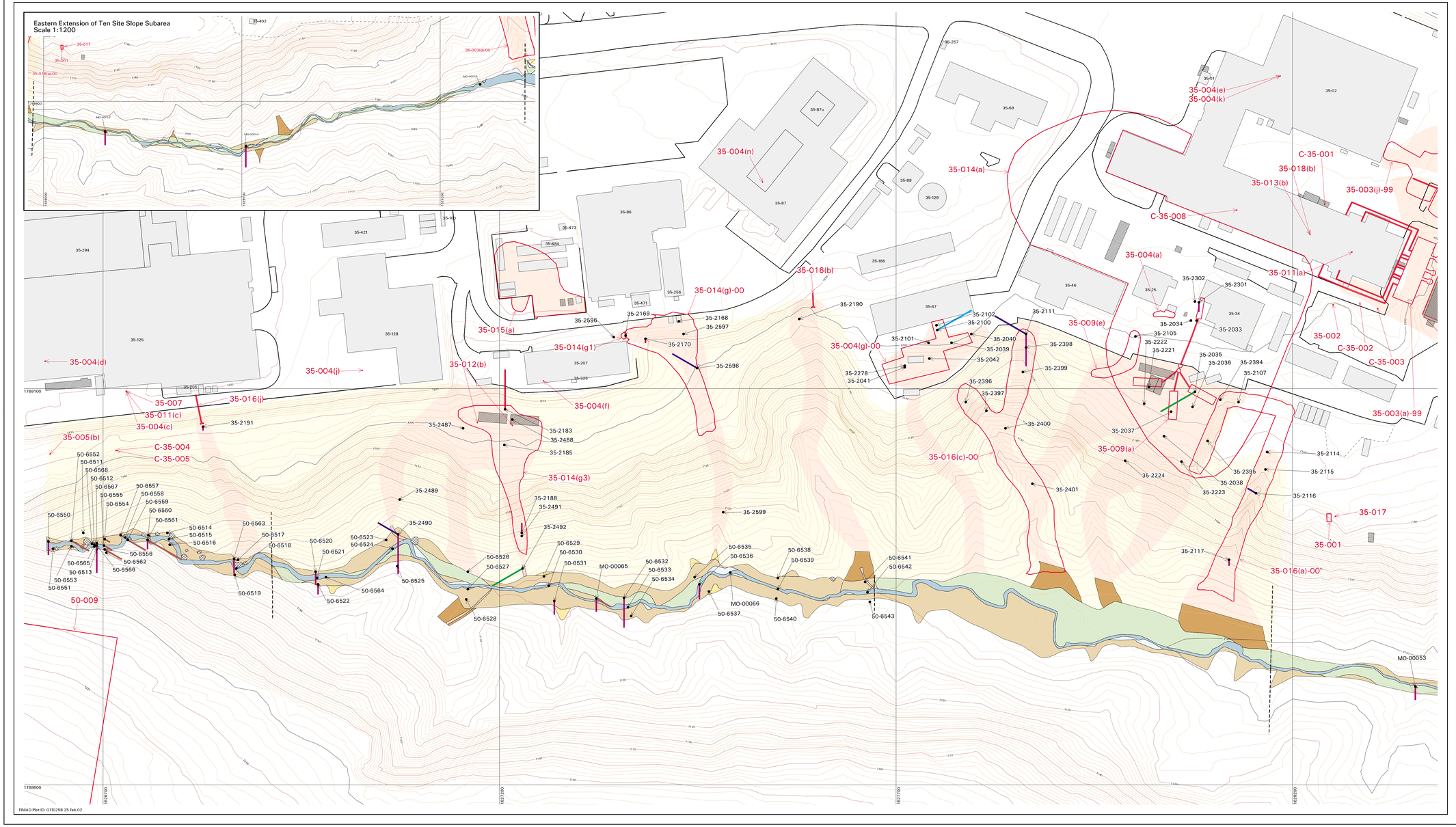
Spoke Plots

Spoke plots are visualization tools that provide a snapshot of the relative concentration of a specific analyte at a given locale. The relative concentration of each analyte is shown as a spoke radiating from a hub (a sample location). The spoke plots help convey information about

- where samples of each analyte type were collected,
- spatial data gaps,
- the distribution of contaminant concentrations within and among the PRS-affected areas, and
- the relation of contaminant concentrations between PRS-affected areas and canyon sediments.

For each subarea, a map with spoke plots was created for each *class* of chemicals (i.e., organic chemicals, inorganic chemicals, and radioisotopes). The mechanics of deriving the spoke plots and the instructions for using them is given in section 2.4.2.2.

Some copies of this SAP include paper copies of the spoke plots; others do not. If the spoke plots are included, they are located in clear plastic sleeves at the back of the binder. All copies of this SAP include a CD. This CD holds electronic versions of the spoke plots (in PDF format) as well as the data described in Appendix C.



TA-35, Ten Site Slope Subarea, Organic Chemicals Spoke Plot

- Contour, 2 foot
- Contour, 10 foot
- PRS Outline
- Road, Paved
- Road/Trail, Dirt
- Former Structure
- Structure
- Ten Site Slope Subarea
- TA-35 PRS Affected Area
- Location of Samples Submitted for Analysis

GEOMORPHOLOGY

- c1
- c1b
- c1ct
- c2
- c2a
- c2b
- c3
- disturbed, fill, or manmade
- fan
- f1
- f2
- Qal
- Qf
- rip rap
- road
- rock
- Best Management Practice (BMP)

Representative Organic Chemicals for Ten Site Slope Subarea

CHEMICAL	MAXIMUM RATIO	MAXIMUM CONCENTRATION
Aldrin	4.077	0.011
Aroclor-1254	1.361	0.132
Aroclor-1260	76.000	1.520
Benzo(a)pyrene	285.714	1.600
Bis(2-ethylhexyl)phthalate	1.500	4.800
Dibenz(a,h)anthracene	82.143	0.460

Each value is the maximum concentration divided by one-tenth of the screening action level (SAL) for that chemical. The maximum spoke length, which represents the largest maximum ratio for each chemical, is set to 1 in. All other ratios (concentration divided by one-tenth of SAL) for each chemical are represented by spoke lengths that are proportional to 1 in.

Cartography by: Doug Walther
Date: February 25, 2002 GISLab Plot ID: G110258

N

State Plane Coordinate System, New Mexico Central Zone.
1983 North American Datum

Grid provides NM State Plane coordinates in feet.
Grid interval, in feet: 500
Feet per inch on map = 50

SCALE 1:600

METERS

FEET

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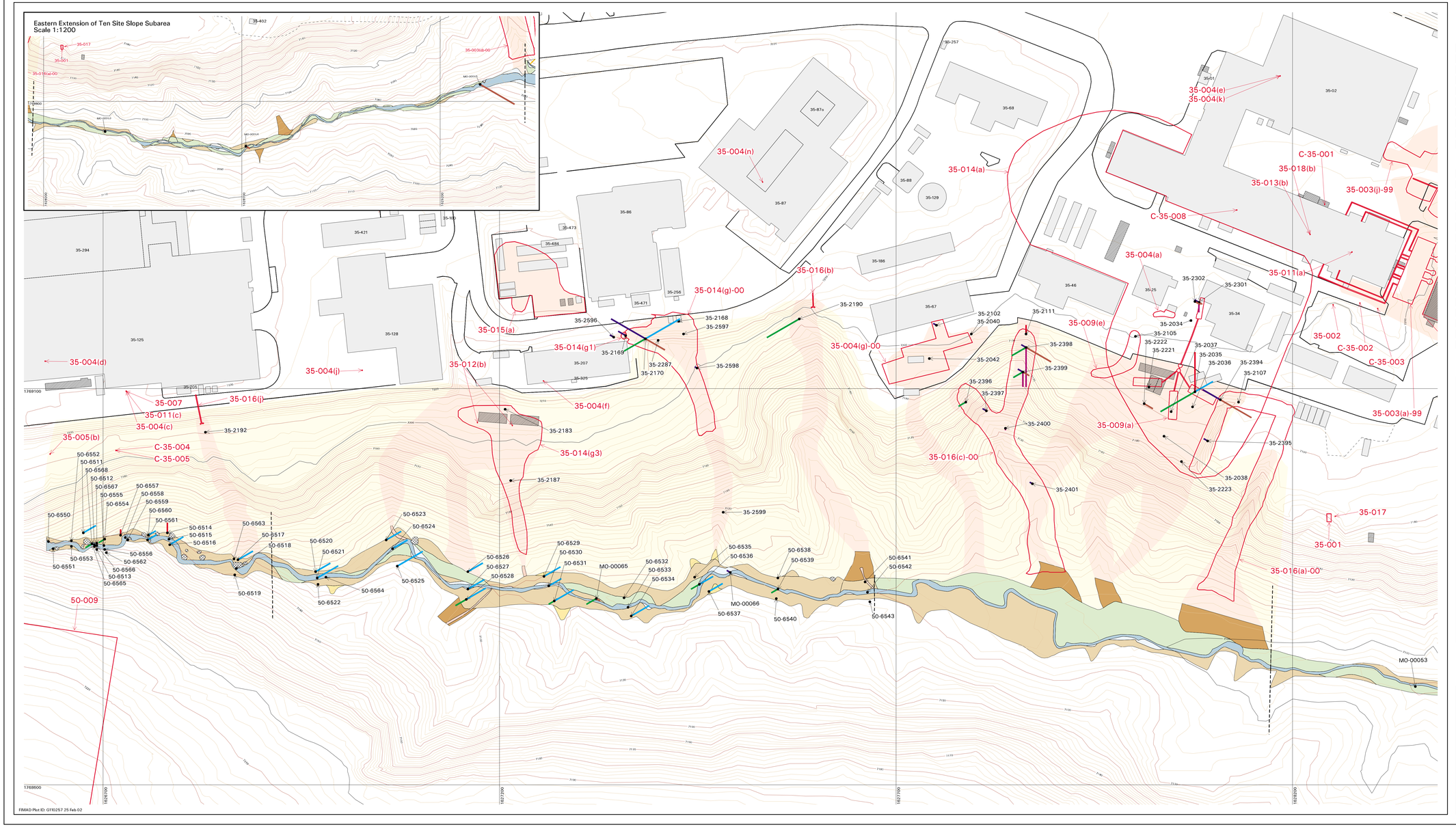
BASEMAP SOURCES: Boundary, structure, and utility data are from Los Alamos National Laboratory Engineering Division and Los Alamos County Utility and Engineering Departments. Contour data is from Los Alamos National Laboratory Environmental Restoration Program aerial survey, September 1991.

FIMAD Plot ID: G110258 25 Feb 02



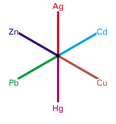
TA-35, Ten Site Slope Subarea, Inorganic Chemicals Spoke Plot

- Contour, 2 foot
- Contour, 10 foot
- PRS Outline
- Road, Paved
- Road/Trail, Dirt
- Former Structure
- Structure
- Ten Site Slope Subarea
- TA-35 PRS Affected Area
- Location of Samples Submitted for Analysis

GEOMORPHOLOGY

- c1
- c1b
- c1ct
- c2
- c2a
- c2b
- c3
- disturbed, fill, or manmade
- fan
- f1
- f2
- Qal
- Qf
- rip rap
- road
- rock
- Best Management Practice (BMP)

Representative Inorganic Chemicals for Ten Site Slope Subarea



CHEMICAL	MAXIMUM RATIO	MAXIMUM CONCENTRATION
AG	13.700	13.700
CD	5.750	2.300
CU	10.625	119.000
HG	27.000	2.700
PB	6.357	92.000
ZN	15.410	752.000

Each value is the maximum concentration divided by the background value (BV) for that chemical. The maximum spoke length, which represents the largest maximum ratio for each chemical, is set to 1 in. All other ratios (concentration divided by BV) for each chemical are represented by spoke lengths that are proportional to 1 in.

Cartography by: Doug Walther
Date: February 25, 2002 GISLab Plot ID: G110257

N

State Plane Coordinate System, New Mexico Central Zone.
1983 North American Datum

Grid provides NM State Plane coordinates in feet.
Grid Interval, in feet: 500
Feet per inch on map = 50

SCALE 1:600

METERS: 0 15 30 45 60

FEET: 0 50 100 150 200

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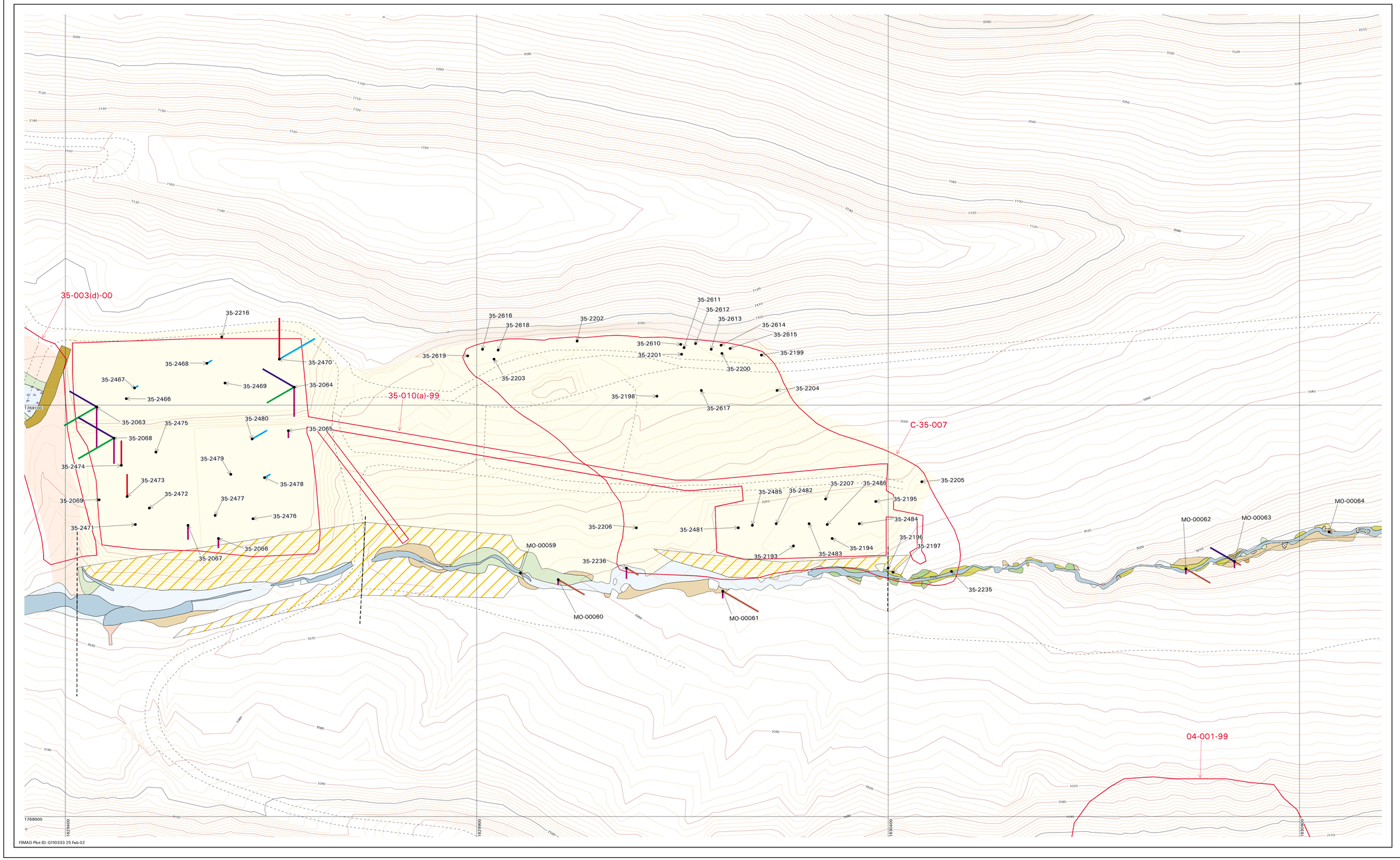
BASEMAP SOURCES: Boundary, structure, and utility data are from Los Alamos National Laboratory Engineering Division and Los Alamos County Utility and Engineering Departments. Contour data is from Los Alamos National Laboratory Environmental Restoration Program aerial survey, September 1991.



FIMAD Plot ID: G110333 25 Feb 02

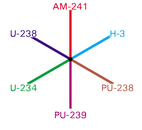
TA-35, Ten Site Canyon Subarea, Rad Chemicals Spoke Plot

- Contour, 2 foot
- Contour, 10 foot
- Contour, 100 foot
- PRS Outline
- Road, Paved
- Road/Trail, Dirt
- Former Structure
- Structure
- Ten Site Canyon Subarea
- TA-35 PRS Affected Area
- Location of Samples Submitted for Analysis

GEOMORPHOLOGY

- c1
- c1b
- c1ct
- c2
- c2a
- c2b
- c3
- disturbed, fill, or manmade
- fan
- f1
- f2
- Qal
- Qf
- rip rap
- road
- rock
- Best Management Practice (BMP)

Representative Radionuclides for Ten site Canyon



CHEMICAL	MAXIMUM RATIO	MAXIMUM CONCENTRATION
AM-241	41.231	0.536
H-3	232.376	178.000
PU-238	330.000	2.523
PU-239	64.074	3.460
U-234	1.718	4.450
U-238	1.528	3.500

Each value is the maximum concentration divided by the background value (BV) or one-tenth of the SAL if BV is not available for that chemical. The maximum spoke length, which represents the largest maximum ratio for each chemical, is set to 1 in. All other ratios (concentration divided by BV or one-tenth of the SAL, as appropriate) for each chemical are represented by spoke lengths that are proportional to 1 in.

Cartography by: Doug Walther
Date: February 25, 2002 GISLab Plot ID: G110333

N

State Plane Coordinate System, New Mexico Central Zone.
1983 North American Datum

Grid provides NM State Plane coordinates in feet.
Grid interval, in feet: 500
Feet per inch on map = 50

SCALE 1:600

METERS

FEET

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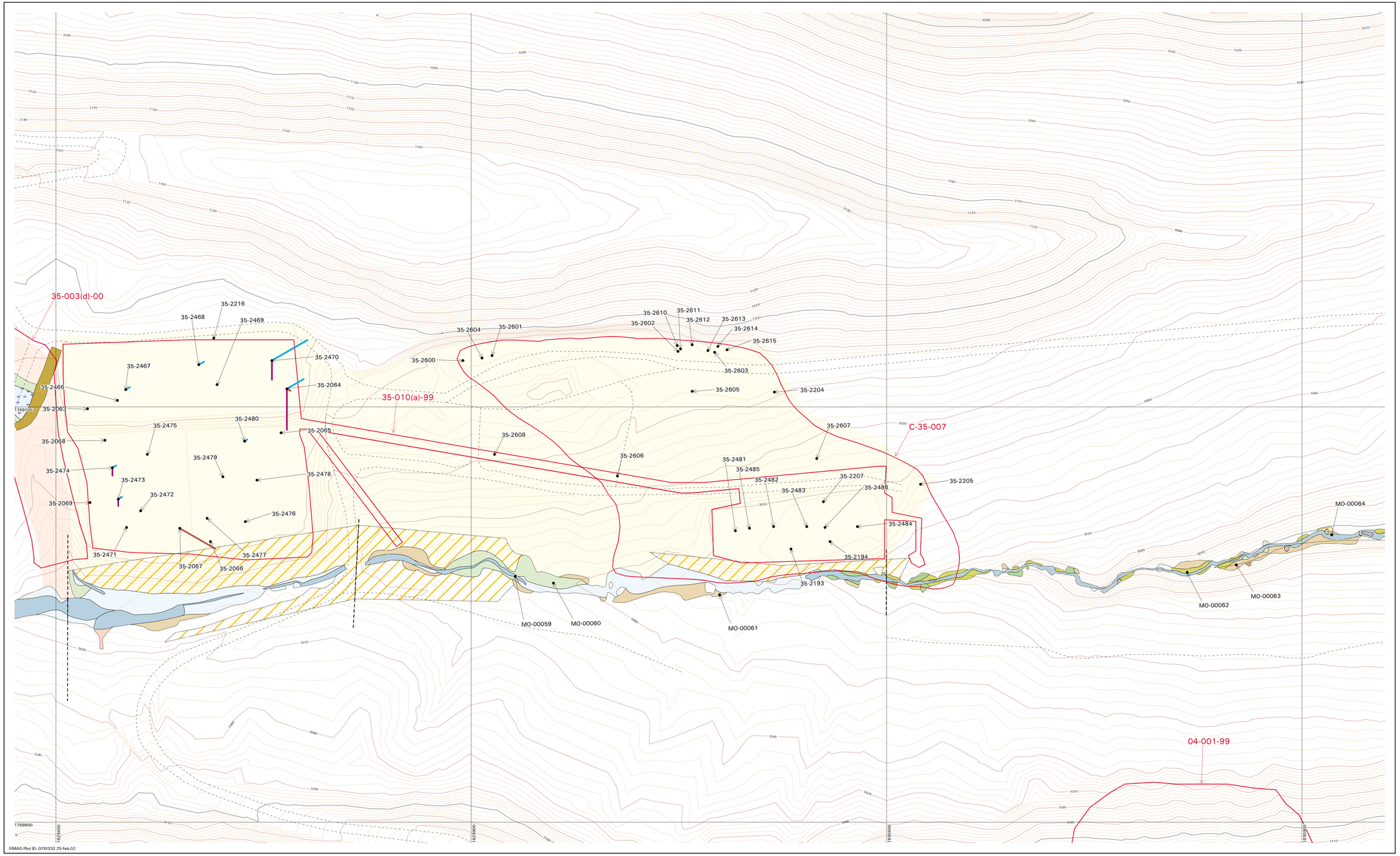
Basemap Sources: Boundary, structure, and utility data are from Los Alamos National Laboratory Engineering Division and Los Alamos County Utility and Engineering Departments. Contour data is from Los Alamos National Laboratory Environmental Restoration Program aerial survey, September 1991.



FIMAD Plot ID: G110332 25 Feb 02

TA-35, Ten Site Canyon Subarea, Organic Chemicals Spoke Plot

- Contour, 2 foot
- Contour, 10 foot
- Contour, 100 foot
- PRS Outline
- Road, Paved
- Road/Trail, Dirt
- Former Structure
- Structure
- Ten Site Canyon Subarea
- TA-35 PRS Affected Area
- Location of Samples Submitted for Analysis

GEOMORPHOLOGY

- c1
- c1b
- c1ct
- c2
- c2a
- c2b
- c3
- disturbed, fill, or manmade
- fan
- f1
- f2
- Qal
- Qf
- rip rap
- road
- rock
- Best Management Practice (BMP)

Representative Organic Chemicals for Ten Site Canyon Subarea

CHEMICAL	MAXIMUM RATIO	MAXIMUM CONCENTRATION
Acetone	0.000	2.600
Aroclor-1254	12.371	1.200
Aroclor-1260	140.000	2.800
Benzo(a)anthracene	0.000	0.043
Benzo(k)fluoranthene	0.000	0.000
Bis(2-ethylhexyl)phthalate	5.938	19.000

Each value is the maximum concentration divided by one-tenth of the screening action level (SAL) for that chemical. The maximum spoke length, which represents the largest maximum ratio for each chemical, is set to 1 in. All other ratios (concentration divided by one-tenth of SAL) for each chemical are represented by spoke lengths that are proportional to 1 in.

Cartography by: Doug Walther
Date: February 25, 2002 GISLab Plot ID: G110332

N

State Plane Coordinate System, New Mexico Central Zone.
1983 North American Datum

Grid provides NM State Plane coordinates in feet.
Grid interval, in feet: 500
Feet per inch on map = 50

SCALE 1:600

METERS: 0, 15, 30, 45, 60

FEET: 0, 50, 100, 150, 200

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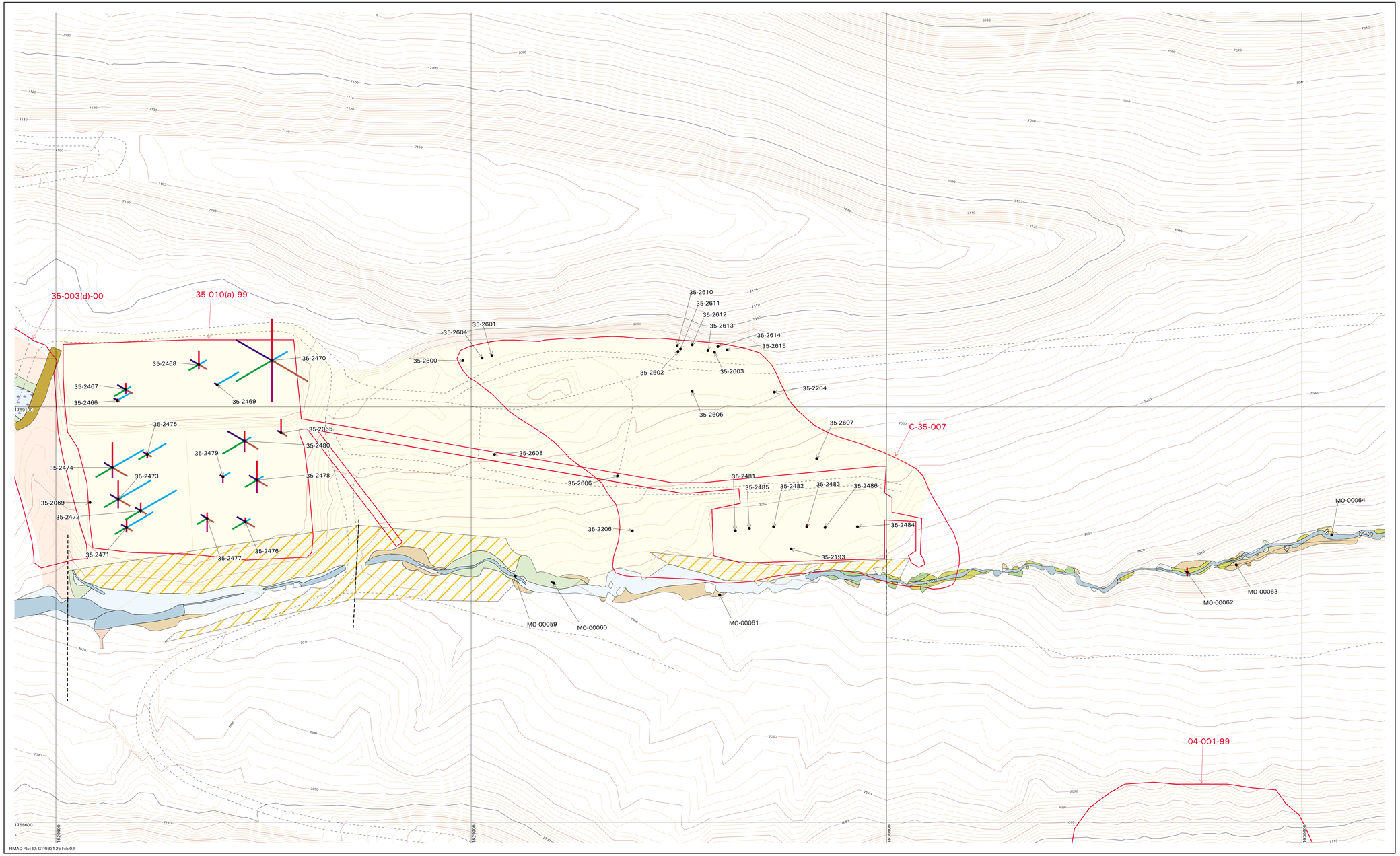
Basemap Sources: Boundary, structure, and utility data are from Los Alamos National Laboratory Engineering Division and Los Alamos County Utility and Engineering Departments. Contour data is from Los Alamos National Laboratory Environmental Restoration Program aerial survey, September 1991.

TA-35, Ten Site Canyon Subarea, Inorganic Chemicals Spoke Plot



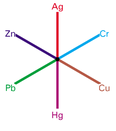
FIMAD Plot ID: G110331 25 Feb 02

Contour, 2 foot
Contour, 10 foot
Contour, 100 foot
PRS Outline
Road, Paved
Road/Trail, Dirt
Former Structure
Structure
Ten Site Canyon Subarea
TA-35 PRS Affected Area
Location of Samples Submitted for Analysis

GEOMORPHOLOGY

c1
c1b
c1ct
c2
c2a
c2b
c3
disturbed, fill, or manmade
fan
f1
f2
Qal
Qf
rip rap
road
rock
Best Management Practice (BMP)

Representative Inorganic Chemicals for Ten Site Canyon Subarea



CHEMICAL	MAXIMUM RATIO	MAXIMUM CONCENTRATION
AG	56.000	56.000
CR	9.104	77.000
CU	29.252	430.000
HG	40.000	4.000
PB	4.395	98.000
ZN	14.139	690.000

Each value is the maximum concentration divided by the background value (BV) for that chemical. The maximum spoke length, which represents the largest maximum ratio for each chemical, is set to 1 in. All other ratios (concentration divided by BV) for each chemical are represented by spoke lengths that are proportional to 1 in.

Cartography by: Doug Walther
Date: February 25, 2002 GISLab Plot ID: G110331

N

State Plane Coordinate System, New Mexico Central Zone.
1983 North American Datum

Grid provides NM State Plane coordinates in feet.
Grid interval, in feet: 500
Feet per inch on map = 50

SCALE 1:600

0 15 30 45 60
METERS

0 50 100 150 200
FEET

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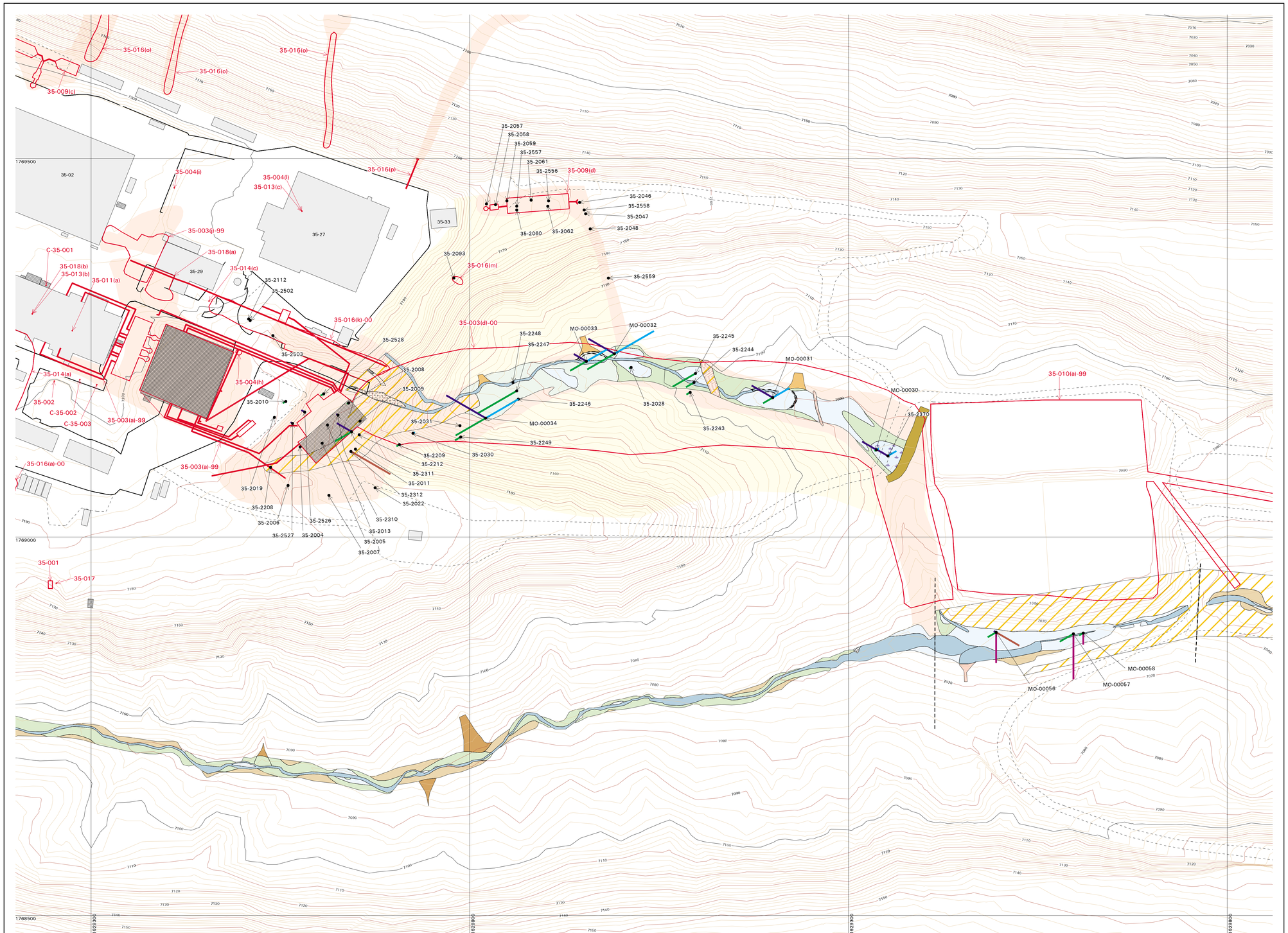
Basemap Sources: Boundary, structure, and utility data are from Los Alamos National Laboratory Engineering Division and Los Alamos County Utility and Engineering Departments. Contour data is from Los Alamos National Laboratory Environmental Restoration Program aerial survey, September 1991.



FIMAD Plot ID: G110310 19 Dec 01

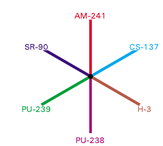
TA-35, Pratt Canyon Subarea, Rad Chemicals Spoke Plot

- Contour, 2 foot
- Contour, 10 foot
- Contour, 100 foot
- PRS Outline
- Road, Paved
- Road/Trail, Dirt
- Former Structure
- Structure
- Pratt Canyon Subarea
- TA-35 PRS Affected Area
- Location of Samples Submitted for Analysis

GEOMORPHOLOGY

- c1
- c1b
- c1ct
- c2
- c2a
- c2b
- c3
- disturbed, fill, or manmade
- fan
- f1
- f2
- Qal
- Qf
- rip rap
- road
- rock
- Best Management Practice (BMP)

Representative Rad Chemicals for Pratt Canyon Subarea



CHEMICAL	MAXIMUM RATIO	MAXIMUM CONCENTRATION
AM-241	0.000	0.412
CS-137	27.778	25.000
H-3	2.623	4.414
PU-238	253.333	1.520
PU-239	25.441	1.730
SR-90	113.462	118.000

Each value is the maximum concentration divided by the background value (BV) or one-tenth of the SAL if BV is not available for that chemical. The maximum spoke length, which represents the largest maximum ratio for each chemical, is set to 1 in. All other ratios (concentration divided by BV or one-tenth of the SAL as appropriate) for each chemical are represented by spoke lengths that are proportional to 1 in.

Cartography by: Doug Walther
Date: December 19, 2001 GISLab Plot ID: G110310

N

State Plane Coordinate System, New Mexico Central Zone.
1983 North American Datum

Grid provides NM State Plane coordinates in feet.
Grid interval, in feet: 500
Feet per inch on map = 60

SCALE 1:720

0 18 36 54 72
METERS

0 60 120 180 240
FEET

DISCLAIMER OF LIABILITY:
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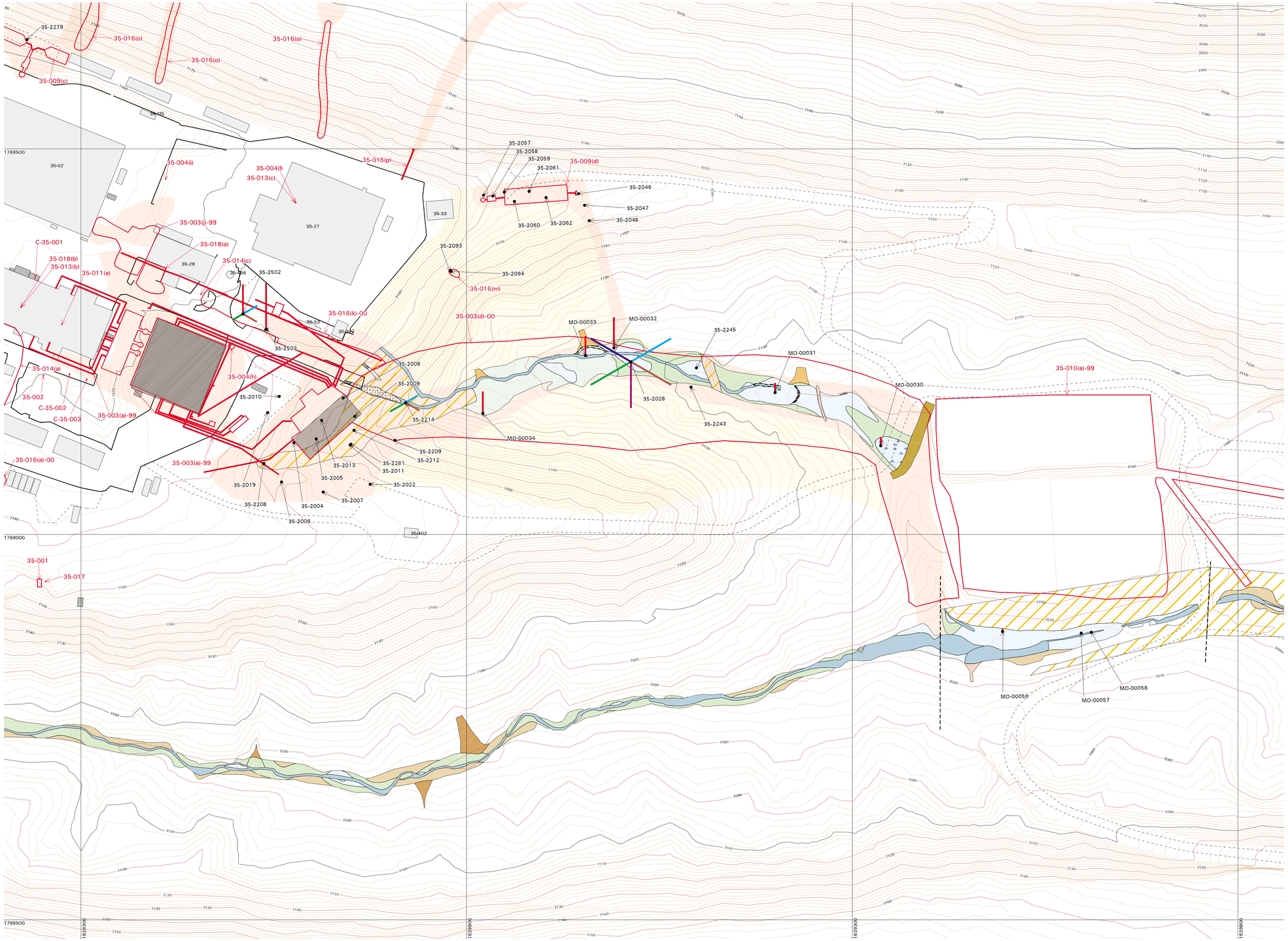
Basemap Sources: Boundary, structure, and utility data are from Los Alamos National Laboratory Engineering Division and Los Alamos County Utility and Engineering Departments. Contour data is from Los Alamos National Laboratory Environmental Restoration Program aerial survey, September 1991.



FIMAD Plot ID: G110309 19 Dec 01

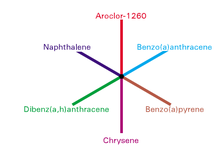
TA-35, Pratt Canyon Subarea, Organic Chemicals Spoke Plot

- Contour, 2 foot
- Contour, 10 foot
- Contour, 100 foot
- PRS Outline
- Road, Paved
- Road/Trail, Dirt
- Former Structure
- Structure
- Pratt Canyon Subarea
- TA-35 PRS Affected Area
- Location of Samples Submitted for Analysis

GEOMORPHOLOGY

- c1
- c1b
- c1ct
- c2
- c2a
- c2b
- c3
- disturbed, fill, or manmade
- fan
- f1
- f2
- Qal
- Qf
- rip rap
- road
- rock
- Best Management Practice (BMP)

Representative Organic Chemicals for Pratt Canyon Subarea



CHEMICAL	MAXIMUM RATIO	MAXIMUM CONCENTRATION
Aroclor-1260	45.500	0.910
Benzo(a)anthracene	146.429	8.200
Benzo(a)pyrene	1303.571	7.300
Chrysene	1.357	7.600
Dibenz(a,h)anthracene	392.857	2.200
Naphthalene	1.273	7.000

Each value is the maximum concentration divided by one-tenth of the screening action level (SAL) for that chemical. The maximum spoke length, which represents the largest maximum ratio for each chemical, is set to 1 in. All other ratios (concentration divided by one-tenth of SAL) for each chemical are represented by spoke lengths that are proportional to 1 in.

Cartography by: Doug Walther
Date: December 19, 2001 GISLab Plot ID: G110309

N

State Plane Coordinate System, New Mexico Central Zone.
1983 North American Datum

Grid provides NM State Plane coordinates in feet.
Grid interval, in feet: 500
Feet per inch on map = 60

SCALE 1:720

0 18 36 54 72
METERS

0 60 120 180 240
FEET

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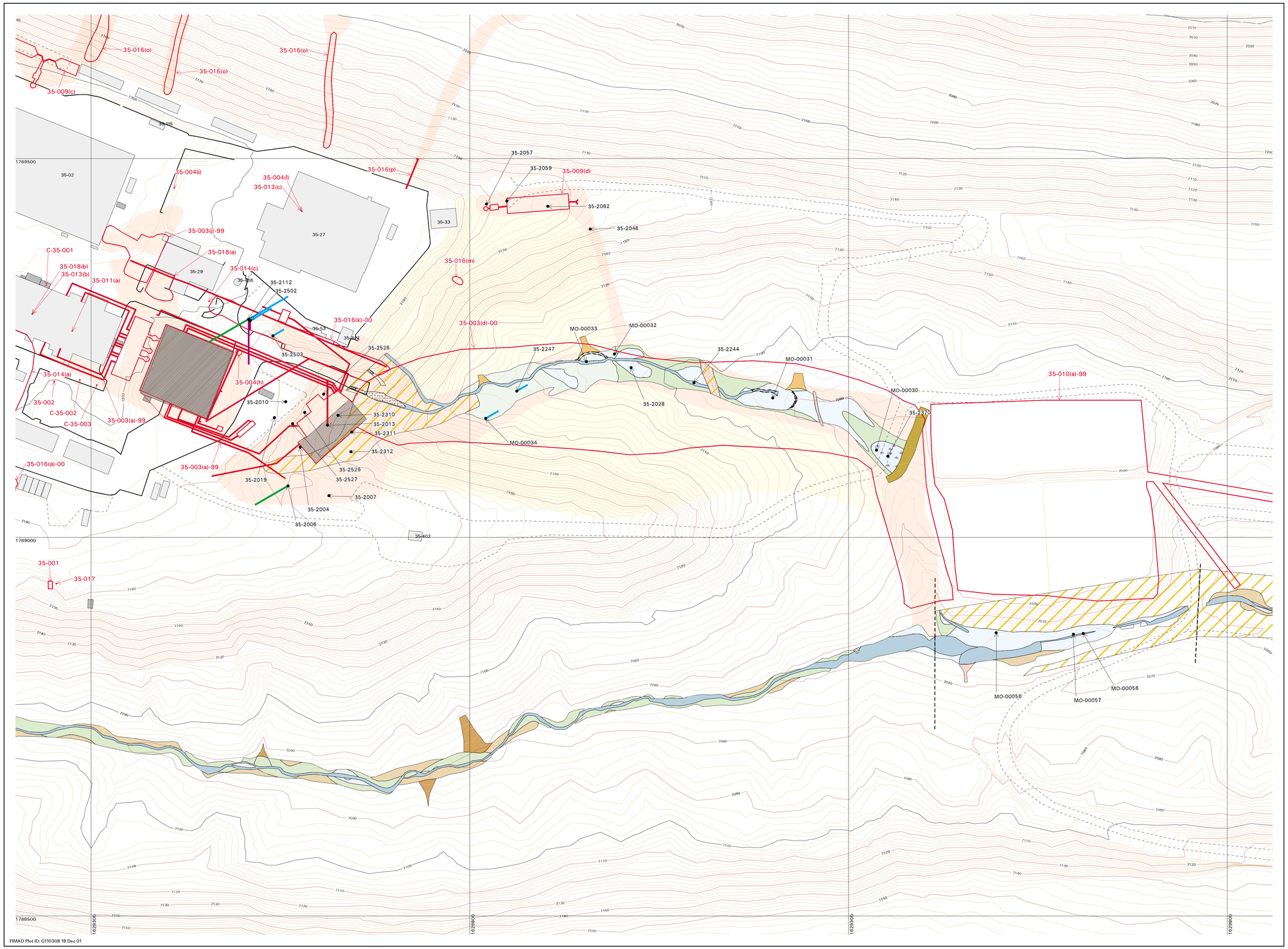
Basemap Sources: Boundary, structure, and utility data are from Los Alamos National Laboratory Engineering Division and Los Alamos County Utility and Engineering Departments. Contour data is from Los Alamos National Laboratory Environmental Restoration Program aerial survey, September 1991.



FIMAD Plot ID: G110308 19 Dec 01

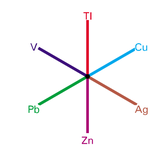
TA-35, Pratt Canyon Subarea, Inorganic Chemicals Spoke Plot

- Contour, 2 foot
- Contour, 10 foot
- Contour, 100 foot
- PRS Outline
- Road, Paved
- Road/Trail, Dirt
- Former Structure
- Structure
- Pratt Canyon Subarea
- TA-35 PRS Affected Area
- Location of Samples Submitted for Analysis

GEOMORPHOLOGY

- c1
- c1b
- c1ct
- c2
- c2a
- c2b
- c3
- disturbed, fill, or manmade
- fan
- f1
- f2
- Qal
- Qf
- rip rap
- road
- rock
- Best Management Practice (BMP)

Representative Inorganic Chemicals for Pratt Canyon Subarea



CHEMICAL	MAXIMUM RATIO	MAXIMUM CONCENTRATION
TL	16.273	17.900
CU	3.680	54.100
AG	0.000	0.580
ZN	11.742	573.000
PB	1.309	29.200
V	0.000	16.400

Each value is the maximum concentration divided by the background value (BV) for that chemical. The maximum spoke length, which represents the largest maximum ratio for each chemical, is set to 1 in. All other ratios (concentration divided by BV) for each chemical are represented by spoke lengths that are proportional to 1 in.

Cartography by: Doug Walther
Date: December 19, 2001 GISLab Plot ID: G110308

N

State Plane Coordinate System, New Mexico Central Zone.
1983 North American Datum

Grid provides NM State Plane coordinates in feet.
Grid interval, in feet: 500
Feet per inch on map = 60

SCALE 1:720

0 18 36 54 72
METERS

0 60 120 180 240
FEET

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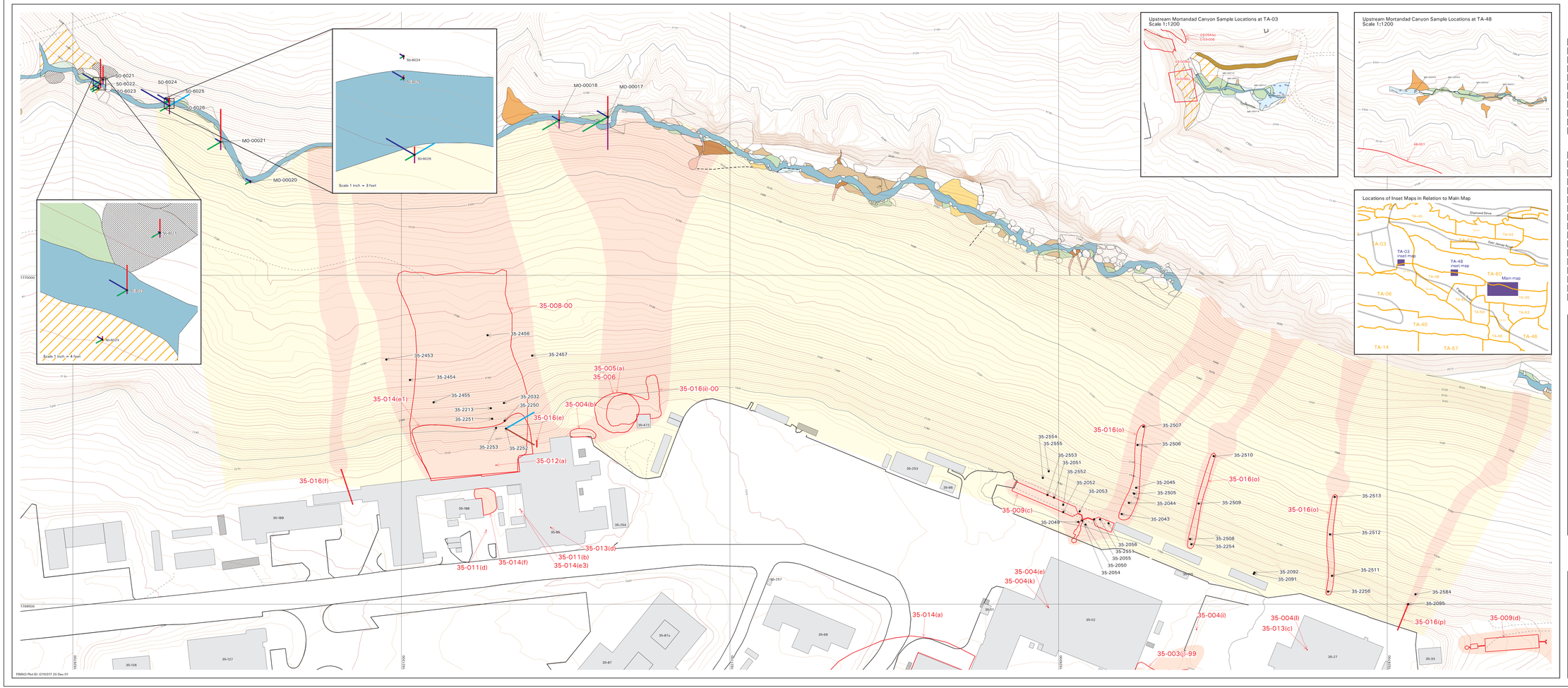
Basemap Sources: Boundary, structure, and utility data are from Los Alamos National Laboratory Engineering Division and Los Alamos County Utility and Engineering Departments. Contour data is from Los Alamos National Laboratory Environmental Restoration Program aerial survey, September 1991.



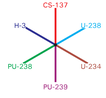
TA-35, Mortandad Slope Subarea, Rad Chemicals Spoke Plot (west)

- Contour, 2 foot
- Contour, 10 foot
- Contour, 100 foot
- PRS Outline
- Road, Paved
- Road/Trail, Dirt
- Former Structure
- Structure
- Mortandad Slope Subarea
- TA-35 PRS Affected Area
- Location of Samples Submitted for Analysis

GEOMORPHOLOGY

- c1
- c1b
- c1ct
- c2
- c2a
- c2b
- c3
- disturbed, fill, or manmade
- fan
- f1
- f2
- Qal
- Qf
- rip rap
- road
- rock
- Best Management Practice (BMP)

Representative Rad Chemicals for Mortandad Slope Subarea



CHEMICAL	MAXIMUM RATIO	MAXIMUM CONCENTRATION
CS-137	542.222	488.000
H-3	122.618	11.403
PU-238	5366.667	32.200
PU-239	1688.235	114.800
U-234	1.185	3.070
U-238	1.454	3.330

Each value is the maximum concentration divided by the background value (BV) or one-tenth of the SAL if BV is not available for that chemical. The maximum spoke length, which represents the largest maximum ratio for each chemical, is set to 1 in. All other ratios (concentration divided by BV or one-tenth of the SAL as appropriate) for each chemical are represented by spoke lengths that are proportional to 1 in.

Cartography by: Doug Walther
Date: December 20, 2001 GISLab Plot ID: G110317

N

State Plane Coordinate System, New Mexico Central Zone.
1983 North American Datum

Grid provides NM State Plane coordinates in feet.
Grid Interval, in feet: 500
Feet per inch on map = 50

SCALE 1:600

METERS

FEET

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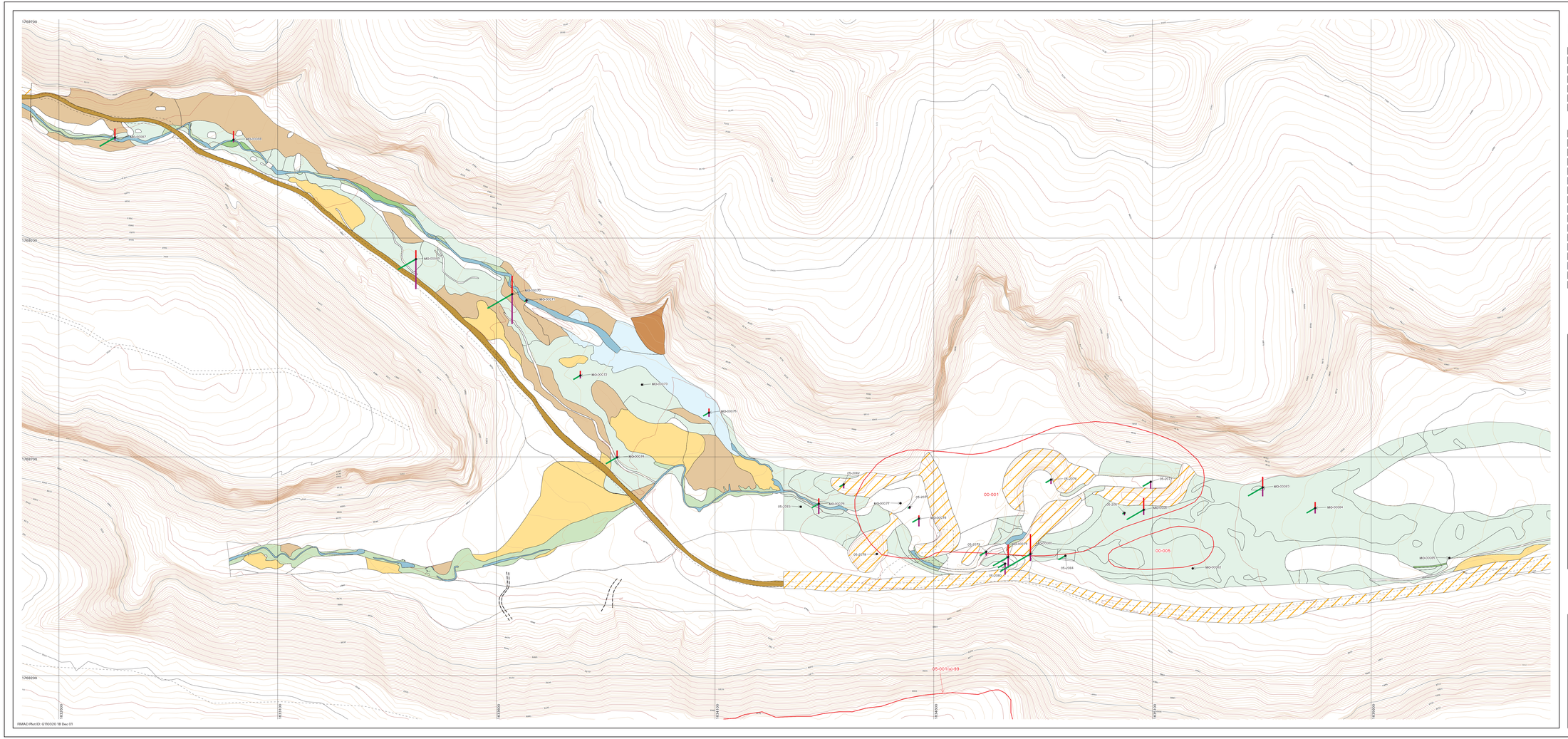
Data Sources: Los Alamos County GIS, Los Alamos National Laboratory Engineering Division, and Los Alamos County Utility and Engineering Departments. Contour data is from Los Alamos National Laboratory Environmental Restoration Program aerial survey, September 1991.



FIRMAD Plot ID: G110320 18 Dec 01

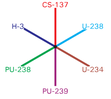
TA-35, Mortandad Slope Subarea, Rad Chemicals Spoke Plot (east)

- Contour, 2 foot
- Contour, 10 foot
- Contour, 100 foot
- PRS Outline
- Road, Paved
- Road/Trail, Dirt
- Location of Samples Submitted for Analysis

GEOMORPHOLOGY

- c1
- c1b
- c1ct
- c2
- c2a
- c2b
- c3
- disturbed, fill, or manmade
- fan
- f1
- f2
- Qal
- Qf
- rip rap
- road
- rock
- Best Management Practice (BMP)

Representative Rad Chemicals for Mortandad Slope Subarea



CHEMICAL	MAXIMUM RATIO	MAXIMUM CONCENTRATION
CS-137	542.222	488.000
H-3	122.618	11.403
PU-238	5366.667	32.200
PU-239	1688.235	114.800
U-234	1.185	3.070
U-238	1.454	3.330

Each value is the maximum concentration divided by the background value (BV) or one-tenth of the SAL if BV is not available for that chemical. The maximum spoke length, which represents the largest maximum ratio for each chemical, is set to 1 in. All other ratios (concentration divided by BV or one-tenth of the SAL, as appropriate) for each chemical are represented by spoke lengths that are proportional to 1 in.

Cartography by: Doug Walther
Date: December 18, 2001

GISLab Plot ID: G110320

N

State Plane Coordinate System, New Mexico Central Zone.
1983 North American Datum

Grid provides NM State Plane coordinates in feet.
Grid interval, in feet: 500
Feet per inch on map = 80

SCALE 1:960

METERS: 0, 24, 48, 72, 96

FEET: 0, 80, 160, 240, 320

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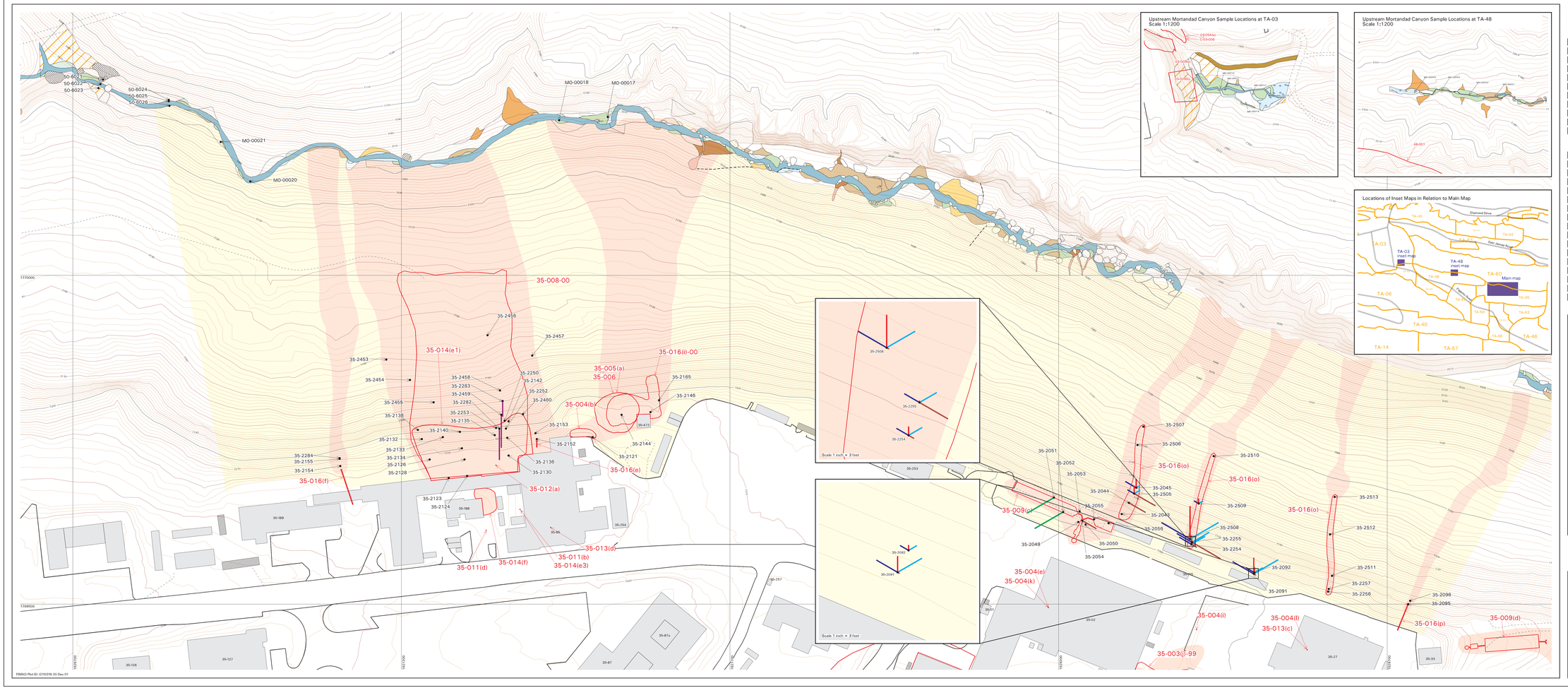
Data sources: Topographic base map from Los Alamos National Laboratory Engineering Division and Los Alamos County Utility and Engineering Departments. Contour data is from Los Alamos National Laboratory Environmental Restoration Program aerial survey, September 1991.

TA-35, Mortandad Slope Subarea, Organic Chemicals Spoke Plot (west)



Contour, 2 foot
Contour, 10 foot
Contour, 100 foot
PRS Outline
Road, Paved
Road/Trail, Dirt
Former Structure
Structure
Mortandad Slope Subarea
TA-35 PRS Affected Area
Location of Samples Submitted for Analysis

GEOMORPHOLOGY
c1
c1b
c1ct
c2
c2a
c2b
c3
disturbed, fill, or manmade
fan
f1
f2
Qal
Qf
rip rap
road
rock
Best Management Practice (BMP)

Representative Organic Chemicals for Mortandad Slope Subarea

CHEMICAL	MAXIMUM RATIO	MAXIMUM CONCENTRATION
Aroclor-1254	19.381	1.880
Benzo(a)pyrene	8571.429	48.000
Benzo(k)fluoranthene	80.357	45.000
Bis(2-ethylhexyl)phthalate	2.688	8.600
Chrysene	8.393	47.000
Trichloropropane(1,2,3-)	128.571	0.018

Each value is the maximum concentration divided by one-tenth of the screening action level (SAL) for that chemical. The maximum spoke length, which represents the largest maximum ratio for each chemical, is set to 1 in. All other ratios (concentration divided by one-tenth of SAL) for each chemical are represented by spoke lengths that are proportional to 1 in.

Cartography by: Doug Walther
Date: December 20, 2001
GISLab Plot ID: G110316

N

State Plane Coordinate System, New Mexico Central Zone.
1983 North American Datum

Grid provides NM State Plane coordinates in feet.
Grid Interval, in feet: 500
Feet per inch on map = 50

SCALE 1:600

METERS

FEET

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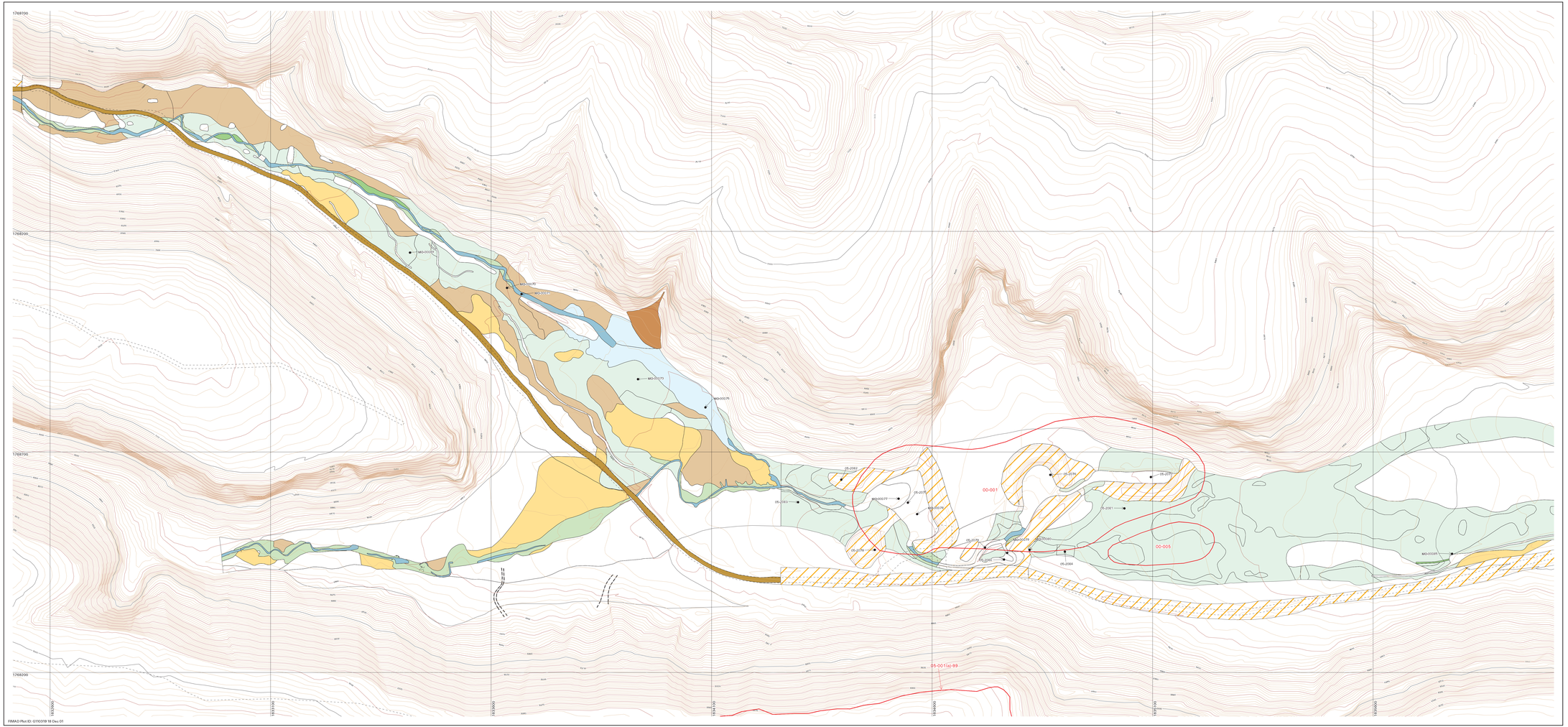
Cartography by Doug Walther, Geographic Information Systems Lab, Los Alamos National Laboratory Engineering Division, and Los Alamos County Utility and Engineering Departments. Contour data is from Los Alamos National Laboratory Environmental Restoration Program aerial survey, September 1991.

FIMAD Plot ID: G110316 20 Dec 01



FIRMAD Plot ID: G110319 18 Dec 01

TA-35, Mortandad Slope Subarea, Organic Chemicals Spoke Plot (east)

- Contour, 2 foot
- Contour, 10 foot
- Contour, 100 foot
- PRS Outline
- Road, Paved
- Road/Trail, Dirt
- Location of Samples Submitted for Analysis

GEOMORPHOLOGY

- c1
- c1b
- c1ct
- c2
- c2a
- c2b
- c3
- disturbed, fill, or manmade
- fan
- f1
- f2
- Qal
- Qf
- rip rap
- road
- rock
- Best Management Practice (BMP)

Representative Organic Chemicals for Mortandad Slope Subarea

CHEMICAL	MAXIMUM RATIO	MAXIMUM CONCENTRATION
Aroclor-1254	19.381	1.880
Benzo(a)pyrene	8571.429	48.000
Benzo(k)fluoranthene	80.357	45.000
Bis(2-ethylhexyl)phthalate	2.688	8.600
Chrysene	8.393	47.000
Trichloropropane(1,2,3-)	128.571	0.018

Each value is the maximum concentration divided by one-tenth of the screening action level (SAL) for that chemical. The maximum spoke length, which represents the largest maximum ratio for each chemical, is set to 1 in. All other ratios (concentration divided by one-tenth of SAL) for each chemical are represented by spoke lengths that are proportional to 1 in.

Cartography by: Doug Walther
Date: December 18, 2001 GISLab Plot ID: G110319

N

State Plane Coordinate System, New Mexico Central Zone.
1983 North American Datum

Grid provides NM State Plane coordinates in feet.
Grid interval, in feet: 500
Feet per inch on map = 80

SCALE 1:960

METERS: 0, 24, 48, 72, 96

FEET: 0, 80, 160, 240, 320

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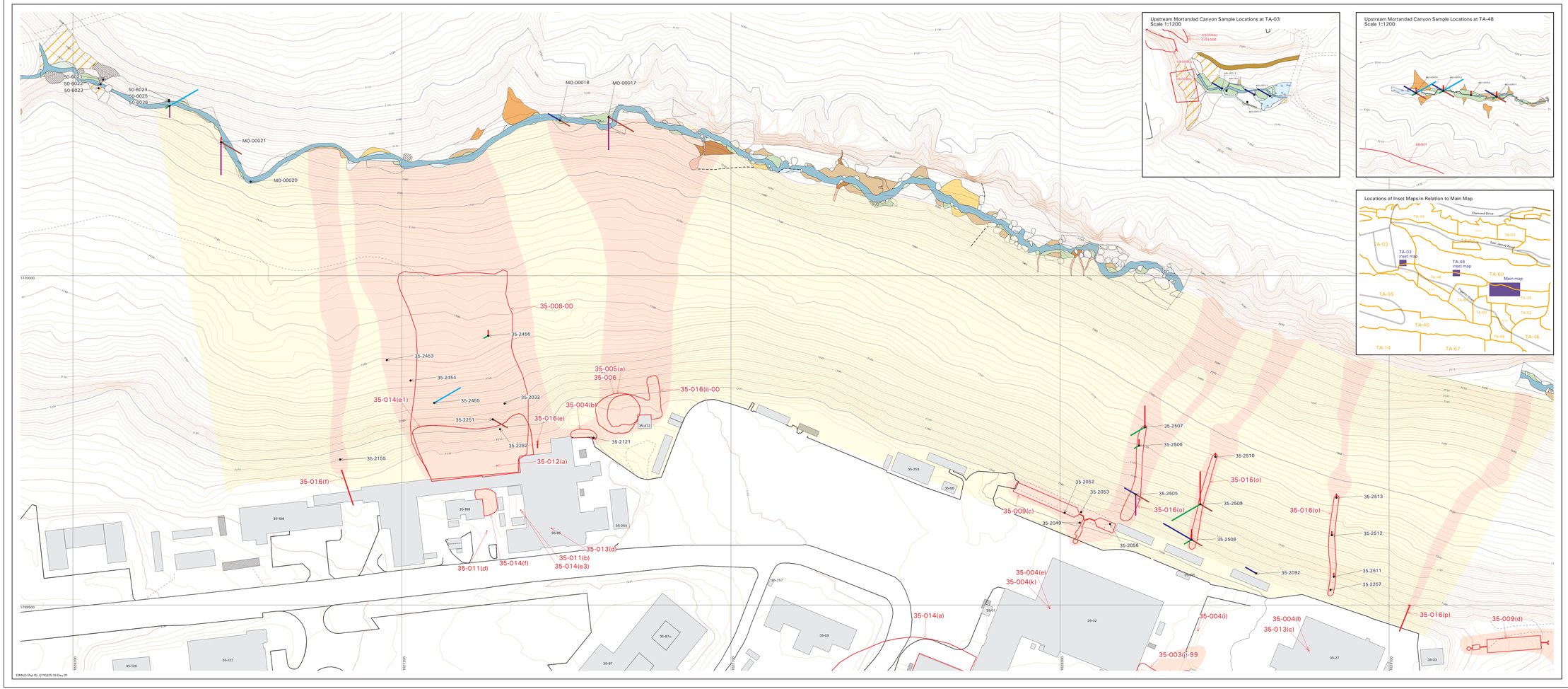
Data sources: Topo base data from Los Alamos National Laboratory Engineering Division and Los Alamos County Utility and Engineering Departments. Contour data is from Los Alamos National Laboratory Environmental Restoration Program aerial survey, September 1991.



TA-35, Mortandad Slope Subarea, Inorganic Chemicals Spoke Plot (west)

- Contour, 2 foot
- Contour, 10 foot
- Contour, 100 foot
- PRS Outline
- Road, Paved
- Road/Trail, Dirt
- Former Structure
- Structure
- Mortandad Slope Subarea
- TA-35 PRS Affected Area
- Location of Samples Submitted for Analysis

GEOMORPHOLOGY

- c1
- c1b
- c1ct
- c2
- c2a
- c2b
- c3
- disturbed, fill, or manmade
- fan
- f1
- f2
- Qal
- Qf
- rip rap
- road
- rock
- Best Management Practice (BMP)

Representative Inorganic Chemicals for Mortandad Slope Subarea

CHEMICAL	MAXIMUM RATIO	MAXIMUM CONCENTRATION
BE	1.527	2.600
CR	10.207	197.000
CU	3.321	37.200
HG	5.600	0.560
NI	7.143	110.000
ZN	2.992	146.000

Each value is the maximum concentration divided by the background value (BV) for that chemical. The maximum spoke length, which represents the largest maximum ratio for each chemical, is set to 1 in. All other ratios (concentration divided by BV) for each chemical are represented by spoke lengths that are proportional to 1 in.

Cartography by: Doug Walther
Date: December 18, 2001
GISLab Plot ID: G110315

N

State Plane Coordinate System, New Mexico Central Zone.
1983 North American Datum

Grid provides NM State Plane coordinates in feet.
Grid Interval, in feet: 500
Feet per inch on map = 50

SCALE 1:600

METERS

FEET

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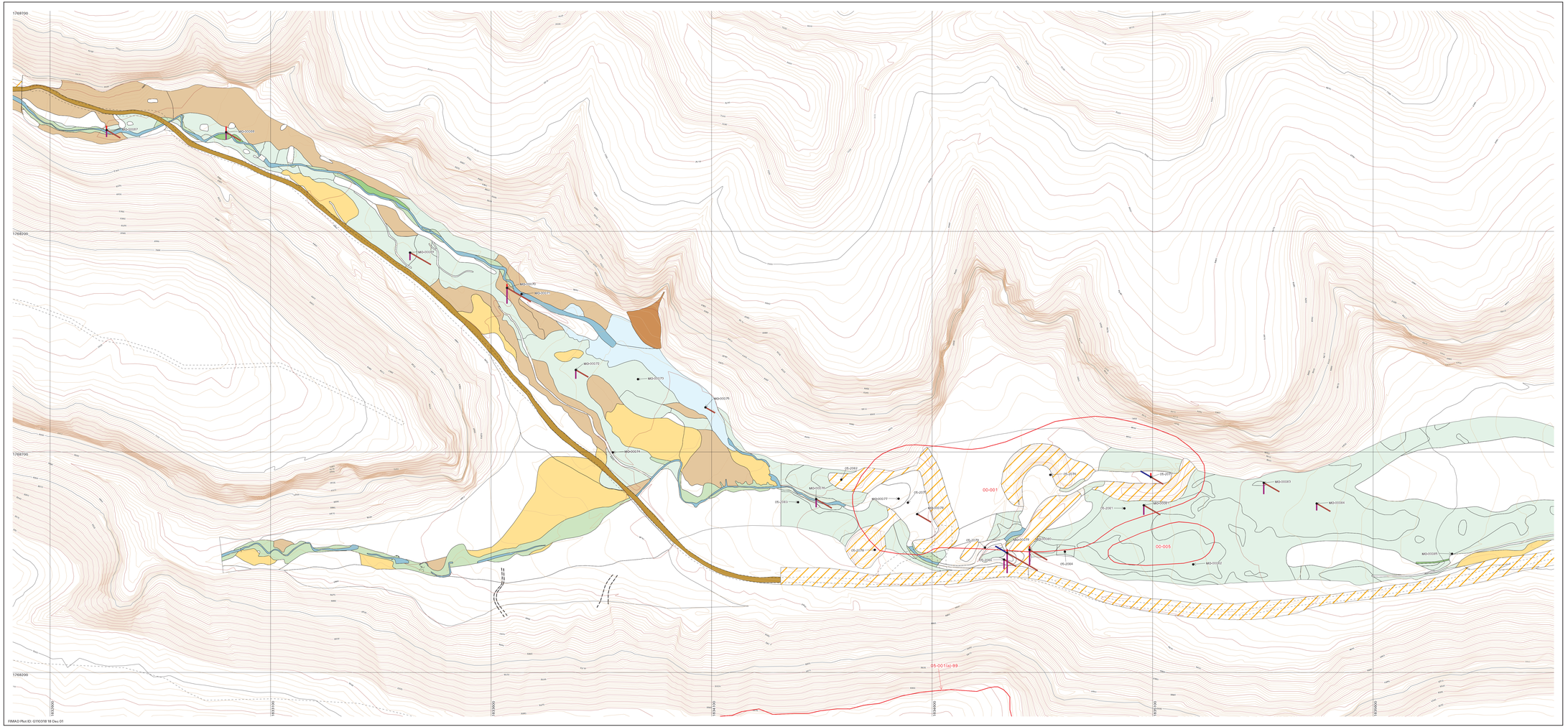
Data Sources: Los Alamos National Laboratory, Los Alamos County Utility and Engineering Departments. Contour data is from Los Alamos National Laboratory Environmental Restoration Program aerial survey, September 1991.



FIMAD Plot ID: G110318 18 Dec 01

TA-35, Mortandad Slope Subarea, Inorganic Chemicals Spoke Plot (east)

- Contour, 2 foot
- Contour, 10 foot
- Contour, 100 foot
- PRS Outline
- Road, Paved
- Road/Trail, Dirt
- Location of Samples Submitted for Analysis

GEOMORPHOLOGY

- c1
- c1b
- c1ct
- c2
- c2a
- c2b
- c3
- disturbed, fill, or manmade
- fan
- f1
- f2
- Qal
- Qf
- rip rap
- road
- rock
- Best Management Practice (BMP)

Representative Inorganic Chemicals for Mortandad Slope Subarea

CHEMICAL	MAXIMUM RATIO	MAXIMUM CONCENTRATION
BE	1.527	2.600
CR	10.207	197.000
CU	3.321	37.200
HG	5.600	0.560
NI	7.143	110.000
ZN	2.992	146.000

Each value is the maximum concentration divided by the background value (BV) for that chemical. The maximum spoke length, which represents the largest maximum ratio for each chemical, is set to 1 in. All other ratios (concentration divided by BV) for each chemical are represented by spoke lengths that are proportional to 1 in.

Cartography by: Doug Walther
Date: December 18, 2001

GISLab Plot ID: G110318

N

State Plane Coordinate System, New Mexico Central Zone.
1983 North American Datum

Grid provides NM State Plane coordinates in feet.
Grid interval, in feet: 500
Feet per inch on map = 80

SCALE 1:960

METERS

FEET

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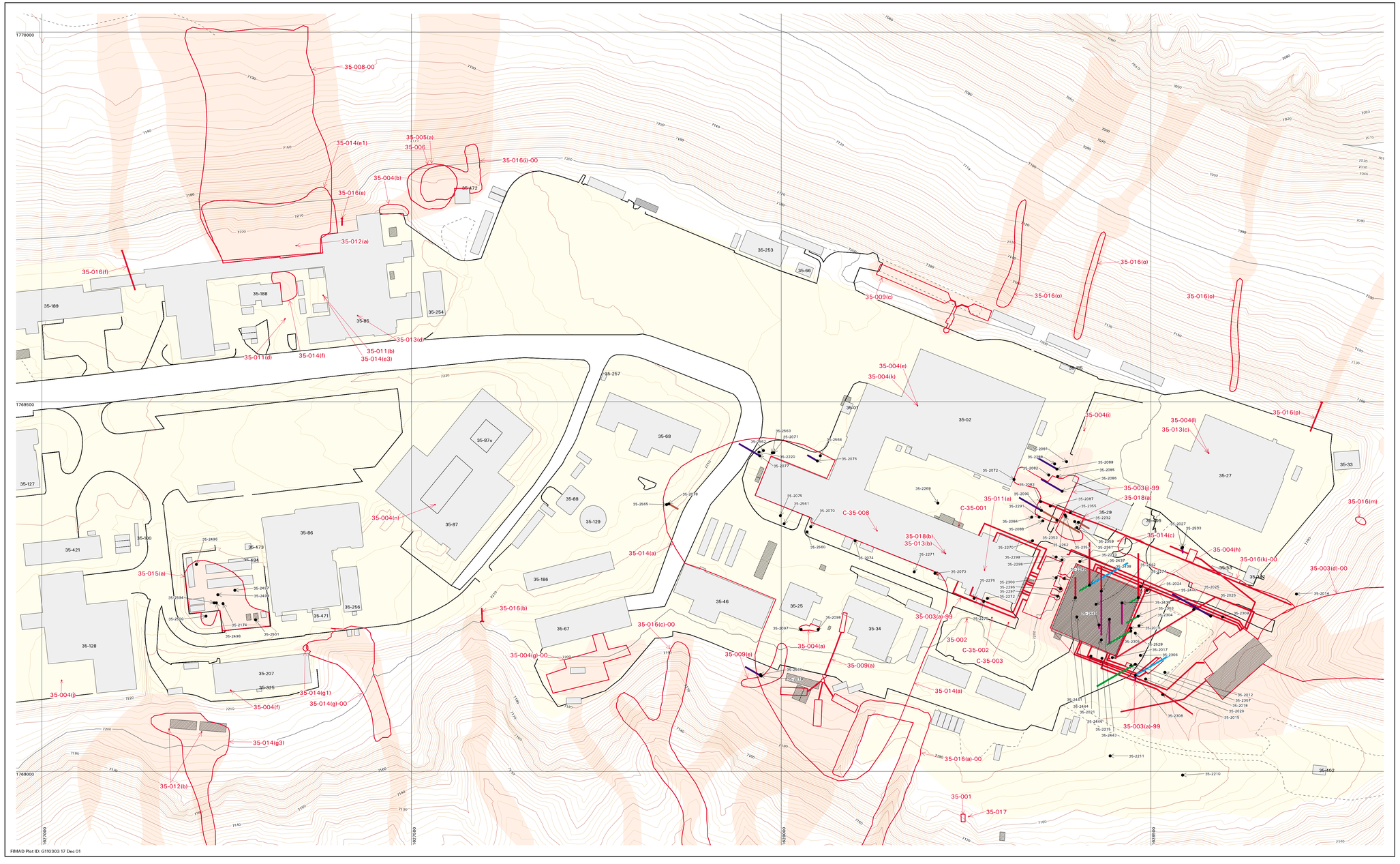
Data sources: Topo base data from Los Alamos National Laboratory Engineering Division and Los Alamos County Utility and Engineering Departments. Contour data is from Los Alamos National Laboratory Environmental Restoration Program aerial survey, September 1991.

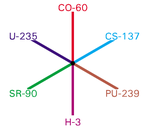


FIMAD Plot ID: G110303 17 Dec 01

TA-35, Mesa Top Subarea, Rad Chemicals Spoke Plot

- Contour, 2 foot
- Contour, 10 foot
- Contour, 100 foot
- PRS Outline
- Road, Paved
- Road/Trail, Dirt
- Former Structure
- Structure
- Mesa Top Subarea
- TA-35 PRS Affected Area
- Location of Samples Submitted for Analysis

Representative Rad Chemicals for Mesa Top Subarea



CHEMICAL	MAXIMUM RATIO	MAXIMUM CONCENTRATION
CO-60	5.945	0.654
CS-137	1.782	2.940
H-3	12.702	9.730
PU-239	122.407	6.610
SR-90	2590.909	1140.000
U-235	5.620	1.124

Each value is the maximum concentration divided by the background value (BV) or one-tenth of the SAL if BV is not available for that chemical. The maximum spoke length, which represents the largest maximum ratio for each chemical, is set to 1 in. All other ratios (concentration divided by BV or one-tenth of the SAL as appropriate) for each chemical are represented by spoke lengths that are proportional to 1 in.

Cartography by: Doug Walther
Date: December 17, 2001
GISLab Plot ID: G110303

N

State Plane Coordinate System, New Mexico Central Zone.
1983 North American Datum

Grid provides NM State Plane coordinates in feet.
Grid Interval, in feet: 500
Feet per inch on map = 60

SCALE 1:720

METERS

FEET

DISCLAIMER OF LIABILITY:
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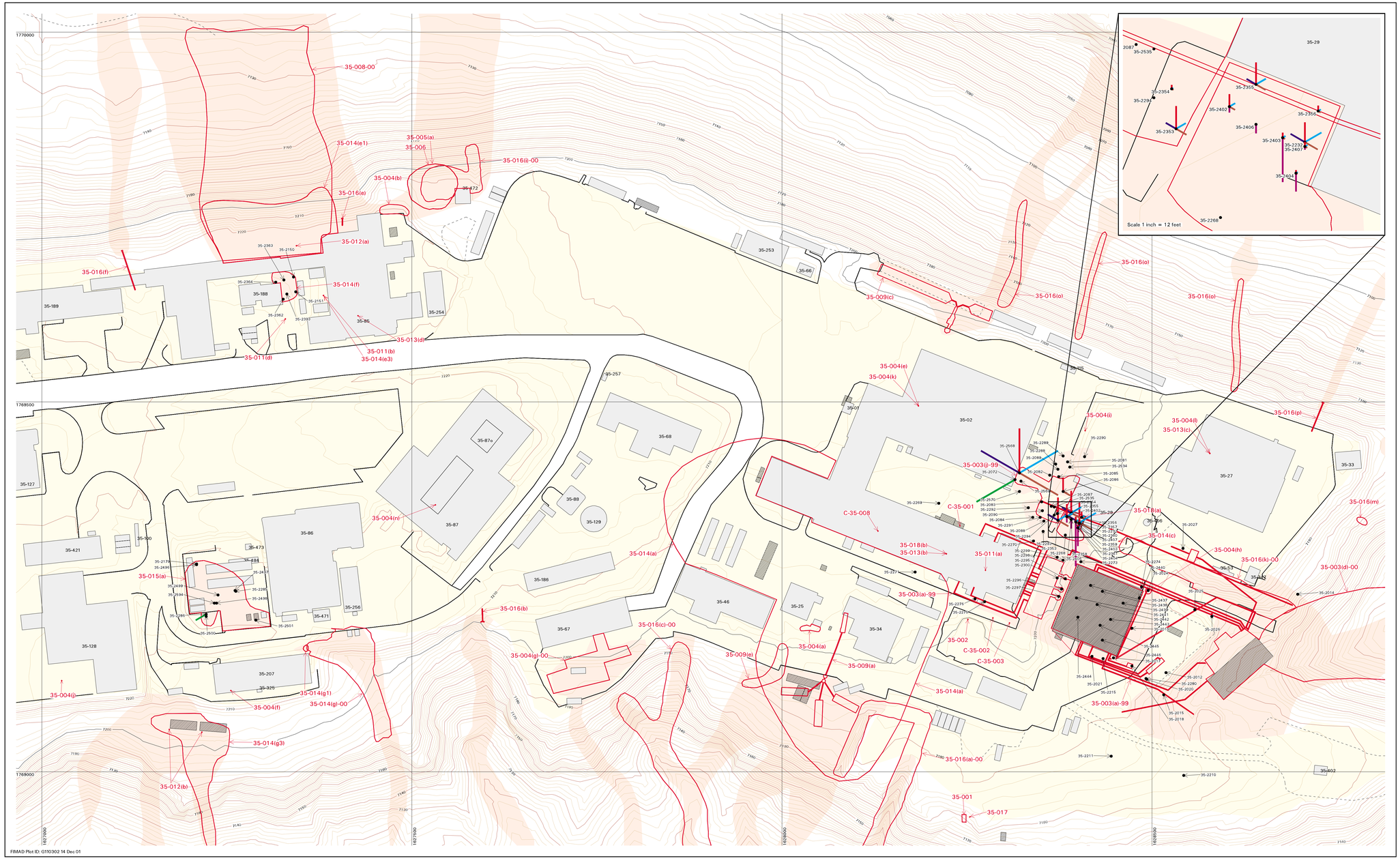
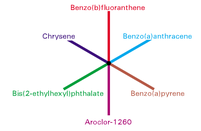
Basemap Sources: Building, structure, and utility lines are from Los Alamos National Laboratory Engineering Drawings and Los Alamos County Utility and Engineering Departments. Contour data is from Los Alamos National Laboratory Environmental Restoration Program aerial survey, September 1991.

TA-35, Mesa Top Subarea, Organic Chemicals Spoke Plot



- Contour, 2 foot
- Contour, 10 foot
- Contour, 100 foot
- PRS Outline
- Road, Paved
- Road/Trail, Dirt
- Former Structure
- Structure
- Mesa Top Subarea
- TA-35 PRS Affected Area
- Location of Samples Submitted for Analysis

Representative Organic Chemicals for Mesa Top Subarea



CHEMICAL	MAXIMUM RATIO	MAXIMUM CONCENTRATION
Aroclor-1260	17000.000	340.000
Benzo(a)anthracene	500.000	28.000
Benzo(a)pyrene	3928.571	22.000
Benzo(b)fluoranthene	321.429	18.000
Bis(2-ethylhexyl)phthalate	4.375	14.000
Chrysene	4.821	27.000

Each value is the maximum concentration divided by one-tenth of the screening action level (SAL) for that chemical. The maximum spoke length, which represents the largest maximum ratio for each chemical, is set to 1 in. All other ratios (concentration divided by one-tenth of SAL) for each chemical are represented by spoke lengths that are proportional to 1 in.

Cartography by: Doug Walther
Date: December 14, 2001
GISLab Plot ID: G110302

N

State Plane Coordinate System, New Mexico Central Zone.
1983 North American Datum

Grid provides NM State Plane coordinates in feet.
Grid Interval, in feet: 500
Feet per inch on map = 60

SCALE 1:720

METERS

FEET

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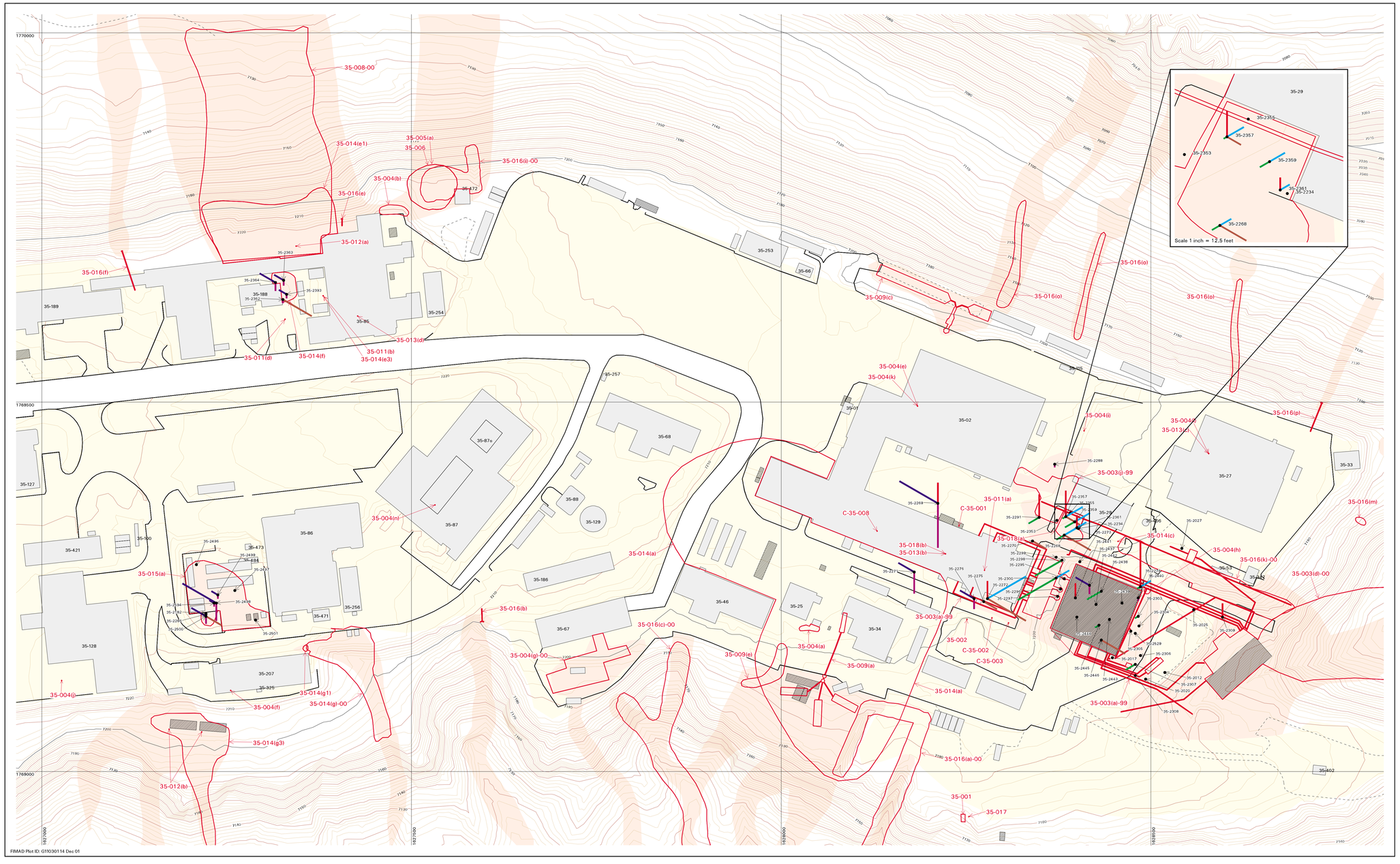
Basemap Sources: Building Footprints, and utility lines are from Los Alamos National Laboratory Engineering Drawings and Los Alamos County Utility and Engineering Departments. Contour data is from Los Alamos National Laboratory Environmental Restoration Program aerial survey, September 1991.

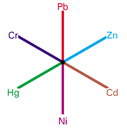


FIMAD Plot ID: G110301 14 Dec 01

TA-35, Mesa Top Subarea, Inorganic Chemicals Spoke Plot

- Contour, 2 foot
- Contour, 10 foot
- Contour, 100 foot
- PRS Outline
- Road, Paved
- Road/Trail, Dirt
- Former Structure
- Structure
- Mesa Top Subarea
- TA-35 PRS Affected Area
- Location of Samples Submitted for Analysis

Representative Inorganic Chemicals for Mesa Top Subarea



CHEMICAL	MAXIMUM RATIO	MAXIMUM CONCENTRATION
CD	4.000	1.600
CR	11.347	219.000
HG	20.000	2.000
NI	15.974	246.000
PB	3.659	81.600
ZN	4.180	204.000

Each value is the maximum concentration divided by the background value (BV) for that chemical. The maximum spoke length, which represents the largest maximum ratio for each chemical, is set to 1 in. All other ratios (concentration divided by BV) for each chemical are represented by spoke lengths that are proportional to 1 in.

Cartography by: Doug Walther
Date: December 14, 2001
GISLab Plot ID: G110301

N

State Plane Coordinate System, New Mexico Central Zone.
1983 North American Datum

Grid provides NM State Plane coordinates in feet.
Grid Interval, in feet: 500
Feet per inch on map = 60

SCALE 1:720

METERS

FEET

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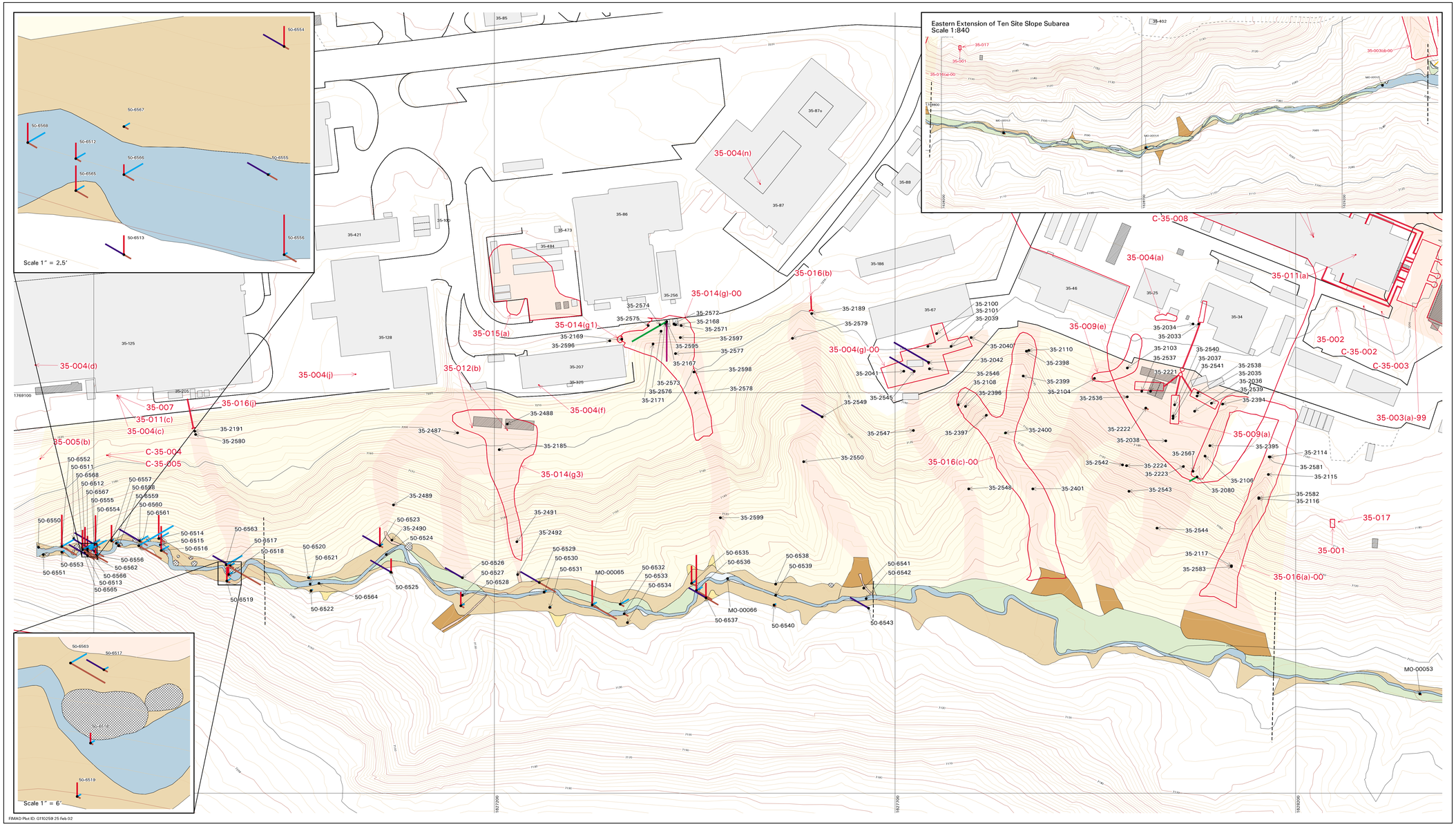
Basemap Sources: Building, roads, trails, and utility lines are from Los Alamos National Laboratory Engineering Drawings and Los Alamos County Utility and Engineering Departments. Contour data is from Los Alamos National Laboratory Environmental Restoration Program aerial survey, September 1991.

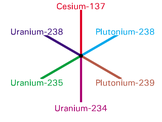
TA-35, Ten Site Slope Subarea, Rad Chemicals Spoke Plot



Contour, 2 foot
Contour, 10 foot
PRS Outline
Road, Paved
Road/Trail, Dirt
Former Structure
Structure
Ten Site Slope Subarea
TA-35 PRS Affected Area
Location of Samples Submitted for Analysis

GEOMORPHOLOGY
c1
c1b
c1ct
c2
c2a
c2b
c3
disturbed, fill, or manmade
fan
f1
f2
Qal
Qf
rip rap
road
rock
Best Management Practice (BMP)

Representative Rad Chemicals for Ten Site Slope Subarea



CHEMICAL	MAXIMUM RATIO	MAXIMUM CONCENTRATION
Cesium-137	3.983	3.585
Plutonium-238	11302.830	67.817
Plutonium-239	286.912	19.510
Uranium-234	37.178	96.290
Uranium-235	29.705	5.941
Uranium-238	2.205	5.050

Each value is the maximum concentration divided by the background value (BV) or one-tenth of the SAL if BV is not available for that chemical. The maximum spoke length, which represents the largest maximum ratio for each chemical, is set to 1 in. All other ratios (concentration divided by BV or one-tenth of the SAL as appropriate) for each chemical are represented by spoke lengths that are proportional to 1 in.

Cartography by: Doug Walther
Date: February 25, 2002 GISLab Plot ID: G110259

N

State Plane Coordinate System, New Mexico Central Zone.
1983 North American Datum

Grid provides NM State Plane coordinates in feet.
Grid interval, in feet: 500
Feet per inch on map = 50

SCALE 1:600

METERS

FEET

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BASEMAP SOURCES: Boundary, structure, and utility data are from Los Alamos National Laboratory Engineering Division and Los Alamos County Utility and Engineering Departments. Contour data is from Los Alamos National Laboratory Environmental Restoration Program aerial survey, September 1991.

FIMAD Plot ID: G110259 25 Feb 02