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Date: April 12, 2005
Refer To: ER2005-0214

Mr. James Bearzi, Chief
NMED – Hazardous Waste Bureau
2905 Rodeo Park Drive East
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Santa Fe, NM 87505-6303

RECEIVED
APR 2005
NMED Hazardous
Waste Bureau

SUBJECT: RESPONSE TO NOTICE OF DISAPPROVAL FOR THE ACCELERATED CORRECTIVE ACTION WORK PLAN FOR SOLID WASTE MANAGEMENT UNIT 33-013, A FORMER STORAGE AREA, AT TECHNICAL AREA 33

Dear Mr. Bearzi:

This letter and enclosures comprise the Los Alamos National Laboratory's Environmental Stewardship-Remediation Services project's response to the Notice of Disapproval (NOD) for the Accelerated Corrective Action Work Plan for Solid Waste Management Unit (SWMU) 33-013, a Former Storage Area, at Technical Area 33 (HWB-LANL-05-003). The Remediation Services Project Office received the NOD from the New Mexico Environment Department's Hazardous Waste Bureau on March 28, 2005. Enclosed are the certification (Enclosure 1); responses to each NMED NOD comment (Enclosure 2); and the revised Accelerated Corrective Action Work Plan for Solid Waste Management Unit (SWMU) 33-013, a Former Storage Area, at Technical Area 33 (Enclosure 3).

If you have any questions, please contact Paula Bertino at (505) 665-2198 or David Gregory at (505) 667-5808.

Sincerely,

David McInroy, Deputy Project Director
Remediation Services
Los Alamos National Laboratory

Sincerely,

David Gregory, Federal Project Director
Department of Energy
Los Alamos Site Operations

DM/DG/NQ/eim

4796

Enclosures: 1) Certification
2) Response to NOD (ER2005-0201)
3) Corrective Action Work Plan, Rev 1 (ER2005-0187)

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CERTIFICATION

CERTIFICATION BY THE ENVIRONMENTAL STEWARDSHIP–REMEDIATION SERVICES (ENV-RS) PROJECT TECHNICAL REPRESENTATIVES

Document Title: **RESPONSE TO NOTICE OF DISAPPROVAL FOR THE ACCELERATED CORRECTIVE ACTION WORK PLAN FOR SOLID WASTE MANAGEMENT UNIT 33-013, A FORMER STORAGE AREA, AT TECHNICAL AREA 33**

I certify under penalty of law that these documents and all attachments were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violation.

Name: _____ Date: 4/11/05

David McInroy, Deputy Project Director
Remediation Services
Los Alamos National Laboratory

or

_____ Date: _____

Ken Hargis, Division Leader
Environmental Stewardship Division
Los Alamos National Laboratory

_____ Date: 4/12/05

David Gregory, Federal Project Director
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Department of Energy/Los Alamos Site Office

Or

_____ Date: _____

John Ordaz,
Assistant Area Manager of Environmental Projects
Department of Energy/Los Alamos Site Office

Response to
NMED Comments on the Accelerated Corrective Action Work Plan for Solid Waste Management Unit 33-013, a Former Storage Area at Technical Area 33, Dated March 2005
Los Alamos National Laboratory, NM 0890010515

INTRODUCTION

To facilitate review of this response, the New Mexico Environment Department's (NMED's) comments are included verbatim. Los Alamos National Laboratory's (LANL's) responses follow each NMED comment.

COMMENTS

NMED Comment

1. *Section 2.2 Contaminant Transport Mechanisms and Potential Receptors:*

   The Permittees must include subsurface infiltration/migration as a mechanism of contaminant release from the site. As seen at MDA AB at TA-49, the lack of evapotranspiration resulting from an asphalt cover may produce contaminated water that could migrate through gravity flow and capillary forces. As seen at the TA-21-57 aboveground storage tank diesel spill, saturated conditions caused by water are not necessarily needed for contaminant migration to significant depths. If moisture is encountered during site investigation or remediation, the Permittees must collect samples at the moist intervals and determine the vertical extent of any moist zones. The Permittees must also include in the revised work plan a contingency plan to address the characterization of any water encountered.

   The Permittees must consider that the pathway from subsurface contamination to human receptors is complete because planned construction activities will likely expose workers to any residual contaminated soil or tuff.

LANL Response

The discussion of subsurface transport of contaminants in Section 2.2 has been revised to indicate that localized areas of comparatively moderate moisture content may be present beneath impervious barriers, such as asphalt surfaces. The discussion of field screening of samples in Section 5.1.2 has been revised to indicate that visual inspection of samples will include inspection for moisture. The presence of elevated moisture in soils beneath the asphalt pad or at confirmation sample intervals will be evaluated to determine if the sampling intervals should be revised. If free liquid is observed in sufficient quantities to allow for sample collection, one or more samples will be collected.

LANL notes that the planned construction activities will not take place until after soil/tuff has been removed to levels where such exposure will not result in unacceptable risk. Construction activity that will occur at this site will include mitigation of contaminant exposure via site-specific health and safety plans and occupational exposure limit requirements (e.g., Occupational Safety and Health Administration (OSHA) and National Institute for Occupational Safety and health (NIOSH)). In addition, through the project review process required prior to any construction activities at LANL, the construction organization will be informed of any contamination found or remaining at the site and the potential for impacts on human health. This is routine procedure for any activity that may disturb a site containing a SWMU or Area of Concern (AOC). This notification will ensure that appropriate safety and health requirements will be implemented by the construction organization and the Laboratory to protect workers. However, LANL will evaluate the confirmation sampling data using construction worker soil screening levels (SSLs) for comparison purposes and provide contaminant and risk information to construction organizations that need to

evaluate the potential for worker exposure at the site. Section 2.2 of the ACA plan has been revised to reflect this approach.

NMED Comment

2. *Section 4.0 Scope of Activities:*

The Permittees must describe how they will determine potential risk to human health and the environment. The Permittees must identify which exposure scenario(s) will be used if anything other than a residential. The Permittees must use all available data to make decisions for the site. These would include any storm water sampling data collected from station E340.

LANL Response

Section 4.0 has been revised to indicate that risk will be evaluated by comparing the results of the confirmation samples to SSLs for human and ecological receptors. The screening levels will include NMED's industrial SSLs based on current and reasonably foreseeable future land use and LANL's ecological screening levels. LANL notes that use of a land use scenario other than residential may result in a determination of "complete with controls" for this SWMU.

LANL does not propose to use stormwater data from station E340 to evaluate risk from this site because these data are not representative of this site. This station, which is located near the head of a tributary to Chaquehui Canyon, receives runoff from much of the TA-33 Main Site, not just SWMU 33-013. These data would be more appropriately evaluated as part of the Chaquehui Canyon Aggregate Area investigation.

NMED Comment

3. *Section 5.1.1 Mobilization and Site Preparation:*

The Permittees propose to mark any locations measured during the radiation screening at two times the local background levels. The Permittees must provide a rationale for this factor. The Permittees must also explain if the inspection for stains will be conducted underneath or on top of the soil/pumice veneer. The Permittees have previously identified staining on the asphalt underneath the soil/pumice veneer.

LANL Response

The value of two times local background levels was selected to account for the variations that occur in local background measurements using the screening instrument across a site. A screening level of two times background provides confidence that the measured value is actually above background and is a standard practice at TA-33. Section 5.1.1 was revised to include this rational.

Visual inspections for staining will be made on top of the soil/pumice veneer prior to excavation, on top of the asphalt after the soil/pumice veneer has been removed, and in the soil/tuff after the asphalt has been removed and during excavation. These inspections will be used to bias sampling locations to areas where spilled material may have migrated into the soil beneath the asphalt pad. Section 5.1.1 was revised to provide this clarification.

NMED Comment

4. *Section 5.1.2 Excavation and Confirmation Sampling:*

The Permittees propose using radiation field screening to guide the removal of contaminated soil and tuff. According to previous data summarized in the work plan tables, only one location detected tritium above background levels. More importantly, only two (out of 18) samples were analyzed for tritium. Metals were detected above background levels at most sampling locations. The Permittees must propose other methods in addition to radiation screening to help guide soil and tuff removal. The Permittees must use all of the proposed field-screening methods and laboratory analytical data to guide removal below the proposed six inches if contaminants (radionuclides, inorganics, organics, HE, and PCBs) are still present.

The Permittees propose collecting confirmation samples from 10 randomly selected locations following soil and tuff removal. The Permittees must bias the collection of confirmation samples to correspond to the locations with the highest detected contaminant concentrations. The Permittees must collect confirmation samples from locations AA2036 and AA2037 following soil and tuff removal.

LANL Response

The work plan does propose the use of field-screening methods other than radiation screening. Specifically, the work plan also proposes to screen samples by visual examination and headspace vapor screening for VOCs, which are two of the three field screening methods specified in Section IX.B.2.d of the Compliance Order on Consent, hereinafter referred to as the Consent Order. The other field-screening method specified in Section IX.B.2.d of the Consent Order, x-ray fluorescence (XRF), would not be effective given the low concentrations of metals previously detected at the site. The metals previously detected above background (Table 2 of the work plan) are generally less than the detection limits of XRF. Thus, XRF would not yield useful information for defining the extent of soil requiring excavation. Although tritium may be present at this site, there are no reliable field-screening methods available for tritium.

Section 5.1.2 and Figure 6 have been revised to indicate that two of the confirmation samples will be collected at the locations of samples AAA2036 and AAA2037 and that other sample locations will be biased based on results of field screening, including the observation of staining or moisture. If there are no field screening results indicating potential contamination, samples will be collected at the random locations in addition to the two specified.

NMED Comment

5. *Section 5.1.3 Fixed Laboratory Analytical Methods:*

The Permittees must specify the quantity of QA/QC samples that will be collected.6.

LANL Response

Section 5.1.3 has been revised to indicate the number of QA/QC samples specified by SOP-01.05. These samples include field duplicates at a rate of 1 per 20 or 1 per day per matrix, whichever is greater, and rinsate blanks and VOC trip blanks at a frequency of 1 per 20 or 1 per day, whichever is greater.

NMED Comment

6. *Table 5 SOPs for ACA Activities at SWMU 33-013:*

The Permittees provided descriptions of the type of information that is included in each SOP referenced in the work plan. Instead, the Permittees should have provided descriptions of the investigation, sampling, and analytical methods and procedures that will be conducted, pursuant to Section IX.A of the Consent Order. For example, the Permittees must describe what sampling equipment will be used to collect samples, the procedures for decontaminating sampling equipment, methods of sample collection for given analytes (grab vs. composite), and procedures for calibrating and using field screening instruments. The Permittees must revise this table.

LANL Response

Table 5 presents a summary of the scope of the SOPs and this table has previously been approved by NMED in other work plans prepared in accordance with the Consent Order (e.g. the Accelerated Corrective Action Work Plan for the Investigation and Remediation of Area of Concern 03-001(i) and Solid Waste Management Units 03-029 and 61-002). Table 5 was not revised to provide the information identified in NMED's comment because this information is already provided in the subsections of Section 5.1 of the work plan.

NMED Comment

7. *Appendix C Waste Management and Disposal:*

Given the previous sampling results and the history of the SWMU, the Permittees must assume that the waste generated will be mixed waste instead of low-level waste. The Permittees must identify disposal options for mixed waste.

LANL Response

The results of the previous sampling and the history of SWMU 33-013 do not indicate that the wastes generated during implementation of the ACA work plan will be mixed waste. Specifically, none of the metal results presented in Table 2 are at concentrations that would reasonably be expected to fail the toxicity characteristic leaching procedure (TCLP) for characteristic waste (i.e. the total results are not greater than 20 times the TCLP regulatory levels) and none of the detected organic chemicals identified in Table 3 appear to be associated with listed hazardous wastes. Also, the operational history presented in Section 2.1 does not indicate that the site was used for storage of hazardous waste. Because of the previous detections of tritium at the site and the difficulty in field screening for tritium, the waste will be assumed to be low-level radioactive waste.

Wastes will be characterized as described in Appendix C. If the results of this characterization indicate that the wastes are mixed wastes, they will be managed as mixed waste. Disposal options for mixed waste include shipment to an off-site RCRA-permitted treatment, storage, or disposal facility. The determination of the specific facility would be based on the results of the waste characterization and the waste acceptance criteria of the facility.

LA-UR-05-2601

April 2005

Accelerated Corrective Action Work Plan for Solid Waste Management Unit 33-013, a Former Storage Area, at Technical Area 33

Revision 1

Los Alamos
NATIONAL LABORATORY
Los Alamos NM 87545

CD included with this document

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This document contains data on radioactive materials, including source, special nuclear, and by-product material. The management of these materials is regulated under the Atomic Energy Act and specifically excluded from regulation under the Resource Conservation and Recovery Act and the New Mexico Hazardous Waste Act. Information on radioactive materials and radionuclides, including the results of sampling and analysis of radioactive constituents, is voluntarily provided to the New Mexico Environment Department in accordance with U.S. Department of Energy policy.

Prepared by
Environmental Stewardship–Remediation Services

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Accelerated Corrective Action Work Plan for Solid Waste Management Unit 33-013, a Former Storage Area,

at Technical Area 33

Revision 1

April 2005

Responsible team leader:

Roy Bohn		Project Leader	ENV-ECR	4/11/05
Printed Name	Signature	Title	Organization	Date

Responsible UC representative:

David McInroy		Deputy Project Director	ENV-RS	4/11/05
Printed Name	Signature	Title	Organization	Date

Responsible DOE representative:

David Gregory		Federal Project Director	DOE-LASO	4/12/05
Printed Name	Signature	Title	Organization	Date

EXECUTIVE SUMMARY

This accelerated corrective action (ACA) work plan presents the approach for the characterization and removal of a solid waste management unit (SWMU) within the Chaquehui Canyon Aggregate Area at Los Alamos National Laboratory (LANL or the Laboratory). In accordance with the terms of the March 1, 2005 Compliance Order on Consent, the investigation work plan for this aggregate area is due to the New Mexico Environment Department (NMED) in November 2009. The Laboratory plans to investigate and remediate SWMU 33-013 within the aggregate in advance of the work plan deliverable date because this site lies in the area planned for the Technical Area (TA)-33 High Bay Complex and will be inaccessible during and after the High Bay Complex construction, scheduled to begin in June 2005.

The purpose of the activities described in this ACA work plan is to complete corrective actions at SWMU 33-013 while the site is still accessible. ACA objectives include (1) removing asphalt and potentially contaminated soil from the former waste storage area, designated as SWMU 33-013; and (2) collecting confirmation samples to define the nature and extent of any residual contamination at SWMU 33-013 following the completion of removal activities to support a request for a Certificate for Completion for the site. To meet this objective, the Laboratory's Environmental Stewardship–Remediation Services project (formerly the Environmental Restoration Project) will conduct the following activities:

- perform site surveys,
- remove asphalt and potentially contaminated soil from SWMU 33-013,
- collect confirmation samples to characterize the lateral and vertical extent of any residual contamination at the site, and
- remediate SWMU 33-013 as necessary to reduce any potential risk to human and ecological receptors based on the concentrations of chemicals detected.

Upon completion of ACA activities, the site will be turned over to the TA-33 High Bay Complex Project team for construction; best management practices will be implemented as needed. The waste generated during the sampling and removal activities will be managed in accordance with all applicable Laboratory and regulatory waste management requirements.

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1.0 INTRODUCTION

The Los Alamos National Laboratory (LANL or the Laboratory) is a multidisciplinary research facility owned by the US Department of Energy (DOE) and managed by the Regents of the University of California (UC). The Laboratory is located in north-central New Mexico approximately 60 mi northeast of Albuquerque and 20 mi northwest of Santa Fe. The Laboratory site covers 40 mi^2 of the Pajarito Plateau, which consists of a series of finger-like mesas separated by deep canyons. These canyons contain ephemeral and intermittent streams that run west to east. Mesa tops range in elevation from approximately 6200 to 7800 ft. The eastern portion of the plateau stands 300 to 900 ft above the Rio Grande valley.

The Laboratory's Environmental Stewardship (ENV) – Remediation Services (RS) project (formerly the Environmental Restoration [ER] Project) is involved in a national DOE effort to reduce risk to human health and the environment at its facilities. The goal of the ENV-RS project is to ensure that past DOE operations do not threaten human or environmental health and safety in and around Los Alamos County. To achieve this goal, the ENV-RS project is investigating and, as necessary, remediating sites potentially contaminated by past Laboratory operations. The ENV-RS project will perform the activities in this accelerated corrective action (ACA) work plan to complete the investigation and remediation of Solid Waste Management Unit (SWMU) 33-013.

This ACA work plan presents the approach for the characterization and removal of SWMU 33-013 within the Chaquehui Canyon Aggregate Area at the Laboratory. In accordance with the terms of the March 1, 2005 Compliance Order on Consent (hereinafter referred to as the Consent Order), the investigation work plan for this aggregate area is due to the New Mexico Environment Department (NMED) in November 2009. The Laboratory plans to investigate and remediate SWMU 33-013 within the aggregate in advance of the work plan deliverable date because the site lies in the area planned for the Technical Area (TA)-33 High Bay Complex and will be inaccessible during and after the High Bay Complex's construction, scheduled to begin in June 2005.

To accommodate the TA-33 High Bay Complex construction schedule, the Laboratory has accelerated the schedule for corrective action at SWMU 33-013. SWMU 33-013 is listed in Module VIII of the Laboratory's Hazardous Waste Facility Permit (EPA 1990, 01585; EPA 1994, 44146). NMED has not approved this SWMU for no further action. The Consent Order will modify and replace the corrective action requirements of Module VIII. Under the terms of the Consent Order, NMED may issue Certificates of Completion for corrective actions as either "complete without controls" or "complete with controls." The Laboratory plans to complete corrective actions at SWMU 33-013 to the levels required for NMED to issue a Certificate of Completion for corrective action complete without controls. In the event corrective action at a site receives NMED approval as complete with controls, the Laboratory will assume responsibility for the controls specified for the site by NMED. The Laboratory expects such controls will be limited to institutional/administrative controls to ensure land use remains consistent with residual contamination at the site. In the event NMED will not issue a Certificate of Completion for corrective action at a site, the Facility Owner will assume long-term responsibility for the site.

1.1 General Site Information

SWMU 33-013 is situated on a mesa top of the Pajarito Plateau within the central area of TA-33. The area of the site is bounded by Chaquehui Canyon to the east and a mesa top to the south, west, and north (Figure 1). A brief description of the site is provided in the following sections. Historical investigations of the site are discussed in section 2.4.1.

1.1.1 SWMU 33-013, Former Drum Storage Area

The SWMU described in this ACA work plan is located within the Main Site area of TA-33 (Figure 2). SWMU 33-013 was an uncovered surface storage area (Figure 3) for items awaiting disposal. Long-time employees describe these items as vacuum pumps from throughout the Laboratory, drums containing oil contaminated with tritium and possibly with metals and solvents, and dumpsters of miscellaneous materials (LANL 1995, 71300; LANL 1997, 57021). Some of these containers reportedly leaked and some materials were stored in this area for years (LANL 1995, 71300; LANL 1997, 57021). The storage area was approximately 50 ft x 50 ft and located on the asphalt surface inside the northeast corner of the fence surrounding the former TA-33 Tritium Facility (Building 33-86). Runoff from the area is to the northeast, toward the drainage leading to Chaquehui Canyon. East of the fence the ground slopes at a moderate grade without obvious channeling. The surface of the site consists of a thin layer (less than 1 in.) of soil with pumice from grading the site following decontamination and decommissioning (D&D) of the Tritium Facility (LANL 1997, 57021). A weathered and cracked asphalt pad approximately 6 in. deep lies beneath the soil/pumice veneer. Stains were noted on the asphalt during a 1987 ER Project site visit (LANL 1992, 07671). The exact date that storage operations began is not known, but could date back to the initial operation of Building 33-86 in June 1955. Storage activities were discontinued in 1989. The Laboratory conducted RCRA Facility Investigations (RFIs) in 1993 (LANL 1995, 71300) and 1996 (LANL 1997, 57021). The results of these investigations are included in section 2.4.3 and Appendix B of this ACA work plan.

1.2 Investigation Objectives

The purpose of the activities described in this ACA work plan is to complete corrective actions at SWMU 33-013 while the site is still accessible. ACA objectives include (1) removing asphalt and potentially contaminated soil from the former waste storage area, designated as SWMU 33-013; and (2) collecting confirmation samples to define the nature and extent of any residual contamination at SWMU 33-013. Following the completion of removal activities, a request for a Certificate for Completion for the site will be made to NMED. To meet this objective, the Laboratory's ENV–RS project will conduct the following activities:

- perform site surveys,
- remove asphalt and potentially contaminated soil from SWMU 33-013,
- collect confirmation samples to characterize the lateral and vertical extent of any residual contamination at the site, and
- remediate SWMU 33-013 as necessary to reduce any potential risk to human and ecological receptors based on the concentrations of chemicals detected.

The investigation and remediation of SWMU 33-013 will be conducted in accordance with the requirements contained in the Consent Order. This ACA work plan outlines the scope of activities for investigation and removal of SWMU 33-013, describes the site surface and subsurface conditions, and presents the results of the 1993 and 1996 RFI sampling at SWMU 33-013. Appendix A includes a list of acronyms and abbreviations and defines the terms used in this report. Appendix B contains the analytical data previously collected and reported for the SWMU. Appendix C describes how investigation-derived waste (IDW) will be managed.

2.0 BACKGROUND

2.1 Operational History

TA-33 was established in 1947 as a substitute test site for weapons' components experiments being conducted at Trinity Site in southern New Mexico. Main Site housed offices, laboratories, and shops within a fenced area just south of State Road 4. The high-pressure tritium facility (former Building 33-86) was located at the southern end of Main Site within a separate fence. Construction of the high-pressure tritium facility was completed in 1955. The facility processed tritium gas. The tritium facility ceased operations in 1990 and underwent D&D in the mid-1990s.

A 50-ft square asphalt pad located in the northeast corner of the former tritium facility security fence was used as a drum storage area for liquid waste. Former employees stated that material awaiting disposal, including vacuum pumps from throughout the Laboratory, waste oil, and dumpsters containing miscellaneous solid waste, was also staged on the asphalt pad (LANL 1995, 71300; LANL 1997, 57021). Use of this storage area ceased in 1989 as operations at the tritium facility were discontinued.

2.2 Contaminant Transport Mechanisms and Potential Receptors

The primary mechanisms of contaminant release at SWMU 33-013 could be from contaminated surface soil that might be suspended by wind or in surface runoff.

The potential pathways for human exposure to surface soil and tuff are dermal contact, inhalation of vapors and particulates, and incidental soil ingestion. Pathways from subsurface contamination to potential human receptors would be complete only if contaminated soil or tuff were excavated and brought to the surface. The potential pathways would then be similar to those of a surface soil release (i.e., dermal contact, inhalation of vapors or fugitive dust, and incidental soil ingestion). Note that the planned construction activities will not take place until after potentially contaminated soil/tuff has been removed from the site.

For ecological receptors, pathways from subsurface contamination to potential surface-dwelling animals would be complete only if contaminated soil or tuff were excavated and brought to the surface. The potential pathways would then be similar to those of a surface soil release, which are dermal contact, inhalation of vapors or fugitive dust, incidental ingestion of soil, uptake by plants, and food-web transport. Pathways from subsurface releases may be complete for plants and burrowing animals, including the uptake of contaminants by plant roots and the exposure of burrowing animals through dermal contact, inhalation of vapors or dust, incidental ingestion of soil, and food-web transport.

Downward migration of contaminants in the vadose zone is limited by a lack of hydraulic gradient; however, localized areas of comparatively moderate moisture content may be present beneath the asphalt pad. The lack of saturated conditions in the area restricts vertical migration; however, horizontal migration through storm water runoff is possible. No perched alluvial aquifers have been identified in the area of SWMU 33-013, nor are there springs or seeps nearby that would indicate the presence of perched alluvial aquifers. Therefore, a complete pathway to groundwater, including the regional aquifer, located approximately 900 ft below ground surface (bgs) from the mesa top, is unlikely.

The historical land use at TA-33 has been industrial; the land-use designation will remain industrial (i.e., continued Laboratory use) for the foreseeable future and will be the basis for cleanup. In addition, construction activity for the TA-33 High Bay Complex that will occur at this site will include mitigation of contaminant exposure via site-specific health and safety plans and occupational exposure limit requirements (e.g., Occupational Safety and Health Administration [OSHA] and National Institute for Occupational Safety and Health [NIOSH]). In addition, through the project review process required prior to

any construction activities at LANL, the construction organization will be informed of any contamination found or remaining at the site and the potential for impacts on human health. However, LANL will evaluate the confirmation sampling data using construction worker soil screening level (SSLs) for comparison purposes and provide contaminant and risk information to construction organizations to evaluate potential worker exposure at the site.

2.3 Historical Releases

Potential releases related to historical activities at the site include releases to surface and subsurface soil beneath the asphalt pad (SWMU 33-013) related to storage area operations.

The SWMU was not investigated prior to the Phase I RFI implemented by the ER Project in 1993 (LANL 1992, 07671).

2.4 Summary of Historical Investigations

2.4.1 1993 and 1996 RCRA Facility Investigations at SWMU 33-013

In 1993, the ER Project collected three surface soil samples (Table 1) at random locations from the 0-to-6-inch depth interval beneath the asphalt pad, (Figure 4). The samples were field-screened for radioactivity and submitted to an off-site contract laboratory and analyzed for inorganic chemicals, gamma emitters, tritium, semivolatile organic compounds (SVOCs) and herbicides. Field screening detected no radioactivity above background values (BVs) or fallout values (FVs). Results published in the 1995 RFI Report (LANL 1995, 71300) are included in this ACA work plan in Appendix B.

Inorganic chemicals detected above BVs were beryllium, cadmium chromium, lead, nickel, and silver (Table 2) (Figure 5). Several SVOCs associated with asphalt were detected at low concentrations (Table 3) (Figure 5). Tritium was also detected above the soil FVs (Table 4) (Figure 5).

In 1996, the ER Project collected 14 surface soil samples (directly beneath the asphalt pad) and one subsurface (6-in. to 12-in.) soil sample within the storage area (Table 1) (Figure 4). Nine of the samples were collected at random locations within each cell of a nine-cell grid over the storage area. The remaining samples were collected at locations biased toward stains observed on the asphalt pad. The samples were submitted to an off-site contract laboratory and analyzed for inorganic chemicals and total uranium. Results published in the 1997 RFI Report (LANL 1997, 57021) are presented in Appendix B of this ACA work plan.

Inorganic chemicals detected above BVs were antimony, cadmium, copper, lead, mercury, silver, uranium, and zinc (Table 2) (Figure 5). Total uranium was not detected above FVs.

2.4.2 Summary of Chemicals of Potential Concern

The chemicals of potential concern (COPCs) for SWMU 33-013 are listed below.

- COPCs include inorganic chemicals; organic chemicals (SVOCs); and tritium.

3.0 SITE CONDITIONS

SWMU 33-013 is situated on a mesa top of the Pajarito Plateau at an approximate elevation of 6500 ft. The surface of the plateau slopes generally eastward from the level fenced area formerly occupied by the Tritium Facility (Building 33-86).

The average annual rainfall in the area of TA-33 is estimated to range from 8 to 19 inches. Of this total, approximately 40% occurs as brief, intense thunderstorms during July and August. Intermittent stream

flow in adjacent canyons can occur as a result of these storms. Spring snowmelt runoff may also induce intermittent stream flow in local canyons (LANL 1997, 57021).

Soil in this area and the surrounding mesa top is classified as Hackroy-Rock Complex (LANL 1978, 05702). Field logs indicate soils in this area range from 0- to 8-ft deep. Soils may be sandy and contain many pumice pebbles up to 0.5 inches in size. Clay lenses may be intermixed with pulverized tuff. Soils in the drainages are sandy with some clay and many small pebbles. Bedrock is exposed at many areas in the lower (eastern) part of the site, including the drainage channels east of the former storage area.

Surface soils and alluvium, locally ranging in thickness from zero to a few feet, overlie the bedrock tuff. The subsurface bedrock tuff is composed of cooling units 2-4 of the Quaternary Tshirege (upper) Member of the Bandelier Tuff (Qbt), which consists of multiple layers of ash-flow tuffs approximately 300 to 600 ft thick. Portions of the Tshirege Member are highly welded and form vertical cliffs as well as the caprock on the plateau.

The regional water table is approximately 900 ft bgs from the mesa top on the eastern side of the Pajarito Plateau (LANL 1992, 07671). The movement of meteoric water and potential migration of contaminants from the surface to the aquifer is very limited because of the considerable thickness of the vadose zone and the minimal amount of precipitation at the site.

The area of the site is bounded on the north and east by Ancho Canyon, on the south by United States Forest Service land, and on the west by Bandelier National Monument. The walls of the canyons cutting the Pajarito Plateau generally consist of vertical ledges alternating with steep slopes. The Pajarito Plateau is drained by several west-to-east oriented canyons; surface water flows eastward toward the Rio Grande.

3.1 Surface Conditions

Surficial deposits on the Pajarito Plateau consist of coarse-grained colluvium on steep hillslopes and along the base of cliffs (generally fine-grained fluvial and colluvial sediments with a thin cover of eolian fine-grained sediments on the flatter parts of mesa surfaces) and alluvial fan deposits at the mouths of drainages cut into the mountain front or escarpments related to post-Bandelier faulting. Well-developed soils generally occur only on the gently sloping surfaces associated with the mesas. These soils usually consist of several subhorizons of the Bandelier Tuff that contain reddish clay. Soils present on top of the mesas and the soils making up the steep hill slopes, drainages, and other areas flanking erosionally stable mesa tops are typically thin and weakly developed, possessing only an A horizon and a C horizon. Erosion of the mesa top is caused primarily by shallow runoff on the relatively flat part of the mesas, by deeper runoff in channels cut into mesa surfaces, and by rockfall and colluvial transport on the walls of the canyon.

SWMU 33-013 is located on the top of the mesa. A thin layer of soil is preserved in flat parts of the mesa surface and supports small outcroppings of vegetation. Tuff outcrops dominate the steep mesa slopes, and little to no vegetation is present on the upper slope reaches. Soil development and vegetative covering increase progressively downslope east of the site.

3.2 Subsurface Conditions

The regional stratigraphy of the Pajarito Plateau consists of the Bandelier Tuff, the Puye Formation, the Totavi Lentil deposits, the Santa Fe Group, and the Santa Fe basalts. SWMU 33-013 is located on a mesa top and, therefore, subsurface conditions defining the site include only the plateau's uppermost stratigraphic unit, the Tshirege Member of the Bandelier Tuff and/or fill material deposited to extend the

mesa top. Descriptions of the Bandelier Tuff members associated with the SWMU are provided in the following subsections.

3.2.1 Bandelier Tuff

With regard to Bandelier Tuff, the term welding is used to distinguish between tuffs that are uncompacted and porous (nonwelded) from tuffs that are more compacted and dense (welded). In the field, the degree of welding in tuff is quantified by the degree of flattening of pumice fragments (a higher degree of flattening and elongation equals a higher degree of welding). Petrographically, welded tuffs show adhesion (welding) of grains, but nonwelded tuffs do not. The term devitrified is applied to tuffs whose volcanic glass has crystallized.

3.2.1.1 Tshirege Member

The Tshirege Member of the Bandelier Tuff is a compound cooling unit that resulted from several successive ash-flow deposits separated by periods of inactivity, which allowed for partial cooling of each unit. Properties related to water flow and contaminant migration (e.g., density, porosity, degree of welding, fracture content, and mineralogy) vary both vertically and laterally as a result of localized emplacement temperature, thickness, gas content, and composition.

3.3 Hydrology

The proposed hydrogeologic conceptual model for the Pajarito Plateau (LANL 1998, 59599) predicts that surface conditions such as topography, surface water flow, and microclimate greatly influence the infiltration of water into the subsurface and the subsequent transport of water, vapor, and solutes through the upper regions of the vadose zone. According to model predictions, movement through deeper layers, including the regional aquifer, is influenced only weakly by surface conditions and is influenced more strongly by hydraulic characteristics of aquifer rocks, regional groundwater flow patterns, and stresses induced by water supply production.

The following sections provide an overview of infiltration rates and groundwater occurrence in the vicinity of SWMU 33-013.

3.3.1 Surface Water and Infiltration

Surface and near-surface conditions (topography, precipitation, surface runoff) control water infiltration into the subsurface and the transport of contaminants in the shallow subsurface. In this respect, the climate behavior of mesas and canyons forming the plateau differ from one another (LANL 1998, 59599). Mesas are generally dry, both on the surface and within the rock that forms the mesa. Canyons range from wet to relatively dry; the wettest canyons contain continuous streams and perennial groundwater in the canyon-bottom alluvium. Dry canyons have only occasional stream flow and may lack alluvial groundwater.

There is no perennial surface water in this area. Since the tritium facility was decommissioned in 1990, cattails and chamisa show signs of stress due to diminished water flow from various processes. Ephemeral surface-water flow occurs during the spring snowmelt and summer thunderstorm seasons in the shallow drainages in the area.

The amount of mesa-top recharge along the portion of the Laboratory where SWMU 33-013 is located is minimal. Fractures within mesas do not enhance the movement of dissolved contaminants unless saturated conditions develop. Contaminants in the vapor phase generally migrate in a diffusive manner through mesas (LANL 2000, 69794; LANL 1997, 63131). Most of the surface drainage from the site flows toward Chaquehui Canyon.

3.3.1.1 Groundwater

Groundwater beneath the Pajarito Plateau occurs in three distinct horizons: (1) in the regional aquifer, (2) in shallow perched zones beneath canyons that maintain relatively wet surface conditions (surface flow) for most of the year, and (3) in intermediate perched zones in the vadose zone, between the regional aquifer and the shallow perched zones (LANL 2003, 76059.49).

The regional aquifer occurs within the Santa Fe Group and Puye Formation and is the only aquifer capable of large-scale municipal water supply (LANL 1984, 06513). The regional aquifer extends throughout the Española Basin (an area roughly 2,317 mi^2) and reaches its maximum thickness beneath the Pajarito Plateau (over 800 ft thick [Cordell 1979, 76049]). Depths to the regional aquifer range between about 1,200 ft bgs along the western edge of the plateau to about 600 ft bgs to the east. Beneath SWMU 33-013, the water table elevation is approximately 900 ft bgs from the mesa top (LANL 1992, 07671).

Groundwater in the shallow perched zones occurs within the canyon alluvium (i.e., gravel, sand, and finer sediments deposited by surface flow in the canyon bottoms). The alluvial deposits are limited in their geographical extent and very permeable relative to the underlying Bandelier Tuff; therefore, surface water readily infiltrates the alluvium and becomes captured, forming narrow, ribbon-like alluvial aquifers that lie directly beneath the canyon bottoms. These shallow alluvial aquifers generally occur at depths of less than 100 ft and are as much as 100 ft thick in some locations. With the exception of TA-16, shallow alluvial perched aquifers have been detected only beneath canyons with relatively wet surface conditions (surface flow) for most of the year (e.g., Los Alamos Canyon). Currently, there is no evidence to indicate the presence of a shallow alluvial aquifer beneath SWMU 33-013 (LANL 2003, 76059.49).

Groundwater also occurs in intermediate perched water zones. In areas where low-permeability beds impede the downward migration of water, water will pool and collect, forming isolated intermediate-depth aquifers. Evidence of intermediate depth aquifers has been found beneath Pueblo, Los Alamos, Sandia, Mortandad, Pajarito, Ancho Canyons and Cañon de Valle (LANL 2003, 76059.49). These perched intermediate aquifers are morphologically similar to the shallow alluvial aquifers, occurring as narrow ribbons that follow the canyons; however, the depths at which these intermediate aquifers occur are highly variable, ranging from less than 100 ft bgs to as much as 900 ft bgs from the canyon bottoms.

3.3.1.2 Vadose Zone

The region beneath the ground surface and above the regional aquifer is called the vadose (unsaturated) zone. The source of moisture in the vadose zone is precipitation, most of which is removed as runoff, evaporation, and transpiration (LANL 1997, 63131). The subsurface movement of the remaining moisture (often referred to as recharge) is predominantly vertical in direction and is influenced by properties and conditions of the vadose zone.

The geologic property of the Bandelier Tuff that most influences fluid flow in the unsaturated zone is the degree of welding. Welded tuffs tend to have less matrix porosity and more fractures than nonwelded tuffs. Fractures in welded tuff may include relatively close-spaced cooling joints as well as tectonic fractures. Although nonwelded tuffs also have fractures, they are generally less abundant than in welded tuffs. In and around SWMU 33-013, the mesa caprock is exposed in several tuff outcroppings. The tuff appears highly welded but shows little to no signs of weathering or fractures.

4.0 SCOPE OF ACTIVITIES

The ACA work plan for SWMU 33-013 includes the following activities:

- develop planning and field documents for implementation of the work plan
- mobilize to and prepare site
  - conduct radiation surveys and land surveys (i.e., geophysical and utility) to relocate/confirm SWMU location and previous RFI sample locations before the initiation of excavation activities (including utility locations).
- remove asphalt and potentially contaminated soil from SWMU 33-013 and any soil/tuff with elevated gross radiation levels
- collect confirmation samples
- submit confirmation samples for fixed analytical laboratory analysis
- conduct post-sampling geodetic survey
- determine potential risk to human health and the environment by conducting screening assessments using NMED's industrial SSLs and ecological screening levels (ESLs)
- restore and demobilize from site
- prepare a remedy completion report, including the presentation and analysis of all data collected

Investigation methods for performing the work described above are provided in Section 5.0. The schedule for the planned activities is provided in Section 7.0.

5.0 INVESTIGATION METHODS

Activities described in this work plan will be performed in accordance with the applicable quality assurance (QA) requirements addressed in the ENV-RS Project Quality Management Plan and implementing quality procedures (QPs) and standard operating procedures (SOPs), Laboratory requirement documents (e.g., Laboratory Implementation Requirements and Laboratory Performance Requirements), or equivalent Laboratory-approved subcontractor documents (e.g., statements of work, field implementation plans, etc.). Table 5 presents a summary of the SOPs that will be used for this project. These SOPs are available at http://erproject.lanl.gov/documents/procedures.html.

Additional procedures may be used as necessary to guide the work plan activities. Implementation of the ACA site characterization activities include mobilization and site preparation, removal of asphalt and soil, and collection of confirmation samples at locations associated with SWMU 33-013.

5.1 SWMU 33-013

5.1.1 Mobilization and Site Preparation

Mobilization to SWMU 33-013 will include the delivery and inspection of heavy equipment and the establishment of site work areas using ropes, postings, or construction fencing as appropriate to control access by the public and untrained workers. Access to TA-33 is restricted and the project area is surrounded by a fence that can be secured. Erosion-control best management practices (BMPs) (e.g., silt fence and straw wattles) will be installed before any soil-disturbing activities begin.

Beta/gamma and alpha radiation screening will be performed over the surface of the storage area using an ESP-1 rate meter with an HP-260 probe and a Ludlum Model-139 rate meter equipped with an air proportional probe, respectively. Any measured radioactivity detected above two times local background levels will be noted, and the location of the detection(s) will be marked directly on the ground surface. The value of two time background levels was selected to account for the variability that occurs in local

background across a site. A screening level of two times background provides greater confidence that the measure value is actually above background.

The entire surface of the former storage area will be inspected for staining. Visual inspections for staining will be made on top of the soil/pumice veneer prior to excavation, on top of the asphalt after the soil/pumice veneer has been removed, and in the soil/tuff after the asphalt has been removed and during excavation. These inspections will be used to bias sampling locations to areas where spilled material may have migrated into the soil beneath the asphalt pad.

Land surveys will be conducted before the initiation of excavation activities in accordance with SOP-03.11, Geodetic Surveys, to complete utility locates and the boundaries of the former storage area and the data will be delivered to the ENV-RS Records Processing Facility (RPF) for migration to the ENV-RS Geographical Information System.

5.1.2 Excavation and Confirmation Sampling

Initial removal activities will include excavating asphalt and pumice from the former storage area and the first 6 in. of soil beneath the asphalt/pumice surface and placing the material in a designated roll-off bin located within a registered low level waste (LLW) storage area.

The beta/gamma and alpha radiation screening will be repeated within the excavated area before the collection of confirmation samples. Any measured radioactivity detected above local background levels will be marked directly on the ground surface. Soil/tuff with radioactivity detected above two times the local background levels will be removed until field screening instruments show local background levels. Confirmation samples will be collected from these locations. Visual inspection of samples will include inspection for moisture. The presence of elevated moisture in soils beneath the asphalt pad or at confirmation sample intervals will be evaluated to determine if the sampling intervals should be revised. If free liquid is observed in sufficient quantities to allow for sample collection, one or more samples will be collected by using one or more of the four methods described in SOP-06.13 which include a peristaltic pump, grab samples using a transfer device constructed of polyethylene Teflon™, stainless steel, or glass, grab samples by directly dipping the collection bottle into the water and filling, removing, and capping the bottle, or with an automated sampler. The Field Team Leader will decide which of the sampling methods is most appropriate and document the decision in the Field Notebook or on the Daily Activity Log.

Thirteen confirmation samples (including one field duplicate) will be collected from two depth intervals (0 to 6 in. and 24 to 30 in.) at six locations within the storage area excavation and nine confirmation samples (including one field duplicate) at four locations outside of the 50 ft x 50 ft storage area boundary, primarily from locations on the slope directly northeast of the former storage area (Figure 6). Two of the confirmation samples will be collected at the locations of RFI samples AAA2036 and AAA2037 and other sample locations will be biased based on results of field screening, including the observation of staining and moist soil or tuff. If there are no field screening results indicating potential contamination, samples will be collected at the random locations except the two specified above. The confirmation samples will be collected either by using the spade and scoop method (SOP-06.09) manually or with the assistance of a backhoe or similar equipment or by using a hand auger (SOP-06.10), as appropriate. In accordance with the Order, headspace vapor screening for VOCs (SOP-06.33) will be conducted using a photoionization detector (PID) capable of measuring concentrations as low as 1 ppm. Screening samples will be sealed in mason jars and allowed to equilibrate in a warm area for not less than ten minutes. The headspace gas will then be screened using a PID equipped with an 11.7 eV bulb. To ensure compliance with US

Department of Transportation (DOT) regulations, all samples will be field screened for alpha- and beta-gamma radiation before they are transported to the Sample Management Office (SMO).

5.1.3 Fixed Laboratory Analytical Methods

All samples will be submitted to the SMO for fixed-laboratory analysis of polychlorinated biphenyls (PCBs); VOCs; SVOCs; explosive compounds; tritium; gamma spectroscopy; alpha spectroscopy for americium 241, isotopic uranium, and isotopic plutonium; target analyte list (TAL) metals; perchlorates; strontium-90; and cyanide, with a request for a 30-day turnaround time for the analytical results. Once samples have been collected, samples will be stored and transported to the SMO in accordance with SOP-01.03, Handling, Packaging and Shipping of Samples. The SMO will ship samples to an off-site analytical laboratory qualified according to QP-7.2, Supplier Evaluation, and listed on the ENV-ECR Qualified Suppliers List. Specific analytical methods are described in the EPA document, "Test Methods for Evaluating Solid Wastes" (SW846) and are listed in Table 6.

In accordance with SOP-01.05, quality assurance/quality control (QA/QC) samples will include VOC trip blanks at a frequency of 1 per 20 or 1 per day, whichever is greater, field duplicates at a rate of 1 per 20 or 1 per day per matrix, whichever is greater to evaluate the reproducibility of the sampling technique, and rinsate blanks for TAL metals analysis to evaluate decontamination procedures.

5.1.4 Site Restoration, Decontamination, and Demobilization Activities

Site restoration will include adding imported clean fill to bring the site back to its original grade. BMPs will be installed to prevent the erosion of site soils from stormwater run-on and runoff. The BMPs will be left in place and upgraded as needed to prevent the erosion of site soils. The Laboratory will inspect BMPs as part of the existing BMP maintenance and inspection program for the ENV Division.

Stainless-steel sampling equipment will be decontaminated daily and between uses at sampling locations. To minimize or eliminate liquid waste generation, decontamination of equipment will be accomplished using dry methods whenever possible. If required, an alconox/water solution decontamination technique may be used to decontaminate sampling equipment. Wet or dry decontamination techniques will be conducted in accordance with SOP-01.08, Field Decontamination of Drilling and Sampling Equipment. Any decontamination wastewater generated will be sampled and stored in a 5-gal. plastic bucket.

All sampling and decontamination equipment, materials, and investigation-derived wastes will be removed from the site for disposal in accordance with the Waste Characterization Strategy Form (WCSF).

The investigation-derived waste management plan for wastes generated during the ACA field activities is presented in Appendix C.

5.1.5 Post-sampling Geodetic Survey

A post-investigation geodetic survey will be conducted at the site to confirm the exact sample locations and to ensure any deviations from the proposed sample design are documented. The geodetic survey will be conducted in accordance with SOP-03.11, Geodetic Surveys.

5.2 Proposed Samples and Analytical Suites

Table 6 presents the number of proposed confirmation samples to be collected and the analytical suites the samples will be analyzed for. All activities described in this ACA work plan will be conducted under the applicable subcontractor-approved site-specific health and safety plan. Integrated work documents will be prepared for each activity identified in the site-specific health and safety plan for the fieldwork.

6.0 POSTSAMPLING MONITORING

Currently, there are no monitoring activities at SWMU 33-013. The ACA activities for the investigation and remediation of SWMU 33-013 will be the final remedy for the site. Therefore, post-ACA sampling or monitoring activities are not planned for the site.

7.0 PHOTO DOCUMENTATION

Each phase of the activities outlined in this ACA, including site field work (excavation, sampling, etc.) and restoration will be documented and photographed. A descriptive annotation will be provided for each photograph.

8.0 SCHEDULE

Field activities associated with the implementation of this ACA work plan are expected to begin in May 2005. A remedy completion report for the ACA will be prepared and submitted to the NMED Hazardous Waste Bureau 90 days after ACA activities are completed. The schedule for specific ACA work plan preparation and field activities is summarized in Table 7.

9.0 REFERENCES

The following list includes all documents cited in this report. Parenthetical information following each reference provides the author, publication date, and ER ID number. This information is also included in text citations. ER ID numbers are assigned by the ENV-RS Records Processing Facility (RPF) and are used to locate the document at the RPF and, where applicable, in the ENV-RS project reference set titled "Reference Set for Operable Unit 1122."

Copies of the reference sets are maintained at the NMED Hazardous Waste Bureau; the DOE Los Alamos Site Office; U.S. Environmental Protection Agency, Region 6; and ENV-RS project. The sets were developed to ensure that the administrative authority has all material needed to review this document, and that they are updated periodically as needed.

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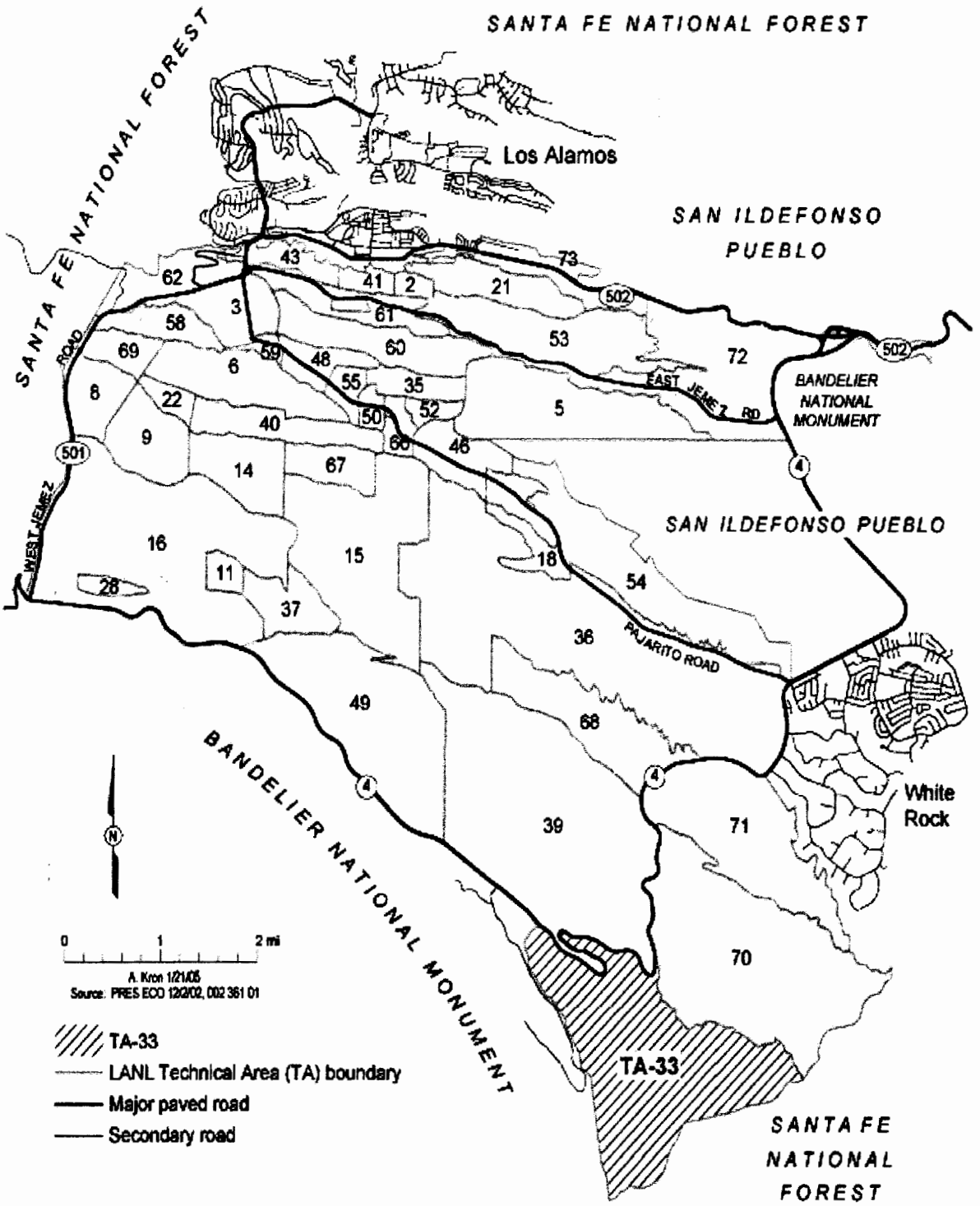

Figure 1. Location of TA-33 with respect to Laboratory TAs and surrounding land holdings

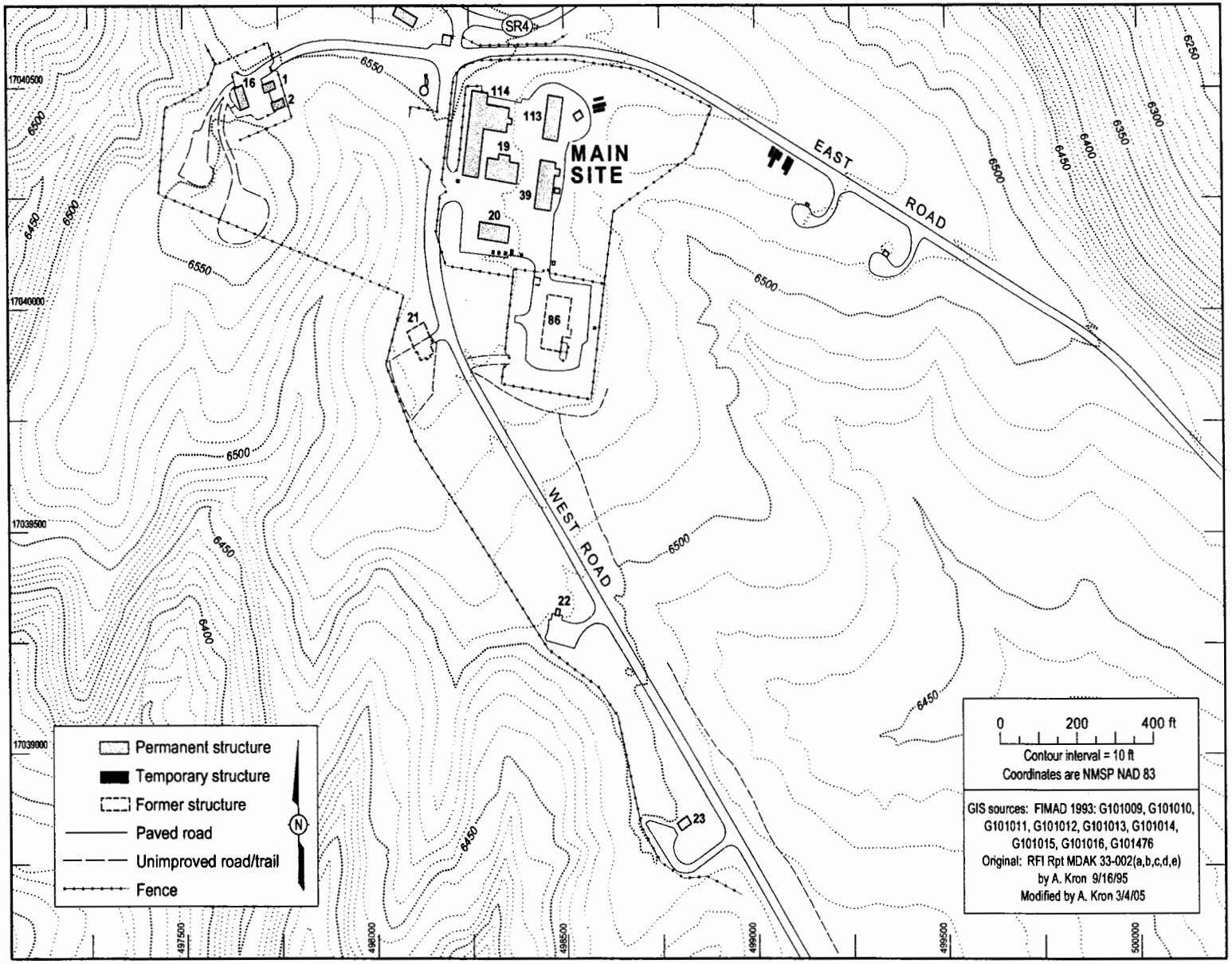

Figure 2. Location of main Site at TA-33

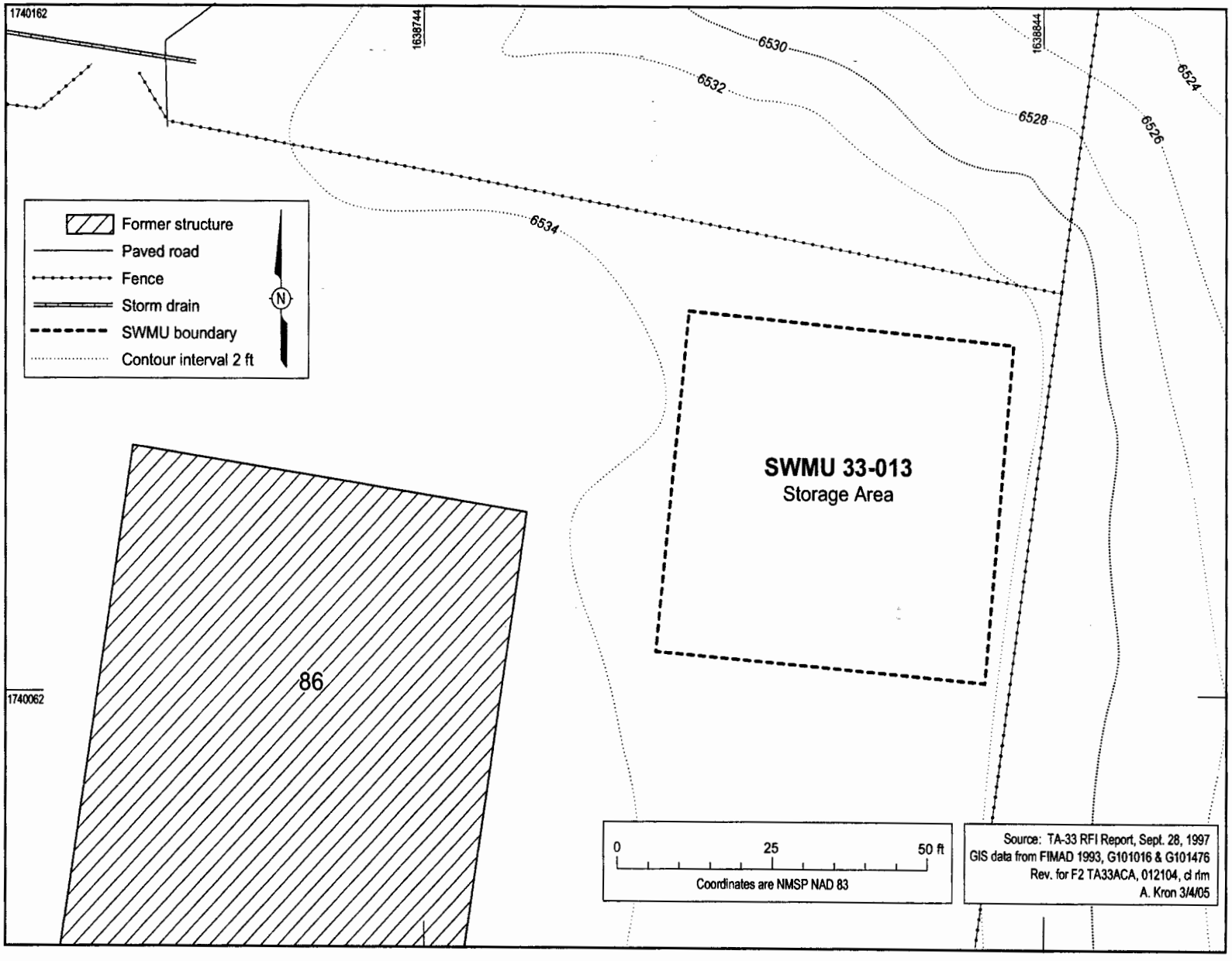

Figure 3. Location of SWMU 33-013 at TA-33

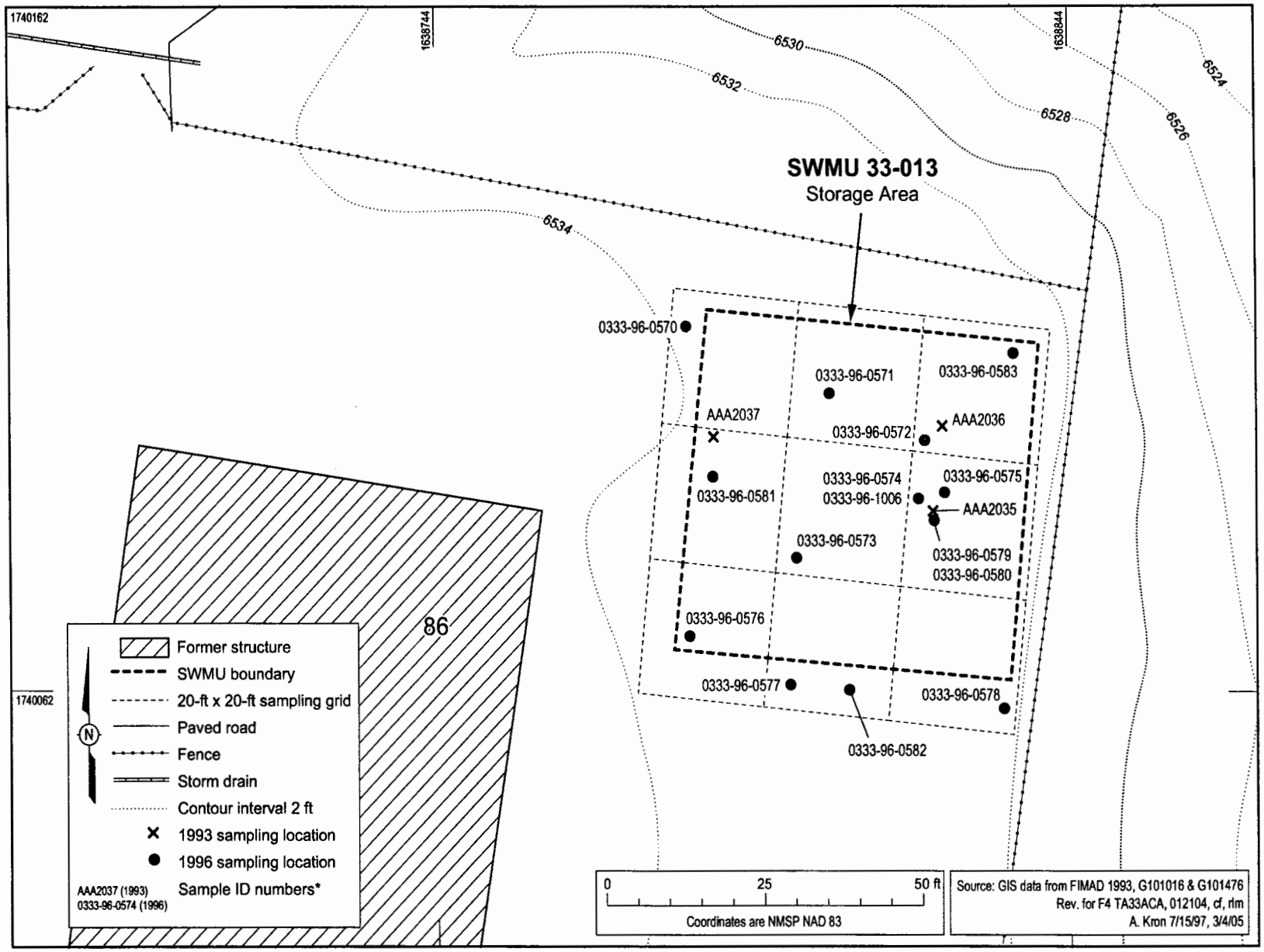

Figure 4. 1993 and 1996 RFI sampling locations at SWMU 33-013 at TA-33

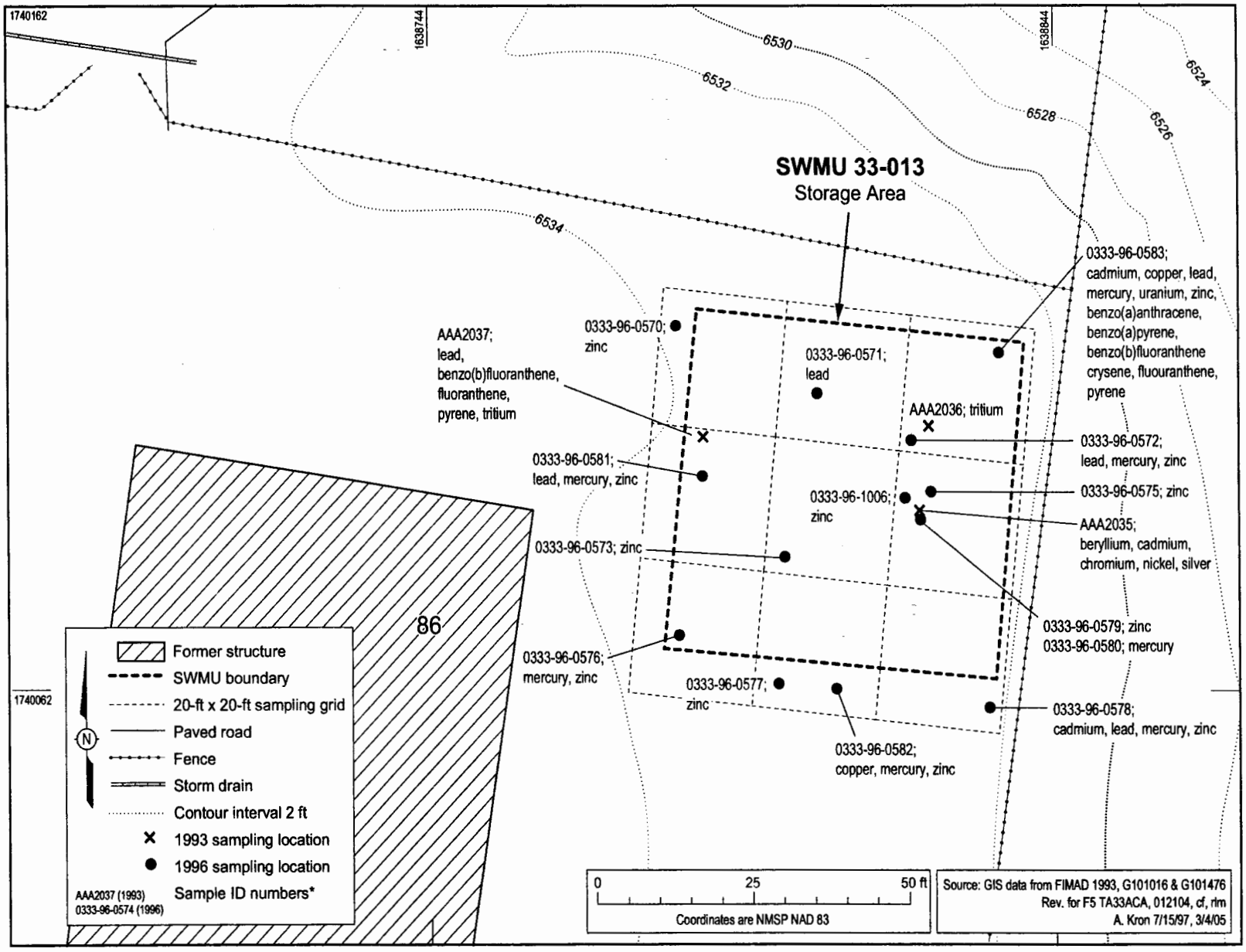

Figure 5. 1993 and 1996 RFI sampling locations with detects at SWMU 33-013 at TA-33

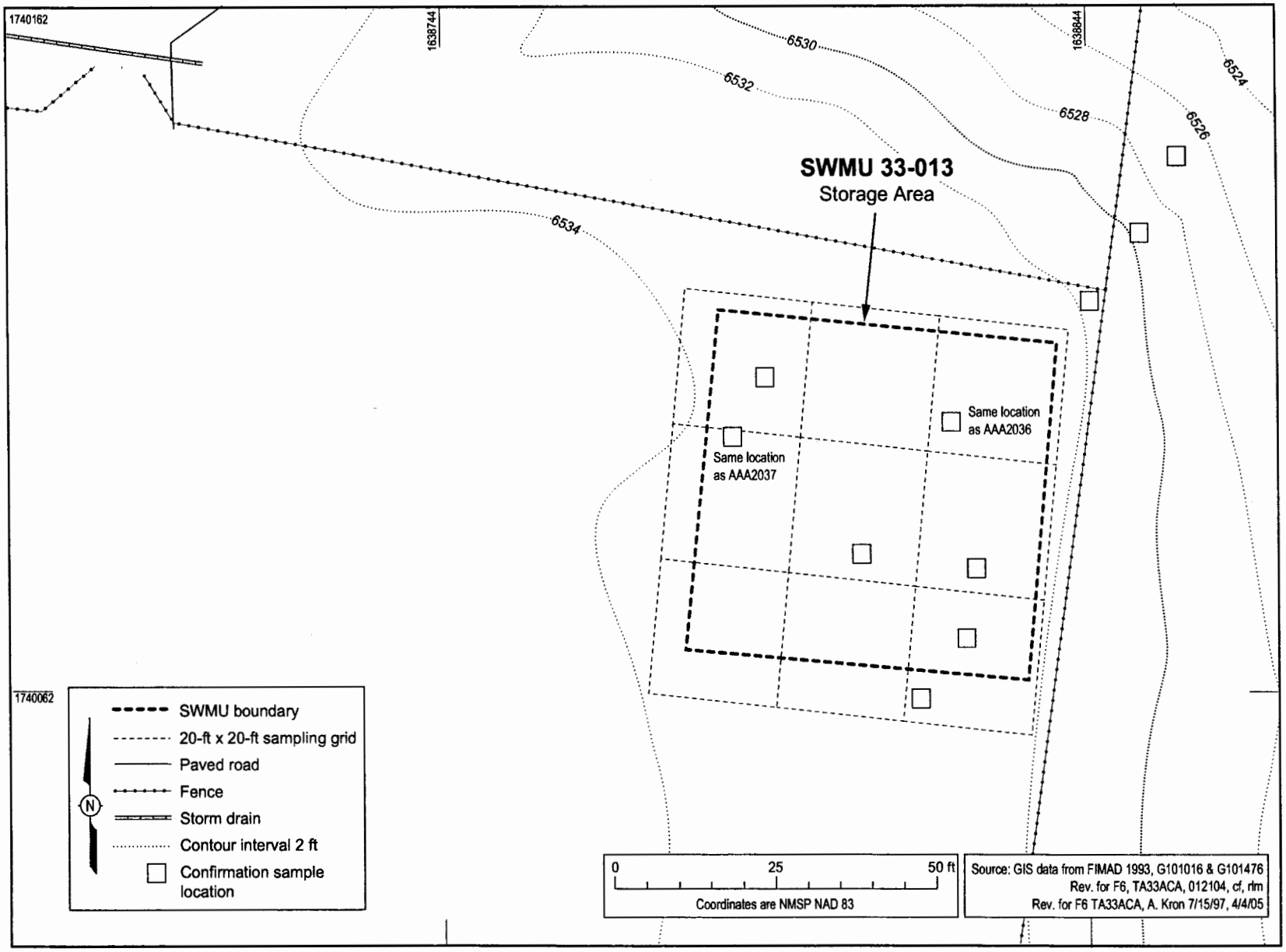

Figure 6. Confirmation sampling locations at SWMU 33-013 at TA-33

Table 1
Samples Collected from SWMU 33-013

Sample ID	Location ID	Depth (ft)	Media	METALS	Uranium	Herbicides	SVOCs	Tritium
AAA2035	33-01090	0-0.5	Fill	14594	NA*	14592	14595	NA
AAA2036	33-01091	0-0.5	Soil	14594	NA	NA	14595	14596
AAA2037	33-01092	0-0.5	Fill	14594	NA	NA	14595	14596
0333-96-0570	33-01557	0-0.5	Fill	2424	NA	NA	NA	NA
0333-96-0571	33-01556	0-0.5	Soil	2424	NA	NA	NA	NA
0333-96-0572	33-01555	0-0.5	Fill	2424	NA	NA	NA	NA
0333-96-0573	33-01560	0-0.5	Fill	2424	NA	NA	NA	NA
0333-96-0574	33-01559	0-0.5	Fill	2424	NA	NA	NA	NA
0333-96-0575	33-01558	0-0.5	Fill	2424	NA	NA	NA	NA
0333-96-0576	33-01563	0-0.5	Fill	2424	NA	NA	NA	NA
0333-96-0577	33-01562	0-0.5	Fill	2424	NA	NA	NA	NA
0333-96-0578	33-01561	0-0.5	Fill	2424	NA	NA	NA	NA
0333-96-0579	33-01090	0-0.5	Fill	2424	NA	NA	NA	NA
0333-96-0580	33-01090	0.5-1	Fill	2424	NA	NA	NA	NA
0333-96-0581	33-01092	0-0.5	Fill	2424	NA	NA	NA	NA
0333-96-0582	33-01661	0-0.5	Soil	2424	NA	NA	NA	NA
0333-96-0583	33-01656	0-0.5	Soil	2758	2759	NA	2757	NA
0333-96-1006	33-01559	0-0.5	Fill	2424	NA	NA	NA	NA

* NA = Not Analyzed.

Table 2
Summary of Inorganic Chemicals Detected Above Background at SWMU 33-013

Sample ID	Location ID	Depth (ft)	Media	Antimony	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Silver	Thallium	Uranium	Zinc
Soil Background Value (mg/kg)				**0.83**	**1.83**	**0.4**	**19.3**	**14.7**	**22.3**	**0.1**	**15.4**	**1**	**0.73**	**1.82**	**48.8**
Industrial Soil Screening Levels[a] (mg/kg)				**454**	**2250**	**1128[b]**	**5000[c]**	**45400**	**750**	**340[c]**	**22500**	**5680**	**74.9**	**200[d]**	**100000**
AAA2035	33-01090	0.00-0.50	Fill[e]	ND[f]	7.8	620	670	ND	ND	ND	100	10	ND	ND	ND
0333-96-0579	33-01090	0.00-0.50	Fill	11 (UJ[g])	ND	0.53 (U[h])	ND	ND	ND	0.11 (U)	ND	2.1 (U)	1.3 (U)	ND	53 (J-[i])
0333-96-0580	33-01090	0.50-1.00	Fill	11 (UJ)	ND	0.54 (U)	ND	ND	ND	0.15	ND	2.2 (U)	1.3 (U)	ND	ND
AAA2037	33-01092	0.00-0.50	Fill	ND	ND	ND	ND	ND	23	ND	ND	ND	ND	ND	ND
0333-96-0581	33-01092	0.00-0.50	Fill	11 (UJ)	ND	0.53 (U)	ND	ND	24	1	ND	2.1 (U)	1.3 (U)	ND	68 (J-)
0333-96-0572	33-01555	0.00-0.50	Fill	10 (UJ)	ND	0.51 (U)	ND	ND	57	0.3	ND	2 (U)	1.3 (U)	ND	59 (J-)
0333-96-0571	33-01556	0.00-0.50	Soil	11 (UJ)	ND	0.53 (U)	ND	ND	26	0.11 (U)	ND	2.1 (U)	1.3 (U)	ND	ND
0333-96-0570	33-01557	0.00-0.50	Fill	11 (UJ)	ND	0.53 (U)	ND	ND	ND	0.11 (U)	ND	2.1 (U)	1.3 (U)	ND	49 (J-)
0333-96-0575	33-01558	0.00-0.50	Fill	11 (UJ)	ND	0.53 (U)	ND	ND	ND	0.11 (U)	ND	2.1 (U)	1.3 (U)	ND	55 (J-)
0333-96-0574	33-01559	0.00-0.50	Fill	11 (UJ)	ND	0.53 (U)	ND	ND	ND	0.11 (U)	ND	2.1 (U)	1.3 (U)	ND	ND
0333-96-1006	33-01559	0.00-0.50	Fill	10 (UJ)	ND	0.52 (U)	ND	ND	ND	ND	ND	2.1 (U)	1.3 (U)	ND	57 (J-)
0333-96-0573	33-01560	0.00-0.50	Fill	11 (UJ)	ND	0.54 (U)	ND	ND	ND	0.11 (U)	ND	2.2 (U)	1.3 (U)	ND	120 (J-)
0333-96-0578	33-01561	0.00-0.50	Fill	10 (UJ)	ND	1.7	ND	ND	35	0.35	ND	2 (U)	1.3 (U)	ND	190 (J-)
0333-96-0577	33-01562	0.00-0.50	Fill	10 (UJ)	ND	0.52 (U)	ND	ND	ND	ND	ND	2.1 (U)	1.3 (U)	ND	49 (J-)
0333-96-0576	33-01563	0.00-0.50	Fill	10 (UJ)	ND	0.52 (U)	ND	ND	ND	0.33	ND	2.1 (U)	1.3 (U)	ND	83 (J-)
0333-96-0583	33-01656	0.00-0.50	Soil	5.2 (U)	ND	0.7	ND	19.9	40.4	0.14	ND	ND	ND	2.08 (J)	165
0333-96-0582	33-01661	0.00-0.50	Soil	10 (UJ)	ND	0.5 (U)	ND	17	ND	0.44	ND	2 (U)	1.3 (U)	ND	76 (J-)

a Levels obtained from "Technical Background Document for Development of Soil Screening Levels" (NMED 2004, 85615).

b Cadmium industrial Soil Screening Level in "Technical Background Document for Development of Soil Screening Levels" (NMED 2004, 85615) is incorrect. It was recalculated using NMED parameters and toxicity values.

c EPA Region 6 Human Health Medium-Specific Screening Levels, (EPA 2004, 87478).

d EPA Region 9 PRG Table, http://www.epa.gov/region09/waste/sfund/prg/files/04prgtable.pdf.

e Soil background used for fill (LANL 1998, 59730).

f ND = Not detected.

g UJ = The chemical was undetected, and the result is estimated.

h U = Undetected.

i J- = The chemical was positively identified, and the result is likely biased low.

Table 3
Summary of Detected Organic Chemicals at SWMU 33-013

Sample ID	Location ID	Depth (ft)	Media	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Chrysene	Fluoranthene	Pyrene
Industrial Soil Screening Levels[a] (mg/kg)				23.4	2.34	23.4	2340	24400	31300
AAA2037	33-01092	0.00-0.50	Fill	ND[b]	ND	0.43	ND	0.34	1.3
0333-96-0583	33-01656	0.00-0.50	Soil	1.5 (J[c])	1.5 (J)	1.8 (J)	1.8 (J)	3.5 (J)	3 (J)

[a] Levels obtained from "Technical Background Document for Development of Soil Screening Levels" (NMED 2004, 85615).

[b] ND = Not detected.

[c] J = The chemical was positively identified, and the result is estimated.

Table 4
Summary of Radionuclides Detected Above Background at SWMU 33-013

Sample ID	Location ID	Depth (ft)	Media	Tritium
Soil Background Value (pCi/ml)				**0.76**
Industrial Screening Action Levels[a] (pCi/g)				**260**
AAA2036	33-01091	0.00-0.50	Soil	3342.29[bc]
AAA2037	33-01092	0.00-0.50	Fill[d]	26.7

[a] Screening Action Levels obtained from RESRAD Residual Radioactive Material Risk Assessment Calculations version 6.21.

[b] Results Unit are pCi/g.

[c] Results rounded off to two decimal places.

[d] Soil background used for fill, (LANL 1998, 59730).

Table 5
SOPs for ACA Activities at SWMU 33-013

Procedure	Title	Summary
SOP 1.01	General Instructions for Field Investigations	Provides an overview of instructions regarding activities to be performed before, during, and after field investigations completed by the LANL ENV-RS project. It is assumed that field investigations involve standard sampling equipment, personal protective equipment, waste-management, and site-control equipment/materials. Procedure covers: pre-mobilization activities, mobilization to the site, documentation and sample collection activities, sample media evaluation, surveying, and completing lessons learned.
SOP 1.02	Sample Containers and Preservation	Describes the specific requirements/process for sample containers, preservation techniques, and holding times as specified by field regulations and guidance documents. The use of specific types of sample container and preservation techniques is mandatory for hazardous site investigations because the integrity of any sample is diminished over time. Physical factors (light, pressure, temperature, etc.), chemical factors (changes in pH, volatilization, etc.), and biological factors may alter the original quality of the sample. Because the various target parameters are uniquely altered at varying rates, distinct sample containers, preservation techniques, and holding times have been established to maintain sample integrity for a reasonable and acceptable period of time. Procedure covers: documenting SOP deviations, using proper sample containers and preservatives, performing data entry, implementing containment procedures, preserving samples, implementing holding times, completing documentation, implementing post-operation activities, and performing lessons learned.
SOP 1.03	Handling, Packaging, and Transporting Field Samples	Directs field team members in the preparation of environmental and waste-characterization samples for transportation to the Sample Management Office or an approved radiation screening laboratory. In general, samples taken for the Remediation Services Project are expected to have a low concentration of potential contaminants, although higher concentrations will be present in some cases. These low-concentration samples that do not satisfy the DOT hazard-class definitions are classified as environmental samples and are not subject to DOT regulations. Historical data, knowledge of processes, and field screening results will assist the team members in making decisions as to whether a sample can be designated as "environmental" or if it needs to be treated as a DOT-regulated material. Procedure covers: transportation of environmental- and DOT-regulated samples.

Table 5 (continued)

Procedure	Title	Summary
SOP 1.04	Sample Control and Field Documentation	Describes the process for documenting samples collected for the ENV-RS project using sample control and field documentation, specifically, container labels, sample collection logs, chain of custody (COC)/request for analysis forms, and daily activity log forms or field notebooks. Procedure covers: performing request notification, generating sample control and field documentation, completing sample collection logs, using field chain-of-custody forms, delivering samples to the sample management office, delivering samples to another analytical laboratory, using custody seals, collecting the samples, completing sample control and field documentation, completing field investigation summaries, and performing field closeouts.
SOP 1.05	Field Quality Control Samples	Describes the requirements for the collection of field QC samples to ensure the reliability and validity of field and laboratory data. Field QC samples shall be collected as described in this procedure and taken to the SMO with the regular field samples for subsequent chemical and physical testing. Procedure covers pre-operation activities, collecting and preparing each type of QC sample, including equipment rinsate blank, field duplicate, and trip blank.
SOP 1.06	Management of Environmental Restoration Project Wastes	Describes the process for managing waste generated during corrective action activities. This procedure outlines the preparation, approval, and retention of all required documents associated with waste generation. The procedure covers: waste identification and characterization, waste minimization/recycling, waste generation/storage, segregation, waste treatment, authorized release limits, packaging/transportation, disposal options, and specific ENV-RS project policies, including the area of contamination policy, environmental media, and contained-in policy.
SOP 1.07	Operational Guidelines for Taking Soil and Water Samples in Explosive Areas	States the responsibilities and describes the processes for taking surface and subsurface soil samples and water samples in the high explosives (HE) corridor. Procedure covers: pre-sampling activities, selecting sampling locations, sampling activities, use of HE field screening tests, and transporting samples.

Table 5 (continued)

Procedure	Title	Summary
SOP 1.08	Field Decontamination of Drilling and Sampling Equipment	Describes the process for the general field decontamination of drilling and sampling equipment. It is intended to help ensure the integrity of soil, sediment, rock, water, and other samples collected from potentially contaminated sites and to minimize the potential for cross contamination between sampling locations. Implementation of this procedure will help protect site and community personnel, requiring that equipment not be removed from a controlled area without proper decontamination. Procedure covers: set up of dry and wet decontamination areas, drilling/excavation equipment decontamination, and sampling equipment decontamination.
SOP 1.10	Waste Characterization	Describes the development of a strategy for characterizing wastes generated during projects. This procedure (1) identifies the steps involved in waste identification and characterization as delineated by Laboratory requirements, and (2) provides instructions for completing a WCSF, a task that is required before every project.
SOP 1.12	Field Site Closeout Checklist	Describes the process for documenting the completion of fieldwork at individual ENV-RS projects sites. This checklist is designed to ensure that upon demobilization from an ENV-RS project field site, all necessary field compliance activities, equipment accountability, and documentation are complete. The procedure is applicable to all subcontractor and UC project personnel who participate in field activities. Field activities included in this procedure are site investigation, remediation, and interim action projects. Field activities that do not generate waste, collect samples, or fulfill regulatory requirements (e.g., BMP inspection) are exempt from this procedure. Periodic activities such as BMP inspection can postpone site-closeout activities until the end of the period of performance or annually, whichever is shorter.
SOP 3.11	Coordinating and Evaluating Geodetic Surveys	Describes the methodology for coordinating and evaluating geodetic surveys and establishing QA/QC and control for geodetic survey data. The procedure covers evaluating geodetic survey requirements, preparing to perform a geodetic survey, performing geodetic survey field activities, preparing geodetic survey data for QA review, performing QA review of geodetic survey data, and submitting geodetic survey data.
SOP 6.09	Spade and Scoop Method for the Collection of Soil Samples	Describes the process for spade-and-scoop collection of shallow (i.e., typically 0 to 12 inches) soil samples. The "spade-and-scoop" method involves digging a hole to the desired depth, as prescribed in the sampling and analysis plan, and collecting a discrete grab or portion of a composite sample. Procedure covers: pre-sampling activities, sampling activities, and post-sampling activities.

Table 5 (continued)

Procedure	Title	Summary
SOP 6.10	Hand Auger and Thin-Wall Tube Sampler	States the responsibilities and describes the process for collecting surface and subsurface (up to about 15 ft) soil samples with a hand auger and thin-wall tube sampler. This procedure describes the selection and use of sampling methods and equipment at sites that may include contamination with hazardous or radioactive materials. This procedure covers: pre-sampling activities, sampling activities, collecting field duplicates, and post-sampling activities.
SOP 6.13	Surface Water Sampling	Describes the process for collecting water samples from streams, ponds, lagoons, seeps, springs, rivers, lakes, or other water flowing or impounded at the ground surface. Samples may be collected using a peristaltic pump, grab sample transfer device, dipper, or automated sampler. The Sampler or Field Team Leader will decide which of the four sampling methods described in the procedure is most appropriate. The method used to collect samples will be documented in the Field Notebook or on the Daily Activity Log.
SOP 6.33	Headspace Vapor Screening with a Photoionization Detector	Describes the process for screening headspace vapor for VOC in soil samples with a PID. The PID is a portable, nonspecific, vapor/gas detector employing the principle of photoionization to detect and measure real-time concentrations of a variety of chemical compounds, both organic and inorganic, in air. This procedure covers: performing field calibration, operating, and post operating activities.
SOP 10.14	Performing and Documenting Gross Gamma Radiation Scoping Surveys	Describes the process for performing and documenting gross gamma radiation scoping surveys for radioactivity in buildings and soils.

Table 6
Proposed Confirmation Samples and Analytical Suites for SWMU 33-013 after Excavation

Depth (in.)	Description	Chemical and Radiochemical Analyses		Total Number of Samples
0 to 6 and 24 to 30	Collected after removal of the asphalt pad and first six inches of soil directly beneath the pad	VOCs (8260B), explosive compounds (8321A), PCBs (8082), SVOCs (8270C), perchlorates (8321A), TAL metals (6010B, 6020, 7471A), and cyanide (9012A)	gamma spectroscopy (EPA:901.1), alpha spectroscopy (HASL-300:AM-241), isotopic plutonium (HASL-300:IsoPu), isotopic uranium (HASL-300:IsoU), tritium (EPA:906.0), Sr-90 (EPA:905.0)	12 planned 1 duplicate
0 to 6 and 24 to 30	Collected from four locations outside the 50 ft x 50 ft storage area	VOCs (8260B), explosive compounds (8321A), PCBs (8082), SVOCs (8270C), perchlorates (8321A), TAL metals (6010B, 6020, 7471A), and cyanide (9012A)	gamma spectroscopy (EPA:901.1), alpha spectroscopy (HASL-300:AM-241), isotopic plutonium (HASL-300:IsoPu), isotopic uranium (HASL-300:IsoU), tritium (EPA:906.0), Sr-90 (EPA:905.0)	8 planned 1 duplicate

Table 7
ACA Field Implementation Schedule for SWMU 33-013

Activity	Duration (workdays)
Preparation/readiness review	38
Field preparation: • mobilize equipment • implement BMPs • establish work zone and waste management area	1
Gross radiation and geodetic surveys (pre-excavation)]	2
Excavation and soil removal	1
Confirmation sampling	15
Post-sampling geodetic survey	2
Laboratory analysis	35
Site restoration and demobilization	6
Final site inspection	1
Data validation	12
Total duration	**124**

Appendix A

Acronyms and Abbreviations

LIST OF ACRONYMS AND ABBREVIATIONS

ACA	accelerated corrective action
AOC	area of concern
bgs	below ground surface
BMP	best management practice
BV	background value
CFR	Code of Federal Regulations
COC	chain of custody
Consent Order	Compliance Order on Consent
COPC	chemical of potential concern
D&D	decontamination & decommissioning
DOE	U.S. Department of Energy
DOT	Department of Transportation
EM	electromagnetic (induction)
ENV	Environmental Stewardship Division
ENV-RS	Environmental Stewardship Division—Remediation Services project
ENV-SWRC	Environmental Stewardship Division—Solid Waste Regulatory Compliance Group
EPA	Environmental Protection Agency
EQL	estimated quantitation limit
ER	Environmental Restoration
ESL	ecological screening level
FV	fallout value
HE	high explosives
HSWA	Hazardous and Solid Waste Amendments
IA	Interim Action
IDW	investigation-derived waste
Laboratory	Los Alamos National Laboratory
LANL	Los Alamos National Laboratory
LIR	Laboratory Implementation Requirement
LLW	low-level waste
NA	Not Analyzed
ND	Not Detected
NIOSH	National Institute for Occupational Safety and health
NMSW	New Mexico special waste
NMED	New Mexico Environment Department
OSHA	Occupational Safety and Health Administration
PAAA	Price Anderson Act Amendment

PCB	polychlorinated biphenyl
PID	photoionization detector
QA	quality assurance
QC	quality control
QP	quality procedure
Qbt	Quaternary Tshirege member of the Bandelier tuff
RCRA	Resource Conservation and Recovery Act
RESRAD	Residual Radioactive Material
RFI	RCRA facility investigation
RPF	Records Processing Facility
RS	Remediation Services
SAL	Screening Action Level
SMO	Sample Management Office
SOP	standard operating procedure
SSL	soil screening level
SVOC	semivolatile organic compound
SWMU	solid waste management unit
SWPPP	Storm Water Pollution Prevention Plan
TA	technical area
TAL	target analyte list
TCLP	toxicity characteristic leaching procedure
TSCA	Toxic Substance Control Act
UC	University of California
VCP	vitrified clay pipe
VOC	volatile organic compound
WCSF	waste characterization strategy form

Appendix B

Historical Analytical Data for
Solid Waste Management Unit 33-013

(CD inside back cover of this work plan)

URI	SEQ NUM	REQUEST NUM	SAMPLE ID	LAB REPORT NUM	EXCAV FLAG	COMPOS TYPE CODE	SAMPLE TECH CODE	SAMPLE USG CODE	FIELD PREP	PRS	PRS ORDER	LOCATION ID	BEGIN DEPTH	END DEPTH	DEPTH UNITS	FLD MATRIX CODE	MATRIX	MEDIA CODE	RF CLASS	ANALYTE CODE	ANALYTE NAME
17367302	CST3:0710685	14596	AAA2035	20553	N	NA	SS	INV	Not Applicable		0	33-01090	0	0.5	FT	S	SO	FILL	RAD	CS-137	Cesium-137
17367312	CST3:0710686	14596	AAA2036	20553	N	NA	SS	INV	Not Applicable		0	33-01091	0	0.5	FT	S	SO	ALLH	RAD	CS-137	Cesium-137
17367322	CST3:0710687	14596	AAA2037	20553	N	NA	SS	INV	Not Applicable		0	33-01092	0	0.5	FT	S	SO	FILL	RAD	CS-137	Cesium-137

URI	PERCENT MOISTURE	IDL	MDL	MDA	QUANT LMT	DLC	DILUTION FACTOR	TEXT RESULT	SAMPLE VALUE	UNCERTAINTY	REPORTING UNITS	STD SAMPLE VALUE	STD UNCERTAINTY	STD REPORTING UNITS	FU4 QUAL	RFI REASON CODE	LAB QUALIFIER	LANL QUALIFIER 1	LANL QUALIFIER 2	LANL QUALIFIER 3	LANL QUALIFIER 4	LANL QUALIFIER 5	LANL QUALIFIER 6
17367302									0.79	0	PCI/G	0.79	0	PCI/G	R	R5a	U	U	U	R			
17367312									0.64	0	PCI/G	0.64	0	PCI/G	R	R5a	U	U	U	R			
17367322									0.66	0	PCI/G	0.66	0	PCI/G	R	R5a	U	U	U	R			

URI	LANL QUALIFIER REASON 1	LANL QUALIFIER REASON 2	LANL QUALIFIER REASON 3	LANL QUALIFIER REASON 4	LANL QUALIFIER REASON 5	LANL QUALIFIER REASON 6	LANL SET TYPE CODE 1	LANL SET TYPE CODE 2	LANL SET TYPE CODE 3	LANL SET TYPE CODE 4	LANL SET TYPE CODE 5	LANL SET TYPE CODE 6	FIELD QC TYPE CODE	SAMPLE TYPE CODE	ANALYTICAL SUITE	ANYL METH CODE	LAB CODE	LAB NAME	ANALYSIS DATE	SHIPPING DATE	COLLECTION DATE
17367302	GULAB	R5	R5a				REPORTING	ROUTINE03	ROUTINE03				NA	CS	GAMMA_SPEC	Generic:Gamma Spec.	RGGJ	Rust Geotech, Grand Junction, CO	09-Aug-93		12-May-93
17367312	GULAB	R5	R5a				REPORTING	ROUTINE03	ROUTINE03				NA	CS	GAMMA_SPEC	Generic:Gamma Spec.	RGGJ	Rust Geotech, Grand Junction, CO	09-Aug-93		12-May-93
17367322	GULAB	R5	R5a				REPORTING	ROUTINE03	ROUTINE03				NA	CS	GAMMA_SPEC	Generic:Gamma Spec.	RGGJ	Rust Geotech, Grand Junction, CO	09-Aug-93		12-May-93

URI	SEQ NUM	REQUEST NUM	SAMPLE ID	LAB REPORT NUM	EXCAV FLAG	COMPOS TYPE CODE	SAMPLE TECH CODE	SAMPLE USG CODE	FIELD PREP	PRS	PRS ORDER	LOCATION ID	BEGIN DEPTH	END DEPTH	DEPTH UNITS	DEPTH	FLD MATRIX CODE	MATRIX	MEDIA CODE
21965252	CST3:0710668	14596	AAA2036	20551	N	NA	SS	INV	Not Applicable	33-013	2	33-01091	0	0.5	FT	0-0.5 FT	S	SO	ALLH
21965262	CST3:0710669	14596	AAA2037	20551	N	NA	SS	INV	Not Applicable	33-013	2	33-01092	0	0.5	FT	0-0.5 FT	S	SO	FILL

URI	RFI CLASS	ANALYTE CODE	ANALYTE NAME	PERCENT MOISTURE	IDL	MDL	MDA	QUANT LMT	DLC	DILUTION FACTOR	TEXT RESULT	SAMPLE VALUE	UNCERTAINTY	REPORTING UNITS	STD SAMPLE VALUE	STD UNCERTAINTY	STD REPORTING UNITS	FU4 QUAL	RFI REASON CODE	LAB QUALIFIER
21965252	RAD	H-3	Tritium	4								80214.93	579.375	PCI/ML	3342.289	24.14063	PCI/G			
21965262	RAD	H-3	Tritium	6.7								371.46	2.74	PCI/ML	26.67505	0.1967631	PCI/G			

URI	LANL QUALIFIER 1	LANL QUALIFIER 2	LANL QUALIFIER 3	LANL QUALIFIER 4	LANL QUALIFIER 5	LANL QUALIFIER 6	LANL QUALIFIER REASON 1	LANL QUALIFIER REASON 2	LANL QUALIFIER REASON 3	LANL QUALIFIER REASON 4	LANL QUALIFIER REASON 5	LANL QUALIFIER REASON 6
21965252	NQ	NQ	U	NQ			RNQ	NQ	R5	NQ		
21965262	NQ	NQ	U	NQ			RNQ	NQ	R5	NQ		

URI	LANL SET TYPE CODE 1	LANL SET TYPE CODE 2	LANL SET TYPE CODE 3	LANL SET TYPE CODE 4	LANL SET TYPE CODE 5	LANL SET TYPE CODE 6	FIELD QC TYPE CODE	SAMPLE TYPE CODE	ANALYTICAL SUITE	ANYL METH CODE	LAB CODE	LAB NAME	ANALYSIS DATE	SHIPPING DATE	COLLECTION DATE
21965252	REPORTING	ROUTINE03	ROUTINE03	ROUTINE03			NA	CS	H3	LA-10300-M, Vol. 1:R230	RGGJ	Rust Geotech, Grand Junction, CO	8/9/1993		5/12/1993
21965262	REPORTING	ROUTINE03	ROUTINE03	ROUTINE03			NA	CS	H3	LA-10300-M, Vol. 1:R230	RGGJ	Rust Geotech, Grand Junction, CO	8/9/1993		5/12/1993

URI	SEQ NUM	REQUEST NUM	SAMPLE ID	LAB REPORT NUM	EXCAV FLAG	COMPOS TYPE CODE	SAMPLE TECH CODE	SAMPLE USG CODE	FIELD PREP	PRS	PRS ORDER	LOCATION ID	BEGIN DEPTH	END DEPTH	DEPTH UNITS	DEPTH	FLD MATRIX CODE	MATRIX	MEDIA CODE	RFI CLASS	ANALYTE CODE	ANALYTE NAME
2156152	CST3:0709500	14595	AAA2035	19002	N	NA	SS	INV	Not Applicable	33-013	2	33-01090	0	0.5	FT	0-0.5 FT	S	SO	FILL	ORGANI	83-32-9	Acenaphthene
2157882	CST3:0709540	14595	AAA2035	19002	N	NA	SS	INV	Not Applicable	33-013	2	33-01090	0	0.5	FT	0-0.5 FT	S	SO	FILL	ORGANI	208-96-8	Acenaphthylene
2156452	CST3:0709507	14595	AAA2035	19002	N	NA	SS	INV	Not Applicable	33-013	2	33-01090	0	0.5	FT	0-0.5 FT	S	SO	FILL	ORGANI	62-53-3	Aniline
2157132	CST3:0709523	14595	AAA2035	19002	N	NA	SS	INV	Not Applicable	33-013	2	33-01090	0	0.5	FT	0-0.5 FT	S	SO	FILL	ORGANI	120-12-7	Anthracene
2157532	CST3:0709533	14595	AAA2035	19002	N	NA	SS	INV	Not Applicable	33-013	2	33-01090	0	0.5	FT	0-0.5 FT	S	SO	FILL	ORGANI	103-33-3	Azobenzene
2155872	CST3:0709493	14595	AAA2035	19002	N	NA	SS	INV	Not Applicable	33-013	2	33-01090	0	0.5	FT	0-0.5 FT	S	SO	FILL	ORGANI	92-87-5	Benzidine
2157272	CST3:0709527	14595	AAA2035	19002	N	NA	SS	INV	Not Applicable	33-013	2	33-01090	0	0.5	FT	0-0.5 FT	S	SO	FILL	ORGANI	56-55-3	Benzo(a)anthracene
2156802	CST3:0709516	14595	AAA2035	19002	N	NA	SS	INV	Not Applicable	33-013	2	33-01090	0	0.5	FT	0-0.5 FT	S	SO	FILL	ORGANI	50-32-8	Benzo(a)pyrene
2157842	CST3:0709539	14595	AAA2035	19002	N	NA	SS	INV	Not Applicable	33-013	2	33-01090	0	0.5	FT	0-0.5 FT	S	SO	FILL	ORGANI	205-99-2	Benzo(b)fluoranthene
2158072	CST3:0709544	14595	AAA2035	19002	N	NA	SS	INV	Not Applicable	33-013	2	33-01090	0	0.5	FT	0-0.5 FT	S	SO	FILL	ORGANI	191-24-2	Benzo(g,h,i)perylene
2157942	CST3:0709542	14595	AAA2035	19002	N	NA	SS	INV	Not Applicable	33-013	2	33-01090	0	0.5	FT	0-0.5 FT	S	SO	FILL	ORGANI	207-08-9	Benzo(k)fluoranthene
2156352	CST3:0709505	14595	AAA2035	19002	N	NA	SS	INV	Not Applicable	33-013	2	33-01090	0	0.5	FT	0-0.5 FT	S	SO	FILL	ORGANI	65-85-0	Benzoic Acid
2157722	CST3:0709537	14595	AAA2035	19002	N	NA	SS	INV	Not Applicable	33-013	2	33-01090	0	0.5	FT	0-0.5 FT	S	SO	FILL	ORGANI	100-51-6	Benzyl Alcohol
2156602	CST3:0709511	14595	AAA2035	19002	N	NA	SS	INV	Not Applicable	33-013	2	33-01090	0	0.5	FT	0-0.5 FT	S	SO	FILL	ORGANI	111-91-1	Bis(2-chloroethoxy)methane
2156612	CST3:0709512	14595	AAA2035	19002	N	NA	SS	INV	Not Applicable	33-013	2	33-01090	0	0.5	FT	0-0.5 FT	S	SO	FILL	ORGANI	111-44-4	Bis(2-chloroethyl)ether
2156562	CST3:0709510	14595	AAA2035	19002	N	NA	SS	INV	Not Applicable	33-013	2	33-01090	0	0.5	FT	0-0.5 FT	S	SO	FILL	ORGANI	117-81-7	Bis(2-ethylhexyl)phthalate
2157482	CST3:0709532	14595	AAA2035	19002	N	NA	SS	INV	Not Applicable	33-013	2	33-01090	0	0.5	FT	0-0.5 FT	S	SO	FILL	ORGANI	101-55-3	Bromophenyl-phenylether[4-]
2155432	CST3:0709483	14595	AAA2035	19002	N	NA	SS	INV	Not Applicable	33-013	2	33-01090	0	0.5	FT	0-0.5 FT	S	SO	FILL	ORGANI	85-68-7	Butylbenzylphthalate
2157232	CST3:0709526	14595	AAA2035	19002	N	NA	SS	INV	Not Applicable	33-013	2	33-01090	0	0.5	FT	0-0.5 FT	S	SO	FILL	ORGANI	59-50-7	Chloro-3-methylphenol[4-]
2156742	CST3:0709515	14595	AAA2035	19002	N	NA	SS	INV	Not Applicable	33-013	2	33-01090	0	0.5	FT	0-0.5 FT	S	SO	FILL	ORGANI	106-47-8	Chloroaniline[4-]
2155942	CST3:0709495	14595	AAA2035	19002	N	NA	SS	INV	Not Applicable	33-013	2	33-01090	0	0.5	FT	0-0.5 FT	S	SO	FILL	ORGANI	91-58-7	Chloronaphthalene[2-]
2155732	CST3:0709490	14595	AAA2035	19002	N	NA	SS	INV	Not Applicable	33-013	2	33-01090	0	0.5	FT	0-0.5 FT	S	SO	FILL	ORGANI	95-57-8	Chlorophenol[2-]
2156282	CST3:0709503	14595	AAA2035	19002	N	NA	SS	INV	Not Applicable	33-013	2	33-01090	0	0.5	FT	0-0.5 FT	S	SO	FILL	ORGANI	7005-72-3	Chlorophenyl-phenyl[4-] Ether
2157922	CST3:0709541	14595	AAA2035	19002	N	NA	SS	INV	Not Applicable	33-013	2	33-01090	0	0.5	FT	0-0.5 FT	S	SO	FILL	ORGANI	218-01-9	Chrysene
17364712	CST3:0709068	14592	AAA2035	20048	N	NA	SS	INV	Not Applicable	33-013	2	33-01090	0	0.5	FT	0-0.5 FT	S	SO	FILL	ORGANI	94-75-7	D[2,4-]
17364662	CST3:0709063	14592	AAA2035	20048	N	NA	SS	INV	Not Applicable	33-013	2	33-01090	0	0.5	FT	0-0.5 FT	S	SO	FILL	ORGANI	75-99-0	Dalapon
17364702	CST3:0709067	14592	AAA2035	20048	N	NA	SS	INV	Not Applicable	33-013	2	33-01090	0	0.5	FT	0-0.5 FT	S	SO	FILL	ORGANI	94-82-6	DB[2,4-]
2157372	CST3:0709529	14595	AAA2035	19002	N	NA	SS	INV	Not Applicable	33-013	2	33-01090	0	0.5	FT	0-0.5 FT	S	SO	FILL	ORGANI	53-70-3	Dibenz(a,h)anthracene
2156872	CST3:0709518	14595	AAA2035	19002	N	NA	SS	INV	Not Applicable	33-013	2	33-01090	0	0.5	FT	0-0.5 FT	S	SO	FILL	ORGANI	132-64-9	Dibenzofuran
17364652	CST3:0709062	14592	AAA2035	20048	N	NA	SS	INV	Not Applicable	33-013	2	33-01090	0	0.5	FT	0-0.5 FT	S	SO	FILL	ORGANI	1918-00-9	Dicamba

URI	PERCENT MOISTURE	IDL	MDL	MDA	QUANT LMT	DLC	DILUTION FACTOR	TEXT RESULT	SAMPLE VALUE	UNCERTAINTY	REPORTING UNITS	STD SAMPLE VALUE	STD UNCERTAINTY	STD REPORTING	FU4_QUAL	RFI REASON CODE	LAB QUALIFIER	LANL QUALIFIER 1	LANL QUALIFIER 2	LANL QUALIFIER 3	LANL QUALIFIER 4	LANL QUALIFIER 5	LANL QUALIFIER 6	LANL QUALIFIER	LANL QUALIFIER	LANL QUALIFIER	LANL QUALIFIER	LANL QUALIFIER	LANL QUALIFIER
2156152									0.33	0	MG/KG	0.33	0	MG/KG	U	U_LAB	U	U	U					SULAB	U_LAB				
2157882									0.33	0	MG/KG	0.33	0	MG/KG	U	U_LAB	U	U	U					SULAB	U_LAB				
2156452									0.33	0	MG/KG	0.33	0	MG/KG	U	U_LAB	U	U	U					SULAB	U_LAB				
2157132									0.33	0	MG/KG	0.33	0	MG/KG	U	U_LAB	U	U	U					SULAB	U_LAB				
2157532									0.33	0	MG/KG	0.33	0	MG/KG	U	U_LAB	U	U	U					SULAB	U_LAB				
2155872									0.33	0	MG/KG	0.33	0	MG/KG	U	U_LAB	U	U	U					SULAB	U_LAB				
2157272									0.33	0	MG/KG	0.33	0	MG/KG	U	U_LAB	U	U	U					SULAB	U_LAB				
2156802									0.33	0	MG/KG	0.33	0	MG/KG	U	U_LAB	U	U	U					SULAB	U_LAB				
2157842									0.33	0	MG/KG	0.33	0	MG/KG	U	U_LAB	U	U	U					SULAB	U_LAB				
2158072									0.33	0	MG/KG	0.33	0	MG/KG	U	U_LAB	U	U	U					SULAB	U_LAB				
2157942									0.33	0	MG/KG	0.33	0	MG/KG	U	U_LAB	U	U	U					SULAB	U_LAB				
2156352									0.33	0	MG/KG	0.33	0	MG/KG	U	U_LAB	U	U	U					SULAB	U_LAB				
2157722									0.33	0	MG/KG	0.33	0	MG/KG	U	U_LAB	U	U	U					SULAB	U_LAB				
2156602									0.33	0	MG/KG	0.33	0	MG/KG	U	U_LAB	U	U	U					SULAB	U_LAB				
2156612									0.33	0	MG/KG	0.33	0	MG/KG	U	U_LAB	U	U	U					SULAB	U_LAB				
2156562									0.33	0	MG/KG	0.33	0	MG/KG	U	U_LAB	U	U	U					SULAB	U_LAB				
2157482									0.33	0	MG/KG	0.33	0	MG/KG	U	U_LAB	U	U	U					SULAB	U_LAB				
2155432									0.33	0	MG/KG	0.33	0	MG/KG	U	U_LAB	U	U	U					SULAB	U_LAB				
2157232									0.33	0	MG/KG	0.33	0	MG/KG	U	U_LAB	U	U	U					SULAB	U_LAB				
2156742									0.33	0	MG/KG	0.33	0	MG/KG	U	U_LAB	U	U	U					SULAB	U_LAB				
2155942									0.33	0	MG/KG	0.33	0	MG/KG	U	U_LAB	U	U	U					SULAB	U_LAB				
2155732									0.33	0	MG/KG	0.33	0	MG/KG	U	U_LAB	U	U	U					SULAB	U_LAB				
2156282									0.33	0	MG/KG	0.33	0	MG/KG	U	U_LAB	U	U	U					SULAB	U_LAB				
2157922									0.33	0	MG/KG	0.33	0	MG/KG	U	U_LAB	U	U	U					SULAB	U_LAB				
17364712									0.25	0	MG/KG	0.25	0	MG/KG	U	U_LAB	U	U	U					OULAB	U_LAB				
17364662									1.2	0	MG/KG	1.2	0	MG/KG	U	U_LAB	U	U	U					OULAB	U_LAB				
17364702									0.19	0	MG/KG	0.19	0	MG/KG	U	U_LAB	U	U	U					OULAB	U_LAB				
2157372									0.33	0	MG/KG	0.33	0	MG/KG	U	U_LAB	U	U	U					SULAB	U_LAB				
2156872									0.33	0	MG/KG	0.33	0	MG/KG	U	U_LAB	U	U	U					SULAB	U_LAB				
17364652									0.056	0	MG/KG	0.056	0	MG/KG	U	U_LAB	U	U	U					OULAB	U_LAB				

URI	LANL SET TYPE CODE 1	LANL SET TYPE CODE 2	LANL SET TYPE CODE 3	LANL SET TYPE CODE 4	LANL SET TYPE CODE 5	LANL SET TYPE CODE 6	FIELD QC TYPE CODE	SAMPLE TYPE CODE	ANALYTICAL SUITE	ANYL METH CODE	LAB CODE	LAB NAME	ANALYSIS DATE	SHIPPING DATE	COLLECTION DATE
2156152	REPORTIN	ROUTINE03					NA	CS	SVOC	SW-846:8270	CST	LANL Chemical Sciences & Technology	6/21/1993		5/12/1993
2157882	REPORTIN	ROUTINE03					NA	CS	SVOC	SW-846:8270	CST	LANL Chemical Sciences & Technology	6/21/1993		5/12/1993
2156452	REPORTIN	ROUTINE03					NA	CS	SVOC	SW-846:8270	CST	LANL Chemical Sciences & Technology	6/21/1993		5/12/1993
2157132	REPORTIN	ROUTINE03					NA	CS	SVOC	SW-846:8270	CST	LANL Chemical Sciences & Technology	6/21/1993		5/12/1993
2157532	REPORTIN	ROUTINE03					NA	CS	SVOC	SW-846:8270	CST	LANL Chemical Sciences & Technology	6/21/1993		5/12/1993
2155872	REPORTIN	ROUTINE03					NA	CS	SVOC	SW-846:8270	CST	LANL Chemical Sciences & Technology	6/21/1993		5/12/1993
2157272	REPORTIN	ROUTINE03					NA	CS	SVOC	SW-846:8270	CST	LANL Chemical Sciences & Technology	6/21/1993		5/12/1993
2156802	REPORTIN	ROUTINE03					NA	CS	SVOC	SW-846:8270	CST	LANL Chemical Sciences & Technology	6/21/1993		5/12/1993
2157842	REPORTIN	ROUTINE03					NA	CS	SVOC	SW-846:8270	CST	LANL Chemical Sciences & Technology	6/21/1993		5/12/1993
2158072	REPORTIN	ROUTINE03					NA	CS	SVOC	SW-846:8270	CST	LANL Chemical Sciences & Technology	6/21/1993		5/12/1993
2157942	REPORTIN	ROUTINE03					NA	CS	SVOC	SW-846:8270	CST	LANL Chemical Sciences & Technology	6/21/1993		5/12/1993
2156352	REPORTIN	ROUTINE03					NA	CS	SVOC	SW-846:8270	CST	LANL Chemical Sciences & Technology	6/21/1993		5/12/1993
2157722	REPORTIN	ROUTINE03					NA	CS	SVOC	SW-846:8270	CST	LANL Chemical Sciences & Technology	6/21/1993		5/12/1993
2156602	REPORTIN	ROUTINE03					NA	CS	SVOC	SW-846:8270	CST	LANL Chemical Sciences & Technology	6/21/1993		5/12/1993
2156612	REPORTIN	ROUTINE03					NA	CS	SVOC	SW-846:8270	CST	LANL Chemical Sciences & Technology	6/21/1993		5/12/1993
2156562	REPORTIN	ROUTINE03					NA	CS	SVOC	SW-846:8270	CST	LANL Chemical Sciences & Technology	6/21/1993		5/12/1993
2157482	REPORTIN	ROUTINE03					NA	CS	SVOC	SW-846:8270	CST	LANL Chemical Sciences & Technology	6/21/1993		5/12/1993
2155432	REPORTIN	ROUTINE03					NA	CS	SVOC	SW-846:8270	CST	LANL Chemical Sciences & Technology	6/21/1993		5/12/1993
2157232	REPORTIN	ROUTINE03					NA	CS	SVOC	SW-846:8270	CST	LANL Chemical Sciences & Technology	6/21/1993		5/12/1993
2156742	REPORTIN	ROUTINE03					NA	CS	SVOC	SW-846:8270	CST	LANL Chemical Sciences & Technology	6/21/1993		5/12/1993
2155942	REPORTIN	ROUTINE03					NA	CS	SVOC	SW-846:8270	CST	LANL Chemical Sciences & Technology	6/21/1993		5/12/1993
2155732	REPORTIN	ROUTINE03					NA	CS	SVOC	SW-846:8270	CST	LANL Chemical Sciences & Technology	6/21/1993		5/12/1993
2156282	REPORTIN	ROUTINE03					NA	CS	SVOC	SW-846:8270	CST	LANL Chemical Sciences & Technology	6/21/1993		5/12/1993
2157922	REPORTIN	ROUTINE03					NA	CS	SVOC	SW-846:8270	CST	LANL Chemical Sciences & Technology	6/21/1993		5/12/1993
17364712	REPORTIN	ROUTINE03					NA	CS	HERB	SW-846:8150	QESL	Quanterra Environmental Services, St. Louis, MO	8/23/1993		5/12/1993
17364662	REPORTIN	ROUTINE03					NA	CS	HERB	SW-846:8150	QESL	Quanterra Environmental Services, St. Louis, MO	8/23/1993		5/12/1993
17364702	REPORTIN	ROUTINE03					NA	CS	HERB	SW-846:8150	QESL	Quanterra Environmental Services, St. Louis, MO	8/23/1993		5/12/1993
2157372	REPORTIN	ROUTINE03					NA	CS	SVOC	SW-846:8270	CST	LANL Chemical Sciences & Technology	6/21/1993		5/12/1993
2156872	REPORTIN	ROUTINE03					NA	CS	SVOC	SW-846:8270	CST	LANL Chemical Sciences & Technology	6/21/1993		5/12/1993
17364652	REPORTIN	ROUTINE03					NA	CS	HERB	SW-846:8150	QESL	Quanterra Environmental Services, St. Louis, MO	8/23/1993		5/12/1993

URI	SEQ NUM	REQUEST NUM	SAMPLE ID	LAB REPORT	EXCAV FLAG	COMPOS TYPE	SAMPLE TECH CODE	SAMPLE USG CODE	FIELD PREP	PRS	PRS ORDER	LOCATION ID	BEGIN DEPTH	END DEPTH	DEPTH UNITS	DEPTH	FLD MATRIX	MATRIX	MEDIA CODE	RFI CLASS	ANALYTE CODE	ANALYTE NAME	PERCENT MOISTURE	IDL	MDL	MDA	QUANT LMT	DLC	DILUTION FACTOR	TEXT RESULT	SAMPLE VALUE	UNCERTAINTY	REPORTING UNITS	STD SAMPLE VALUE	STD UNCERTAINTY	STD REPORTING	FU4 QUAL	RFI REASON	LAB QUALIFIER	LANL QUALIFIER 1	LANL QUALIFIER 2	LANL QUALIFIER 3	LANL QUALIFIER 4	LANL QUALIFIER 5	LANL QUALIFIER 6	LANL QUALIFIER	LANL QUALIFIER	LANL QUALIFIER	LANL QUALIFIER	LANL QUALIFIER	LANL QUALIFIER	LANL SET TYPE CODE 1	LANL SET TYPE CODE 2	LANL SET TYPE CODE 3	LANL SET TYPE CODE 4	LANL SET TYPE CODE 5	LANL SET TYPE CODE 6	FIELD QC TYPE CODE	SAMPLE TYPE CODE	ANALYTICAL SUITE	ANYL METH CODE	LAB CODE	LAB NAME	ANALYSIS DATE	SHIPPING DATE	COLLECTION DATE
14257852	S:00665390	2423	0233-96-057		N	NA	SS	INV	Not Applicable	33-013	2	33-01090	0	0.5	FT	0-0.5 FT	S	SO	FILL	INORGANI	AL	Aluminum							50		3100		MG/KG	3100		MG/KG				P						INONE						LEGACY						NA	CS	METALS	SW-846:6010A	KA	KEMRON	8/1/1996	7/24/1996	7/23/1996
14257892	S:00665392	2423	0233-96-057		N	NA	SS	INV	Not Applicable	33-013	2	33-01090	0	0.5	FT	0-0.5 FT	S	SO	FILL	INORGANI	SB	Antimony							50		11		MG/KG	11		MG/KG	UJ	I3e	U	UJ	UJ	UJ	J-			I3e	I3e	I3e	I3e			LEGACY	REPORTIN	ROUTINE0	ROUTINE0			NA	CS	METALS	SW-846:6010A	KA	KEMRON	8/1/1996	7/24/1996	7/23/1996
14242142	S:00664715	2423	0233-96-057		N	NA	SS	INV	Not Applicable	33-013	2	33-01090	0	0.5	FT	0-0.5 FT	S	SO	FILL	INORGANI	AS	Arsenic							49		1.1		MG/KG	1.1		MG/KG	U	U_LAB	U	U	U					IULAB	U_LAB					REPORTIN	ROUTINE03					NA	CS	METALS	SW-846:7060A	KA	KEMRON	7/29/1996	7/24/1996	7/23/1996
14257932	S:00665395	2423	0233-96-057		N	NA	SS	INV	Not Applicable	33-013	2	33-01090	0	0.5	FT	0-0.5 FT	S	SO	FILL	INORGANI	BA	Barium							50		38		MG/KG	38		MG/KG				NQ	NQ					INONE	NQ					REPORTIN	ROUTINE03					NA	CS	METALS	SW-846:6010A	KA	KEMRON	8/1/1996	7/24/1996	7/23/1996
14257972	S:00665397	2423	0233-96-057		N	NA	SS	INV	Not Applicable	33-013	2	33-01090	0	0.5	FT	0-0.5 FT	S	SO	FILL	INORGANI	BE	Beryllium							50		0.53		MG/KG	0.53		MG/KG	U	U_LAB	U	U	U					IULAB	U_LAB					REPORTIN	ROUTINE03					NA	CS	METALS	SW-846:6010A	KA	KEMRON	8/1/1996	7/24/1996	7/23/1996
14258052	S:00665400	2423	0233-96-057		N	NA	SS	INV	Not Applicable	33-013	2	33-01090	0	0.5	FT	0-0.5 FT	S	SO	FILL	INORGANI	CD	Cadmium							50		0.53		MG/KG	0.53		MG/KG	U	U_LAB	U	U	U					IULAB	U_LAB					REPORTIN	ROUTINE03					NA	CS	METALS	SW-846:6010A	KA	KEMRON	8/1/1996	7/24/1996	7/23/1996
14258112	S:00665402	2423	0233-96-057		N	NA	SS	INV	Not Applicable	33-013	2	33-01090	0	0.5	FT	0-0.5 FT	S	SO	FILL	INORGANI	CA	Calcium							50		1600		MG/KG	1600		MG/KG				NQ	NQ					INONE	NQ					REPORTIN	ROUTINE03					NA	CS	METALS	SW-846:6010A	KA	KEMRON	8/1/1996	7/24/1996	7/23/1996
14258212	S:00665405	2423	0233-96-057		N	NA	SS	INV	Not Applicable	33-013	2	33-01090	0	0.5	FT	0-0.5 FT	S	SO	FILL	INORGANI	CR	Chromium							50		2.9		MG/KG	2.9		MG/KG				NQ	NQ					INONE	NQ					REPORTIN	ROUTINE03					NA	CS	METALS	SW-846:6010A	KA	KEMRON	8/1/1996	7/24/1996	7/23/1996
14258292	S:00665407	2423	0233-96-057		N	NA	SS	INV	Not Applicable	33-013	2	33-01090	0	0.5	FT	0-0.5 FT	S	SO	FILL	INORGANI	CO	Cobalt							50		1.7		MG/KG	1.7		MG/KG				NQ	NQ					INONE	NQ					REPORTIN	ROUTINE03					NA	CS	METALS	SW-846:6010A	KA	KEMRON	8/1/1996	7/24/1996	7/23/1996
14258362	S:00665410	2423	0233-96-057		N	NA	SS	INV	Not Applicable	33-013	2	33-01090	0	0.5	FT	0-0.5 FT	S	SO	FILL	INORGANI	CU	Copper							50		3.8		MG/KG	3.8		MG/KG				NQ	NQ					INONE	NQ					REPORTIN	ROUTINE03					NA	CS	METALS	SW-846:6010A	KA	KEMRON	8/1/1996	7/24/1996	7/23/1996
14258432	S:00665412	2423	0233-96-057		N	NA	SS	INV	Not Applicable	33-013	2	33-01090	0	0.5	FT	0-0.5 FT	S	SO	FILL	INORGANI	FE	Iron							50		7100		MG/KG	7100		MG/KG				NQ	NQ					INONE	NQ					REPORTIN	ROUTINE03					NA	CS	METALS	SW-846:6010A	KA	KEMRON	8/1/1996	7/24/1996	7/23/1996
14243302	S:00664763	2423	0233-96-057		N	NA	SS	INV	Not Applicable	33-013	2	33-01090	0	0.5	FT	0-0.5 FT	S	SO	FILL	INORGANI	PB	Lead							49		7.5		MG/KG	7.5		MG/KG				NQ	NQ					INONE	NQ					REPORTIN	ROUTINE03					NA	CS	METALS	SW-846:7421	KA	KEMRON	7/30/1996	7/24/1996	7/23/1996
14258512	S:00665415	2423	0233-96-057		N	NA	SS	INV	Not Applicable	33-013	2	33-01090	0	0.5	FT	0-0.5 FT	S	SO	FILL	INORGANI	MG	Magnesiu							50		140		MG/KG	140		MG/KG				NQ	NQ					INONE	NQ					REPORTIN	ROUTINE03					NA	CS	METALS	SW-846:6010A	KA	KEMRON	8/1/1996	7/24/1996	7/23/1996
14258582	S:00665418	2423	0233-96-057		N	NA	SS	INV	Not Applicable	33-013	2	33-01090	0	0.5	FT	0-0.5 FT	S	SO	FILL	INORGANI	MN	Manganes							50		250		MG/KG	250		MG/KG				NQ	NQ					INONE	NQ					REPORTIN	ROUTINE03					NA	CS	METALS	SW-846:6010A	KA	KEMRON	8/1/1996	7/24/1996	7/23/1996
14246372	S:00664928	2423	0233-96-057		N	NA	SS	INV	Not Applicable	33-013	2	33-01090	0	0.5	FT	0-0.5 FT	S	SO	FILL	INORGANI	HG	Mercury							167		0.11		MG/KG	0.11		MG/KG	U	U_LAB	U	U	U					IULAB	U_LAB					REPORTIN	ROUTINE03					NA	CS	METALS	SW-846:7471A	KA	KEMRON	7/30/1996	7/24/1996	7/23/1996
14258642	S:00665421	2423	0233-96-057		N	NA	SS	INV	Not Applicable	33-013	2	33-01090	0	0.5	FT	0-0.5 FT	S	SO	FILL	INORGANI	NI	Nickel							50		3.4		MG/KG	3.4		MG/KG				NQ	NQ					INONE	NQ					REPORTIN	ROUTINE03					NA	CS	METALS	SW-846:6010A	KA	KEMRON	8/1/1996	7/24/1996	7/23/1996
14258712	S:00665424	2423	0233-96-057		N	NA	SS	INV	Not Applicable	33-013	2	33-01090	0	0.5	FT	0-0.5 FT	S	SO	FILL	INORGANI	K	Potassium							50		210		MG/KG	210		MG/KG				NQ	NQ					INONE	NQ					REPORTIN	ROUTINE03					NA	CS	METALS	SW-846:6010A	KA	KEMRON	8/1/1996	7/24/1996	7/23/1996
14244212	S:00664824	2423	0233-96-057		N	NA	SS	INV	Not Applicable	33-013	2	33-01090	0	0.5	FT	0-0.5 FT	S	SO	FILL	INORGANI	SE	Selenium							49		1.1		MG/KG	1.1		MG/KG	UJ	I3e	U	UJ	UJ	UJ	J-			I3e	I3E	I3e	I3e			LEGACY	REPORTIN	ROUTINE0	ROUTINE0			NA	CS	METALS	SW-846:7740	KA	KEMRON	8/1/1996	7/24/1996	7/23/1996
14258742	S:00665426	2423	0233-96-057		N	NA	SS	INV	Not Applicable	33-013	2	33-01090	0	0.5	FT	0-0.5 FT	S	SO	FILL	INORGANI	AG	Silver							50		2.1		MG/KG	2.1		MG/KG	U	U_LAB	U	U	U					IULAB	U_LAB					REPORTIN	ROUTINE03					NA	CS	METALS	SW-846:6010A	KA	KEMRON	8/1/1996	7/24/1996	7/23/1996
14258762	S:00665429	2423	0233-96-057		N	NA	SS	INV	Not Applicable	33-013	2	33-01090	0	0.5	FT	0-0.5 FT	S	SO	FILL	INORGANI	NA	Sodium							50		130		MG/KG	130		MG/KG				NQ	NQ					INONE	NQ					REPORTIN	ROUTINE03					NA	CS	METALS	SW-846:6010A	KA	KEMRON	8/1/1996	7/24/1996	7/23/1996
14245202	S:00664888	2423	0233-96-057		N	NA	SS	INV	Not Applicable	33-013	2	33-01090	0	0.5	FT	0-0.5 FT	S	SO	FILL	INORGANI	TL	Thallium							49		1.3		MG/KG	1.3		MG/KG	U	U_LAB	U	U	U					IULAB	U_LAB					REPORTIN	ROUTINE03					NA	CS	METALS	SW-846:7841	KA	KEMRON	7/31/1996	7/24/1996	7/23/1996
14263442	S:00665817	2424	0233-96-057		N	NA	SS	INV	Not Applicable	33-013	2	33-01090	0	0.5	FT	0-0.5 FT	S	SO	FILL	INORGANI	U	Uranium							1		0.37		MG/KG	0.37		MG/KG	J	I1	B	J	J	NQ				I1	I1	NQ				REPORTIN	ROUTINE03	ROUTINE0				NA	CS	METALS	SW-846:6020	RGGJ	Rust Geotech, Grand Junction, CO	8/13/1996	7/24/1996	7/23/1996
14258832	S:00665431	2423	0233-96-057		N	NA	SS	INV	Not Applicable	33-013	2	33-01090	0	0.5	FT	0-0.5 FT	S	SO	FILL	INORGANI	V	Vanadium							50		8.2		MG/KG	8.2		MG/KG				NQ	NQ					INONE	NQ					REPORTIN	ROUTINE03					NA	CS	METALS	SW-846:6010A	KA	KEMRON	8/1/1996	7/24/1996	7/23/1996
14258872	S:00665434	2423	0233-96-057		N	NA	SS	INV	Not Applicable	33-013	2	33-01090	0	0.5	FT	0-0.5 FT	S	SO	FILL	INORGANI	ZN	Zinc							50		53		MG/KG	53		MG/KG	J-	I3e		J-	J-	J-				I3a	I3a	I3e				LEGACY	REPORTIN	ROUTINE0				NA	CS	METALS	SW-846:6010A	KA	KEMRON	8/1/1996	7/24/1996	7/23/1996
14258972	S:00665437	2423	0233-96-058		N	NA	SS	INV	Not Applicable	33-013	2	33-01090	0.5	1	FT	0.5-1 FT	S	SO	FILL	INORGANI	AL	Aluminum							50		4800		MG/KG	4800		MG/KG				P						INONE						LEGACY						NA	CS	METALS	SW-846:6010A	KA	KEMRON	8/1/1996	7/24/1996	7/23/1996
14259032	S:00665441	2423	0233-96-058		N	NA	SS	INV	Not Applicable	33-013	2	33-01090	0.5	1	FT	0.5-1 FT	S	SO	FILL	INORGANI	SB	Antimony							50		11		MG/KG	11		MG/KG	UJ	I3e	U	UJ	UJ	UJ	J-			I3e	I3e	I3e	I3e			LEGACY	REPORTIN	ROUTINE0	ROUTINE0			NA	CS	METALS	SW-846:6010A	KA	KEMRON	8/1/1996	7/24/1996	7/23/1996
14242242	S:00664718	2423	0233-96-058		N	NA	SS	INV	Not Applicable	33-013	2	33-01090	0.5	1	FT	0.5-1 FT	S	SO	FILL	INORGANI	AS	Arsenic							50		1.1		MG/KG	1.1		MG/KG	U	U_LAB	U	U	U					IULAB	U_LAB					REPORTIN	ROUTINE03					NA	CS	METALS	SW-846:7060A	KA	KEMRON	7/29/1996	7/24/1996	7/23/1996
14259062	S:00665445	2423	0233-96-058		N	NA	SS	INV	Not Applicable	33-013	2	33-01090	0.5	1	FT	0.5-1 FT	S	SO	FILL	INORGANI	BA	Barium							50		44		MG/KG	44		MG/KG				NQ	NQ					INONE	NQ					REPORTIN	ROUTINE03					NA	CS	METALS	SW-846:6010A	KA	KEMRON	8/1/1996	7/24/1996	7/23/1996
14259102	S:00665449	2423	0233-96-058		N	NA	SS	INV	Not Applicable	33-013	2	33-01090	0.5	1	FT	0.5-1 FT	S	SO	FILL	INORGANI	BE	Beryllium							50		0.54		MG/KG	0.54		MG/KG	U	U_LAB	U	U	U					IULAB	U_LAB					REPORTIN	ROUTINE03					NA	CS	METALS	SW-846:6010A	KA	KEMRON	8/1/1996	7/24/1996	7/23/1996
14259142	S:00665453	2423	0233-96-058		N	NA	SS	INV	Not Applicable	33-013	2	33-01090	0.5	1	FT	0.5-1 FT	S	SO	FILL	INORGANI	CD	Cadmium							50		0.54		MG/KG	0.54		MG/KG	U	U_LAB	U	U	U					IULAB	U_LAB					REPORTIN	ROUTINE03					NA	CS	METALS	SW-846:6010A	KA	KEMRON	8/1/1996	7/24/1996	7/23/1996
14259182	S:00665457	2423	0233-96-058		N	NA	SS	INV	Not Applicable	33-013	2	33-01090	0.5	1	FT	0.5-1 FT	S	SO	FILL	INORGANI	CA	Calcium							50		730		MG/KG	730		MG/KG				NQ	NQ					INONE	NQ					REPORTIN	ROUTINE03					NA	CS	METALS	SW-846:6010A	KA	KEMRON	8/1/1996	7/24/1996	7/23/1996
14259212	S:00665460	2423	0233-96-058		N	NA	SS	INV	Not Applicable	33-013	2	33-01090	0.5	1	FT	0.5-1 FT	S	SO	FILL	INORGANI	CR	Chromium							50		3.4		MG/KG	3.4		MG/KG				NQ	NQ					INONE	NQ					REPORTIN	ROUTINE03					NA	CS	METALS	SW-846:6010A	KA	KEMRON	8/1/1996	7/24/1996	7/23/1996
14259252	S:00665464	2423	0233-96-058		N	NA	SS	INV	Not Applicable	33-013	2	33-01090	0.5	1	FT	0.5-1 FT	S	SO	FILL	INORGANI	CO	Cobalt							50		2.3		MG/KG	2.3		MG/KG				NQ	NQ					INONE	NQ					REPORTIN	ROUTINE03					NA	CS	METALS	SW-846:6010A	KA	KEMRON	8/1/1996	7/24/1996	7/23/1996
14259302	S:00665468	2423	0233-96-058		N	NA	SS	INV	Not Applicable	33-013	2	33-01090	0.5	1	FT	0.5-1 FT	S	SO	FILL	INORGANI	CU	Copper							50		4		MG/KG	4		MG/KG				NQ	NQ					INONE	NQ					REPORTIN	ROUTINE03					NA	CS	METALS	SW-846:6010A	KA	KEMRON	8/1/1996	7/24/1996	7/23/1996
14259342	S:00665472	2423	0233-96-058		N	NA	SS	INV	Not Applicable	33-013	2	33-01090	0.5	1	FT	0.5-1 FT	S	SO	FILL	INORGANI	FE	Iron							50		7500		MG/KG	7500		MG/KG				NQ	NQ					INONE	NQ					REPORTIN	ROUTINE03					NA	CS	METALS	SW-846:6010A	KA	KEMRON	8/1/1996	7/24/1996	7/23/1996
14243352	S:00664766	2423	0233-96-058		N	NA	SS	INV	Not Applicable	33-013	2	33-01090	0.5	1	FT	0.5-1 FT	S	SO	FILL	INORGANI	PB	Lead							50		6.7		MG/KG	6.7		MG/KG				NQ	NQ					INONE	NQ					REPORTIN	ROUTINE03					NA	CS	METALS	SW-846:7421	KA	KEMRON	7/30/1996	7/24/1996	7/23/1996

14223802	S:00662796	2758	0333-96-058		N	NA	SS	INV	Not Applicable	23-013	2	33-01656	0	0.5	FT	0-0.5 FT	S	SO	ALLH	INORGANI	CA	Calcium	1		2740		MG/KG	2740		MG/KG				A						INONE						LEGACY						NA	CS	METALS	CLP:ILM03.0-200.7	ESE	Environmental Sciences & Engineering, Inc., Gaine	11/22/1996	11/6/1996	11/5/1996
14223842	S:00662799	2758	0333-96-058		N	NA	SS	INV	Not Applicable	23-013	2	33-01656	0	0.5	FT	0-0.5 FT	S	SO	ALLH	INORGANI	CR	Chromium	1		3.1		MG/KG	3.1		MG/KG				A						INONE						LEGACY						NA	CS	METALS	CLP:ILM03.0-200.7	ESE	Environmental Sciences & Engineering, Inc., Gaine	11/22/1996	11/6/1996	11/5/1996
20197772	S:00662802	2758	0333-96-058		N	NA	SS	INV	Not Applicable	23-013	2	33-01656	0	0.5	FT	0-0.5 FT	S	SO	ALLH	INORGANI	CO	Cobalt	1		1.4		MG/KG	1.4		MG/KG	J	I1	B	A	J	NQ				INONE	I1	NQ				LEGACY	ROUTINE03	ROUTINE0				NA	CS	METALS	CLP:ILM03.0-200.7	ESE	Environmental Sciences & Engineering, Inc., Gaine	11/22/1996	11/6/1996	11/5/1996
14223862	S:00662804	2758	0333-96-058		N	NA	SS	INV	Not Applicable	23-013	2	33-01656	0	0.5	FT	0-0.5 FT	S	SO	ALLH	INORGANI	CU	Copper	1		19.9		MG/KG	19.9		MG/KG				A						INONE						LEGACY						NA	CS	METALS	CLP:ILM03.0-200.7	ESE	Environmental Sciences & Engineering, Inc., Gaine	11/22/1996	11/6/1996	11/5/1996
14223872	S:00662806	2758	0333-96-058		N	NA	SS	INV	Not Applicable	23-013	2	33-01656	0	0.5	FT	0-0.5 FT	S	SO	ALLH	INORGANI	FE	Iron	1		3600		MG/KG	3600		MG/KG				A						INONE						LEGACY						NA	CS	METALS	CLP:ILM03.0-200.7	ESE	Environmental Sciences & Engineering, Inc., Gaine	11/22/1996	11/6/1996	11/5/1996
20197852	S:00662848	2758	0333-96-058		N	NA	SS	INV	Not Applicable	23-013	2	33-01656	0	0.5	FT	0-0.5 FT	S	SO	ALLH	INORGANI	PB	Lead	8		40.4		MG/KG	40.4		MG/KG			*	A	NQ					INONE	NQ					LEGACY	ROUTINE03					NA	CS	METALS	CLP:ILM03.0-200.7	ESE	Environmental Sciences & Engineering, Inc., Gaine	11/22/1996	11/6/1996	11/5/1996
14223922	S:00662811	2758	0333-96-058		N	NA	SS	INV	Not Applicable	23-013	2	33-01656	0	0.5	FT	0-0.5 FT	S	SO	ALLH	INORGANI	MG	Magnesiu	1		763		MG/KG	763		MG/KG				A						INONE						LEGACY						NA	CS	METALS	CLP:ILM03.0-200.7	ESE	Environmental Sciences & Engineering, Inc., Gaine	11/22/1996	11/6/1996	11/5/1996
20197782	S:00662814	2758	0333-96-058		N	NA	SS	INV	Not Applicable	23-013	2	33-01656	0	0.5	FT	0-0.5 FT	S	SO	ALLH	INORGANI	MN	Manganes	1		159		MG/KG	159		MG/KG			*	A	NQ					INONE	NQ					LEGACY	ROUTINE03					NA	CS	METALS	CLP:ILM03.0-200.7	ESE	Environmental Sciences & Engineering, Inc., Gaine	11/22/1996	11/6/1996	11/5/1996
26825562	S:00662857	2758	0333-96-058		N	NA	SS	INV	Not Applicable	23-013	2	33-01656	0	0.5	FT	0-0.5 FT	S	SO	ALLH	INORGANI	HG	Mercury	1		0.14		MG/KG	0.14		MG/KG				NQ	NQ					INONE	NQ					REPORTIN	ROUTINE03					NA	CS	METALS	CLP:ILM03.0-245.1	ESE	Environmental Sciences & Engineering, Inc., Gaine	11/25/1996	11/6/1996	11/5/1996
20197792	S:00662817	2758	0333-96-058		N	NA	SS	INV	Not Applicable	23-013	2	33-01656	0	0.5	FT	0-0.5 FT	S	SO	ALLH	INORGANI	NI	Nickel	1		3.1		MG/KG	3.1		MG/KG	J	I1	B	A	J	NQ				INONE	I1	NQ				LEGACY	ROUTINE03	ROUTINE0				NA	CS	METALS	CLP:ILM03.0-200.7	ESE	Environmental Sciences & Engineering, Inc., Gaine	11/22/1996	11/6/1996	11/5/1996
20197802	S:00662820	2758	0333-96-058		N	NA	SS	INV	Not Applicable	23-013	2	33-01656	0	0.5	FT	0-0.5 FT	S	SO	ALLH	INORGANI	K	Potassium	1		371		MG/KG	371		MG/KG	J	I1	B	A	J	NQ				INONE	I1	NQ				LEGACY	ROUTINE03	ROUTINE0				NA	CS	METALS	CLP:ILM03.0-200.7	ESE	Environmental Sciences & Engineering, Inc., Gaine	11/22/1996	11/6/1996	11/5/1996
20197862	S:00662859	2758	0333-96-058		N	NA	SS	INV	Not Applicable	23-013	2	33-01656	0	0.5	FT	0-0.5 FT	S	SO	ALLH	INORGANI	SE	Selenium	1		0.25		MG/KG	0.25		MG/KG	U	U_LAB	UN	A	U					INONE	U_LAB					LEGACY	ROUTINE03					NA	CS	METALS	CLP:ILM03.0-200.7	ESE	Environmental Sciences & Engineering, Inc., Gaine	11/23/1996	11/6/1996	11/5/1996
20197812	S:00662823	2758	0333-96-058		N	NA	SS	INV	Not Applicable	23-013	2	33-01656	0	0.5	FT	0-0.5 FT	S	SO	ALLH	INORGANI	AG	Silver	1		0.52		MG/KG	0.52		MG/KG	U	U_LAB	U	A	U					INONE	U_LAB					LEGACY	ROUTINE03					NA	CS	METALS	CLP:ILM03.0-200.7	ESE	Environmental Sciences & Engineering, Inc., Gaine	11/22/1996	11/6/1996	11/5/1996
20197822	S:00662827	2758	0333-96-058		N	NA	SS	INV	Not Applicable	23-013	2	33-01656	0	0.5	FT	0-0.5 FT	S	SO	ALLH	INORGANI	NA	Sodium	1		182		MG/KG	182		MG/KG	J	I1	B	A	J	NQ				INONE	I1	NQ				LEGACY	ROUTINE03	ROUTINE0				NA	CS	METALS	CLP:ILM03.0-200.7	ESE	Environmental Sciences & Engineering, Inc., Gaine	11/22/1996	11/6/1996	11/5/1996
20197872	S:00662863	2758	0333-96-058		N	NA	SS	INV	Not Applicable	23-013	2	33-01656	0	0.5	FT	0-0.5 FT	S	SO	ALLH	INORGANI	TL	Thallium	1		0.2		MG/KG	0.2		MG/KG	U	U_LAB	U	A	U					INONE	U_LAB					LEGACY	ROUTINE03					NA	CS	METALS	CLP:ILM03.0-200.7	ESE	Environmental Sciences & Engineering, Inc., Gaine	11/22/1996	11/6/1996	11/5/1996
14223962	S:00662866	2759	0333-96-058		N	NA	SS	INV	Not Applicable	23-013	2	33-01656	0	0.5	FT	0-0.5 FT	S	SO	ALLH	INORGANI	U	Uranium	1		2.08	0.14	MG/KG	2.08	0.14	MG/KG	J	J_LAB	J	J	J	J				IJLAB	I1	J_LAB				REPORTIN	ROUTINE03	ROUTINE0				NA	CS	URANIUM	Generic:Uranium KP	ATIC	Analytical Technologies, Inc., Historical code one	11/22/1996	11/6/1996	11/5/1996
20197832	S:00662821	2758	0333-96-058		N	NA	SS	INV	Not Applicable	23-013	2	33-01656	0	0.5	FT	0-0.5 FT	S	SO	ALLH	INORGANI	V	Vanadium	1		4.3		MG/KG	4.3		MG/KG	J	I1	B	A	J	NQ				INONE	I1	NQ				LEGACY	ROUTINE03	ROUTINE0				NA	CS	METALS	CLP:ILM03.0-200.7	ESE	Environmental Sciences & Engineering, Inc., Gaine	11/22/1996	11/6/1996	11/5/1996
14223942	S:00662834	2758	0333-96-058		N	NA	SS	INV	Not Applicable	23-013	2	33-01656	0	0.5	FT	0-0.5 FT	S	SO	ALLH	INORGANI	ZN	Zinc	1		165		MG/KG	165		MG/KG				A						INONE						LEGACY						NA	CS	METALS	CLP:ILM03.0-200.7	ESE	Environmental Sciences & Engineering, Inc., Gaine	11/22/1996	11/6/1996	11/5/1996
14260162	S:00665562	2423	0333-96-058		N	NA	SS	INV	Not Applicable	23-013	2	33-01661	0	0.5	FT	0-0.5 FT	S	SO	ALLH	INORGANI	AL	Aluminum	50		3200		MG/KG	3200		MG/KG				P						INONE						LEGACY						NA	CS	METALS	SW-846:6010A	KA	KEMRON	8/1/1996	7/24/1996	7/23/1996
14260192	S:00665567	2423	0333-96-058		N	NA	SS	INV	Not Applicable	23-013	2	33-01661	0	0.5	FT	0-0.5 FT	S	SO	ALLH	INORGANI	SB	Antimony	50		10		MG/KG	10		MG/KG	UJ	I3e	U	UJ	UJ	UJ	J-			I3e	I3e	I3e	I3e			LEGACY	REPORTIN	ROUTINE0	ROUTINE0			NA	CS	METALS	SW-846:6010A	KA	KEMRON	8/1/1996	7/24/1996	7/23/1996
14242452	S:00664723	2423	0333-96-058		N	NA	SS	INV	Not Applicable	23-013	2	33-01661	0	0.5	FT	0-0.5 FT	S	SO	ALLH	INORGANI	AS	Arsenic	49		1		MG/KG	1		MG/KG	U	U_LAB	U	U	U					IULAB	U_LAB					REPORTIN	ROUTINE03					NA	CS	METALS	SW-846:7060A	KA	KEMRON	7/29/1996	7/24/1996	7/23/1996
14260232	S:00665570	2423	0333-96-058		N	NA	SS	INV	Not Applicable	23-013	2	33-01661	0	0.5	FT	0-0.5 FT	S	SO	ALLH	INORGANI	BA	Barium	50		58		MG/KG	58		MG/KG				NQ	NQ					INONE	NQ					REPORTIN	ROUTINE03					NA	CS	METALS	SW-846:6010A	KA	KEMRON	8/1/1996	7/24/1996	7/23/1996
14260262	S:00665573	2423	0333-96-058		N	NA	SS	INV	Not Applicable	23-013	2	33-01661	0	0.5	FT	0-0.5 FT	S	SO	ALLH	INORGANI	BE	Beryllium	50		0.5		MG/KG	0.5		MG/KG	U	U_LAB	U	U	U					IULAB	U_LAB					REPORTIN	ROUTINE03					NA	CS	METALS	SW-846:6010A	KA	KEMRON	8/1/1996	7/24/1996	7/23/1996
14260302	S:00665576	2423	0333-96-058		N	NA	SS	INV	Not Applicable	23-013	2	33-01661	0	0.5	FT	0-0.5 FT	S	SO	ALLH	INORGANI	CD	Cadmium	50		0.5		MG/KG	0.5		MG/KG	U	U_LAB	U	U	U					IULAB	U_LAB					REPORTIN	ROUTINE03					NA	CS	METALS	SW-846:6010A	KA	KEMRON	8/1/1996	7/24/1996	7/23/1996
14260322	S:00665579	2423	0333-96-058		N	NA	SS	INV	Not Applicable	23-013	2	33-01661	0	0.5	FT	0-0.5 FT	S	SO	ALLH	INORGANI	CA	Calcium	50		2000		MG/KG	2000		MG/KG				NQ	NQ					INONE	NQ					REPORTIN	ROUTINE03					NA	CS	METALS	SW-846:6010A	KA	KEMRON	8/1/1996	7/24/1996	7/23/1996
14260352	S:00665582	2423	0333-96-058		N	NA	SS	INV	Not Applicable	23-013	2	33-01661	0	0.5	FT	0-0.5 FT	S	SO	ALLH	INORGANI	CR	Chromium	50		15		MG/KG	15		MG/KG				NQ	NQ					INONE	NQ					REPORTIN	ROUTINE03					NA	CS	METALS	SW-846:6010A	KA	KEMRON	8/1/1996	7/24/1996	7/23/1996
14260422	S:00665584	2423	0333-96-058		N	NA	SS	INV	Not Applicable	23-013	2	33-01661	0	0.5	FT	0-0.5 FT	S	SO	ALLH	INORGANI	CO	Cobalt	50		2.4		MG/KG	2.4		MG/KG				NQ	NQ					INONE	NQ					REPORTIN	ROUTINE03					NA	CS	METALS	SW-846:6010A	KA	KEMRON	8/1/1996	7/24/1996	7/23/1996
14260462	S:00665587	2423	0333-96-058		N	NA	SS	INV	Not Applicable	23-013	2	33-01661	0	0.5	FT	0-0.5 FT	S	SO	ALLH	INORGANI	CU	Copper	50		17		MG/KG	17		MG/KG				NQ	NQ					INONE	NQ					REPORTIN	ROUTINE03					NA	CS	METALS	SW-846:6010A	KA	KEMRON	8/1/1996	7/24/1996	7/23/1996
14260492	S:00665589	2423	0333-96-058		N	NA	SS	INV	Not Applicable	23-013	2	33-01661	0	0.5	FT	0-0.5 FT	S	SO	ALLH	INORGANI	FE	Iron	50		7700		MG/KG	7700		MG/KG				NQ	NQ					INONE	NQ					REPORTIN	ROUTINE03					NA	CS	METALS	SW-846:6010A	KA	KEMRON	8/1/1996	7/24/1996	7/23/1996
14243452	S:00664774	2423	0333-96-058		N	NA	SS	INV	Not Applicable	23-013	2	33-01661	0	0.5	FT	0-0.5 FT	S	SO	ALLH	INORGANI	PB	Lead	49		16		MG/KG	16		MG/KG				NQ	NQ					INONE	NQ					REPORTIN	ROUTINE03					NA	CS	METALS	SW-846:7421	KA	KEMRON	7/30/1996	7/24/1996	7/23/1996
14260512	S:00665592	2423	0333-96-058		N	NA	SS	INV	Not Applicable	23-013	2	33-01661	0	0.5	FT	0-0.5 FT	S	SO	ALLH	INORGANI	MG	Magnesiu	50		1100		MG/KG	1100		MG/KG				NQ	NQ					INONE	NQ					REPORTIN	ROUTINE03					NA	CS	METALS	SW-846:6010A	KA	KEMRON	8/1/1996	7/24/1996	7/23/1996
14260542	S:00665595	2423	0333-96-058		N	NA	SS	INV	Not Applicable	23-013	2	33-01661	0	0.5	FT	0-0.5 FT	S	SO	ALLH	INORGANI	MN	Manganes	50		140		MG/KG	140		MG/KG				NQ	NQ					INONE	NQ					REPORTIN	ROUTINE03					NA	CS	METALS	SW-846:6010A	KA	KEMRON	8/1/1996	7/24/1996	7/23/1996
14246622	S:00664947	2423	0333-96-058		N	NA	SS	INV	Not Applicable	23-013	2	33-01661	0	0.5	FT	0-0.5 FT	S	SO	ALLH	INORGANI	HG	Mercury	167		0.44		MG/KG	0.44		MG/KG				NQ	NQ					INONE	NQ					REPORTIN	ROUTINE03					NA	CS	METALS	SW-846:7471A	KA	KEMRON	7/30/1996	7/24/1996	7/23/1996
14260592	S:00665598	2423	0333-96-058		N	NA	SS	INV	Not Applicable	23-013	2	33-01661	0	0.5	FT	0-0.5 FT	S	SO	ALLH	INORGANI	NI	Nickel	50		9.2		MG/KG	9.2		MG/KG				NQ	NQ					INONE	NQ					REPORTIN	ROUTINE03					NA	CS	METALS	SW-846:6010A	KA	KEMRON	8/1/1996	7/24/1996	7/23/1996
14260622	S:00665600	2423	0333-96-058		N	NA	SS	INV	Not Applicable	23-013	2	33-01661	0	0.5	FT	0-0.5 FT	S	SO	ALLH	INORGANI	K	Potassium	50		680		MG/KG	680		MG/KG				NQ	NQ					INONE	NQ					REPORTIN	ROUTINE03					NA	CS	METALS	SW-846:6010A	KA	KEMRON	8/1/1996	7/24/1996	7/23/1996
14244382	S:00664828	2423	0333-96-058		N	NA	SS	INV	Not Applicable	23-013	2	33-01661	0	0.5	FT	0-0.5 FT	S	SO	ALLH	INORGANI	SE	Selenium	49		1		MG/KG	1		MG/KG	UJ	I3e	U	UJ	UJ	UJ	J-			I3e	I3E	I3e	I3e			LEGACY	REPORTIN	ROUTINE0	ROUTINE0			NA	CS	METALS	SW-846:7740	KA	KEMRON	8/1/1996	7/24/1996	7/23/1996
14260662	S:00665604	2423	0333-96-058		N	NA	SS	INV	Not Applicable	23-013	2	33-01661	0	0.5	FT	0-0.5 FT	S	SO	ALLH	INORGANI	AG	Silver	50		2		MG/KG	2		MG/KG	U	U_LAB	U	U	U					IULAB	U_LAB					REPORTIN	ROUTINE03					NA	CS	METALS	SW-846:6010A	KA	KEMRON	8/1/1996	7/24/1996	7/23/1996
14260702	S:00665608	2423	0333-96-058		N	NA	SS	INV	Not Applicable	23-013	2	33-01661	0	0.5	FT	0-0.5 FT	S	SO	ALLH	INORGANI	NA	Sodium	50		150		MG/KG	150		MG/KG				NQ	NQ					INONE	NQ					REPORTIN	ROUTINE03					NA	CS	METALS	SW-846:6010A	KA	KEMRON	8/1/1996	7/24/1996	7/23/1996
14245292	S:00664900	2423	0333-96-058		N	NA	SS	INV	Not Applicable	23-013	2	33-01661	0	0.5	FT	0-0.5 FT	S	SO	ALLH	INORGANI	TL	Thallium	49		1.3		MG/KG	1.3		MG/KG	U	U_LAB	U	U	U					IULAB	U_LAB					REPORTIN	ROUTINE03					NA	CS	METALS	SW-846:7841	KA	KEMRON	7/31/1996	7/24/1996	7/23/1996
14263512	S:00665824	2424	0333-96-058		N	NA	SS	INV	Not Applicable	23-013	2	33-01661	0	0.5	FT	0-0.5 FT	S	SO	ALLH	INORGANI	U	Uranium	1		0.23		MG/KG	0.23		MG/KG	J	I1	B	J	J	NQ				I1	I1	NQ				REPORTIN	ROUTINE03	ROUTINE0				NA	CS	METALS	SW-846:6020	RGGJ	Rust Geotech, Grand Junction, CO	8/13/1996	7/24/1996	7/23/1996
14260742	S:00665612	2423	0333-96-058		N	NA	SS	INV	Not Applicable	23-013	2	33-01661	0	0.5	FT	0-0.5 FT	S	SO	ALLH	INORGANI	V	Vanadium	50		14		MG/KG	14		MG/KG				NQ	NQ					INONE	NQ					REPORTIN	ROUTINE03					NA	CS	METALS	SW-846:6010A	KA	KEMRON	8/1/1996	7/24/1996	7/23/1996
14260762	S:00665616	2423	0333-96-058		N	NA	SS	INV	Not Applicable	23-013	2	33-01661	0	0.5	FT	0-0.5 FT	S	SO	ALLH	INORGANI	ZN	Zinc	50		76		MG/KG	76		MG/KG	J-	I3e		J-	J-	J-				I3a	I3a	I3e				LEGACY	REPORTIN	ROUTINE0				NA	CS	METALS	SW-846:6010A	KA	KEMRON	8/1/1996	7/24/1996	7/23/1996

SAMPLE ID	PRS
AAA2035	33-013
AAA2036	33-013
AAA2037	33-013
0333-96-0570	33-013
0333-96-0571	33-013
0333-96-0572	33-013
0333-96-0573	33-013
0333-96-0574	33-013
0333-96-0575	33-013
0333-96-0576	33-013
0333-96-0577	33-013
0333-96-0578	33-013
0333-96-0579	33-013
0333-96-0580	33-013
0333-96-0581	33-013
0333-96-0582	33-013
0333-96-0583	33-013
0333-96-1006	33-013

This appendix presents all analytical data collected for Solid Waste Management Unit 33-013 during the previous site investigations: (1) the 1993 RFI sampling and (2) the 1996 Phase II RFI sampling. All analytical data are provided on the accompanying CD labeled "Historical Analytical Data for SWMU 33-013."

Appendix C

Waste Management and Disposal

WASTE MANAGEMENT AND DISPOSAL

The waste streams that may be generated and managed during investigation and remediation activities for the TA-33 High Bay Complex project affecting SWMU 33-013 include the following:

- excavated soil and asphalt (co-mingled) from SWMU 33-013,
- personal protective equipment, sampling supplies, decontamination trash, and other investigation-derived waste.

Anticipated waste streams, regulatory classifications, estimated amounts, and disposal pathways are shown in Table C-1. The volumes are estimated. More accurate volumes, final waste determinations, and disposal pathways will be based on sample results and the extent of contamination.

Table C-1. Waste Streams from SWMU 33-013

Waste Stream	Waste Type	Estimated Maximum Volume	Ship To
Excavated soil and asphalt (co-mingled) from SWMU 33-013	Solid, suspect Low level Waste (LLW)*	17 yd^3	Area G, LANL, Los Alamos, NM
Personal protective equipment, sampling supplies, and other investigation-derived waste	Solid, suspect LLW	<1 yd^3	Area G, LANL, Los Alamos, NM

* Pending pre-construction waste characterization sampling.

All wastes generated during the investigation and remediation of the TA-33 High Bay Complex project SWMU will be managed in a way that is protective of human health and the environment, compliant with applicable federal, state, Department of Energy (DOE), and Laboratory regulatory requirements, and consistent with Laboratory waste-minimization goals. All waste generated during field investigation activities will be managed in accordance with applicable standard operating procedures (SOPs). SOPs applicable to the characterization and management of solid waste are as follows:

- SOP-01.06, Management of ENV-RS Project Waste and
- SOP-01.10, Waste Characterization.

Investigation activities will be conducted in a manner that minimizes the generation of waste. Waste minimization is accomplished by implementing the requirements of the ENV-RS projects portion of the 2003 Pollution Prevention Roadmap (LANL 2003, 85205).

The characterization of the waste streams generated from the excavation of soil and asphalt will be based on previous site investigation and waste characterization data, knowledge of historical operations, preconstruction waste characterization data from SWMU 33-013, confirmation sample data, and additional waste characterization samples of excavated material.

It is anticipated that excavated material will be managed as LLW, pending final characterization, because of the suspected presence of radionuclides. Concentrations of hazardous chemicals detected during previous investigations of the site were below regulatory thresholds for hazardous waste. The LLW will be managed in a less-than-90-day LLW storage area registered with ENV–Solid Waste Regulatory Compliance Group (SWRC). One LLW waste storage area will be set up in the fenced area near SWMU

33-013 and will be inspected in accordance with requirements for the specific waste type and classification.

To minimize or eliminate liquid waste generation, decontamination of equipment will be accomplished using dry methods.

Before field investigation activities begin, a waste characterization strategy form (WCSF) will be prepared and approved in accordance with requirements of SOP-01.10, Waste Characterization. The WCSF will provide detailed information on waste characterization, waste handling and segregation strategy, containerization, and potential volume generation. Waste characterization will be achieved through direct sampling of the waste or sampling of the media being investigated (i.e., surface and subsurface soil, etc.). If direct waste characterization sampling is necessary, it will be described in the WCSF. Waste profile forms will be submitted for waste streams generated from this investigation.

The selection of waste containers will be based on the appropriate Department of Transportation (DOT) requirements and the type and amount of waste planned for generation. Immediately following containerization, each waste container will be individually labeled showing the waste classification, item identification number, and date of generation. Container and storage requirements will be described in the WCSF, based on requirements outlined in the most recent versions of the Laboratory's Waste Management Facilities Waste Acceptance Criteria and Laboratory Implementation Requirement (LIR) 404-00-03, "Hazardous and Mixed Waste Requirements"; LIR-404-00-04, "Managing Solid Waste"; LIR 404-00-06; and LIR 405-10-01, "Packaging and Transportation." Transportation of waste will comply with appropriate DOT requirements. After determining waste classification, disposal of solid waste will take place at an approved off-site disposal facility. Transportation and disposal requirements will be detailed in the WCSF. The sites will be verified as "waste free" by ENV-RS project waste management personnel before completion of the project, based on the Field Site Closeout Checklist in SOP-01.12.