

**Kirtland Air Force Base
Albuquerque, New Mexico**

**RCRA Facility Investigation
Sampling and Analysis Plan
Solid Waste Management Unit 6-30
Radioactive Burial 11 (RW-06)**

Final Draft - May 19, 1997



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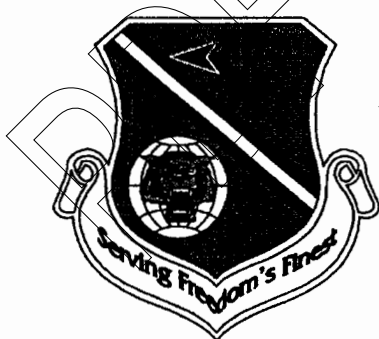
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**INSTALLATION RESTORATION PROGRAM
KIRTLAND AIR FORCE BASE
ALBUQUERQUE, NEW MEXICO**

**FINAL DRAFT
RCRA FACILITY INVESTIGATION (RFI)
SAMPLING AND ANALYSIS PLAN
FOR
SOLID WASTE MANAGEMENT UNIT 6-30
RADIOACTIVE BURIAL 11 (RW-06)**

MAY 19, 1997

Prepared For

HQ AFCEE/ERDM

ENVIRONMENTAL RESTORATION DIVISION

BROOKS AFB, TEXAS 78235-5363

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Prepared By

CH2M HILL

ALBUQUERQUE, NEW MEXICO

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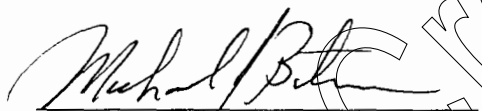
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PREFACE

This Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Sampling and Analysis Plan (SAP) specifies the investigative activities proposed at Solid Waste Management Unit 6-30, Radioactive Burial 11 (RW-06) of the RCRA Part B Permit for Kirtland Air Force Base (AFB). This SAP was prepared to address the requirement of the U.S. Air Force (USAF) Statement of Work dated February 13, 1997, and the requirements for an RFI Report as specified in the RCRA Part B Permit for Kirtland AFB.

This report was prepared by CH2M HILL in May 1997. Mr. Bassim D. Shebaro of the Air Force Center for Environmental Excellence was the Restoration Team Chief and Mr. Rodney Arnold served as the Contracting Officer's Representative.



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ACRONYMS

AFB	Air Force Base
AFCEE	Air Force Center for Environmental Excellence
AFWL	Air Force Weapons Laboratory
ASTM	American Society for Testing and Materials
bgs	below ground surface
DRO	diesel range organics
EPA	U.S. Environmental Protection Agency
ft	feet
GRO	gasoline range organics
GPR	ground-penetrating radar
HHRB	human health risk-based
IRP	Installation Restoration Program
mg/kg	milligram per kilogram
MSD	matrix spike duplicate
NFA	No Further Action
NMED	New Mexico Environment Department
QC	quality control
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
SAP	Sampling and Analysis Plan
SNL	Sandia National Laboratories
SVOC	semivolatile organic compound
SWMU	solid waste management unit
TAL	target analyte list
USAF	U.S. Air Force
VOC	volatile organic compound

1. INTRODUCTION

This Sampling and Analysis Plan (SAP) was prepared to further characterize the nature and extent of contaminants present at Solid Waste Management Unit (SWMU) 6-30, Radioactive Burial 11 (RW-06) at Kirtland Air Force Base (AFB). This investigation is being conducted in response to the Notice of Deficiency received from the U.S. Environmental Protection Agency (EPA) Region 6 and the New Mexico Environment Department (NMED) (EPA, 1995; NMED, 1995). SWMU 6-30 consists of nine burial trenches previously used for disposal of radioactive material. This SAP will serve as a guide in the field while the investigation is conducted and contains site background and environmental setting, results of previous investigations, data gaps, and the site-specific work plans and rationale. The NMED and EPA did not require a separate Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Work Plan for this site. Rather, this investigation will be conducted in accordance with the *Kirtland AFB Base-Wide Plans for Installation Restoration Program (IRP)* (U.S. Air Force [USAF], 1995).

1.1 Description of the Investigation

SWMU 6-30 occupies approximately 4.5 acres within the riding stables complex in the southeast portion of Kirtland AFB (Figure 1-1). From 1960 to 1971, SWMU 6-30 was part of a 40-acre facility operated by the Radiobiology Laboratory, Biophysics Branch, Air Force Weapons Laboratory (AFWL) (USAF, 1981). A major site feature is the presence of nine trenches that were previously used for the disposal of animal carcasses, radioactive material, and small quantities of hazardous and toxic chemicals, including acids, mercury, cyanides, and silver. This site is listed in Appendix IV to Module IV of Kirtland's RCRA Part B Permit.

The objective of the sampling plan for SWMU 6-30 is to determine if there is contaminant source material present in the trenches and delineate the horizontal and vertical extent of contaminants released at the site. The results of this investigation will provide information to determine the need for any additional corrective action or a recommendation for No Further Action.

1.2 Scoping Documents

This SAP serves as the scoping document for the SWMU 6-30 RFI. The *Kirtland AFB Base-Wide Plans* serve as additional project scoping documents for this investigation (USAF, 1995). The modules to the Plans include:

- Project Management Plan
- Data Collection Quality Assurance Plan
 - Part I: Field Sampling Plan
 - Part II: Quality Assurance Project Plan
- Data Management Plan
- Site Safety and Health Plan
- Investigation Derived Waste Management Plan
- Community Relations Plan

Base-Wide Plans will govern all aspects of the RFI activities unless they are specifically modified by this SAP or the site-specific health and safety plan for SWMU 6-30.

2. SWUM 6-30, RADIOACTIVE BURIAL 11 (RW-06)

SWMU 6-30 occupies approximately 4.5 acres within the riding stables complex in the southeast portion of Kirtland AFB (Figure 2-1).

2.1 Site Background and Environmental Setting

From 1960 to 1971, SWMU 6-30 was part of a 40-acre facility operated by the Radiobiology Laboratory, Biophysics Branch, AFWL (USAF, 1981). A major site feature is the presence of backfilled trenches that were previously used to dispose of animal carcasses. The May 13, 1966, request by AFWL for an amendment to its U.S. Atomic Energy Commission permit states that the first four trenches were approximately 50 x 9 x 2 ft and were covered with approximately 4 ft of compacted earthen material; two were covered with asphalt caps. The two remaining trenches are approximately 100 x 20 x 6 ft. One of these trenches was still open and in use at the time of the permit request (Shoppen, 1966). Based on the interpretation of information obtained during a geophysical survey performed at the site in 1994 (Section 2.2), SWMU 6-30 consists of nine trenches having boundaries as presented in Figure 2-2.

Although no accurate records were kept for the quantity of waste disposed, estimates were found in the Phase I study which reported the disposal of 1,000 to 1,500 sheep, 60 to 75 burros, 40 to 50 goats, 100 to 120 chickens, 500 to 1,000 rats, 5 to 10 cows, and 50 to 60 dogs (USAF, 1981). In addition, small quantities of hazardous and toxic chemicals were disposed of in the trenches, including acids, mercury, cyanides, and silver. The Phase I study reported that most of the radioactive material buried in the trenches was in the form of induced activity and short half-lived elements, but several millicuries of elements with longer half-lives (zirconium, niobium, cesium, iodine, and yttrium) may be present (USAF, 1981). Small amounts of the wastes were buried in drums (deBoer, 1992). Anecdotal information suggests that a 55-gallon drum of waste mercury was disposed of in one of the trenches, although this claim is not substantiated.

2.2 Previous Investigations

Several surveys and investigations have been conducted at SWMU 6-30:

- A Phase I records and historical review study revealed that the site was a trench-and-fill operation from 1960 to 1971 (USAF, 1981).
- A Phase II, Stage 1, IRP field investigation identified sodium and iron in soil samples collected during the advancement of two 100-ft exploratory holes at the south end of the site. Lead, mercury, silver, total organic halogens, oils and greases, and pesticides were not detected. Field-screening for gamma radiation performed on the drill cuttings identified no levels above background (USAF, 1985).
- A June 1992 radiation survey to determine possible air and surface soil contamination identified no radiation levels above background conditions (Caputo, 1992).
- A Sandia National Laboratories (SNL) technology demonstration project, which consisted of installing a horizontal soil boring beneath the six southernmost trenches and measuring gamma radiation in soil adjacent to the borehole using a downhole gamma-ray spectrometer, identified no radiation levels above background conditions (Floran, 1994).

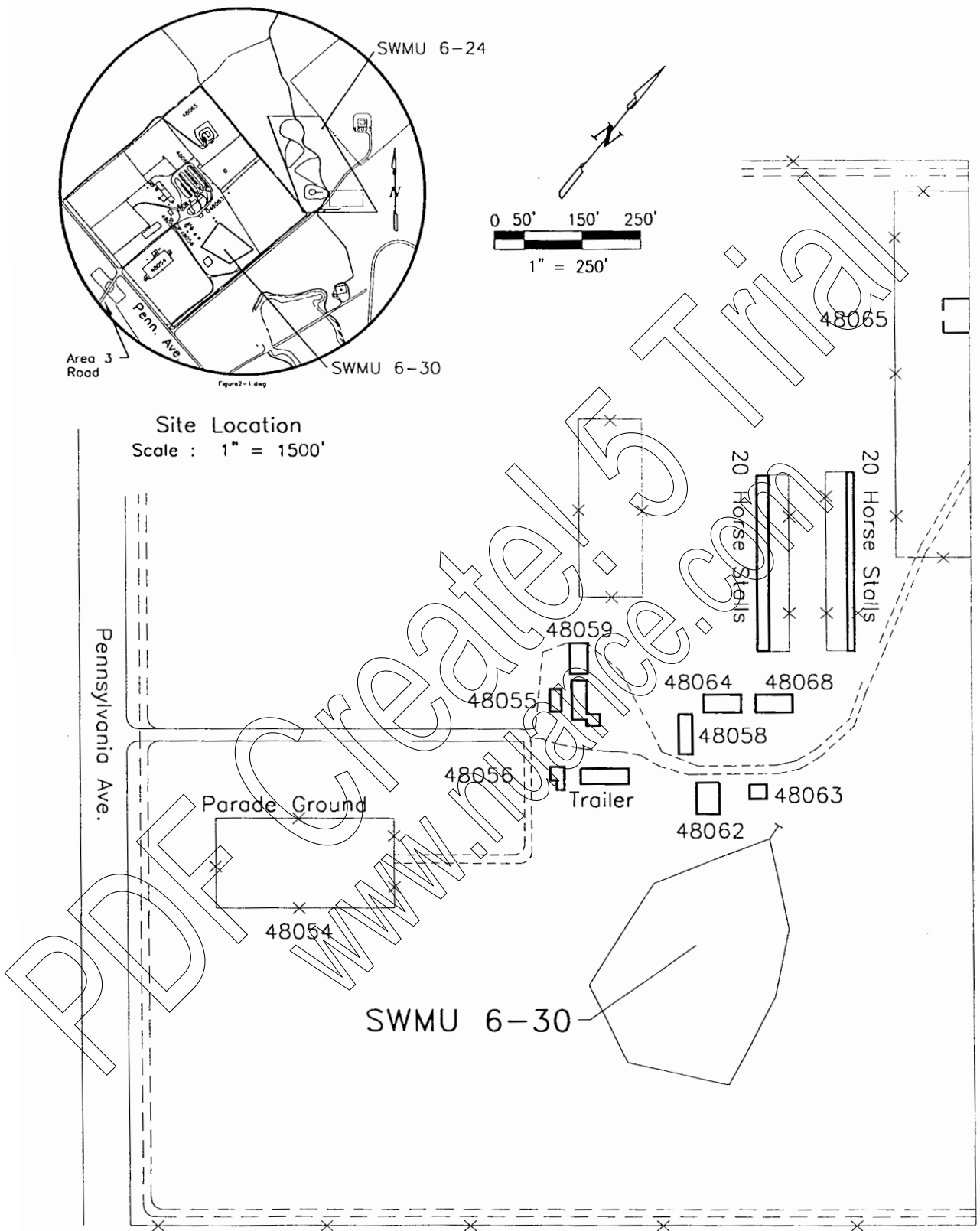
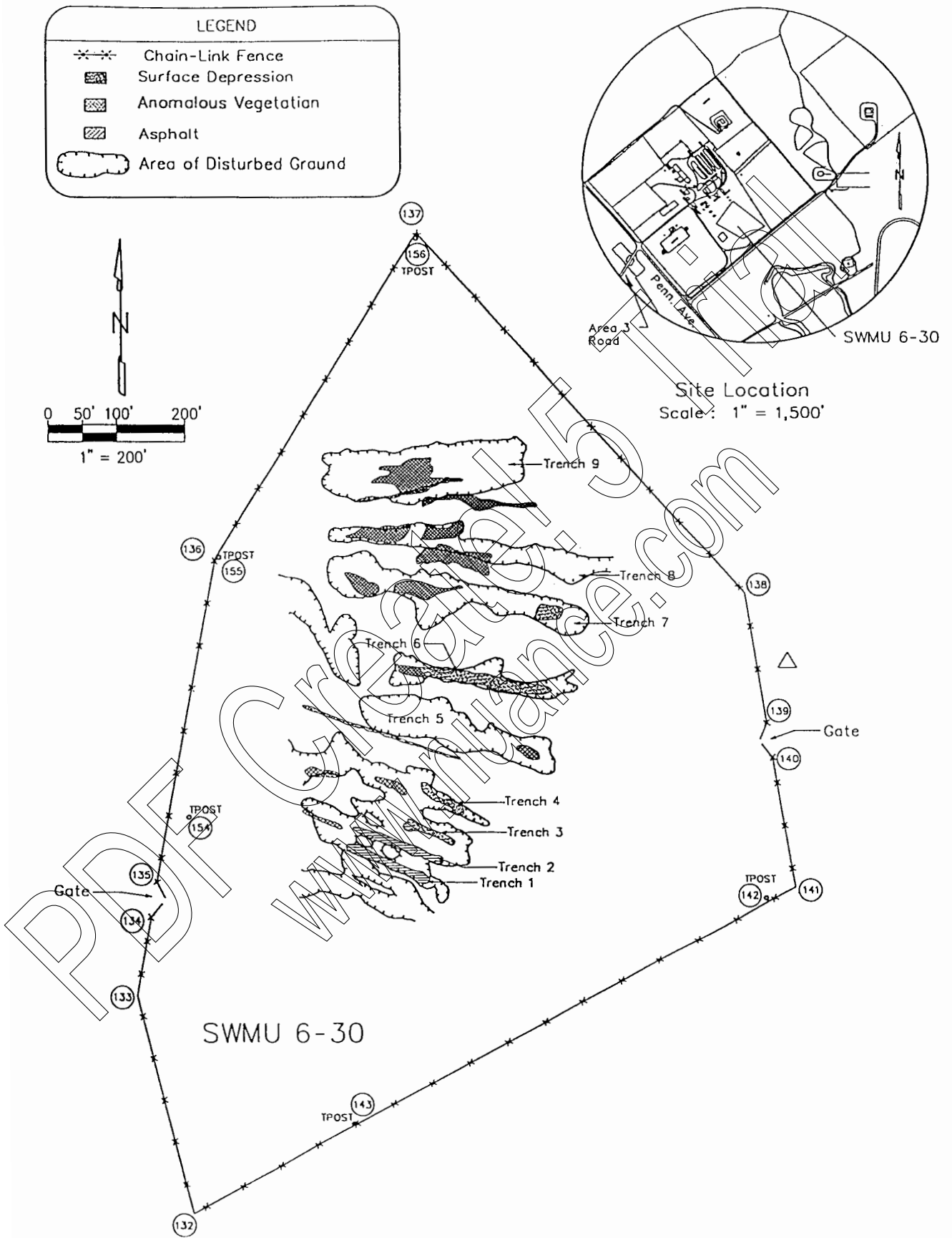


Figure 2-1. Vicinity Map



- June 1994 geophysical surveys conducted to further define the extent and depth of the trenches, combined with information from aerial photographs taken in 1966 and 1979 and from observed ground features (depressions, anomalous vegetation and surface debris), were used to construct a map of the most probable trench areas. The interpretation of these data indicated that nine trenches existed.
- The Appendix IV, Stage 2D-1 RFI to determine the nature and extent of trench contamination, included surface and subsurface soil sampling in soil adjacent to the trenches (USAF, 1994). Soil samples were analyzed for petroleum hydrocarbon gasoline range organics (GRO) and diesel range organics (DRO), volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), metals, cyanide, gross alpha, gross beta, radium-226, radium-228, soil pH, and soil moisture. Analytical results did indicate the presence of GROs, DROs, VOCs, SVOCs; however, all concentrations were below both regulatory and human health risk-based (HHRB) action levels. Metals detected above the HHRB action level included beryllium (0.3 to 0.9 milligram per kilogram [mg/kg]), manganese (428 to 516 mg/kg), and chromium (1,130 mg/kg). No cyanide was detected in any of the samples collected. Analytical results for radiological parameters showed the samples exceeding background concentrations were found among boreholes well distributed about the site, except for one borehole having samples from four depths with gross alpha levels above background.

2.3 Data Gaps

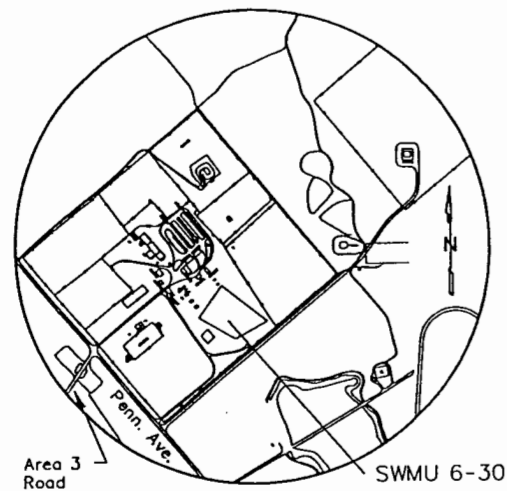
The EPA and NMED were concerned about the Stage 2D-1 RFI (EPA, 1995; NMED, 1995). Specifically, previous investigations did not include any sampling and analysis from materials within the trench. Subsurface soil data are needed to confirm the presence of and characterize the extent of vertical migration of radioactive and chemical contaminants buried in the trenches at the site. Further work is required to confirm the existence, magnitude, and extent of potential contamination buried at SWMU 6-30.

2.4 Work Plan and Rationale

The proposed scope of investigation is shown in Figure 2-3 and summarized in Table 2-1. The field program has been designed to determine if contamination is present within the trenches and in the surrounding soils with a direct-push drill rig (Geoprobe). The number of boreholes per trench are based on trench length (approximate 30-ft spacing between boreholes). The depth of boreholes within a trench is based on trench depth (shallow trenches having 20-ft borehole depths and deep trenches having 30-ft borehole depths). Specifically:

- Two 20-ft boreholes will be driven in Trenches 1 and 2 (two boreholes)
- One 20-ft borehole will be driven in Trenches 3 and 4 (one borehole)
- Four 30-ft boreholes will be driven in Trenches 5, 6, and 9 (four boreholes)
- Five 30-ft boreholes will be driven in Trenches 7 and 8 (five boreholes)
- Four boreholes will be driven to the depth of the deepest environmental sample for background sample collection (four boreholes)

Soil samples will be collected from each borehole at 5-ft intervals to the bottom of the trench and from two additional sampling intervals below the bottom of the trench (10-ft below the bottom of the trench). If field-screening indicates the presence of contaminants at the 5- or 10-ft depths below the trench, sampling will continue in 5-ft increments until two successive 5-ft samples show no contamination.



Site Location
Scale : 1" = 1,500'

LEGEND	
●	Proposed Sampling Locations
▲	Proposed Background Sampling Locations
○	Found Monument (As Noted)
---x---	Chain-Link Fence
○	Steel T-Fence Post (T-Post)
①37	Data Table Point Number
▨	Surface Depression
▩	Anomalous Vegetation
▧	Asphalt
⬭	Area of Disturbed Ground

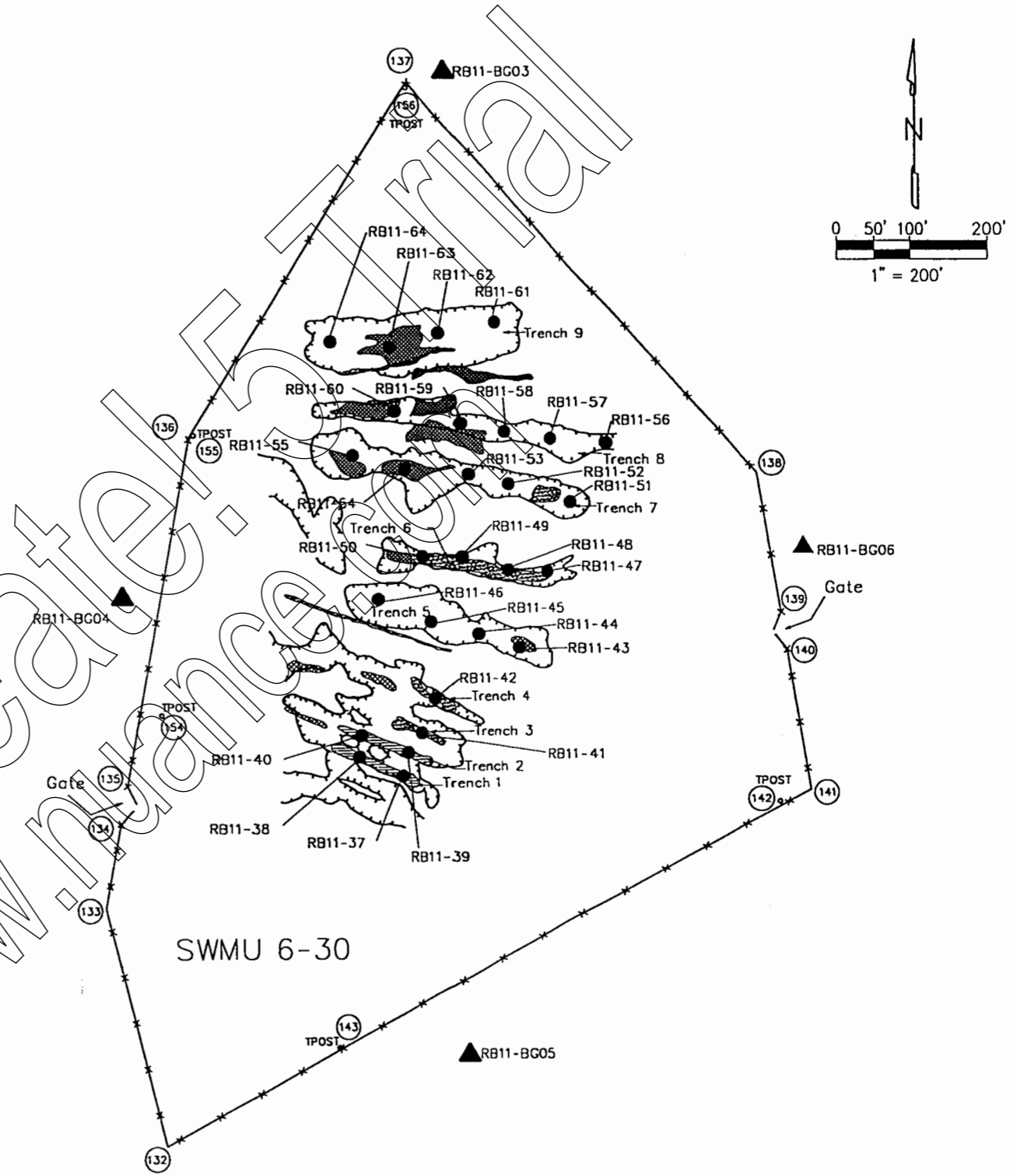


Figure 2-3. Proposed Sampling Locations

Table 2-1. Proposed Sampling

Data Needs	Investigative Technique	Location	Number of Samples	Analyses	Selected Analytical Options ^a
Determine if contaminants are present in trenches and if they have been released to surrounding soil	Drill 28 boreholes with a Geoprobe in nine trenches; collect samples at 5-ft intervals to 10 ft below the bottom of the trench; maximum proposed sampling depth is 30 ft bgs; four boreholes will be drilled to the same depth as the deepest environmental sample to collect background samples; samples will be collected at 5-ft intervals.	Boreholes will be drilled in each trench and will be spaced ~30 ft apart	154 environmental samples	VOCs	Level II
			16 duplicates	SVOCs	Level II
			8 matrix spike duplicates	Metals	Level II
			15 equipment blanks	Cyanide	Level II
			15 trip blanks (VOCs)	Gross alpha	--
				Gross beta	--
				Gamma spectroscopy	--
				Soil pH	Level I
				Soil moisture	Level I

^a Refers to the type of data package from the analytical laboratory. Level I/Level II data packages are defined by the AFCEE contract; the Level II report is equivalent to an EPA CLP report.

Samples will be analyzed for VOCs (EPA Method 8260), SVOCs (EPA Method 8270), metals (EPA Methods 6010/200.7), mercury (EPA Method 7471) cyanide (EPA Method 9010A), gross alpha and beta (EPA Method 900), gamma spectroscopy (EPA Method 901.1), soil pH (EPA Method 9045), and soil moisture (ASTM D2216) (Table 2-2).

To supplement the data from the two existing Appendix IV, Stage 2D-1 background boreholes, RB11-BG01 and RB11-BG02 (USAF, 1994), four additional background boreholes will be advanced. Background samples will be collected from the same intervals and analyzed for the same parameters as environmental samples.

All samples will be field-screened for VOCs, radioactivity, and mercury vapor. Field-screening equipment is described in the Health and Safety Plan Addendum. If field-screening indicates the presence of nonradiological contaminants at the proposed depth, subsurface sampling will continue and be extended to a depth where field-screening does not indicate the presence of nonradiological contamination in two successive 5-ft sampling intervals. If field-screening indicates radiological levels above the action level (see Health and Safety Plan Addendum), all affected intrusive equipment will be left in place and field activities will cease until appropriate protective and investigative measures have been identified and implemented.

Table 2-2. Summary of Analytical Parameters

Sample Number ¹	Trench	VOCs EPA 8260	SVOCs EPA 8270	Metals EPA 6010 & 200.7, 7471	Cyanide EPA 9010A	Gross Alpha & Gross Beta EPA 900	Gamma Spec EPA 901.1	Soil Moisture/pH ASTM D2216 / EPA 9045
RB11-37-0305	1	•	•	•	•	•	•	•
RB11-37-0810	1	•	•	•	•	•	•	•
RB11-37-1315	1	•	•	•	•	•	•	•
RB11-37-1820	1	•	•	•	•	•	•	•
RB11-38-0305	1	•	•	•	•	•	•	•
RB11-38-0810	1	•	•	•	•	•	•	•
RB11-38-1315	1	•	•	•	•	•	•	•
RB11-38-1820	1	•	•	•	•	•	•	•
RB11-39-0305	2	•	•	•	•	•	•	•
RB11-39-0810	2	•	•	•	•	•	•	•
RB11-39-1315	2	•	•	•	•	•	•	•
RB11-39-1820	2	•	•	•	•	•	•	•
RB11-40-0305	2	•	•	•	•	•	•	•
RB11-40-0810	2	•	•	•	•	•	•	•
RB11-40-1315	2	•	•	•	•	•	•	•
RB11-40-1820	2	•	•	•	•	•	•	•
RB11-41-0305	3	•	•	•	•	•	•	•
RB11-41-0810	3	•	•	•	•	•	•	•

Table 2-2. Summary of Analytical Parameters (Continued)

Sample Number ¹	Trench	VOCs EPA 8260	SVOCs EPA 8270	Metals EPA 6010 & 200.7, 7471	Cyanide EPA 9010A	Gross Alpha & Gross Beta EPA 900	Gamma Spec EPA 901.1	Soil Moisture/pH ASTM D2216 / EPA 9045
RB11-41-1315	3	•	•	•	•	•	•	•
RB11-41-1820	3	•	•	•	•	•	•	•
RB11-42-0305	4	•	•	•	•	•	•	•
RB11-42-0810	4	•	•	•	•	•	•	•
RB11-42-1315	4	•	•	•	•	•	•	•
RB11-42-1820	4	•	•	•	•	•	•	•
RB11-43-0305	5	•	•	•	•	•	•	•
RB11-43-0810	5	•	•	•	•	•	•	•
RB11-43-1315	5	•	•	•	•	•	•	•
RB11-43-1820	5	•	•	•	•	•	•	•
RB11-43-2325	5	•	•	•	•	•	•	•
RB11-43-2830	5	•	•	•	•	•	•	•
RB11-44-0305	5	•	•	•	•	•	•	•
RB11-44-0810	5	•	•	•	•	•	•	•
RB11-44-1315	5	•	•	•	•	•	•	•
RB11-44-1820	5	•	•	•	•	•	•	•
RB11-44-2325	5	•	•	•	•	•	•	•
RB11-44-2830	5	•	•	•	•	•	•	•
RB11-45-0305	5	•	•	•	•	•	•	•

Table 2-2. Summary of Analytical Parameters (Continued)

Sample Number ¹	Trench	VOCs EPA 8260	SVOCs EPA 8270	Metals EPA 6010 & 200.7, 7471	Cyanide EPA 9010A	Gross Alpha & Gross Beta EPA 900	Gamma Spec EPA 901.1	Soil Moisture/pH ASTM D2216 / EPA 9045
RB11-45-0810	5	•	•	•	•	•	•	•
RB11-45-1315	5	•	•	•	•	•	•	•
RB11-45-1820	5	•	•	•	•	•	•	•
RB11-45-2325	5	•	•	•	•	•	•	•
RB11-45-2830	5	•	•	•	•	•	•	•
RB11-46-0305	5	•	•	•	•	•	•	•
RB11-46-0810	5	•	•	•	•	•	•	•
RB11-46-1315	5	•	•	•	•	•	•	•
RB11-46-1820	5	•	•	•	•	•	•	•
RB11-46-2325	5	•	•	•	•	•	•	•
RB11-46-2830	5	•	•	•	•	•	•	•
RB11-47-0305	6	•	•	•	•	•	•	•
RB11-47-0810	6	•	•	•	•	•	•	•
RB11-47-1315	6	•	•	•	•	•	•	•
RB11-47-1820	6	•	•	•	•	•	•	•
RB11-47-2325	6	•	•	•	•	•	•	•
RB11-47-2830	6	•	•	•	•	•	•	•
RB11-48-0305	6	•	•	•	•	•	•	•
RB11-48-0810	6	•	•	•	•	•	•	•

Table 2-2. Summary of Analytical Parameters (Continued)

Sample Number ¹	Trench	VOCs EPA 8260	SVOCs EPA 8270	Metals EPA 6010 & 200.7, 7471	Cyanide EPA 9010A	Gross Alpha & Gross Beta EPA 900	Gamma Spec EPA 901.1	Soil Moisture/pH ASTM D2216 / EPA 9045
RB11-48-1315	6	•	•	•	•	•	•	•
RB11-48-1820	6	•	•	•	•	•	•	•
RB11-48-2325	6	•	•	•	•	•	•	•
RB11-48-2830	6	•	•	•	•	•	•	•
RB11-49-0305	6	•	•	•	•	•	•	•
RB11-49-0810	6	•	•	•	•	•	•	•
RB11-49-1315	6	•	•	•	•	•	•	•
RB11-49-1820	6	•	•	•	•	•	•	•
RB11-49-2325	6	•	•	•	•	•	•	•
RB11-49-2830	6	•	•	•	•	•	•	•
RB11-50-0305	6	•	•	•	•	•	•	•
RB11-50-0810	6	•	•	•	•	•	•	•
RB11-50-1315	6	•	•	•	•	•	•	•
RB11-50-1820	6	•	•	•	•	•	•	•
RB11-50-2325	6	•	•	•	•	•	•	•
RB11-50-2830	6	•	•	•	•	•	•	•
RB11-51-0305	7	•	•	•	•	•	•	•
RB11-51-0810	7	•	•	•	•	•	•	•
RB11-51-1315	7	•	•	•	•	•	•	•

Table 2-2. Summary of Analytical Parameters (Continued)

Sample Number ¹	Trench	VOCs EPA 8260	SVOCs EPA 8270	Metals EPA 6010 & 200.7, 7471	Cyanide EPA 9010A	Gross Alpha & Gross Beta EPA 900	Gamma Spec EPA 901.1	Soil Moisture/pH ASTM D2216 / EPA 9045
RB11-51-1820	7	•	•	•	•	•	•	•
RB11-51-2325	7	•	•	•	•	•	•	•
RB11-51-2830	7	•	•	•	•	•	•	•
RB11-52-0305	7	•	•	•	•	•	•	•
RB11-52-0810	7	•	•	•	•	•	•	•
RB11-52-1315	7	•	•	•	•	•	•	•
RB11-52-1820	7	•	•	•	•	•	•	•
RB11-52-2325	7	•	•	•	•	•	•	•
RB11-52-2830	7	•	•	•	•	•	•	•
RB11-53-0305	7	•	•	•	•	•	•	•
RB11-53-0810	7	•	•	•	•	•	•	•
RB11-53-1315	7	•	•	•	•	•	•	•
RB11-53-1820	7	•	•	•	•	•	•	•
RB11-53-2325	7	•	•	•	•	•	•	•
RB11-53-2830	7	•	•	•	•	•	•	•
RB11-54-0305	7	•	•	•	•	•	•	•
RB11-54-0810	7	•	•	•	•	•	•	•
RB11-54-1315	7	•	•	•	•	•	•	•
RB11-54-1820	7	•	•	•	•	•	•	•

Table 2-2. Summary of Analytical Parameters (Continued)

Sample Number ¹	Trench	VOCs EPA 8260	SVOCs EPA 8270	Metals EPA 6010 & 200.7, 7471	Cyanide EPA 9010A	Gross Alpha & Gross Beta EPA 900	Gamma Spec EPA 901.1	Soil Moisture/pH ASTM D2216 / EPA 9045
RB11-54-2325	7	•	•	•	•	•	•	•
RB11-54-2830	7	•	•	•	•	•	•	•
RB11-55-0305	7	•	•	•	•	•	•	•
RB11-55-0810	7	•	•	•	•	•	•	•
RB11-55-1315	7	•	•	•	•	•	•	•
RB11-55-1820	7	•	•	•	•	•	•	•
RB11-55-2325	7	•	•	•	•	•	•	•
RB11-55-2830	7	•	•	•	•	•	•	•
RB11-56-0305	8	•	•	•	•	•	•	•
RB11-56-0810	8	•	•	•	•	•	•	•
RB11-56-1315	8	•	•	•	•	•	•	•
RB11-56-1820	8	•	•	•	•	•	•	•
RB11-56-2325	8	•	•	•	•	•	•	•
RB11-56-2830	8	•	•	•	•	•	•	•
RB11-57-0305	8	•	•	•	•	•	•	•
RB11-57-0810	8	•	•	•	•	•	•	•
RB11-57-1315	8	•	•	•	•	•	•	•
RB11-57-1820	8	•	•	•	•	•	•	•
RB11-57-2325	8	•	•	•	•	•	•	•

Table 2-2. Summary of Analytical Parameters (Continued)

Sample Number ¹	Trench	VOCs EPA 8260	SVOCs EPA 8270	Metals EPA 6010 & 200.7, 7471	Cyanide EPA 9010A	Gross Alpha & Gross Beta EPA 900	Gamma Spec EPA 901.1	Soil Moisture/pH ASTM D2216/ EPA 9045
RB11-57-2830	8	•	•	•	•	•	•	•
RB11-58-0305	8	•	•	•	•	•	•	•
RB11-58-0810	8	•	•	•	•	•	•	•
RB11-58-1315	8	•	•	•	•	•	•	•
RB11-58-1820	8	•	•	•	•	•	•	•
RB11-58-2325	8	•	•	•	•	•	•	•
RB11-58-2830	8	•	•	•	•	•	•	•
RB11-59-0305	8	•	•	•	•	•	•	•
RB11-59-0810	8	•	•	•	•	•	•	•
RB11-59-1315	8	•	•	•	•	•	•	•
RB11-59-1820	8	•	•	•	•	•	•	•
RB11-59-2325	8	•	•	•	•	•	•	•
RB11-59-2830	8	•	•	•	•	•	•	•
RB11-60-0305	8	•	•	•	•	•	•	•
RB11-60-0810	8	•	•	•	•	•	•	•
RB11-60-1315	8	•	•	•	•	•	•	•
RB11-60-1820	8	•	•	•	•	•	•	•
RB11-60-2325	8	•	•	•	•	•	•	•
RB11-60-2830	8	•	•	•	•	•	•	•

Table 2-2. Summary of Analytical Parameters (Continued)

Sample Number ¹	Trench	VOCs EPA 8260	SVOCs EPA 8270	Metals EPA 6010 & 200.7, 7471	Cyanide EPA 9010A	Gross Alpha & Gross Beta EPA 900	Gamma Spec EPA 901.1	Soil Moisture/pH ASTM D2216 / EPA 9045
RB11-61-0305	9	•	•	•	•	•	•	•
RB11-61-0810	9	•	•	•	•	•	•	•
RB11-61-1315	9	•	•	•	•	•	•	•
RB11-61-1820	9	•	•	•	•	•	•	•
RB11-61-2325	9	•	•	•	•	•	•	•
RB11-61-2830	9	•	•	•	•	•	•	•
RB11-62-0305	9	•	•	•	•	•	•	•
RB11-62-0810	9	•	•	•	•	•	•	•
RB11-62-1315	9	•	•	•	•	•	•	•
RB11-62-1820	9	•	•	•	•	•	•	•
RB11-62-2325	9	•	•	•	•	•	•	•
RB11-62-2830	9	•	•	•	•	•	•	•
RB11-63-0305	9	•	•	•	•	•	•	•
RB11-63-0810	9	•	•	•	•	•	•	•
RB11-63-1315	9	•	•	•	•	•	•	•
RB11-63-1820	9	•	•	•	•	•	•	•
RB11-63-2325	9	•	•	•	•	•	•	•
RB11-63-2830	9	•	•	•	•	•	•	•
RB11-64-0305	9	•	•	•	•	•	•	•

Table 2-2. Summary of Analytical Parameters (Continued)

Sample Number ¹	Trench	VOGs EPA 8260	SVOCs EPA 8270	Metals EPA 6010 & 200.7, 7471	Cyanide EPA 9010A	Gross Alpha & Gross Beta EPA 900	Gamma Spec EPA 901.1	Soil Moisture/pH ASTM D2216/ EPA 9045
RB11-64-0810	9	•	•	•	•	•	•	•
RB11-64-1315	9	•	•	•	•	•	•	•
RB11-64-1820	9	•	•	•	•	•	•	•
RB11-64-2325	9	•	•	•	•	•	•	•
RB11-64-2830	9	•	•	•	•	•	•	•
RB11-BG03-0305	Bkgrnd	•	•	•	•	•	•	•
RB11-BG03-0810	Bkgrnd	•	•	•	•	•	•	•
RB11-BG03-1315	Bkgrnd	•	•	•	•	•	•	•
RB11-BG03-1820	Bkgrnd	•	•	•	•	•	•	•
RB11-BG03-2325	Bkgrnd	•	•	•	•	•	•	•
RB11-BG03-2830	Bkgrnd	•	•	•	•	•	•	•
RB11-BG04-0305	Bkgrnd	•	•	•	•	•	•	•
RB11-BG04-0810	Bkgrnd	•	•	•	•	•	•	•
RB11-BG04-1315	Bkgrnd	•	•	•	•	•	•	•
RB11-BG04-1820	Bkgrnd	•	•	•	•	•	•	•
RB11-BG04-2325	Bkgrnd	•	•	•	•	•	•	•
RB11-BG04-2830	Bkgrnd	•	•	•	•	•	•	•
RB11-BG05-0305	Bkgrnd	•	•	•	•	•	•	•
RB11-BG05-0810	Bkgrnd	•	•	•	•	•	•	•

Table 2-2. Summary of Analytical Parameters (Concluded)

Sample Number ¹	Trench	VOCs EPA 8260	SVOCs EPA 8270	Metals EPA 6010 & 200.7, 7471	Cyanide EPA 9010A	Gross Alpha & Gross Beta EPA 900	Gamma Spec EPA 901.1	Soil Moisture/pH ASTM D2216/ EPA 9045
RB11-BG05-1315	Bkgrnd	•	•	•	•	•	•	•
RB11-BG05-1820	Bkgrnd	•	•	•	•	•	•	•
RB11-BG05-2325	Bkgrnd	•	•	•	•	•	•	•
RB11-BG05-2830	Bkgrnd	•	•	•	•	•	•	•
RB11-BG06-0305	Bkgrnd	•	•	•	•	•	•	•
RB11-BG06-0810	Bkgrnd	•	•	•	•	•	•	•
RB11-BG06-1315	Bkgrnd	•	•	•	•	•	•	•
RB11-BG06-1820	Bkgrnd	•	•	•	•	•	•	•
RB11-BG06-2325	Bkgrnd	•	•	•	•	•	•	•
RB11-BG06-2830	Bkgrnd	•	•	•	•	•	•	•
QC Samples a								
Trip Blank b		15	0	0	0	0	0	0
Equip Rinsate c		15	15	15	15	15	15	15
Field Duplicate d		16	16	16	16	16	16	16
MSD Samples e		8	8	8	8	8	8	8

Footnotes on the following page

¹ **Sample Number** denotes SWMU designation (per previous IRP classification)—borehole number—sampling interval relative to ft bgs; i.e., sample number RB11-37-0305 would be the soil sample collected at RB11 from borehole 37 at a sampling interval of 3 to 5 ft bgs.

- a Estimated field quality control (QC) samples.
- b **Trip Blanks**—Samples which originate from analyte-free water taken from the laboratory to the sampling site and returned to the laboratory with the VOC samples. One trip blank per cooler containing VOC samples. Trip blanks are analyzed for VOCs only.
- c **Equipment Rinse Blanks**—Collected for each type of nondedicated sampling equipment used and analyzed for the same parameters as the samples they are used to collect. Equipment blanks will be collected and sent to the laboratory on a daily basis. Only equipment blanks collected every other day will be analyzed.
- d **Field Duplicates**—A single sample split into two portions during a single act of sampling. Assesses the overall precision of the sampling and analysis program. Collected at a frequency of 10% of the total number of samples for chemical analyses and analyzed for the same parameters as equivalent samples.
- e **Matrix Spike Duplicate (MSD)** for laboratory quality control, collected 1 in 20 samples (5 % frequency).

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