Sampling and Analysis Plan for Potential Release Sites

35-008, 35-010(a through e), 35-014(e_1 and g_3), 35-015(a), and 35-016(k, l, and o)

Field Unit 4

Environmental Restoration Project

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TABLE OF CONTENTS

ACRONYMS AND ABBREVIATIONS **ACR-1**

1.0 INTRODUCTION **1**

1.1 Regulatory Drivers 1

2.0 PROBLEM DEFINITION AND DESIGN OF SAMPLING AND ANALYSIS PLAN **4**

2.1 PRS Nos. 35-008 and 35-014(e_1) 4

2.1.1 Summary of Historical Data 5

2.1.2 Problem Statement 13

2.1.3 Sampling and Analysis Plan Design 14

2.2 PRS Nos. 35-010(a, b, and c) 15

2.2.1 Summary of Historical Data 16

2.2.2 Problem Statement 21

2.2.3 Sampling and Analysis Plan Design 22

2.3 PRS Nos. 35-010(d and e) 24

2.3.1 Summary of Historical Data 28

2.3.2 Problem Statement 28

2.3.3 Sampling and Analysis Plan Design 31

2.4 PRS No. 35-014(g_3) 31

2.4.1 Summary of Historical Data 32

2.4.2 Problem Statement 33

2.4.3 Sampling and Analysis Plan Design 36

2.5 PRS No. 35-015(a) 37

2.5.1 Summary of Historical Data 38

2.5.2 Problem Statement 42

2.5.3 Sampling and Analysis Plan Design 42

2.6 PRS Nos. 35-016(k and l) 43

2.6.1 Summary of Historical Data 44

2.6.2 Problem Statement 44

2.6.3 Sampling and Analysis Plan Design 47

2.7 PRS No. 35-016(o) 47

2.7.1 Summary of Historical Data 48

2.7.2 Problem Statement 51

2.7.3 Sampling and Analysis Plan Design 51

3.0 DATA USE AND DATA QUALITY REQUIREMENTS 53

3.1 Use of Data To Meet SAP Objectives 53

3.2 Requirements for Data Quality 54

4.0 SAMPLING AND ANALYSIS PLAN IMPLEMENTATION 55

4.1 Field Methods 55

4.2 Measurement Methods 57

4.3 Field Decisions 59

4.3.1 Biased Sampling from Borehole Cores Based on Geological Criteria 59

4.3.1.1 Backfill/Tuff Interface 59

4.3.1.2 Fracture Fill Material 59

4.3.2 Biased Sampling from Borehole Cores Based on Field Beta/Gamma Radiation Measurements 59

4.4 Sample Handling 60

4.5 Data Tracking 60

5.0 DATA ASSESSMENT 60

5.1 Verification and Routine Validation 60

5.2 Data Quality Assessment 60

6.0 ADMINISTRATION 60

6.1 Project Task Organization 60

6.2 Training 61

6.3 Records 61

6.4 Oversight 62

6.5 Inspection and Acceptance Policies 63

6.6 Reports to Management 63

7.0 REFERENCES 63

ATTACHMENT

Data Tables A-1

FIGURES

1-1 Location of TA-35 with respect to Laboratory technical areas and surrounding land holdings 2

1-2 Areas where potential release sites at TA-35 are located 3

2.1.1-1 Existing and proposed sample locations for PRS Nos. 35-008 and 35-014(e_1) 11

2.1.1-2 Existing and proposed Location ID Nos. for PRS Nos. 35-008 and 35-014(e_1) 12

2.2.1-1 Existing sample locations for PRS Nos. 35-010(a, b, and c) 17

2.2.1-2 Cross section A–A' of borehole 35-2216 and cross section B–B' of borehole 35-2069 20

2.2.3-1 Sections of inactive sewage lagoons used to determine sample locations for PRS Nos. 35-010(a, b, and c) 25
2.3-1 Plot of discharge data for NPDES outfall EPA-SSS-10S 27
2.3.1-1 Existing and proposed sample locations for PRS Nos. 35-010(d and e) 29
2.4.1-1 Existing and proposed sample locations for PRS No. 35-014(g_3) 35
2.5.1-1 Existing and proposed sample locations for PRS No. 35-015(a) 41
2.6.1-1 Existing and proposed sample locations for PRS Nos. 35-016(k and l) 45
2.7.1-1 Existing and proposed sample locations for PRS No. 35-016(o) 49

TABLES

2.1.1-1 Summary of RFI Samples Taken at PRS Nos. 35-008 and 35-014(e_1) 6
2.1.3-1 Summary of Proposed Sampling for PRS Nos. 35-008 and 35-014(e_1) 15
2.2.1-1 Summary of RFI Samples Taken at PRS Nos. 35-010(a, b, and c) 18
2.2.3-1 Summary of Proposed Sampling for PRS Nos. 35-010(a, b, and c) 26
2.3-1 Summary of Discharge Data for NPDES Outfall EPA-SSS-10S 27
2.3.1-1 Summary of RFI Samples Taken at PRS Nos. 35-010(d and e) 30
2.3.3-1 Summary of Proposed Sampling for PRS Nos. 35-010(d and e) 32
2.4.1-1 Summary of RFI Samples Taken at PRS No. 35-014(g_3) 34
2.4.3-1 Summary of Proposed Sampling for PRS No. 35-014(g_3) 37
2.5.1-1 Summary of RFI Samples Taken at PRS No. 35-015(a) 39
2.5.3-1 Summary of Proposed Sampling for PRS No. 35-015(a) 43
2.6.1-1 Summary of RFI Samples Taken at PRS Nos. 35-016(k and l) 46
2.6.3-1 Summary of Proposed Sampling for PRS Nos. 35-016(k and l) 47
2.7.1-1 Summary of RFI Samples Taken at PRS No. 35-016(o) 50
2.7.3-1 Summary of Proposed Sampling for PRS No. 35-016(o) 52
4.1-1 Summary of Requirements for Soil and Water Sampling Methods 56
4.2-1 Analyte Suites and Analytical Methods for Analysis of Organic Chemicals in Soil and Water Samples 57
4.2-2 Analyte List, Estimated Detection Limits, and Analytical Methods for Inorganic Chemicals in Soil and Surface Runoff Water Samples 58
4.2-3 Analyte List, Estimated Quantitation Limits, and Analytical Methods for Radionuclides in Soil Samples 59
6.1-1 Field Unit 4 Key Personnel 61
6.3-1 Field Activity Documentation 62

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ACRONYMS AND ABBREVIATIONS

CMP	corrugated metal pipe
COPC	chemical of potential concern
cpm	counts per minute
CVAA	cold vapor atomic absorption
DOE	Department of Energy
DOE/LAAO	Los Alamos Area Office of the Department of Energy
EDL	estimated detection limit
EPA	Environmental Protection Agency
EQL	estimated quantitation limit
ER	Environmental Restoration
FIMAD	Facility for Information Management, Analysis, and Display
FTL	field team leader
FU	field unit
GC/ECD	gas chromatography/electron capture detector
GC/FID	gas chromatography/flame ionization detector
GC/MS	gas chromatography/mass spectrometry
GFAA	graphite furnace atomic absorption
GPD	gallons per day
H&S	health and safety
HSWA	Hazardous and Solid Waste Amendments
ICPES	inductively coupled plasma emission spectroscopy
ICPMS	inductively coupled plasma mass spectrometry
J	The analyte was positively identified, and the associated numerical value is the approximate concentration of the analyte in the sample.
J+	Reported value is an estimate and likely biased high.
J–	Reported value is an estimate and likely biased low.
LAS	large area swipe
NA	not analyzed
N/A	not applicable
N.A.	not available
ND	not detected
NM	New Mexico
NPDES	National Pollutant Discharge Elimination System
NR	not requested
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PID	photoionization detector

PPE	personal protective equipment
ppm	parts per million
PRS	potential release site
QAPP	quality assurance project plan
QA/QC	quality assurance/quality control
Qbt2	cooling unit 2 of the Tshirege Member of the Bandelier Tuff
Qbt3	cooling unit 3 of the Tshirege Member of the Bandelier Tuff
QC	quality control
R	The sample results are rejected because of serious deficiencies in the ability to analyze the sample and meet quality control criteria; presence or absence cannot be verified.
RCRA	Resource Conservation and Recovery Act
RCT	radiological control technician
RFI	RCRA facility investigation
RPF	Records-Processing Facility
S	The sample results were obtained using a screening analytical method performed in a mobile laboratory.
SAL	screening action level
SAP	sampling and analysis plan
SMO	Sample Management Office
SOP	standard operating procedures
SSHASP	site-specific health and safety plan
SVOC	semivolatile organic compound
SWMU	solid waste management unit
TA	Technical Area
TPH	total petroleum hydrocarbons
U	The analyte was analyzed for but not detected. Reported value is the sample quantitation limit or detection limit.
UCL	upper confidence limit
UJ	The analyte was analyzed for but not detected. Reported value is an estimate of the sample quantitation limit or detection limit.
UTL	upper tolerance limit
VOC	volatile organic compound
WQCC	Water Quality Control Commission
XRF	x-ray fluorescence

1.0 INTRODUCTION

This sampling and analysis plan (SAP) addresses supplemental sample collection at Technical Area (TA) -35 to confirm the presence or absence of contamination and to define the extent of contaminants at Potential Release Site (PRS) Nos. 35-008, 35-010(a through e), 35-014(e_1 and g_3), 35-015(a), and 35-016(k, l, and o). A single SAP has been written for these PRSs because the data collection requirements are similar.

A primary component of this SAP is the collection of additional gamma spectroscopy data at several of the PRSs. Mobile laboratory gamma spectroscopy data collected during the Phase I Resource Conservation and Recovery Act (RCRA) facility investigation (RFI) are unusable for site decisions. Therefore, additional samples will be collected and analyzed for gamma-emitting radionuclides as necessary to fulfill the objectives of the Phase I SAPs submitted as part of the *RFI Work Plan for Operable Unit 1129* (LANL 1992, 7666) (hereafter referred to as "the work plan") and the addendum to the work plan (Pratt 1994, 43475).

The goal of the Phase I SAPs was to confirm the presence or absence of Laboratory-derived contamination at the TA-35 PRSs. At some PRSs, the numbers or locations of samples collected or the quality of the analytical data were not adequate to determine the presence or absence of contaminants. This SAP recommends sampling to meet the goal of the work plan for those PRSs. At some PRSs, chemicals of potential concern (COPCs) have already been identified. Therefore, this SAP also includes additional sampling to determine the extent of contamination at these PRSs. Data for establishing the extent of contamination may be used to confirm assumptions regarding environmental transport and redistribution of contaminants. In addition, this SAP describes sampling of surface runoff water at some of the PRSs. The runoff water sampling activity results will answer questions related to surface water concerns for PRSs that potentially discharge into canyon watercourses.

The PRSs in this SAP are addressed individually in Section 2.0 with the following exceptions. PRS Nos. 35-008 and 35-014(e_1) are addressed collectively because of their geographic proximity and similar sampling requirements. For the same reasons, PRS Nos. 35-010(a, b, and c), PRS Nos. 35-010 (d and e), and PRS Nos. 35-016(k and l) are also addressed collectively. Figure 1-1 shows the location of TA-35; Figure 1-2 shows the locations of the PRSs addressed in this SAP.

1.1 Regulatory Drivers

Sampling is primarily driven by the Module VIII Hazardous and Solid Waste Amendments (HSWA) of the Laboratory's hazardous waste facility permit, which was issued on May 23, 1990 (EPA 1990, 1585) and modified on May 19, 1994.

State regulatory drivers may include the following.

State of New Mexico's (NM) Water Quality Act and implementing regulations

- NM Environment Department Drinking Water Regulations (1995, 55501)
- NM Water Quality Control Commission (WQCC) Standards for Interstate and Intrastate Streams (1995, 50265)
- NM WQCC Ground and Surface Water Quality Protection Regulations (1995, 54406)

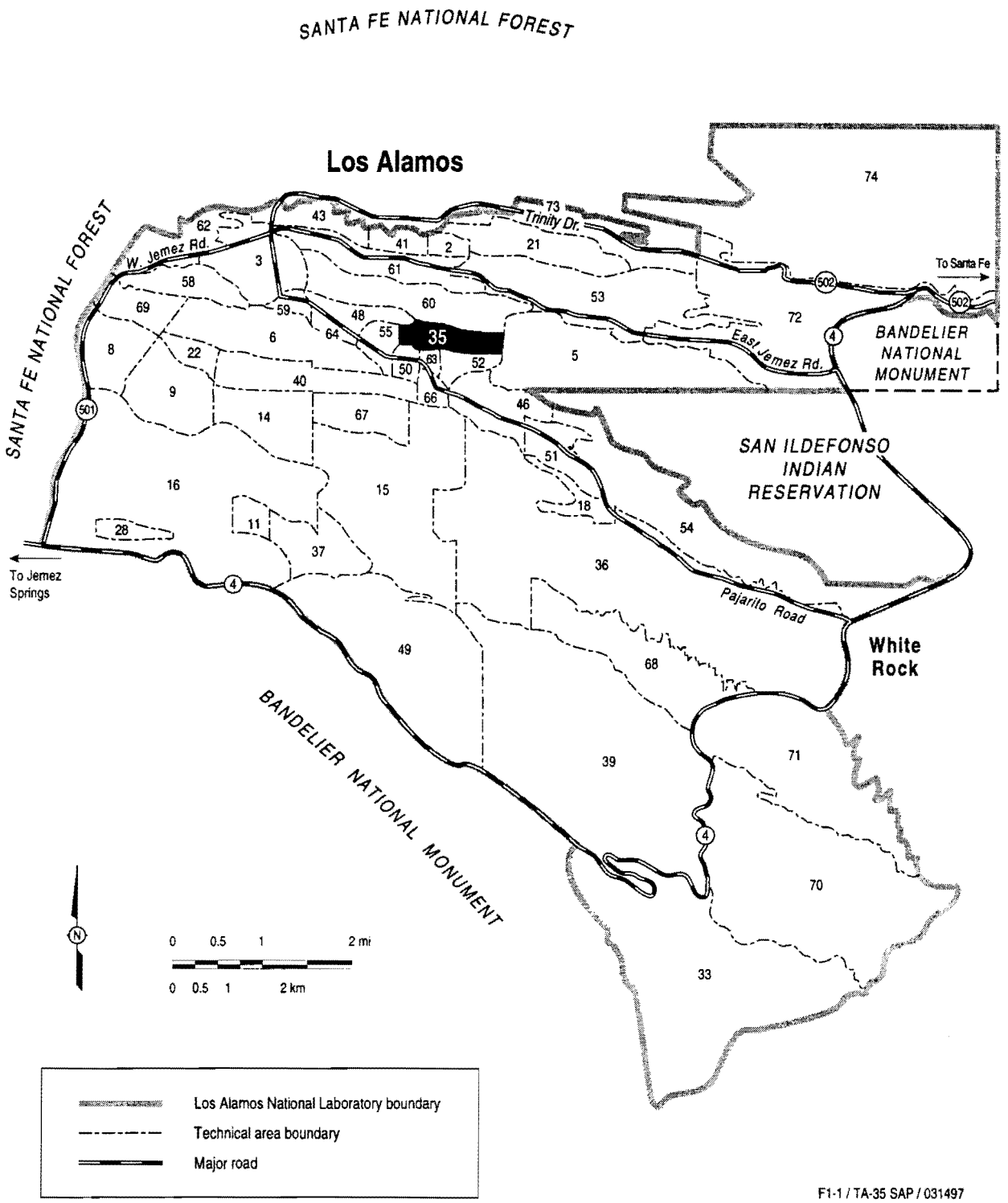
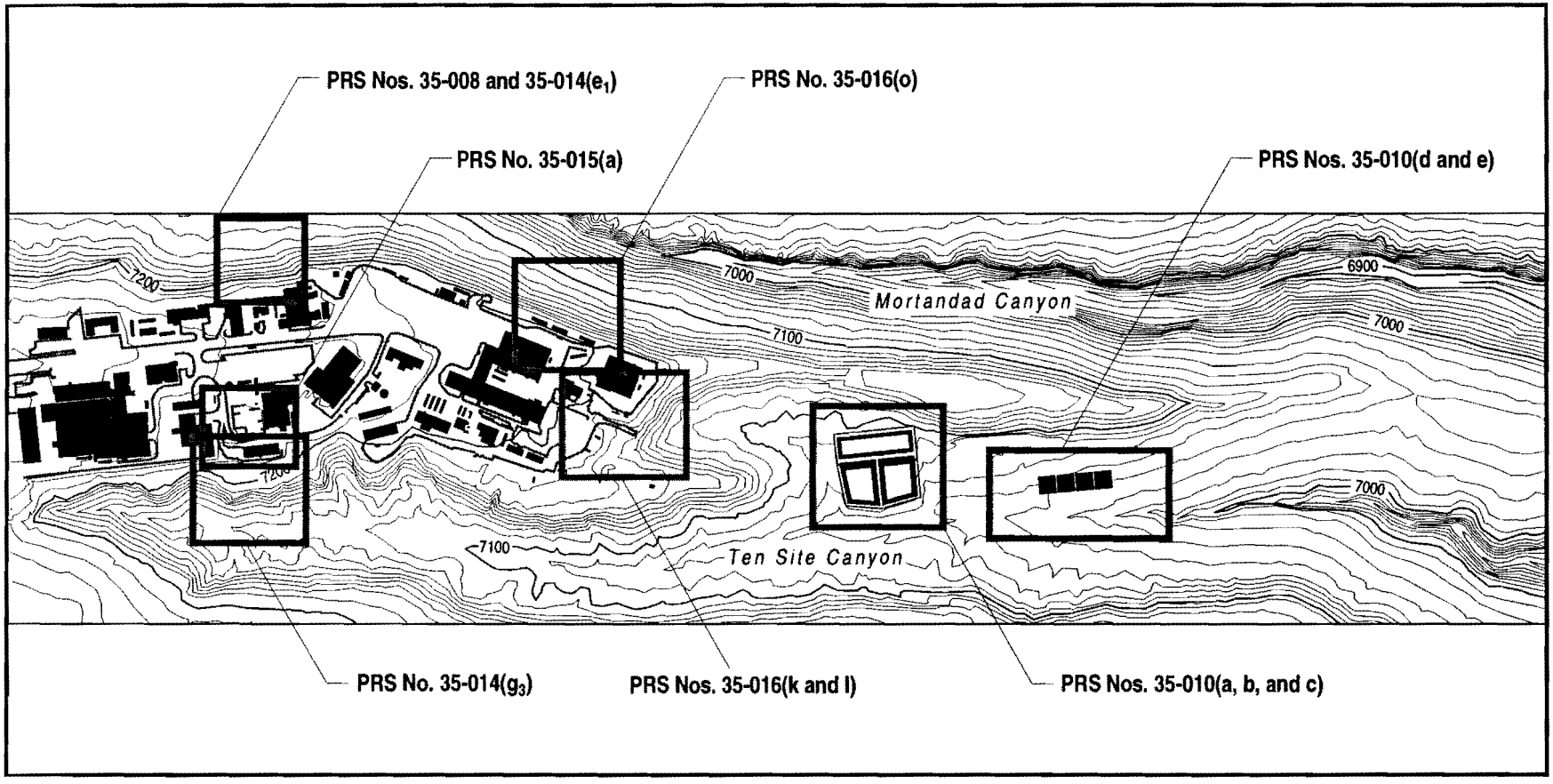


Figure 1-1. Location of TA-35 with respect to Laboratory technical areas and surrounding land holdings.



Source: FIMAD G105318

F1-2 / TA-35 SAP / 031897

Figure 1-2. Areas where potential release sites at TA-35 are located.

- NM Solid Waste Act and implementing regulations
- NM Hazardous Waste Act and implementing regulations
- NM Radioactive and Hazardous Materials Act and implementing regulations

Federal regulatory drivers may include the following.

- The Federal Facilities Compliance Act and implementing regulations
- The Toxic Substances Control Act and implementing regulations
- RCRA/HSWA Acts and implementing regulations

Federal regulatory drivers may also include the Clean Water Act and implementing regulations.

An additional standard for radiological contaminants is Department of Energy (DOE) Order 5400.5, "Radiation Protection of the Public and the Environment." In 1993 this DOE order was issued as a Proposed Rule in the Federal Register (58-FR-16268) and covers, among other topics, establishment of dose limits to the public from operations that are under DOE control.

2.0 PROBLEM DEFINITION AND DESIGN OF SAMPLING AND ANALYSIS PLAN

2.1 PRS Nos. 35-008 and 35-014(e_1)

These PRSs are located on the north side of Ten Site Mesa, which has a slope of about 30% into Mortandad Canyon. A storm drain outfall discharges to the central part of the disposal area near the oil spill and has created a drainage channel that is highly incised and contains asphalt and other debris. The ground surface is covered with grasses and shrubs, a few pine trees, pine needle debris, and leaves.

PRS No. 35-008 primarily comprises construction debris. The site was reported to include scrap metal and pipe, paint cans, a 55-gal. drum, and miscellaneous building material trash including a large concrete slab, conduits, asphalt, pipe, and reinforcing rods. During a site inspection in 1991 (Roberson 1991, 21576) only a small amount of debris (tubing, scrap metal, and soda cans) was observed at the PRS. The site has probably been in existence since 1977 when the Chemical Laser Facility (TA-35-85) was constructed. Debris associated with the PRS extends approximately 100 ft along the upper portion of the mesa edge and down the mesa slope approximately 50 ft.

PRS No. 35-014(e_1) is an area of oil-stained soil on the northern edge of Ten Site Mesa that is associated with a dielectric oil spill that occurred east of building TA-35-188 when a forklift punctured an aboveground oil storage tank. The oil tank was removed before 1992. The amount of oil that was spilled is unknown; however, it was reported that the spill may have flowed northward to the mesa edge and partially down the mesa slope. A 1984 photograph indicates that the spill flowed down the side of the mesa. Reports also suggest that oil-stained soil may have been pushed over the edge of the mesa during cleanup of the spill, although no cleanup of the spill or the PRS site has been documented. After the oil spill, a long, narrow laser corridor extension to TA-35-85 was built between TA-35-188 and the edge of the mesa to house laser experiments. This building extension covers part of the area of the reported oil spill, and construction of this building extension may have included site leveling, soil stabilization, and possibly extension and stabilization of the mesa edge by backfilling with soil and riprap materials.

At PRS No. 35-014(e_1), oil is visible on the slope near the edge of the mesa as dark stained soil that covers an area of backfill material about 15 ft by 10 ft. The occasional odor of hydrocarbons is present at the site. No stained soils or odors are apparent on the mesa top north of TA-35-85.

2.1.1 Summary of Historical Data

The addendum to the work plan and the final SAP documentation (Pratt 1995, 43528; Pratt 1994, 46026) stated that 28 locations would be sampled to characterize radionuclides, polychlorinated biphenyls (PCBs), volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), polycyclic aromatic hydrocarbons (PAHs), and inorganic chemicals at PRS Nos. 35-008 and 35-014(e_1). Sample locations were to include three depth intervals (0 to 1 ft, 1 to 2 ft, and 2 to 3 ft) for a total of 84 individual samples.

Phase I sampling was performed on June 23 and 24, 1994, and March 15, 17, 20, and 22, 1995. Eighty-four samples were collected from 28 locations (not including duplicate quality assurance/quality control [QA/QC] samples). Twenty-eight hand-auger holes were drilled to a depth of 3 ft. The sample collection intervals are shown in Table 2.1.1-1. Beta/gamma radiation measurements obtained during field screening of the samples ranged from 170 to 420 counts per minute (cpm), which are within background levels.

On December 11, 1995, supplemental sampling was performed to resample Location ID Nos. 35-2032 and 35-2253 (see Figure 2.1.1-1 and Figure 2.1.1-2) because the original sample material was lost at the analytical laboratory. Two hand-auger holes were drilled to a depth of 2 ft. At location ID No. 35-2282 (formerly Location ID No. 35-2253) a surface sample was collected, and a subsurface sample was collected at the 1- to 2-ft interval. At Location ID No. 35-2283 (formerly Location ID No. 35-2032) a subsurface sample was collected at the 1- to 2-ft interval. Beta/gamma radiation measurements obtained during field screening of the samples were all 100 cpm, which are within background levels.

The existing sample locations for PRS Nos. 35-008 and 35-014(e_1) are shown in Figure 2.1.1-1 and Figure 2.1.1-2. A summary of the samples that were collected and the associated analyses is presented in Table 2.1.1-1. The analytical data are presented in the attachment of this SAP.

The following analyses were performed.

- Eighteen samples were analyzed for inorganic chemicals using energy dispersive x-ray fluorescence (XRF). Three samples were analyzed for inorganic chemicals using Environmental Protection Agency (EPA) SW-846 methods. Table A-1 in the attachment of this SAP contains the results for inorganic chemical analysis.

- At a fixed-site laboratory, 19 samples were analyzed for alpha-emitting radionuclides, and 1 sample was analyzed by gamma spectroscopy. Table A-2 in the attachment of this SAP contains the fixed-site laboratory results for radionuclides.

- Thirty-three samples were analyzed for VOCs in the mobile laboratory. Six samples were analyzed for VOCs at a fixed-site laboratory. Seventeen samples were analyzed for PAHs in the mobile laboratory. Seventeen samples were analyzed for SVOCs in the mobile laboratory. Seven samples were analyzed for SVOCs at a fixed-site laboratory. Eighty-six samples were analyzed for PCBs in the mobile laboratory. Eight samples were analyzed for PCBs at a fixed-site laboratory. Three samples were analyzed for diesel-range total petroleum hydrocarbons (TPH) at a fixed-site laboratory. See Table 2.1.1-1 to associate analytical suites with specific samples. Table A-3 in The attachment of this SAP contains the results for organic chemical analysis.

TABLE 2.1.1-1

SUMMARY OF RFI SAMPLES TAKEN AT PRS Nos. 35-008 AND 35-014(e_1)[a]

Part 1

PRS	Location ID	Sample ID	Depth (ft)	Media	VOCs Mobile Lab	VOCs Fixed Lab	SVOCs Mobile Lab	SVOCs Fixed Lab	PCBs Mobile Lab	PCBs Fixed Lab
35-008	35-2032	AAB4269	0–0.5	Soil	17861	NR[b]	17861	NR	17861	NR
35-008	35-2032	AAB4270	1–2	Soil	17861	NR	NR	NR	NR	NR
35-008	35-2032	AAB4271	2–3	Soil	17861	NR	17861	NR	17861	NR
35-008	35-2213	AAB4272	0–0.5	Soil	17861	NR	17861	NR	17861	NR
35-008	35-2213	AAB4273	0–0.5	Soil	17861	NR	17861	NR	17861	NR
35-008	35-2213	AAB4274	1–2	Soil	17861	NR	17861	NR	17861	NR
35-008	35-2213	AAB4275	2–3	Soil	17861	NR	17861	NR	17861	NR
35-008	35-2250	AAB4276	0–0.5	Soil	17894	17890	17894	17890	NR	17890
35-008	35-2250	AAB4277	1–2	Qbt3	17894	NR	17894	NR	17894	NR
35-008	35-2250	AAB4278	2–3	Qbt3	17894	NR	17894	NR	17894	NR
35-008	35-2251	XAAB4257	0–0.5	Soil	17861	NR	17861	NR	17861	NR
35-008	35-2251	XAAB4258	1–2	Qbt3	17861	NR	17861	NR	17861	NR
35-008	35-2251	XAAB4259	2–3	Qbt3	17861	17859	17861	NR	17861	NR
35-008	35-2252	XAAB4260	0–0.5	Soil	17894	NR	17894	NR	17894	NR
35-008	35-2252	XAAB4261	1–2	Qbt3	17894	NR	17894	NR	17894	NR
35-008	35-2252	XAAB4262	2–3	Qbt3	17894	NR	17894	NR	17894	NR

Part 2

PRS	Location ID	Sample ID	Depth (ft)	Media	XRF Mobile Lab	Inorganic Fixed Lab	Alpha Spec Fixed Lab	Gamma Spec Mobile Lab	Gamma Spec Fixed Lab
35-008	35-2032	AAB4269	0–0.5	Soil	19541	19653	19551	18965	NR
35-008	35-2032	AAB4270	1–2	Soil	19541	NR	19551	18965	NR
35-008	35-2032	AAB4271	2–3	Soil	19541	NR	19551	18965	NR
35-008	35-2213	AAB4272	0–0.5	Soil	19541	NR	19551	18965	NR
35-008	35-2213	AAB4273	0–0.5	Soil	19541	NR	19551	18965	NR
35-008	35-2213	AAB4274	1–2	Soil	NR	NR	19551	18965	NR
35-008	35-2213	AAB4275	2–3	Soil	19541	NR	19551	18965	NR
35-008	35-2250	AAB4276	0–0.5	Soil	18537	NR	18791	18966	NR
35-008	35-2250	AAB4277	1–2	Qbt3	18537	NR	18791	18966	18791
35-008	35-2250	AAB4278	2–3	Qbt3	18537	NR	18791	18966	NR
35-008	35-2251	XAAB4257	0–0.5	Soil	19541	19653	19551	18965	NR
35-008	35-2251	XAAB4258	1–2	Qbt3	19541	NR	19551	18965	NR
35-008	35-2251	XAAB4259	2–3	Qbt3	19541	NR	19551	18965	NR
35-008	35-2252	XAAB4260	0–0.5	Soil	18537	NR	18791	18966	NR
35-008	35-2252	XAAB4261	1–2	Qbt3	18537	NR	18791	18966	NR
35-008	35-2252	XAAB4262	2–3	Qbt3	18537	NR	18791	18966	NR

a. The numbers in the analytical suite columns are analytical request numbers.
b. Not requested

TABLE 2.1.1-1 (continued)

SUMMARY OF RFI SAMPLES TAKEN AT PRS Nos. 35-008 AND 35-014(e_1)[a]

Part 1

PRS	Location ID	Sample ID	Depth (ft)	Media	VOCs Mobile Lab	SVOCs Mobile Lab	SVOCs Fixed Lab	PAH Mobile Lab	PCBs Mobile Lab	PCBs Fixed Lab
35-008	35-2253	XAAB4263	0–0.5	Soil	17894	NR[b]	17890	NR	NR	17890
35-008	35-2253	XAAB4264	1–2	Soil	17894	17894	NR	NR	17894	NR
35-008	35-2253	XAAB4265	2–3	Soil	17894	17894	NR	NR	17894	NR
35-008	35-2282	0435-95-0202	0–0.5	Soil	NR	NR	1678	NR	NR	NR
35-008	35-2282	0435-95-0203	1–2	Soil	NR	NR	1678	NR	NR	NR
35-008	35-2283	0435-95-0204	1–2	Soil	NR	NR	1678	NR	NR	1678
35-014(e_1)	35-2122	AAC1213	0–1	Soil	21641	NR	NR	21641	21641	NR
35-014(e_1)	35-2122	AAC1228	0–1	Soil	21641	NR	NR	21641	21641	NR
35-014(e_1)	35-2122	AAC1214	1–2	Soil	NR	NR	NR	NR	21641	NR
35-014(e_1)	35-2122	AAC1215	2–3	Soil	NR	NR	NR	NR	21641	NR
35-014(e_1)	35-2123	AAC1216	0–1	Soil	NR	NR	NR	NR	21747	NR
35-014(e_1)	35-2123	AAC1217	1–2	Soil	NR	NR	NR	NR	21747	NR
35-014(e_1)	35-2123	AAC1218	2–3	Soil	NR	NR	NR	NR	21747	NR
35-014(e_1)	35-2124	AAC1219	0–1	Soil	NR	NR	NR	NR	21747	NR
35-014(e_1)	35-2124	AAC1220	1–2	Soil	21747	NR	NR	21747	21747	NR
35-014(e_1)	35-2124	AAC1221	2–3	Soil	NR	NR	NR	NR	21747	NR

Part 2

PRS	Location ID	Sample ID	Depth (ft)	Media	TPH Fixed Lab	XRF Mobile Lab	Inorganic Fixed Lab	Alpha Spec Fixed Lab	Gamma Spec Mobile Lab
35-008	35-2253	XAAB4263	0–0.5	Soil	NR	18537	NR	18791	18966
35-008	35-2253	XAAB4264	1–2	Soil	NR	18537	NR	18791	18966
35-008	35-2253	XAAB4265	2–3	Soil	NR	18537	NR	18791	18966
35-008	35-2282	0435-95-0202	0–0.5	Soil	1678	NR	NR	NR	1678
35-008	35-2282	0435-95-0203	1–2	Soil	1678	NR	1679	NR	1678
35-008	35-2283	0435-95-0204	1–2	Soil	1678	NR	NR	NR	1678
35-014(e_1)	35-2122	AAC1213	0–1	Soil	NR	NR	NR	NR	21640
35-014(e_1)	35-2122	AAC1228	0–1	Soil	NR	NR	NR	NR	21640
35-014(e_1)	35-2122	AAC1214	1–2	Soil	NR	NR	NR	NR	21640
35-014(e_1)	35-2122	AAC1215	2–3	Soil	NR	NR	NR	NR	21640
35-014(e_1)	35-2123	AAC1216	0–1	Soil	NR	NR	NR	NR	21745
35-014(e_1)	35-2123	AAC1217	1–2	Soil	NR	NR	NR	NR	21745
35-014(e_1)	35-2123	AAC1218	2–3	Soil	NR	NR	NR	NR	21745
35-014(e_1)	35-2124	AAC1219	0–1	Soil	NR	NR	NR	NR	21745
35-014(e_1)	35-2124	AAC1220	1–2	Soil	NR	NR	NR	NR	21745
35-014(e_1)	35-2124	AAC1221	2–3	Soil	NR	NR	NR	NR	21745

a. The numbers in the analytical suite columns are analytical request numbers.
b. Not requested

TABLE 2.1.1-1 (continued)

SUMMARY OF RFI SAMPLES TAKEN AT PRS Nos. 35-008 AND 35-014(e_1)[a]

Part 1

PRS	Location ID	Sample ID	Depth (ft)	Media	VOCs Mobile Lab	VOCs Fixed Lab	SVOCs Fixed Lab	PAH Mobile Lab
35-014(e_1)	35-2125	AAC1222	0–1	Soil	NR[b]	NR	NR	NR
35-014(e_1)	35-2125	AAC1223	1–2	Soil	NR	NR	NR	NR
35-014(e_1)	35-2125	AAC1224	2–3	Soil	NR	NR	NR	NR
35-014(e_1)	35-2126	AAC1225	0–1	Soil	NR	NR	NR	NR
35-014(e_1)	35-2126	AAC1226	1–2	Soil	NR	NR	NR	21598
35-014(e_1)	35-2126	AAC1227	2–3	Soil	21598	21576	21576	21598
35-014(e_1)	35-2127	AAC1229	0–1	Soil	NR	NR	NR	21597
35-014(e_1)	35-2127	AAC1230	1–2	Soil	NR	NR	NR	NR
35-014(e_1)	35-2127	AAC1231	2–3	Soil	NR	NR	NR	NR
35-014(e_1)	35-2128	AAC1232	0–1	Soil	21598	21576	NR	21597
35-014(e_1)	35-2128	AAC1233	1–2	Soil	NR	NR	NR	NR
35-014(e_1)	35-2128	AAC1234	2–3	Soil	NR	NR	NR	NR
35-014(e_1)	35-2129	AAC1235	0–1	Soil	NR	NR	NR	NR
35-014(e_1)	35-2129	AAC1236	1–2	Soil	NR	NR	NR	NR
35-014(e_1)	35-2129	AAC1237	1–2	Soil	NR	NR	NR	NR
35-014(e_1)	35-2129	AAC1238	2–3	Soil	NR	NR	NR	NR

Part 2

PRS	Location ID	Sample ID	Depth (ft)	Media	Pest Fixed Lab	PCBs Mobile Lab	PCBs Fixed Lab	Gamma Spec Mobile Lab
35-014(e_1)	35-2125	AAC1222	0–1	Soil	NR	21598	NR	21597
35-014(e_1)	35-2125	AAC1223	1–2	Soil	NR	21598	NR	21597
35-014(e_1)	35-2125	AAC1224	2–3	Soil	NR	21598	NR	21597
35-014(e_1)	35-2126	AAC1225	0–1	Soil	NR	21598	NR	21597
35-014(e_1)	35-2126	AAC1226	1–2	Soil	NR	21598	NR	21597
35-014(e_1)	35-2126	AAC1227	2–3	Soil	21576	21598	21576	21597
35-014(e_1)	35-2127	AAC1229	0–1	Soil	NR	21598	NR	21597
35-014(e_1)	35-2127	AAC1230	1–2	Soil	NR	21598	NR	21597
35-014(e_1)	35-2127	AAC1231	2–3	Soil	NR	21598	NR	21597
35-014(e_1)	35-2128	AAC1232	0–1	Soil	NR	21598	NR	21597
35-014(e_1)	35-2128	AAC1233	1–2	Soil	NR	21598	NR	21597
35-014(e_1)	35-2128	AAC1234	2–3	Soil	NR	21598	NR	21597
35-014(e_1)	35-2129	AAC1235	0–1	Soil	NR	21598	NR	21597
35-014(e_1)	35-2129	AAC1236	1–2	Soil	NR	21598	NR	21597
35-014(e_1)	35-2129	AAC1237	1–2	Soil	NR	21598	NR	21597
35-014(e_1)	35-2129	AAC1238	2–3	Soil	NR	21598	NR	21597

a. The numbers in the analytical suite columns are analytical request numbers.
b. Not requested

TABLE 2.1.1-1 (continued)

SUMMARY OF RFI SAMPLES TAKEN AT PRS Nos. 35-008 AND 35-014(e_1)[a]

Part 1

PRS	Location ID	Sample ID	Depth (ft)	Media	VOCs Mobile Lab	SVOCs Fixed Lab	PAH Mobile Lab
35-014(e_1)	35-2130	AAC1239	0–1	Soil	NR[b]	NR	NR
35-014(e_1)	35-2130	AAC1240	1–2	Soil	21598	21576	21598
35-014(e_1)	35-2130	AAC1241	2–3	Soil	NR	NR	NR
35-014(e_1)	35-2131	AAC1242	0–1	Soil	NR	NR	NR
35-014(e_1)	35-2131	AAC1243	1–2	Soil	NR	NR	NR
35-014(e_1)	35-2131	AAC1244	2–3	Soil	NR	NR	NR
35-014(e_1)	35-2132	AAC1245	0–1	Soil	NR	NR	NR
35-014(e_1)	35-2132	AAC1246	1–2	Soil	NR	NR	NR
35-014(e_1)	35-2132	AAC1247	2–3	Soil	21747	NR	NR
35-014(e_1)	35-2132	AAC1248	2–3	Soil	21747	NR	NR
35-014(e_1)	35-2133	AAC1249	0–1	Soil	NR	NR	NR
35-014(e_1)	35-2133	AAC1250	1–2	Soil	NR	NR	NR
35-014(e_1)	35-2133	AAC1251	2–3	Soil	NR	NR	NR
35-014(e_1)	35-2134	AAC1252	0–1	Soil	21747	NR	21747
35-014(e_1)	35-2134	AAC1253	1–2	Soil	NR	NR	NR
35-014(e_1)	35-2134	AAC1254	2–3	Soil	NR	NR	NR

Part 2

PRS	Location ID	Sample ID	Depth (ft)	Media	Pest Fixed Lab	PCBs Mobile Lab	PCBs Fixed Lab	Gamma Spec Mobile Lab
35-014(e_1)	35-2130	AAC1239	0–1	Soil	NR	21598	NR	21597
35-014(e_1)	35-2130	AAC1240	1–2	Soil	21576	21598	21576	21597
35-014(e_1)	35-2130	AAC1241	2–3	Soil	NR	21598	NR	21597
35-014(e_1)	35-2131	AAC1242	0–1	Soil	NR	21598	NR	21597
35-014(e_1)	35-2131	AAC1243	1–2	Soil	NR	21598	NR	21597
35-014(e_1)	35-2131	AAC1244	2–3	Soil	NR	21598	NR	21597
35-014(e_1)	35-2132	AAC1245	0–1	Soil	NR	21747	NR	21745
35-014(e_1)	35-2132	AAC1246	1–2	Soil	NR	21747	NR	21745
35-014(e_1)	35-2132	AAC1247	2–3	Soil	NR	21747	NR	21745
35-014(e_1)	35-2132	AAC1248	2–3	Soil	NR	NR	NR	NR
35-014(e_1)	35-2133	AAC1249	0–1	Soil	NR	21747	NR	21745
35-014(e_1)	35-2133	AAC1250	1–2	Soil	NR	21747	NR	21745
35-014(e_1)	35-2133	AAC1251	2–3	Soil	NR	21747	NR	21745
35-014(e_1)	35-2134	AAC1252	0–1	Soil	NR	21747	NR	21745
35-014(e_1)	35-2134	AAC1253	1–2	Soil	NR	21747	NR	21745
35-014(e_1)	35-2134	AAC1254	2–3	Soil	NR	21747	NR	21745

a. The numbers in the analytical suite columns are analytical request numbers.
b. Not requested

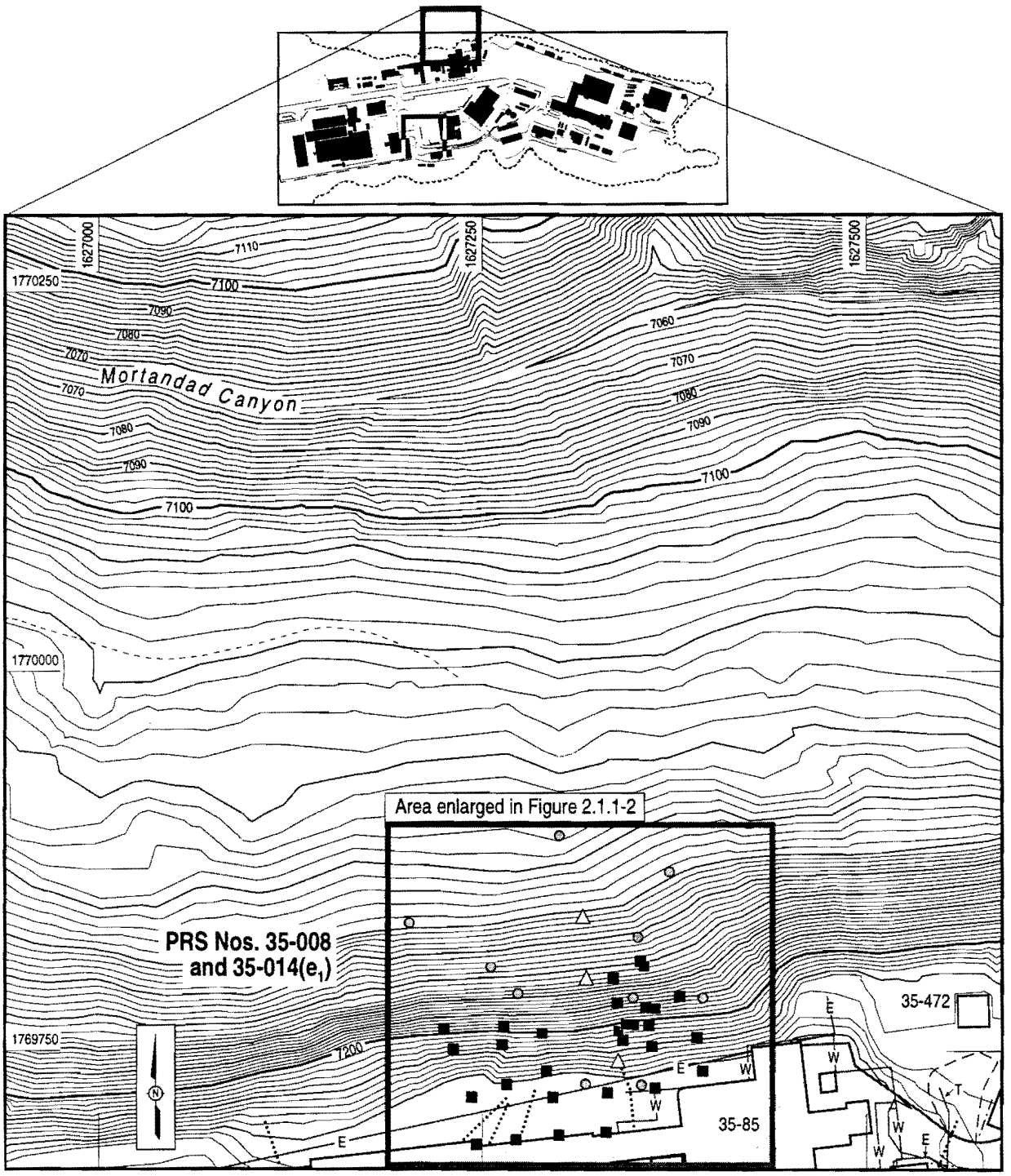
TABLE 2.1.1-1 (continued)

SUMMARY OF RFI SAMPLES TAKEN AT PRS Nos. 35-008 AND 35-014(e_1)[a]

PRS	Location ID	Sample ID	Depth (ft)	Media	VOCs Mobile Lab	VOCs Fixed Lab	PAH Mobile Lab	Pest Fixed Lab	PCBs Mobile Lab	PCBs Fixed Lab	Gamma Spec Mobile Lab
35-014(e_1)	35-2135	AAC1255	0–1	Soil	NR[b]	NR	NR	NR	21747	NR	21745
35-014(e_1)	35-2135	AAC1256	1–2	Soil	NR	NR	NR	NR	21747	NR	21745
35-014(e_1)	35-2135	AAC1257	2–3	Soil	NR	NR	NR	NR	21747	NR	21745
35-014(e_1)	35-2136	AAC1259	0–1	Soil	21641	21602	21641	NR	21641	NR	21640
35-014(e_1)	35-2136	AAC1260	1–2	Soil	NR	NR	NR	NR	21641	NR	21640
35-014(e_1)	35-2136	AAC1258	2–3	Soil	NR	NR	NR	21602	21641	21602	21640
35-014(e_1)	35-2137	AAC1261	0–1	Soil	NR	NR	21641	NR	21641	NR	21640
35-014(e_1)	35-2137	AAC1262	1–2	Soil	NR	NR	21641	NR	21641	NR	21640
35-014(e_1)	35-2137	AAC1263	2–3	Soil	NR	NR	21641	NR	21641	NR	21640
35-014(e_1)	35-2138	AAC1264	0–1	Soil	NR	NR	NR	NR	21610	NR	21609
35-014(e_1)	35-2138	AAC1265	1–2	Qbt3	NR	NR	NR	NR	21610	NR	21609
35-014(e_1)	35-2138	AAC1266	2–3	Qbt3	21610	21595	21610	NR	21610	NR	21609
35-014(e_1)	35-2139	AAC1267	0–1	Soil	NR	NR	NR	NR	21610	NR	21609
35-014(e_1)	35-2139	AAC1268	1–2	Soil	NR	NR	NR	NR	21610	NR	21609
35-014(e_1)	35-2139	AAC1269	2–3	Soil	NR	NR	NR	NR	21610	NR	21609
35-014(e_1)	35-2140	AAC1270	0–1	Soil	21610	NR	21610	NR	21610	NR	21609
35-014(e_1)	35-2140	AAC1271	0–1	Soil	21610	NR	NR	NR	NR	NR	NR
35-014(e_1)	35-2140	AAC1272	1–2	Soil	NR	NR	NR	21595	21595	21595	21609
35-014(e_1)	35-2140	AAC1273	2–3	Soil	NR	NR	NR	NR	21610	NR	21609
35-014(e_1)	35-2140	AAC1283	2–3	Soil	NR	NR	NR	NR	21610	NR	21609
35-014(e_1)	35-2141	AAC1274	0–1	Soil	NR	NR	NR	NR	21610	NR	21609
35-014(e_1)	35-2141	AAC1275	1–2	Soil	NR	NR	NR	NR	21610	NR	21609
35-014(e_1)	35-2141	AAC1276	2–3	Soil	NR	NR	21609	NR	21610	NR	21609
35-014(e_1)	35-2142	AAC1277	0–1	Soil	NR	NR	NR	21602	21641	21602	21640
35-014(e_1)	35-2142	AAC1278	1–2	Soil	21641	NR	21641	NR	21641	NR	21640
35-014(e_1)	35-2142	AAC1279	2–3	Soil	NR	NR	NR	NR	21641	NR	21640
35-014(e_1)	35-2142	AAC1284	2–3	Soil	NR	NR	NR	NR	21641	NR	21640
35-014(e_1)	35-2143	AAC1280	0–1	Soil	NR	NR	NR	NR	21641	NR	21640
35-014(e_1)	35-2143	AAC1281	1–2	Soil	NR	NR	NR	NR	21641	NR	21640
35-014(e_1)	35-2143	AAC1282	2–3	Soil	NR	NR	NR	NR	21641	NR	21640

a. The numbers in the analytical suite columns are analytical request numbers.

b. Not requested



Source: FIMAD G105244

F2.1.1-1 / TA-35 SAP / 031897

0 50 100 150

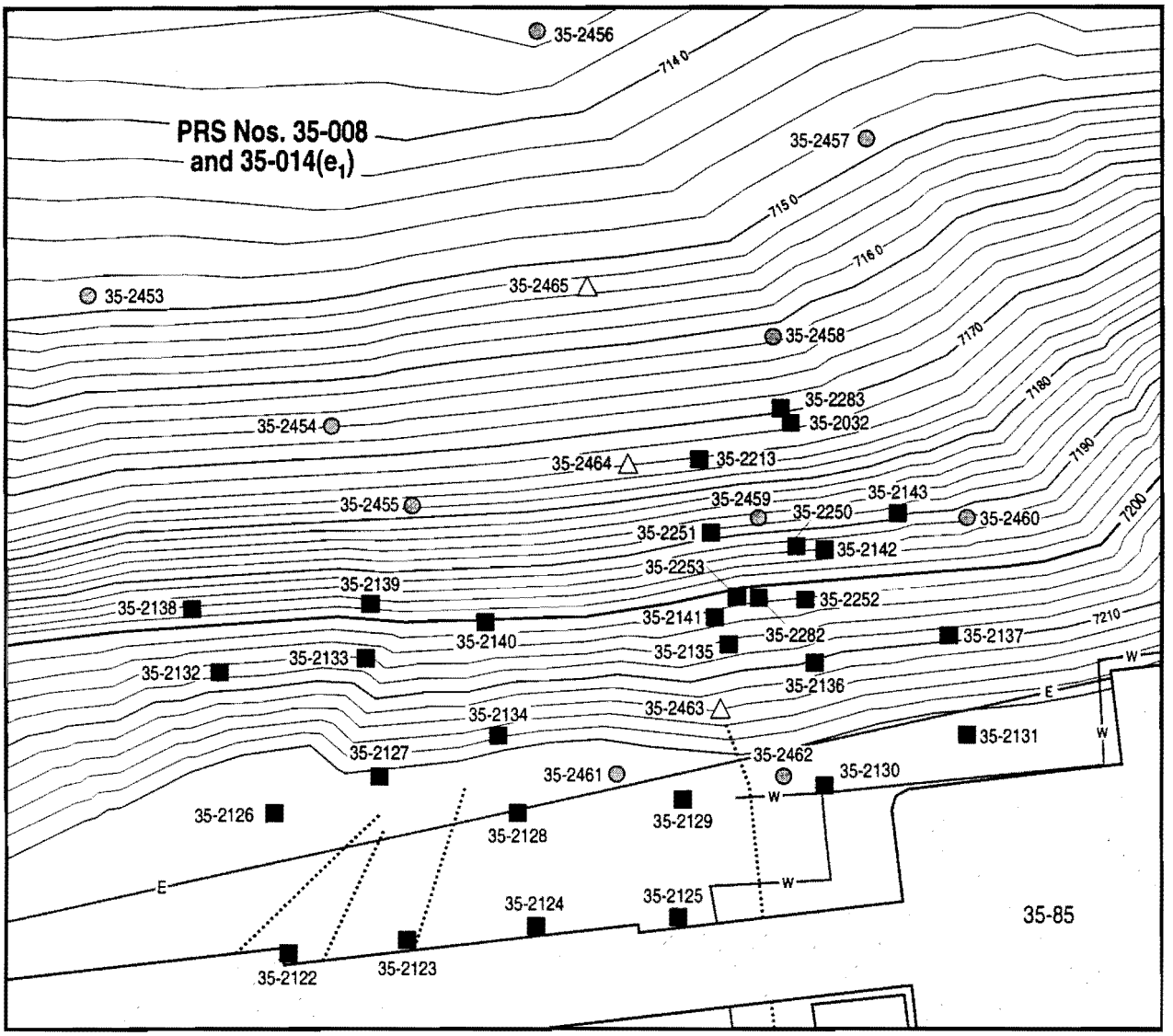
FEET

Coordinates are NMSP NAD-83

Contour interval = 2 ft

▭	Building or structure location	—·—·—	Fence	—E—	Power line
■	Existing sample location	———	Paved area	—W—	Water line
◎	Proposed sample location	— —	Unpaved road	·····	Sewer or waste line/storm drain
△	Water sampling station				

Figure 2.1.1-1. Existing and proposed sample locations for PRS Nos. 35-008 and 35-014(e_1).



Source: FIMAD G105244

F2.1.1-2 / TA-35 SAP / 031797

0 50 100 150

FEET

Coordinates are NMSP NAD-83
Contour interval = 2 ft

N

▭	Building or structure location	—E—	Power line
■	Existing sample location	—W—	Water line
○	Proposed sample location	·····	Sewer or waste line/storm drain
△	Water sampling station		

Figure 2.1.1-2. Existing and proposed Location ID Nos. for PRS Nos. 35-008 and 35-014(e_1).

The inorganic chemicals copper, lead, manganese, thorium, uranium, and zinc were detected above background levels. The radionuclide ^{226}Ra was detected in one sample at 1.61 pCi/g, which is above the screening action level (SAL) of 0.1 pCi/g. However, this concentration is consistent with natural background levels assuming secular equilibrium with $^{234,238}U$ and does not indicate a release. The organic chemicals acenaphthene, acenaphthylene, anthracene, bis(2-ethylhexyl)phthalate, fluoranthene, fluorene, and phenanthrene were detected. The carcinogen azobenzene was detected in six samples that were analyzed in the mobile laboratory at a maximum concentration of 11.1 mg/kg, which is above the SAL of 4 mg/kg. TPH analysis was performed for only three of the samples and was detected in all three samples at a maximum concentration of 27,000 mg/kg. There is no SAL for TPH, but there are narrative standards for TPH in water courses (New Mexico Water Quality Control Commission 1995, 50265). The samples collected at PRS No. 35-008 that were analyzed for SVOCs in the mobile laboratory were grossly contaminated with TPH. However, no sample cleanup was performed before analysis, and the samples were not diluted to minimize the TPH interference. Therefore, the mobile laboratory SVOC results should be regarded as estimates and must be confirmed by fixed-site laboratory analysis. Also, the detection of azobenzene by the mobile laboratory may be a reporting error because azobenzene is not normally associated with PAHs or with petroleum contamination. Also, no VOCs or PCBs were detected.

2.1.2 Problem Statement

The following questions will be addressed by collecting supplemental data.

- Are gamma-emitting radionuclides present above background levels or at levels that pose a threat to human health or the environment at PRS No. 35-008?
- What is the extent of SVOC, TPH, and inorganic chemical contamination at PRS No. 35-008?
- Are any hazardous constituents associated with the TPH contamination?
- Could contaminants represent a potential threat to human health or the environment?
- Could contaminants present in soil pose a threat to surface water quality?

Collection of additional data for PRS Nos. 35-008 and 35-014(e_1) is necessary to determine the extent of TPH and other organic chemicals, to replace the mobile laboratory radionuclide data for PRS No. 35-008, and to supplement the inorganic chemical data set. It was determined that mobile laboratory radionuclide results from the Phase I RFI are not usable to determine the nature of gamma-emitting radionuclide contamination. There is only one fixed-site laboratory analysis for mercury because the analyses for inorganic chemicals were performed predominantly by using XRF, and the detection limit for this technique is greater than the background upper tolerance limit (UTL) value. Also, several inorganic chemicals were measured above background levels. Additional VOC data are necessary to confirm whether VOCs are associated with TPH contamination. (Samples analyzed for TPH were not analyzed for VOCs.) Additional data will be collected to determine if gamma-emitting radionuclides are present and to determine the extent of the organic and inorganic chemicals described above.

Existing data were gathered from samples collected in backfill. The proposed sampling will determine if contamination is also present in native soil and in the tuff below and downgradient from the backfilled area. The presence of a storm drain outfall in the area may have contributed to the mobilization of COPCs. Collection of runoff water samples in the drainage channel that contains the outfall will allow identification of potential surface water problems, if any.

2.1.3 Sampling and Analysis Plan Design

The locations of proposed samples to be collected under this SAP are shown in Figure 2.1.1-1 and Figure 2.1.1-2. Eight hand-auger holes are proposed to be drilled in areas where potential contaminants were identified, in areas of sediment accumulation below the PRSs, and in areas of visible oil staining. Three samples will be collected at each location, one from each of the following depth intervals: 0 to 1 ft, 2 to 3 ft, and at the soil/tuff interface. If the depth to tuff is between 2 and 3 ft, one interval may be eliminated and, if the sediment depth is less than 2 ft, the second sampling intervals may be reduced to less than 1 ft. If the sediment (or soil) is less than 1 ft deep, the first sample will be collected from the 0 to 0.5-ft interval, the second sample will be collected from the interval between 0.5 ft and the soil/tuff interface, and the third interval will be eliminated. In addition, two surface samples (0 to 1-ft interval) are proposed for the mesa top to determine the presence or absence of TPH in that area. A summary of the proposed samples and the associated analyses is presented in Table 2.1.3-1.

Three hand-auger holes are proposed for locations on the bench directly below the spill and the construction debris. Data from these locations will be used to evaluate whether contaminants have accumulated at the base of the slope where sediments have deposited. The location of the hand-auger holes will be biased to areas of visible sediment collection and/or based on field survey screening results. Organic chemicals, as well as transuranics, are expected to accumulate in those areas because they are bound to soil particles or are relatively insoluble and are deposited rather than percolating or running off in solution. If hand-auger locations cannot be field biased in this manner, one hand-auger hole will be drilled directly below the drainage channel at the slope break, and the other two will be drilled approximately 10 and 20 ft farther down the slope.

Five hand-auger holes are proposed for locations on the slope in areas where contaminants were identified during the 1995 sampling, in areas where samples were collected but had incomplete analytical suites, and in areas of visible oil staining. Samples collected from the hand-auger holes will be analyzed for gamma-emitting radionuclides, SVOCs, TPH, and inorganic chemicals. Selected samples from subsurface intervals will also be analyzed for VOCs. In addition to the hand-auger holes, two surface samples are proposed for the mesa top at the head of the release to determine if TPH is present in that area or if it is constrained to the slope.

Surface water samples will be collected from runoff during a storm event. Precipitation or snow melt runoff is the only source of surface water at these PRSs. Single-stage samplers will be installed in three locations of the drainage channel that cuts through the site: one at the head of the drainage by the outfall outlet, a second half way down the mesa slope, and a third at the toe of the slope where the slope breaks. Figure 2.1.1-1 and Figure 2.1.1-2 show the approximate locations of the single-stage samplers. Surface water runoff will be collected and analyzed for SVOCs, TPH, and inorganic chemicals.

The location and type of samples collected as part of the implementation of this SAP will allow not only identification of a release (organic chemicals and radionuclides) but also a preliminary evaluation of the extent of the oil release. The samples will provide information on the sedimentary processes (erosion and/or deposition) that have been active on the slope during the period of releases. Whether contaminants are present in the drainage channel or on the bench below the drainage channel, the depths where they are present, and the relative concentrations among depths and locations will allow the technical team to infer (1) if a significant release has occurred and (2) if the extent of contamination is likely to have been spatially bounded. Based on the interpretation of these data, recommendations for additional action, if any, will be made.

TABLE 2.1.3-1

SUMMARY OF PROPOSED SAMPLING FOR PRS Nos. 35-008 AND 35-014(e_1)

Location ID	Planned Depth (ft)	Media	VOCs	SVOCs	TPH	Inorganic Chemicals	Gamma Spectroscopy
35-2453	0–1	Soil	0	1	1	1	1
35-2453	2–3	Soil	1	1	1	1	1
35-2453	Interface	Soil/tuff	1	1	1	1	1
35-2454	0–1	Soil	0	1	1	1	1
35-2454	2–3	Soil	1	1	1	1	1
35-2454	Interface	Soil/tuff	1	1	1	1	1
35-2455	0–1	Soil	0	1	1	1	1
35-2455	2–3	Soil	1	1	1	1	1
35-2455	Interface	Soil/tuff	1	1	1	1	1
35-2456	0–1	Soil	0	1	1	1	1
35-2456	2–3	Soil	1	1	1	1	1
35-2456	Interface	Soil/tuff	1	1	1	1	1
35-2457	0–1	Soil	0	1	1	0	1
35-2457	2–3	Soil	1	1	1	0	1
35-2457	Interface	Soil/tuff	1	1	1	0	1
35-2458	0–1	Soil	0	1	1	0	0
35-2458	2–3	Soil	0	1	1	0	0
35-2458	Interface	Soil/tuff	0	1	1	0	0
35-2459	0–1	Soil	0	1	1	0	0
35-2459	2–3	Soil	0	1	1	0	0
35-2459	Interface	Soil/tuff	0	1	1	0	0
35-2460	0–1	Soil	0	1	1	0	0
35-2460	2–3	Soil	0	1	1	0	0
35-2460	Interface	Soil/tuff	0	1	1	0	0
35-2461	0–1	Soil	0	0	1	0	0
35-2462	0–1	Soil	0	0	1	0	0
35-2463	N/A	Water	0	1	1	1	0
35-2464	N/A	Water	0	1	1	1	0
35-2465	N/A	Water	0	1	1	1	0

2.2 PRS Nos. 35-010(a, b, and c)

PRS Nos. 35-010(a, b, and c) are the sites of three wastewater treatment lagoons that operated from 1975 through November 1992. These lagoons have concrete sides and are described in Emelity (1974, 55116) as having bottoms lined with a mixture of topsoil and bentonite (100 lb of bentonite per 100 ft^2). However, subsequent site investigations indicate that the liner is no longer present (or is not differentiable from sludge and weathered tuff at the bottom of the lagoons). The Emelity memorandum (1974, 55116) also states that the planned capacity of the facility was 12,000 gallons per day (GPD). The lagoons are located in Ten Site Canyon near the confluence with a small feeder canyon (PRS No. 35-003[r]) informally

known as Pratt Canyon. In addition to sanitary waste, these lagoons are reported to have received small quantities of radionuclides, solvents and other chemicals, and photographic processing wastes from TAs -35, -48, -50, and -55 (LANL 1990, 7511; CEARP 1986, 8657).

2.2.1 Summary of Historical Data

The existing sample locations for PRS Nos. 35-010(a, b, and c) are shown in Figure 2.2.1-1. The data set for this PRS results from the Phase I RFI characterization activities that were conducted in 1994 at 12 locations. A summary of the samples that were collected and the associated analyses is presented in Table 2.2.1-1. The analytical data are presented in the attachment of this SAP.

The work plan and the final SAP documentation (LANL 1992, 7666; Pratt 1995, 43528; Pratt 1994, 38746) stated that in each lagoon two locations would be sampled for sludge, and two locations would be sampled for water. In addition, two boreholes would be drilled at an angle under PRS Nos. 35-010(a and b). A total of 16 soil samples, 12 sludge samples, and 6 water samples were proposed. All samples were to be analyzed for radionuclides, PCBs, VOCs, SVOCs, pesticides, and inorganic chemicals.

A total of 12 locations were sampled, and 16 soil samples, 12 sludge samples, and 4 liquid samples were collected (not including duplicate QA/QC samples). Two sludge samples were collected (one from the top and one from the bottom of the sludge) from each of the three lagoons (Location ID Nos. 35-2063, 35-2064, 35-2065, 35-2066, 35-2067, and 35-2068). Four unfiltered water samples were collected from two lagoons (Location ID Nos. 35-2237, 35-2238, 35-2239, and 35-2240). Two boreholes were drilled at a 45° angle from the surface to a vertical depth of 35.4 ft to collect soil/tuff samples from below the lagoons (Location ID Nos. 35-2216 and 35-2069). See Figure 2.2.1-2 for a cross section showing the angled holes and a profile of the lagoons.

The following analyses were performed.

- Thirty samples were analyzed for inorganic chemicals using XRF. Eight samples were analyzed for inorganic chemicals using EPA SW-846 methods. Table A-4 in the attachment of this SAP contains the results for inorganic chemical analysis.

- At a fixed-site laboratory, 35 samples were analyzed for alpha-emitting radionuclides, and 1 sample was analyzed by gamma spectroscopy. Table A-5 in the attachment of this SAP contains the fixed-site laboratory results for radionuclides.

- Thirty samples were analyzed for VOCs in the mobile laboratory. Nine samples were analyzed for VOCs at a fixed-site laboratory. Eight samples were analyzed for SVOCs at a fixed-site laboratory. All 35 samples were analyzed for PCBs at a fixed-site laboratory. Three samples were analyzed for pesticides at a fixed-site laboratory. See Table 2.2.1-1 for specific samples. Table A-6 in the attachment of this SAP contains the results for organic chemical analysis.

In the soil, tuff, or sludge samples, the inorganic chemicals antimony, calcium, chromium, copper, lead, manganese, mercury, nickel, thorium, uranium, and zinc were detected above background UTL levels. In particular, cadmium, chromium, copper, lead, nickel, and zinc were present in sludge at concentrations that were well above levels in the soil or tuff below the lagoons. The radionuclides ^{234}U, ^{235}U, and ^{238}U were detected above background levels in sludge, although total uranium values measured by XRF were generally higher in the underlying tuff than in sludge. PCBs were detected in 2 of the 12 sludge samples at a maximum concentration of 2.8 mg/kg. Several other organic chemicals were also identified at low

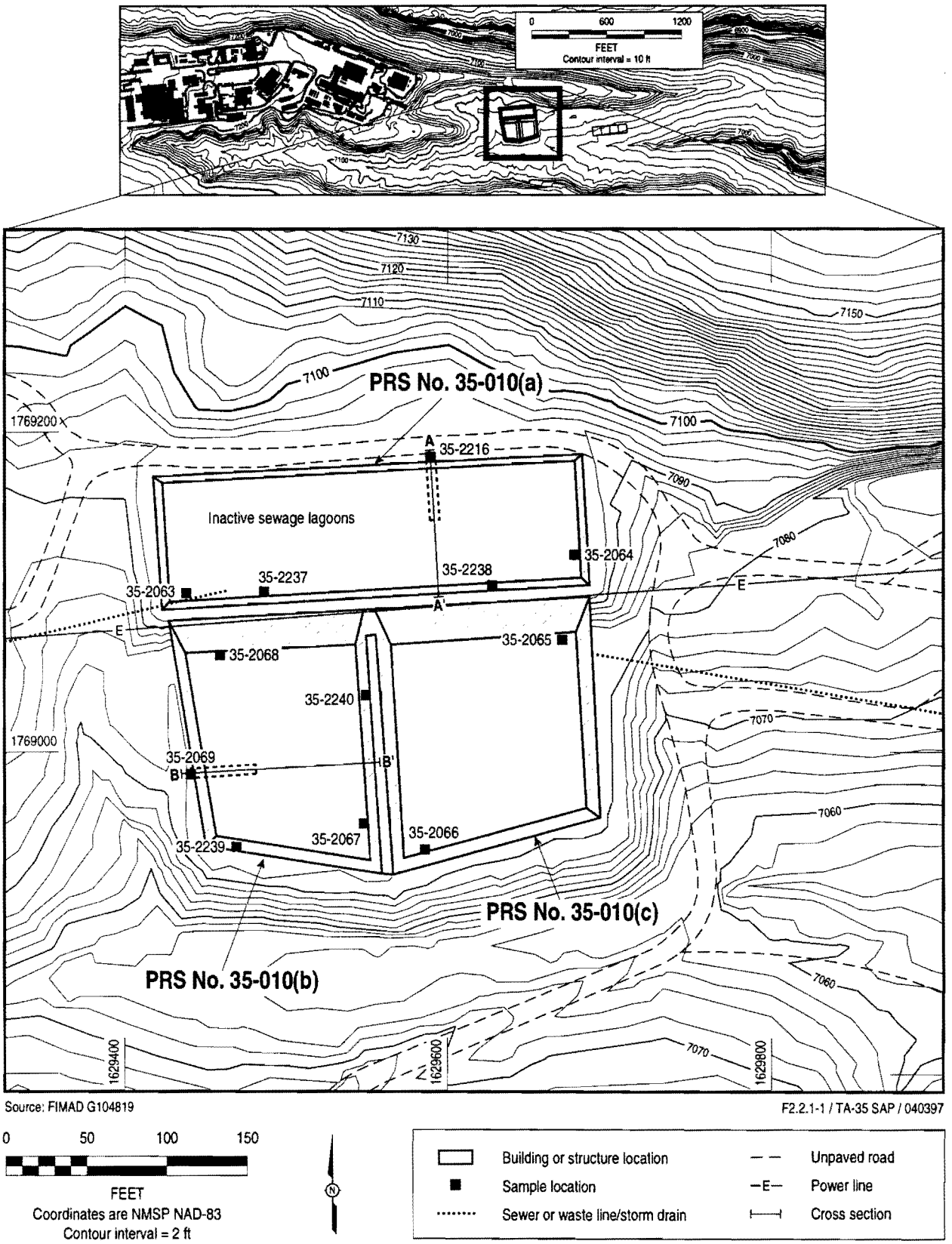


Figure 2.2.1-1. Existing sample locations for PRS Nos. 35-010(a, b, and c).

TABLE 2.2.1-1

SUMMARY OF RFI SAMPLES TAKEN AT PRS Nos. 35-010(a, b, and c)[a]

Part 1

Location ID	Sample ID	Depth (ft)	Media	VOCs Mobile Lab	VOCs Fixed Lab	SVOCs Fixed Lab	Pest Fixed Lab	PCBs Fixed Lab
35-2063	AAA6557	Top	Sludge	17470	NR[b]	NR	NR	17470
35-2063	AAA6558	Bottom	Sludge	17470	NR	NR	NR	17470
35-2064	AAA6560	Top	Sludge	17470	17468	17468	17468	17468
35-2064	AAA6585	Bottom	Sludge	17470	NR	NR	NR	17470
35-2216	AAB1517	5.7–6.4	Soil	17556	NR	NR	NR	17556
35-2216	AAB1518	9.9–10.6	Soil	17556	NR	NR	NR	17556
35-2216	AAB1519	13.4–14.1	Soil	17556	17552	NR	NR	17556
35-2216	AAB1520	17.0–17.7	Soil	17556	NR	NR	NR	17556
35-2216	AAB1521	20.5–21.2	Soil	17556	NR	NR	NR	17556
35-2216	AAB1522	20.5–21.2	Soil	17556	NR	NR	NR	17556
35-2216	AAB1523	24.0–24.7	Soil	17556	NR	NR	NR	17556
35-2216	AAB1524	27.6–28.3	Soil	17550	NR	17549	17550	17550
35-2216	AAB1525	34.6–35.4	Soil	17550	NR	NR	17550	17550
35-2237	AAA6559	N/A	Liquid	NR	17497	17497	NR	17497
35-2238	AAA6586	N/A	Liquid	NR	17497	17497	NR	17497
35-2238	AAA6587	N/A	Liquid	NR	17497	17497	NR	17497
35-2067	AAB1537	Top	Sludge	17470	17468	NR	NR	17470
35-2067	AAB1538	Bottom	Sludge	17470	NR	NR	NR	17470

Part 2

Location ID	Sample ID	Depth (ft)	Media	XRF Mobile Lab	Inorganic Fixed Lab	Alpha Spec Fixed Lab	Gamma Spec Mobile Lab	Gamma Spec Fixed Lab
35-2063	AAA6557	Top	Sludge	19540	NR	19532	NR	NR
35-2063	AAA6558	Bottom	Sludge	19540	NR	19532	NR	NR
35-2064	AAA6560	Top	Sludge	19540	NR	19532	NR	NR
35-2064	AAA6585	Bottom	Sludge	19540	NR	19532	NR	NR
35-2216	AAB1517	5.7–6.4	Soil	19612	19615	19581	18856	NR
35-2216	AAB1518	9.9–10.6	Soil	19612	NR	19581	NR	NR
35-2216	AAB1519	13.4–14.1	Soil	19612	NR	19581	18856	NR
35-2216	AAB1520	17.0–17.7	Soil	19612	NR	19581	18856	NR
35-2216	AAB1521	20.5–21.2	Soil	19612	NR	19581	18856	NR
35-2216	AAB1522	20.5–21.2	Soil	19612	NR	19581	18856	NR
35-2216	AAB1523	24.0–24.7	Soil	19612	NR	19581	18856	NR
35-2216	AAB1524	27.6–28.3	Soil	19544	NR	19554	21854	NR
35-2216	AAB1525	34.6–35.4	Soil	19544	NR	19554	21854	NR
35-2237	AAA6559	N/A	Liquid	NR	19629	19976	18854	NR
35-2238	AAA6586	N/A	Liquid	NR	19629	19976	18854	NR
35-2238	AAA6587	N/A	Liquid	NR	19629	19976	18854	NR
35-2067	AAB1537	Top	Sludge	19540	NR	19532	NR	NR
35-2067	AAB1538	Bottom	Sludge	19540	NR	19532	NR	NR

a. The numbers in the analytical suite columns are analytical request numbers.

b. Not requested

TABLE 2.2.1-1 (continued)

SUMMARY OF RFI SAMPLES TAKEN AT PRS Nos. 35-010(a, b, and c)[a]

Part 1

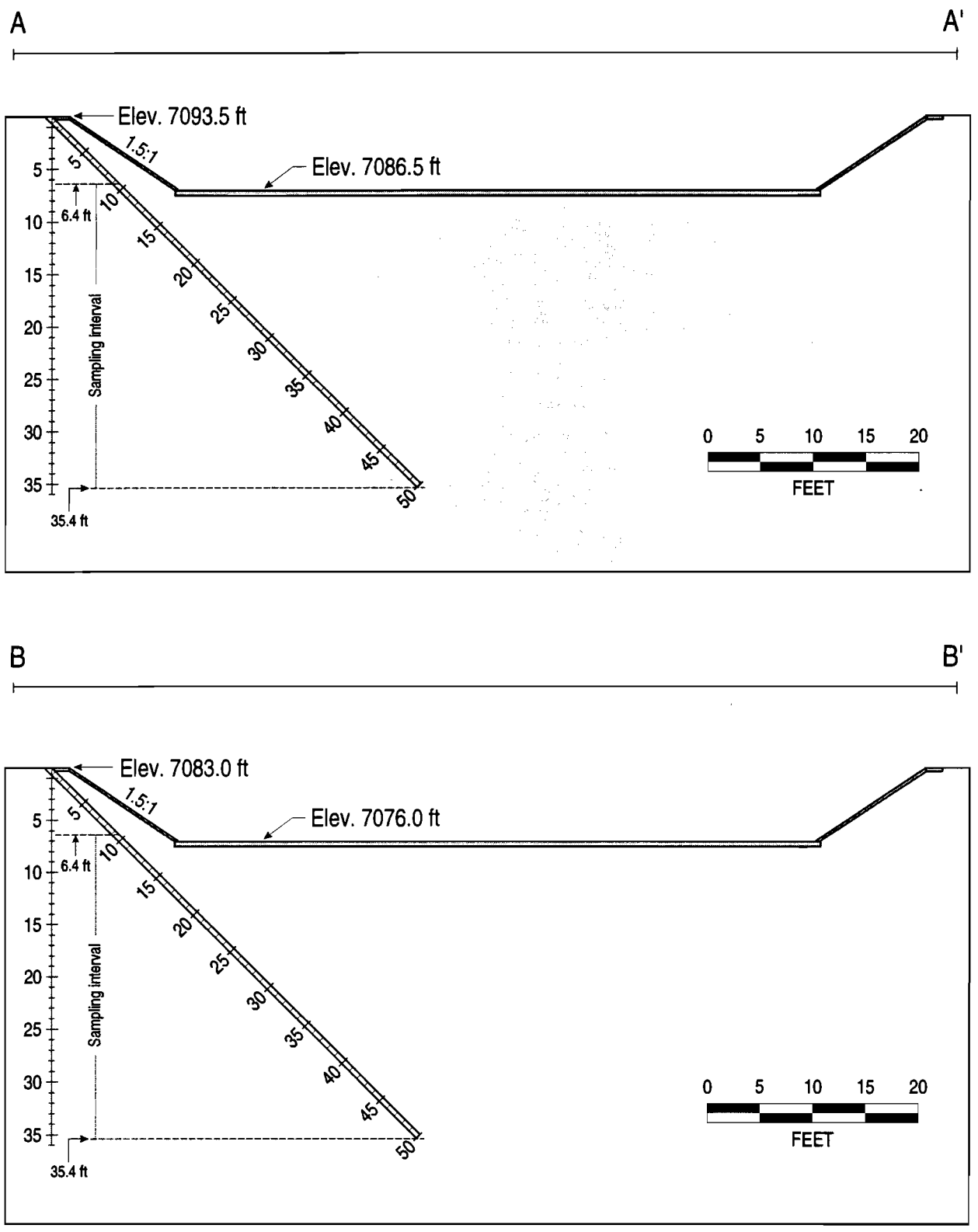
Location ID	Sample ID	Depth (ft)	Media	VOCs Mobile Lab	VOCs Fixed Lab	SVOCs Fixed Lab	Pest Fixed Lab	PCBs Fixed Lab
35-2067	AAB1539	Bottom	Sludge	17470	NR[b]	NR	NR	17470
35-2068	AAB1541	Top	Sludge	17470	NR	NR	NR	17470
35-2068	AAB1542	Bottom	Sludge	17470	NR	NR	NR	17470
35-2069	AAB1509	6.4–7.1	Soil	17554	NR	NR	NR	17554
35-2069	AAB1510	9.2–9.9	Soil	17554	NR	NR	NR	17554
35-2069	AAB1511	13.4–14.1	Soil	17554	NR	NR	NR	17554
35-2069	AAB1512	16.2–17.0	Soil	17554	NR	17551	NR	17554
35-2069	AAB1513	20.5–21.2	Soil	17554	NR	NR	NR	17554
35-2069	AAB1515	24.0–24.7	Soil	17554	NR	NR	NR	17554
35-2069	AAB1514	27.6–28.3	Soil	17554	17551	NR	NR	17554
35-2069	AAB1516	34.6–35.4	Soil	17554	NR	NR	NR	17554
35-2239	AAB1533	N/A	Liquid	NR	17497	17497	NR	17497
35-2240	AAB1536	N/A	Liquid	NR	17497	17497	NR	17497
35-2065	AAA6588	Top	Sludge	17501	NR	NR	NR	17501
35-2065	AAB1532	Bottom	Sludge	17501	NR	NR	NR	17501
35-2066	AAB1534	Top	Sludge	17501	NR	NR	NR	17501
35-2066	AAB1535	Bottom	Sludge	17501	NR	NR	NR	17501

Part 2

Location ID	Sample ID	Depth (ft)	Media	XRF Mobile Lab	Inorganic Fixed Lab	Alpha Spec Fixed Lab	Gamma Spec Mobile Lab	Gamma Spec Fixed Lab
35-2067	AAB1539	Bottom	Sludge	19540	NR	19532	NR	NR
35-2068	AAB1541	Top	Sludge	19540	NR	19532	NR	NR
35-2068	AAB1542	Bottom	Sludge	19540	NR	19532	NR	NR
35-2069	AAB1509	6.4–7.1	Soil	19613	19617	19585	18858	NR
35-2069	AAB1510	9.2–9.9	Soil	19613	NR	19585	18858	NR
35-2069	AAB1511	13.4–14.1	Soil	19613	NR	19585	18858	NR
35-2069	AAB1512	16.2–17.0	Soil	19613	NR	19585	18858	19585
35-2069	AAB1513	20.5–21.2	Soil	19613	NR	19585	18858	NR
35-2069	AAB1515	24.0–24.7	Soil	19613	NR	19585	18858	NR
35-2069	AAB1514	27.6–28.3	Soil	19613	NR	19585	18858	NR
35-2069	AAB1516	34.6–35.4	Soil	19613	NR	19585	18858	NR
35-2239	AAB1533	N/A	Liquid	NR	19629	19976	18854	NR
35-2240	AAB1536	N/A	Liquid	NR	19629	19976	18854	NR
35-2065	AAA6588	Top	Sludge	20499	NR	19976	18854	NR
35-2065	AAB1532	Bottom	Sludge	20499	20440	19976	18554	NR
35-2066	AAB1534	Top	Sludge	20499	NR	19976	18554	NR
35-2066	AAB1535	Bottom	Sludge	20499	NR	19976	18554	NR

a. The numbers in the analytical suite columns are analytical request numbers.

b. Not requested



F2.2.1-2 / TA-35 SAP / 040397

(See Figure 2.2.1-1 for the locations of the cross sections.)

Figure 2.2.1-2. Cross section A–A' of borehole 35-2216 and cross section B–B' of borehole 35-2069.

concentrations in sludge or tuff samples. In the unfiltered water samples, the inorganic chemicals aluminum, arsenic, barium, beryllium, cadmium, chromium, copper, lead, manganese, molybdenum, nickel, selenium, silver, and vanadium appeared elevated.

The mobile laboratory SVOC data for samples collected at PRS Nos. 35-010(a, b, and c) were rejected for use in a human health risk screening assessment because the extraction method used by the mobile laboratory was not adequate for the sludge samples that were collected at the bottom of the lagoons. Therefore, a strong negative bias was expected for the reported results. Also, there was evidence of laboratory-introduced contamination in the analysis of soil and tuff samples collected from the boreholes that were drilled under the lagoons. The reported detected compounds are likely the result of laboratory contamination, and the SVOC results have been rejected.

2.2.2 Problem Statement

The following questions will be addressed by collecting supplemental data.

- Are gamma-emitting radionuclides, ^{90}Sr, or SVOCs present in the sludge or underlying tuff at PRS Nos. 35-010(a, b, and c)?

- What are the average concentrations of gamma-emitting radionuclides, ^{90}Sr, SVOCs, VOCs, PCBs, and inorganic chemicals in the sludge and liner at PRS Nos. 35-010(a, b, and c)?

The focus of the data collection effort is characterization of residual contamination in the existing sludge and liner for potential remedial design purposes. The scope of this investigation does not include past releases from the lagoons either as leakage through the liner or by effluent discharge to Ten Site Canyon before construction of the sand filter beds (PRS Nos. 35-010[d and e]). The Mortandad Canyon investigation, which is part of the Field Unit 4 canyons investigations, will determine what contamination in Ten Site Canyon, if any, is attributable to PRS Nos. 35-010(a, b, and c) and what contamination, if any, is attributable to other sources associated with TA-35 and TA-50. Therefore, the investigation of PRS Nos. 35-010(a, b, and c) will focus on identifying residual contamination within the lagoons themselves to support potential future remedial activities.

Collection of additional data for PRS Nos. 35-010(a, b, and c) is necessary to replace the mobile laboratory SVOC and gamma-emitting radionuclide data and to supplement the inorganic chemical, VOC, and PCB data sets. The mobile laboratory SVOC data were rejected because of the extraction method used and evidence of laboratory-introduced contamination. It was also determined that mobile laboratory radionuclide results from the Phase I RFI are not usable to determine the nature of gamma-emitting radionuclide contamination (LANL 1996, 54448). There is only one fixed-site laboratory analysis for mercury using the EPA SW-846 method (EPA 1986, 31732), and the XRF detection limit of approximately 5 mg/kg is inadequate to properly determine if mercury is present in the sludge. Analytical data for silver, which is a potential contaminant based on knowledge of process, have not been collected. Therefore, additional inorganic chemical analyses are proposed. Additional PCB data will be collected because this chemical is subject to heightened scrutiny due to its toxicity and environmental persistence. The current data set of only four samples per lagoon is inadequate to make a definitive statement regarding the concentration of PCBs in sludge. Finally, sampling for ^{90}Sr and tritium is proposed because these radionuclides are positively associated with processes at the technical areas that contributed waste to these lagoons. The exchange of tritium with organic chemicals is fast, and the kinetics of water exchange or tritium exchange with bound water is fast. Therefore, tritium will be analyzed for at the lagoons but not at the filter beds (Section 2.3).

Currently no data are available for the tuff immediately below the lagoons. Because the underlying tuff is likely to harbor some of the contaminants that are present in the sludge, sampling will be performed to evaluate the presence and approximate concentrations of contaminants in tuff that contacts the lagoon bottoms. Sampling tuff directly below the lagoons will allow a more accurate estimation of the volume of material that may need to be removed and disposed of if remedial actions are undertaken.

2.2.3 Sampling and Analysis Plan Design

The design of this SAP will use information on the variability of contamination obtained from the initial sampling effort to calculate the number of additional samples required to estimate the mean concentration of individual contaminants in sludge with a specified confidence level. The advantage of this approach is that the concentrations of contaminants, as well as their inventory in the sludge, can be bounded with a known degree of confidence for waste classification and disposal purposes. As described in Section 2.2.1 of this SAP, the inorganic chemicals cadmium, chromium, copper, lead, nickel, and zinc were present at concentrations in sludge that were well above levels in the soil or tuff below the lagoons. Because the concentrations of these chemicals are clearly elevated above any nominal levels (such as background soil concentrations), their spatial variability was evaluated and used as the basis for calculating necessary sample size.

The inorganic chemical data represent surface and bottom sludge intervals from two locations in each of the three lagoons. There are a total of 13 data points, including a duplicate sample. An evaluation of the existing data shows evidence of various trends: (1) stratification of contaminants with depth, (2) collocation of contaminants, and (3) no obvious differences in concentrations among the lagoons. At all locations the top interval contains consistently higher concentrations of all six analytes than the bottom interval. This phenomenon is likely the result of soluble contaminants redepositing in the upper layer of sludge as surface water evaporates after ponding. Collocation of contaminants, manifested as individual samples having consistently high or low concentrations of all six analytes, may indicate either heterogeneity at the sample-size scale (bits of solid material) or larger-scale heterogeneity resulting from poor mixing in the lagoons. The evidence of stratification will be incorporated into this SAP by maintaining a top and bottom sludge interval in the sampling scheme. Collocation should not impact the success of this SAP because the goal is the estimation of average concentrations rather than identification of discrete "hot spots." The fact that the three lagoons do not appear to have different patterns in the distribution or concentration of contaminants was used to support the calculation of required sample size using data combined from all lagoons.

One of the assumptions underlying this SAP is that the variability observed in the metals data is relevant to radionuclides and organic chemicals. Because transuranics and high-molecular-weight organic chemicals are generally less soluble than the metals discussed above, there is reason to suspect that these contaminants may be less homogenous than the metals. Therefore, this SAP proposes to use an upper confidence bound on the standard deviation of the most heterogeneous inorganic chemical to calculate sample size. This practice will introduce a measure of conservatism that is intended to account for the possibility that other contaminants may be more heterogeneous than any of the inorganic chemicals evaluated.

The decision goal for this SAP may be phrased as "We wish to have a known degree of certainty that the confidence interval for the sample mean of a contaminant is not greater than a specified value." The "known degree of certainty" has initially been set at 90% as a managerial decision. Similarly, the "specified value" of the confidence interval for the sample mean has been set at ±50%. An example of what this

implies is as follows: if the mean concentration of silver is calculated to be 100 mg/kg then there should be a 90% probability that the true mean is within the range of 50 and 150 mg/kg. The equation used to calculate the required number of samples is

$$n = \left(2 \times z \times UCL(\sigma) / w \right)^2 \qquad (1)$$

where,

n =	number of samples
z =	alpha percentile of the standard normal distribution
UCL(σ) =	95% upper confidence limit for the standard deviation of the concentrations of a contaminant
w =	width of the confidence interval of the mean

and,

$$UCL(\sigma) = \sqrt{\frac{(n - 1) \times s^2}{\chi^2_{(\alpha, n-1)}}} \qquad (2)$$

where,

s^2 =	sample variance
$\chi^2_{(\alpha, n-1)}$ =	alpha percentile of the $\chi^2_{(n-1)}$ distribution

These calculations were performed for each of the six inorganic chemicals described above (cadmium, chromium, copper, lead, nickel, and zinc) using an upper confidence limit (UCL) on the standard deviation based on the data from the 13 samples. The range in sample size necessary to achieve 90% confidence that the true mean is within ±50% of the sample mean ranged from 5 (chromium) to 30 (zinc). To reduce the likelihood of not achieving the sampling objective for all analytes, the estimated sample size will be based on zinc.

It is estimated that 30 samples will be adequate to achieve a 90% confidence that the true mean concentration of all analytes of interest will be within ±50% of the observed sample mean. After additional data are obtained, the actual confidence associated with an interval ±50% of the sample mean will be slightly different because the actual sample standard deviation of each analyte will be used rather than the UCL calculated from the data for zinc. If the sample standard deviation for the previously unmeasured analytes is greater than the UCL for zinc, it is possible that a 90% confidence interval for the mean will be wider than ±50% of the sample mean.

At this time, the 50% window around the sample mean and the 90% confidence level for achieving this accuracy are managerial decisions that are not based on any specific waste acceptance or waste classification criteria. Such criteria may not be identified until after data have been evaluated. If the confidence level associated with the 50% window turns out to be less than 90%, the decision to collect additional data will be made based on requirements associated with the applicable criteria.

The 45 samples will be collected in 15 locations (5 locations per lagoon). At each location, sludge grab samples will be collected from a top and bottom interval. Selection of sample locations will proceed by

dividing each lagoon into five roughly rectangular sections perpendicular to the longest axis (see Figure 2.2.3-1). A rectangular sampling grid with 3-ft spacing will be positioned inside each section in each lagoon. Within each section, the grid nodes will be numbered, and the sample location will be chosen by identifying a grid node with a random number generator. This systematic sampling strategy will ensure that spatial heterogeneity will be assessed in each lagoon to a maximal extent with only 5 sample locations while retaining the randomization that is essential for statistical data analyses.

At each sample location, an additional sample will be collected from the tuff beneath the sludge. During previous site investigations, there was no visible evidence of a bentonite liner in material brought up by the hand auger. Despite this, samples collected from the two slanted boreholes drilled beneath the lagoons during the earlier RFI investigation did not indicate significant contamination. No existing data for the tuff immediately below the lagoons are available, and it is uncertain whether the sludge data are applicable for inferring the nature and variability of contaminant concentrations in this tuff or to what depth contaminants, if any, may have infiltrated. The slanted boreholes intersect the planes of the lagoon sides at a depth of approximately 5 ft or greater below the bottoms. Lead was found at concentrations two to three times its UTL in one sample at this interval. However, little evidence of contamination at deeper intervals was apparent.

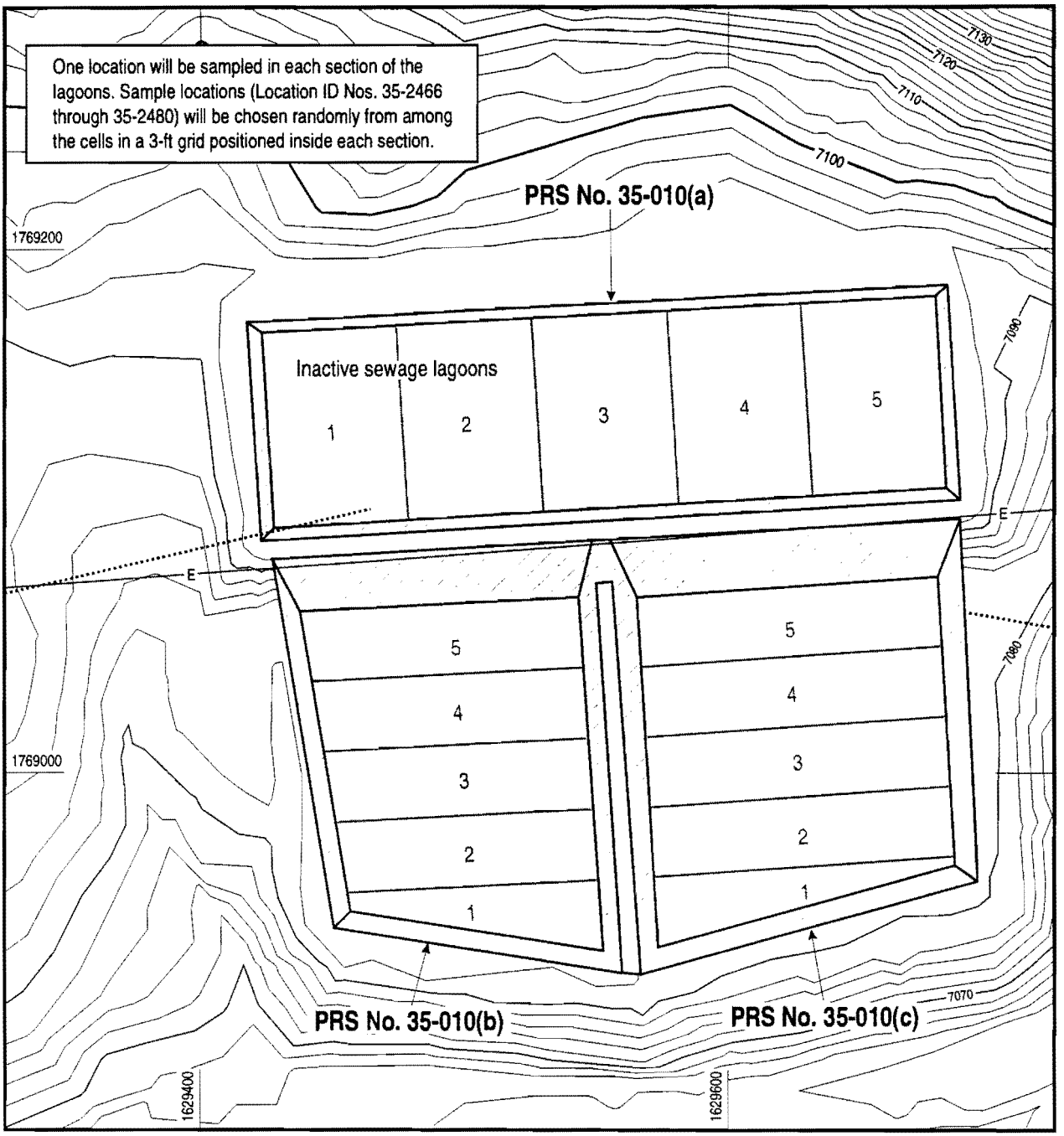
Collecting a single data point from tuff at the locations where sludge is sampled will allow efficient coordination with the sludge sampling effort. The samples will be collected at an approximate depth of 1 to 2 ft below the sludge because the sludge/tuff interface is expected to be indistinct due to the highly weathered nature of the tuff. The purpose of these samples is to estimate the volume of potentially contaminated tuff below the sludge. Existing data from the two slanted boreholes below the lagoons show somewhat elevated metals concentrations only in the sample interval immediately beneath the lagoon bottoms and no evidence of deeper contamination. However, if the new tuff data show significant concentrations of contaminants, additional sampling at greater depths may be necessary during remedial activities.

A summary of the proposed samples and the associated analyses is presented in Table 2.2.3-1.

2.3 PRS Nos. 35-010(d and e)

PRS No. 35-010(d) includes four sand filter beds that handled wastewater discharged from the sewage treatment lagoons (PRS Nos. 35-010[a, b, and c]). Water was subsequently discharged from the sand filter beds through the discharge headwall (PRS No. 35-010[e]). PRS No. 35-010(e) is formerly permitted National Pollutant Discharge Elimination System (NPDES) outfall EPA-SSS-10S. The filters began operation in 1983 and were deactivated in 1992. (The solid waste management unit [SWMU] report indicates that installation of the beds began in 1980 [LANL 1990, 7511].)

The sand filter beds are constructed of 3-ft-high, 6-in.-wide concrete walls. Each bed measures approximately 50 ft by 50 ft. Two-in.-diameter polyvinyl chloride distribution pipes radiate from the center of the sand filter bed to the four corners in three of the four sand filter beds. An 8-in.-diameter riser pipe in the center of each sand filter bed feeds the effluent to the radial pipelines. The sand filter beds are plastic-lined and contain sands of varying composition and texture (fine- to medium-grained quartzose sands to coarse-grained basaltic and granitic gravel). Approximately 2 ft of filter material is present in each filter, and each successive sand filter bed is 1 in. lower than the previous one to provide a hydraulic flow gradient. Vegetation is sparse near the sand filter beds but appears normal and healthy.



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0 50 100

FEET

Coordinates are NMSP NAD-83

Contour interval = 2 ft

Building or structure location

Sewer or waste line/storm drain

—E— Power line

Figure 2.2.3-1. Sections of inactive sewage lagoons used to determine sample locations for PRS Nos. 35-010(a, b, and c).

TABLE 2.2.3-1

SUMMARY OF PROPOSED SAMPLING FOR PRS Nos. 35-010(a, b, and c)

Location ID	Planned Depth (ft)	Media	VOCs	SVOCs	PCBs	Inorganic Fixed Lab	Tritium	Sr-90	Gamma Spectroscopy
35-2466	Surface[a]	Dry sludge	0	1	1	1	1	1	1
35-2466	Interface[b]	Dry sludge	1	1	1	1	1	1	1
35-2466	Tuff[c]	Tuff	1	1	1	1	1	1	1
35-2467	Surface	Dry sludge	0	1	1	1	1	1	1
35-2467	Interface	Dry sludge	1	1	1	1	1	1	1
35-2467	Tuff	Tuff	1	1	1	1	1	1	1
35-2468	Surface	Dry sludge	0	1	1	1	1	1	1
35-2468	Interface	Dry sludge	1	1	1	1	1	1	1
35-2468	Tuff	Tuff	1	1	1	1	1	1	1
35-2469	Surface	Dry sludge	0	1	1	1	1	1	1
35-2469	Interface	Dry sludge	1	1	1	1	1	1	1
35-2469	Tuff	Tuff	1	1	1	1	1	1	1
35-2470	Surface	Dry sludge	0	1	1	1	1	1	1
35-2470	Interface	Dry sludge	1	1	1	1	1	1	1
35-2470	Tuff	Tuff	1	1	1	1	1	1	1
35-2471	Surface	Dry sludge	0	1	1	1	1	1	1
35-2471	Interface	Dry sludge	1	1	1	1	1	1	1
35-2471	Tuff	Tuff	1	1	1	1	1	1	1
35-2472	Surface	Dry sludge	0	1	1	1	1	1	1
35-2472	Interface	Dry sludge	1	1	1	1	1	1	1
35-2472	Tuff	Tuff	1	1	1	1	1	1	1
35-2473	Surface	Dry sludge	0	1	1	1	1	1	1
35-2473	Interface	Dry sludge	1	1	1	1	1	1	1
35-2473	Tuff	Tuff	1	1	1	1	1	1	1
35-2474	Surface	Dry sludge	0	1	1	1	1	1	1
35-2474	Interface	Dry sludge	1	1	1	1	1	1	1
35-2474	Tuff	Tuff	1	1	1	1	1	1	1
35-2475	Surface	Dry sludge	0	1	1	1	1	1	1
35-2475	Interface	Dry sludge	1	1	1	1	1	1	1
35-2475	Tuff	Tuff	1	1	1	1	1	1	1
35-2476	Surface	Dry sludge	0	1	1	1	1	1	1
35-2476	Interface	Dry sludge	1	1	1	1	1	1	1
35-2476	Tuff	Tuff	1	1	1	1	1	1	1
35-2477	Surface	Dry sludge	0	1	1	1	1	1	1
35-2477	Interface	Dry sludge	1	1	1	1	1	1	1
35-2477	Tuff	Tuff	1	1	1	1	1	1	1
35-2478	Surface	Dry sludge	0	1	1	1	1	1	1
35-2478	Interface	Dry sludge	1	1	1	1	1	1	1
35-2478	Tuff	Tuff	1	1	1	1	1	1	1
35-2479	Surface	Dry sludge	0	1	1	1	1	1	1
35-2479	Interface	Dry sludge	1	1	1	1	1	1	1
35-2479	Tuff	Tuff	1	1	1	1	1	1	1
35-2480	Surface	Dry sludge	0	1	1	1	1	1	1
35-2480	Interface	Dry sludge	1	1	1	1	1	1	1
35-2480	Tuff	Tuff	1	1	1	1	1	1	1

a. Surface sample most likely 0 to 6 in.
b. Bentonite weather tuff interface likely at approximately 1 to 2 ft (bottom of lagoon)
c. Sample in tuff without sludge below the sludge and weathered bentonite liner

A diversion channel is present on the hillside above the sand filter beds, which diverts surface water to the east. The berm of the diversion channel is composed of tuff material and 1.5-in.-diameter crushed gravel. A second diversion channel is present west of the sand filter beds and appears to have been constructed by digging a 2-ft-deep channel. These two diversion channels are apparently intended to divert surface water away from the sand filter beds.

PRS No. 35-010(e) is the former NPDES-permitted outfall from the sand filter beds that discharged into Ten Site Canyon. A depth-recording gauge station is located at the outfall and measured the effluent level above a small v-shaped weir discharge point. A rock dissipater apron is present at the discharge point.

Compiled flow records of the NPDES outfall from the sand filter beds into Ten Site Canyon were obtained from personnel from Laboratory group ESH-18 and Johnson Controls World Services, Inc. The flow data (in GPD) were plotted and are shown in Figure 2.3-1. The data indicated how much effluent was being discharged during a significant portion of the life of the sewage lagoons and sand filter beds. The average flow rate was approximately 45,000 GPD. A statistical summary of the discharge data is shown in Table 2.3-1. Emelity (1974, 55116) states in a memorandum that the planned capacity of the facility was 12,000 GPD. Samples are proposed in this SAP to characterize the existing filter material in the beds to determine the nature of contaminants, if any.

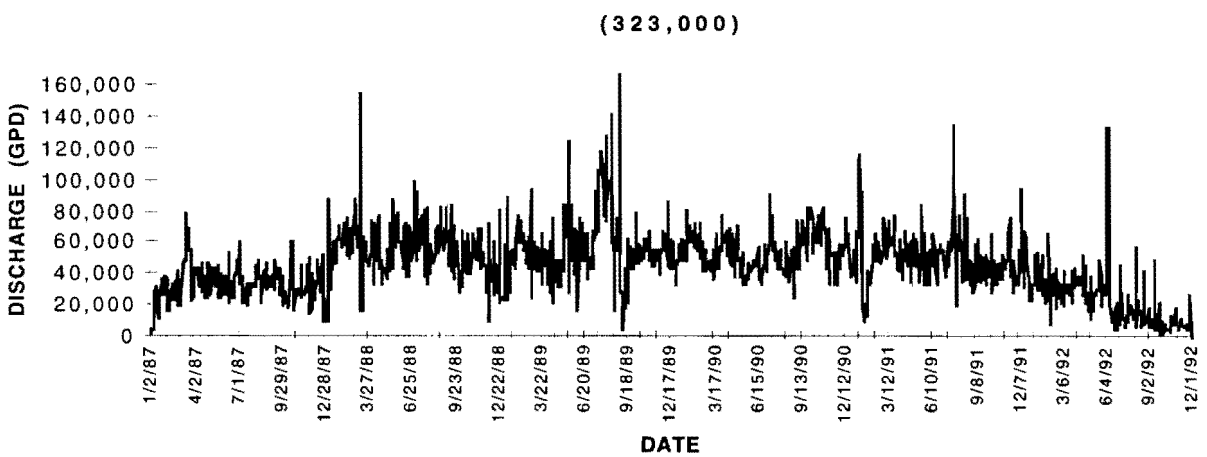


Figure 2.3-1. Plot of discharge data for NPDES outfall EPA-SSS-10S.

TABLE 2.3-1

SUMMARY OF DISCHARGE DATA FOR NPDES OUTFALL EPA-SSS-10S

Mean	44,642 GPD
Median	45,000 GPD
Mode	55,000 GPD
Standard Deviation	20,523 GPD
Range	322,500 GPD
Minimum	500 GPD
Maximum	323,000 GPD
Total	96,516,700 GPD

2.3.1 Summary of Historical Data

PRS Nos. 35-010(d and e) and the existing sample locations are shown in Figure 2.3.1-1. Phase I RFI soil data were collected in 1995. A summary of the samples that were collected and the associated analyses is presented in Table 2.3.1-1.

The work plan and the final SAP documentation (LANL 1992, 7666; Pratt 1995, 45981) indicate that five locations would be sampled to characterize radionuclides, PCBs, VOCs, SVOCs, and inorganic chemicals at PRS Nos. 35-010(d and e). Additionally, one surface sample, which was collected during the investigation of PRS No. C-35-007, was included for evaluation as part of the data set for PRS Nos. 35-010(d and e) because of its proximity to the beds.

Phase I sampling was performed on April 24, 1995. Twelve samples were collected from six locations (not including field duplicate samples). Three surface soil samples (Location ID Nos. 35-2195, 35-2196, and 35-2207) were collected. Three hand-auger holes (Location ID Nos. 35-2193, 35-2194, and 35-2197) were drilled to a depth of 3 ft, and three samples were collected from each location. See Table 2.3.1-1 for specific sample analyses. Beta/gamma radiation measurements ranged from 137 to 237 cpm, which are within background levels.

Phase I samples collected near the sand filter beds have characterized surface and near-surface soil, but no data were obtained for the filter material within the beds. The sample collected in the channel (Location ID No. 35-2197) at the point of discharge does not necessarily represent sediments deposited after 1992; therefore, it may not provide information on releases from the sand filter beds.

The following analyses were performed.

- All samples were analyzed for inorganic chemicals using XRF. One sample was analyzed for inorganic chemicals using EPA SW-846 methods. Table A-7 in the attachment of this SAP contains the results for inorganic chemical analysis.

- At a fixed-site laboratory, all samples were analyzed for alpha-emitting radionuclides, and two samples were analyzed by gamma spectroscopy. Table A-8 in the attachment of this SAP contains the fixed-site laboratory results for radionuclides.

- Ten samples were analyzed for VOCs in the mobile laboratory. One sample was analyzed for VOCs at a fixed-site laboratory. Eleven samples were analyzed for PAHs in the mobile laboratory. One sample was analyzed for SVOCs at a fixed-site laboratory. All samples were analyzed for PCBs in the mobile laboratory. Two samples were analyzed for PCBs at a fixed-site laboratory. See Table 2.3.1-1 for the analytical suites associated with specific samples.

The inorganic chemicals nickel, thorium, and uranium were detected above background levels; no radionuclides were measured above background levels. No organic chemicals were detected in any sample; therefore, no organic data are presented in the attachment of this SAP.

2.3.2 Problem Statement

The following question will be addressed by collecting supplemental data.

- Are radionuclides, inorganic chemicals, or organic chemicals present in the filter material contained in the sand filter beds and, if so, what are the approximate concentrations?

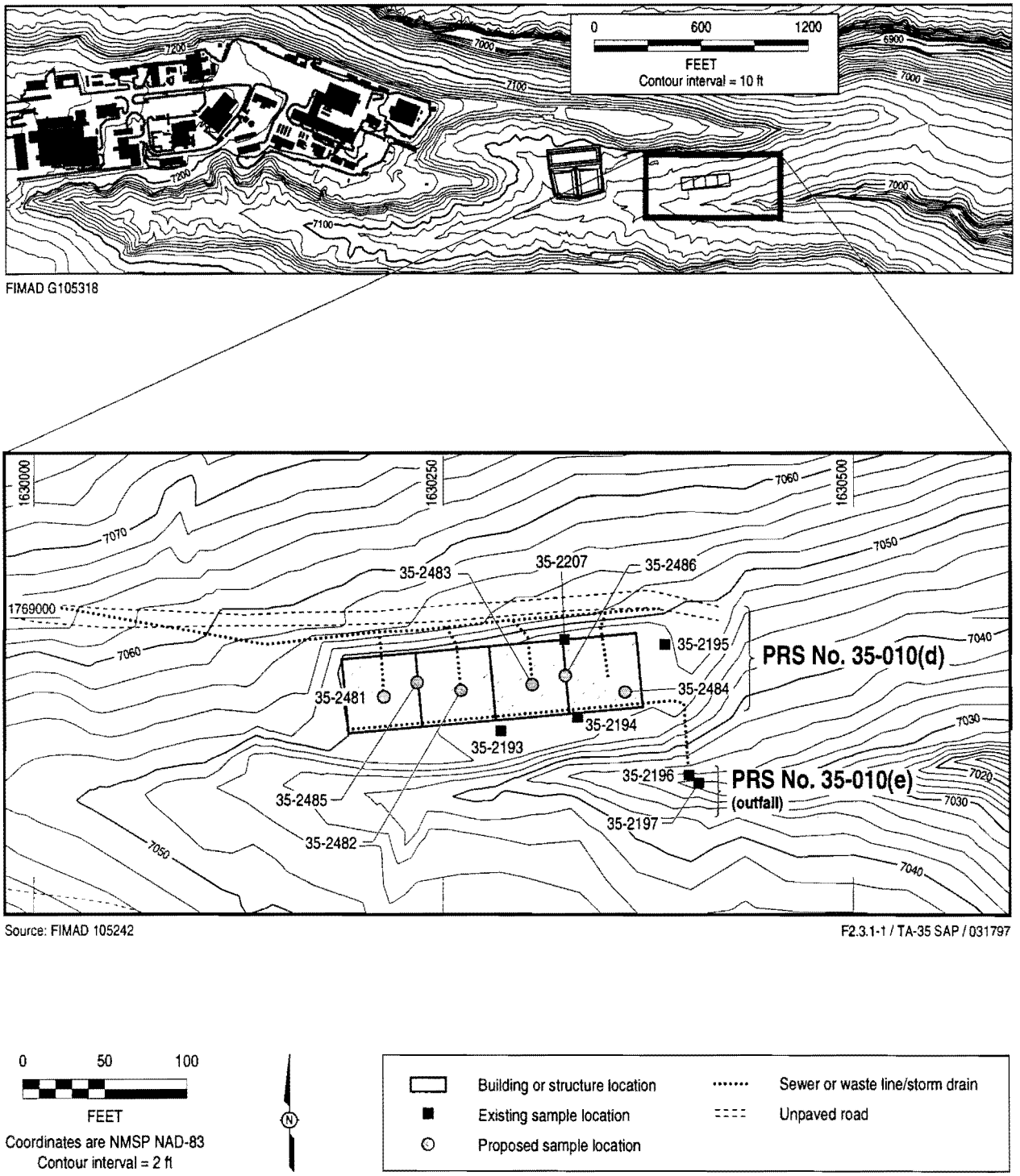


Figure 2.3.1-1. Existing and proposed sample locations for PRS Nos. 35-010(d and e).

TABLE 2.3.1-1

SUMMARY OF RFI SAMPLES TAKEN AT PRS Nos. 35-010(d and e)[a]

Part 1

PRS	Location ID	Sample ID	Depth (ft)	Media	VOCs Mobile Lab	VOCs Fixed Lab	SVOCs Fixed Lab	PAH Mobile Lab	Pest Fixed Lab	PCBs Mobile Lab
35-010(d)	35-2193	0435-95-0112	0–1	Soil	73	NR[b]	NR	73	NR	69
35-010(d)	35-2193	0435-95-0113	1–2	Soil	69	NR	NR	69	69	69
35-010(d)	35-2193	0435-95-0115	2–3	Soil	71	NR	NR	73	NR	71
35-010(d)	35-2194	0435-95-0118	0–1	Soil	69	NR	69	69	NR	69
35-010(d)	35-2194	0435-95-0120	1–2	Soil	69	69	NR	69	NR	69
35-010(d)	35-2194	0435-95-0122	2–2.4	Soil	73	NR	NR	73	NR	69
35-010(d)	35-2195	0435-95-0123	0–0.5	Soil	NR	NR	NR	NR	NR	69
35-010(d)	35-2207	0435-95-0103	0–0.5	Soil	NR	NR	NR	69	69	69
35-010(e)	35-2196	0435-95-0124	0–0.5	Soil	73	NR	NR	73	NR	69
35-010(e)	35-2197	0435-95-0127	0–1	Soil	73	NR	NR	73	NR	69
35-010(e)	35-2197	0435-95-0128	1–2	Soil	73	NR	NR	73	NR	69
35-010(e)	35-2197	0435-95-0129	2–3	Soil	73	NR	NR	73	NR	69

Part 2

PRS	Location ID	Sample ID	Depth (ft)	Media	PCBs Fixed Lab	XRF Mobile Lab	Inorganic Fixed Lab	Alpha Spec Fixed Lab	Gamma Spec Mobile Lab	Gamma Spec Fixed Lab
35-010(d)	35-2193	0435-95-0112	0–1	Soil	NR	71	NR	73	73	NR
35-010(d)	35-2193	0435-95-0113	1–2	Soil	69	69	NR	73	73	NR
35-010(d)	35-2193	0435-95-0115	2–3	Soil	NR	71	71	73	73	73
35-010(d)	35-2194	0435-95-0118	0–1	Soil	NR	69	NR	73	73	NR
35-010(d)	35-2194	0435-95-0120	1–2	Soil	NR	69	NR	73	73	NR
35-010(d)	35-2194	0435-95-0122	2–2.4	Soil	NR	71	NR	73	73	NR
35-010(d)	35-2195	0435-95-0123	0–0.5	Soil	NR	71	NR	73	73	NR
35-010(d)	35-2207	0435-95-0103	0–0.5	Soil	69	69	NR	73	73	73
35-010(e)	35-2196	0435-95-0124	0–0.5	Soil	NR	71	NR	73	73	NR
35-010(e)	35-2197	0435-95-0127	0–1	Soil	NR	71	NR	73	73	NR
35-010(e)	35-2197	0435-95-0128	1–2	Soil	NR	71	NR	73	73	NR
35-010(e)	35-2197	0435-95-0129	2–3	Soil	NR	71	NR	73	73	NR

a. The numbers in the analytical suite columns are analytical request numbers.
b. Not requested

During the discharge period for which records are available (from January 1, 1987, to December 3, 1992), about 100 million gal. of water were discharged from the sand filter beds. This amount of water is likely to have had a significant impact on the local hydrology and to have transported contaminants, if any, in surface water downstream from the point of release. Soluble chemicals may also have been carried into

ground water zones. However, releases from PRS No. 35-010(d) is only one of the potential sources of contamination associated with Ten Site Canyon. The Mortandad Canyon investigation, which is part of the Field Unit 4 canyons investigations, will determine what contamination in Ten Site Canyon, if any, is attributable to the sand filter beds and what contamination, if any, is attributable to other sources. Therefore, the investigation of PRS Nos. 35-010(d and e) will focus on identifying residual contamination within the sand filter beds themselves to support future remedial activities, if any are needed.

Although it was not requested in the original work plan, sampling for ^{90}Sr is proposed because this radionuclide is positively associated with processes at the technical areas that contributed waste to the sewage lagoons, which discharged to PRS Nos. 35-010(d and e). No tritium sampling is proposed because the sand beds are open and subject to repeated precipitation events. Because the material in the beds has no organic component, tritium would be associated only with the pore water and should exchange with the atmosphere relatively quickly.

2.3.3 Sampling and Analysis Plan Design

Samples were collected in 1995 to characterize PRS No. C-35-007 (LANL 1996, 55075), which consisted of sand and gravel piles in Ten Site Canyon that may be previously excavated material from the sand filter beds. Because these samples revealed essentially no contamination, it is expected that the residual filter sands in the beds may likewise prove to be noncontaminated. Therefore, this sampling plan recommends only limited sampling sufficient to confirm this hypothesis.

The sands present within each filter bed are sorted vertically by size with the finer-grained sands present on the bottom of each bed. Because the finer sands will have a larger surface area than the coarser sands, it is anticipated that any residual contamination will be found at a higher concentration in the lower strata of the filter beds. However, samples at both top and bottom intervals of the beds will be collected to confirm this assumption and to better assess the approximate concentrations of contaminants, if any, throughout each bed. Additionally, surface samples are proposed for two locations beneath the plastic liner that forms the bottom of the filter beds to determine if underlying soil may be contaminated. Information from these surface samples will be used to predict whether additional data are required to characterize residual contamination at deeper intervals below the filter beds.

Two grab samples will be collected from the center of each sand filter bed. One sample will be collected in the finer fraction found closest to the liner at the bottom of each sand filter bed, and another sample will be collected in the courser-grained sands at the top of each bed. One surface grab sample of material beneath the liners will be collected from an area between the first and second sand filter beds, and another surface grab sample will be collected from the area between the third and fourth sand filter beds. The locations of proposed samples to be collected under this SAP are shown in Figure 2.3.1-1.

Samples collected from the sand filter beds will be analyzed for alpha- and gamma-emitting radionuclides, ^{90}Sr, PCBs, SVOCs, and inorganic chemicals. A summary of the proposed samples and the associated analyses is presented in Table 2.3.3-1.

2.4 PRS No. 35-014(g_3)

A decommissioned tank farm and waste-oil treatment facility (PRS No. 35-015[a]) were located on the west side of the Carbon Dioxide Laser Building (TA-35-86). PRS No. 35-014(g_3) is the site of a major spill that occurred at the tank farm. The work plan reports that the spill occurred in 1986; however, review of dated

ground photographs (File Nos. 84-51 through 84-55) indicate that the spill occurred no later than May 9, 1984 (LANL 1992, 7666). The spill flowed southward through a culvert under the road on the south side of TA-35-86, across a parking lot west of TA-35-207, down an embankment between the former location of storage tanks TA-35-278 and TA-35-279, and southward across the mesa through a natural drainage pathway into Ten Site Canyon. The tank farm and treatment facility were decommissioned and removed in late 1988 or 1989 (Roberson 1991, 21576).

TABLE 2.3.3-1

SUMMARY OF PROPOSED SAMPLING FOR PRS Nos. 35-010(d and e)

Location ID	Planned Depth (ft)	Media	SVOCs	PCBs	Inorganic Fixed Lab	Isotopic Pu	Isotopic Th	Isotopic U	Sr-90	Gamma Spectroscopy
35-2481	bed surface	Nonsoil sediment	1	1	1	1	1	1	1	1
35-2481	at liner	Nonsoil sediment	1	1	1	1	1	1	1	1
35-2482	bed surface	Nonsoil sediment	1	1	1	1	1	1	1	1
35-2482	at liner	Nonsoil sediment	1	1	1	1	1	1	1	1
35-2483	bed surface	Nonsoil sediment	1	1	1	1	1	1	1	1
35-2483	at liner	Nonsoil sediment	1	1	1	1	1	1	1	1
35-2484	bed surface	Nonsoil sediment	1	1	1	1	1	1	1	1
35-2484	at liner	Nonsoil sediment	1	1	1	1	1	1	1	1
35-2485	below liner	Soil/tuff	1	1	1	1	1	1	1	1
35-2486	below liner	Soil/tuff	1	1	1	1	1	1	1	1

The source of the spill, as documented by 1984 ground photographs, was an oil tanker truck parked on the roadway adjacent to the east side of the tank farm. The pathway of the spilled oil is apparent in the ground photographs. In addition to the culvert pathway described above, an earthen storm water drainage located on the east side of TA-35-128 served as a second drainage pathway into Ten Site Canyon. Oil staining was present in the soil and on exposed tuff south of the former location of storage tanks TA-35-278 and TA-35-279. A hydrocarbon odor was detectable at the time of the Phase I RFI in 1995.

2.4.1 Summary of Historical Data

In 1987, 11 samples were collected along the trace of the spill to the canyon floor and 100 ft downstream as part of Environmental Problem 25 (DOE 1987, 21511). Alpha and gamma radiation, pesticides/PCBs, VOCs, SVOCs, and inorganic chemicals were detected in the samples, although the concentrations of organic chemicals or the levels of radionuclides and metals relative to background levels are unknown

(LANL 1990, 7511). In August 1991, the stained area was observed and still smelled strongly of oil. All vegetation in the path of the spill was dead (Roberson 1991, 21576).

Phase I sampling was performed on April 14, 1995. Eleven soil samples were collected from six locations (not including duplicate QA/QC samples). One surface soil sample (Location ID No. 35-2186) was collected. Five hand-auger holes (Location ID Nos. 35-2183, 35-2184, 35-2185, 35-2187, and 35-2188) were drilled to a depth of 3 ft, and two intervals were sampled in each hole. The sample collection intervals are shown in Table 2.4.1-1. Beta/gamma radiation measurements obtained during field screening of the samples ranged from 180 to 273 cpm, which are within background levels. Table 2.4.1-1 summarizes the existing samples for PRS No. 35-014(g_3); Figure 2.4.1-1 shows the existing sample locations.

The following analyses were performed.

- Eleven samples were analyzed for inorganic chemicals using XRF. Two samples were analyzed for inorganic chemicals using EPA SW-846 methods. Table A-9 in the attachment of this SAP contains the results for inorganic chemical analysis.

- At a fixed-site laboratory, two samples were analyzed for alpha-emitting radionuclides, and three samples were analyzed by gamma spectroscopy. Table A-10 in the attachment of this SAP contains the fixed-site laboratory results for radionuclides.

- Eleven samples were analyzed for VOCs in the mobile laboratory. Two samples were analyzed for VOCs at a fixed-site laboratory. Twelve samples (including duplicate QA/QC samples) were analyzed for PAHs in the mobile laboratory. Two samples were analyzed for SVOCs at a fixed-site laboratory. Thirteen samples (including duplicate QA/QC samples) were analyzed for PCBs in the mobile laboratory. Two samples were analyzed for PCBs at a fixed-site laboratory. See Table 2.4.1-1 for specific samples. Table A-11 in the attachment of this SAP contains the results for organic chemical analysis.

The inorganic chemicals chromium, nickel, uranium, and zinc were detected above background UTL values. The organic chemicals acetone, bis(2-ethylhexyl)phthalate, butanone [2-], methyl-2-pentanone [4-], methylene chloride, toluene, trimethylbenzene [1,2,4-], xylenes (o, m, p) [mixed-], hexanone [2-], and phenanthrene were detected. The two samples analyzed for SVOCs at the fixed-site laboratory required 10-fold dilution because of the presence of hydrocarbon contamination. Therefore, the fixed-site laboratory SVOC results should be regarded as estimates and must be confirmed.

2.4.2 Problem Statement

The following questions will be addressed by collecting supplemental data.

- Are gamma-emitting radionuclides present above background levels at PRS No. 35-014(g_3)?

- What is the extent of organic chemical contamination at PRS No. 35-014(g_3)?

- Could contaminants represent a potential threat to human health or the environment?

- Could contaminants present in soil pose a threat to surface water quality?

TABLE 2.4.1-1

SUMMARY OF RFI SAMPLES TAKEN AT PRS No. 35-014(g_3)[a]

Part 1

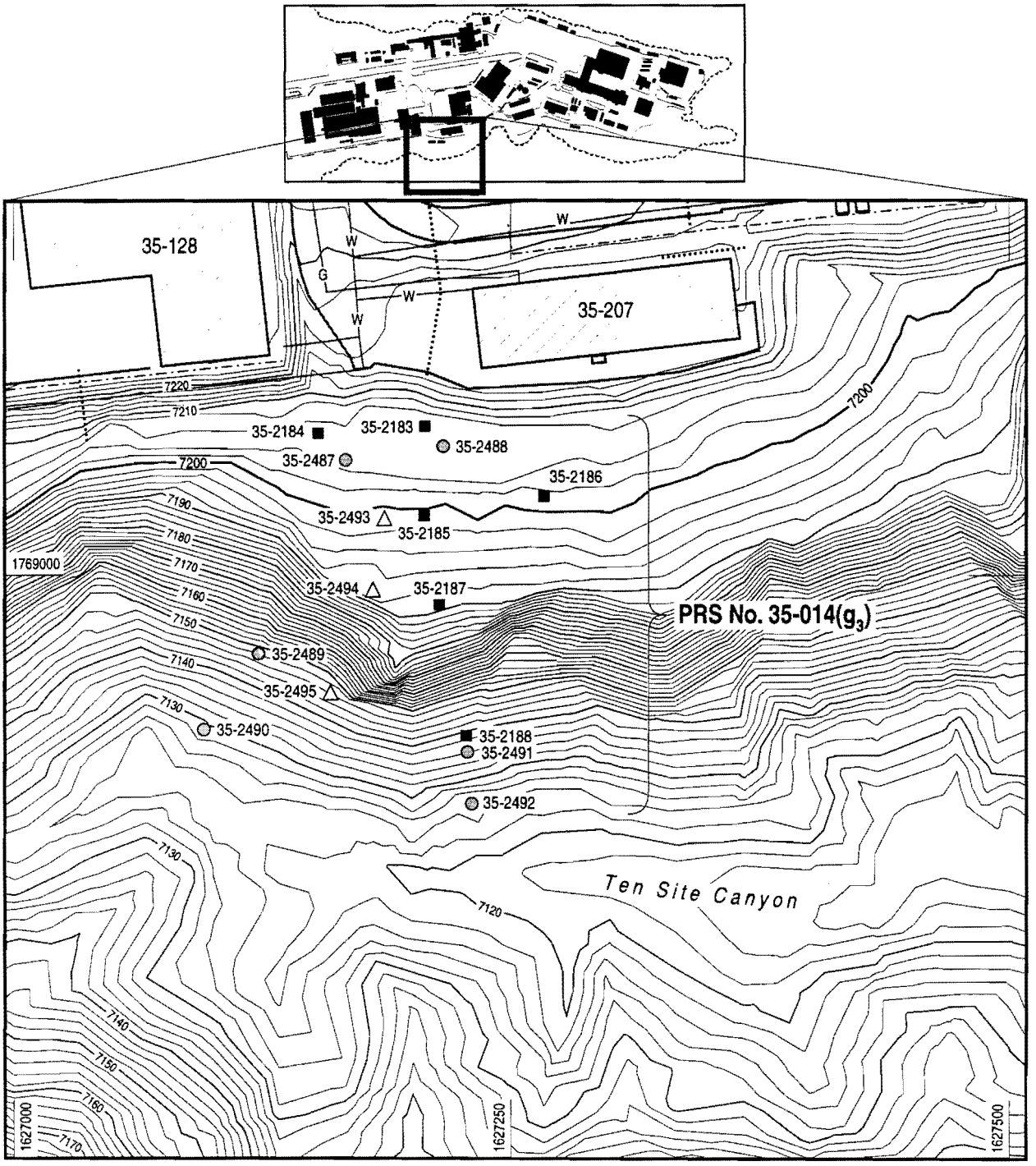
Location ID	Sample ID	Depth (ft)	Media	VOCs Mobile Lab	VOCs Fixed Lab	SVOCs Fixed Lab	PAH Mobile Lab	Pest Fixed Lab	PCBs Mobile Lab
35-2183	0435-95-0032	0–1	Soil	39	NR[b]	NR	39	NR	39
35-2183	0435-95-0033	2–3	Soil	39	NR	NR	39	39	39
35-2183	0435-95-0166	2–3	Soil	NR	NR	NR	NR	NR	NR
35-2184	0435-95-0037	0–1	Soil	39	NR	NR	39	NR	39
35-2184	0435-95-0038	0–1	Soil	39	NR	NR	39	NR	39
35-2184	0435-95-0039	2–3	Soil	NR	NR	NR	39	NR	39
35-2185	0435-95-0040	0–1	Soil	39	39	NR	39	NR	39
35-2185	0435-95-0043	2–3	Soil	39	NR	39	39	NR	39
35-2186	0435-95-0045	0–0.5	Soil	NR	NR	NR	NR	NR	39
35-2186	0435-95-0047	0–0.5	Soil	39	NR	NR	39	NR	39
35-2187	0435-95-0048	0–1	Soil	39	NR	NR	54	NR	54
35-2187	0435-95-0050	2–3	Soil	39	39	NR	39	NR	39
35-2188	0435-95-0052	0–1	Soil	42	NR	NR	42	42	42
35-2188	0435-95-0054	2–3	Soil	42	NR	42	42	NR	42

Part 2

Location ID	Sample ID	Depth (ft)	Media	PCBs Fixed Lab	XRF Mobile Lab	Inorganic Fixed Lab	Alpha Spec Fixed Lab	Gamma Spec Mobile Lab	Gamma Spec Fixed Lab
35-2183	0435-95-0032	0–1	Soil	NR	54	NR	NR	NR	NR
35-2183	0435-95-0033	2–3	Soil	39	54	54	NR	56	56
35-2183	0435-95-0166	2–3	Soil	NR	NR	NR	NR	NR	NR
35-2184	0435-95-0037	0–1	Soil	NR	54	NR	NR	NR	NR
35-2184	0435-95-0038	0–1	Soil	NR	54	NR	NR	NR	NR
35-2184	0435-95-0039	2–3	Soil	NR	54	NR	NR	NR	NR
35-2185	0435-95-0040	0–1	Soil	NR	39	NR	55	NR	56
35-2185	0435-95-0043	2–3	Soil	NR	39	NR	55	NR	NR
35-2186	0435-95-0045	0–0.5	Soil	NR	54	NR	NR	56	56
35-2186	0435-95-0047	0–0.5	Soil	NR	54	NR	NR	NR	NR
35-2187	0435-95-0048	0–1	Soil	NR	54	54	NR	NR	NR
35-2187	0435-95-0050	2–3	Soil	NR	NR	NR	NR	NR	NR
35-2188	0435-95-0052	0–1	Soil	42	42	NR	NR	NR	NR
35-2188	0435-95-0054	2–3	Soil	NR	42	NR	NR	NR	NR

a. The numbers in the analytical suite columns are analytical request numbers.

b. Not requested



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0 50 100 150

FEET

Coordinates are NMSP NAD-83

Contour interval = 2 ft

▭	Building or structure location	·····	Sewer or waste line/storm drain
■	Existing sample location	——	Paved area
○	Proposed sample location	—G—	Gas line
△	Water sampling station	—W—	Water line

Figure 2.4.1-1. Existing and proposed sample locations for PRS No. 35-014(g_3).

Collection of additional data for PRS No. 35-014(g_3) is necessary to determine the extent of potential VOC, SVOC, and TPH contamination and to replace the mobile laboratory radionuclide data. Samples collected in 1995 were not analyzed for TPH, and only two samples were analyzed for SVOCs (these two samples had a 10-fold dilution because of hydrocarbon contamination). Samples for VOC analysis are necessary to confirm the presence of these organic chemicals. It was determined that mobile laboratory radionuclide results from the Phase I RFI are not usable to determine the nature of gamma-emitting radionuclide contamination. Therefore, additional data will be collected. Samples were analyzed for inorganic chemicals and alpha-emitting radionuclides during the initial sampling event. The inorganic chemicals identified were only slightly elevated above background levels, and the activities of alpha-emitting radionuclides were consistent with background levels assuming equilibrium in the thorium and uranium decay series. The previous data collected for inorganic chemicals are sufficient to evaluate their potential impact to human health and the environment. Although only two samples from one location were analyzed using alpha spectrometry, radionuclides are not expected based on the release scenario.

Collection of runoff water samples in the drainage channel in the path of the spill will allow for the determination of surface water problems, if any.

2.4.3 Sampling and Analysis Plan Design

The locations of proposed samples to be collected under this SAP are shown in Figure 2.4.1-1. Six hand-auger holes are proposed to be drilled in areas where potential contaminants were identified, in areas of sediment accumulation, and in areas of visible staining, if any. Three samples will be collected at each location, one from each of the following depth intervals: 0 to 1 ft, 2 to 3 ft, and at the soil/tuff interface. If the depth to tuff is between 2 and 3 ft, one interval may be eliminated and, if the soil depth is less than 2 ft, the second sampling intervals may be reduced to less than 1 ft. A summary of the proposed samples and the associated analyses is presented in Table 2.4.3-1.

Two hand-auger holes are proposed on the mesa top where the oil product accumulated in front of the former transportable buildings and where staining was observed. Hand-auger holes are also proposed for four locations on the bench (area of sediment accumulation) below the spill (it appears that the spill followed two drainage channels). Data from these locations will be used to evaluate whether contaminants have accumulated at the base of the drainage channel that follows the path of the spill. If alluvial fans can be located at the base of the drainage channels, their configuration will help determine the sample locations. If hand-auger locations cannot be field biased in this manner, one hand-auger hole will be located directly below each drainage channel at the slope break where deep sediments are located, and one will be located approximately 20 ft farther down the slope of each drainage channel. The samples will be analyzed for gamma-emitting radionuclides, SVOCs, and TPH. Only the bottom two intervals of each hand-auger hole will be analyzed for VOCs because they usually volatilize quickly in surface soils.

Surface water samples will be collected from runoff during a storm event. Precipitation or snow melt runoff is the only source of surface water at this PRS. Single-stage samplers will be installed in three locations of the drainage channel that was the path of the spill: one at the head of the drainage on the mesa edge, a second half way down the mesa slope, and a third at the toe of the slope where the slope breaks. Figure 2.3.1-1 shows the approximate locations of the single-stage samplers. Surface water runoff will be collected and analyzed for SVOCs and TPH.

The location and type of samples collected as part of the implementation of this SAP will allow not only identification of a release but also a preliminary evaluation of the extent of the release. The samples will provide information on the type of sedimentary processes that have been active on the mesa top and

slope since the period of the release. Whether contaminants are present on the mesa top, in the drainage channels on the slope, or on the bench below the drainage channels; the depths where they are present; and the relative concentrations among depths and locations will allow the technical team to infer (1) if any significant release has occurred and (2) if the extent of contamination, if any, is likely to have been spatially bound. Based on the interpretation of these data, recommendations for additional action, if any, will be made.

TABLE 2.4.3-1

SUMMARY OF PROPOSED SAMPLING FOR PRS No. 35-014(g_3)

Location ID	Planned Depth (ft)	Media	VOCs	SVOCs	TPH	Gamma Spectroscopy
35-2487	0–1	Soil	0	1	1	1
35-2487	2–3	Soil	1	1	1	1
35-2487	Interface	Soil/tuff	1	1	1	1
35-2488	0–1	Soil	0	1	1	1
35-2488	2–3	Soil	1	1	1	1
35-2488	Interface	Soil/tuff	1	1	1	1
35-2489	0–1	Soil	0	1	1	1
35-2489	2–3	Soil	1	1	1	1
35-2489	Interface	Soil/tuff	1	1	1	1
35-2490	0–1	Soil	0	1	1	1
35-2490	2–3	Soil	1	1	1	1
35-2490	Interface	Soil/tuff	1	1	1	1
35-2491	0–1	Soil	0	1	1	1
35-2491	2–3	Soil	1	1	1	1
35-2491	Interface	Soil/tuff	1	1	1	1
35-2492	0–1	Soil	0	1	1	1
35-2492	2–3	Soil	1	1	1	1
35-2492	Interface	Soil/tuff	1	1	1	1
35-2493	N/A	Water	0	1	1	0
35-2494	N/A	Water	0	1	1	0
35-2495	N/A	Water	0	1	1	0

2.5 PRS No. 35-015(a)

PRS No. 35-015(a) is the site of a decommissioned tank farm and waste-oil treatment facility located on the west side of TA-35-86. The former waste-oil treatment facility reprocessed used dielectric oil from the Helios CO_2 laser in TA-35-86 and included oil surge tanks TA-35-149 through TA-35-154, a grease trap, and an oil-treatment unit. When the oil recycling process was complete, separated water was discharged into Ten Site Canyon through a storm sewer (DOE 1987, 8663). Spills from the tank farm were also discharged to a storm sewer and into Ten Site Canyon near TA-35-207 (LANL 1990, 7511). Field notes recorded during a 1988 ER Program environmental survey noted a "bad bad" oil spill at the surge tanks (Shafer 1988, 41150). This is believed to be the same spill, which is designated as PRS No. 35-014(g_3), that ran into Ten Site Canyon south of TA-35-207. PRS No. 35-014(g_3) is discussed in Section 2.4. The

tank farm and treatment facility were decommissioned and removed in late 1988 or 1989 (Roberson 1991, 21576).

Much of the area was paved after the tank farm and waste-oil treatment facility were removed. However, stained areas present in unpaved portions of the tank farm indicate that contaminated soils were not completely removed when the facility was decommissioned (LANL 1990, 7511). Oil staining was present in soil on unpaved areas during the Phase I RFI in 1995.

2.5.1 Summary of Historical Data

In 1985, samples collected near the oil surge tanks indicated no PCB contamination. According to the SWMU report, the oil at the tank farm contained no hazardous constituents (LANL 1990, 7511). However, samples taken from an area stained by a spill (PRS No. 35-014[g_3]) contained detectable quantities of several contaminants (LANL 1990, 7511). Therefore, similar contamination was expected in stained areas at this site.

RFI engineering surveys were performed at PRS No. 35-015(a) on September 14, 1994, September 19, 1994, February 9, 1995, March 27, 1995, March 30, 1995, and May 23, 1996. The surveys consisted of reviews of archival information and ground and aerial photographs, as well as field site inspections and a description of the PRSs. After the Phase I RFI was conducted, two office trailers were set up at the former tank farm site.

Several abandoned oil-handling pipelines remain at the site. At the time of the Phase I RFI, the location of the pipelines could be identified by 4-ft vertical pipe sections that connected to the former tanks. These pipes were subsequently cut flush with the concrete surface and grouted to allow trailers to park at the site. Summer temperatures appear to have caused residual oil in the pipes to expand because oil has seeped around the grout and onto the concrete at three locations in the northern part of the area. Many of the sites in the southern part of the area where vertical pipes were located have been backfilled with aggregate base course up to about 1 ft deep. The backfill material covers most of the Phase I sample locations. No evidence of seeping oil from these vertical pipes has been observed.

Phase I sampling was performed on March 7, 1995. A total of 19 soil samples were collected from 11 locations (not including duplicate QA/QC samples). Six surface soil samples (Location ID Nos. 35-2173, 35-2174, 35-2175, 35-2177, 35-2178, and 35-2181) were collected. Four hand-auger holes (Location ID Nos. 35-2176, 35-2179, 35-2180, and 35-2182) were drilled to a depth of 3 ft; one hand-auger hole (Location ID No. 35-2172) was drilled to a depth of 2 ft. The sample collection intervals are shown in Table 2.5.1-1. Beta/gamma radiation measurements obtained during field screening of the samples ranged from 163 to 261 cpm, which are within background levels.

On December 8, 1995, supplemental sampling was performed to resample Location ID Nos. 35-2180 and 35-2182 because the original sample material was lost at the analytical laboratory. Two hand-auger holes were drilled. At Location ID No. 35-2285 (formerly 35-2180) a subsurface soil sample was collected at the 1- to 2-ft interval. At Location ID No. 35-2286 (formerly 35-2182) subsurface soil samples were collected at the 1- to 2-ft and 2- to 3-ft intervals. Beta/gamma radiation measurements obtained during field screening of the samples ranged from 90 to 120 cpm, which are within background levels.

Table 2.5.1-1 summarizes all sampling for PRS No. 35-015(a); Figure 2.5.1-1 shows the sample locations.

TABLE 2.5.1-1

SUMMARY OF RFI SAMPLES TAKEN AT PRS No. 35-015(a)[a]

Part 1						
Location ID	Sample ID	Depth (ft)	Media	VOCs Mobile Lab	PAH Mobile Lab	PCBs Mobile Lab
35-2172	AAC3350	0–1	Soil	21529	21529	21529
35-2172	AAC3329	1–2	Soil	21529	21529	21529
35-2173	AAC3330	0–0.5	Soil	21529	NR[b]	21529
35-2174	AAC3331	0–0.5	Soil	21529	21529	21529
35-2174	AAC3349	0–0.5	Soil	NR	NR	NR
35-2175	AAC3332	0–0.5	Soil	21529	21529	21529
35-2176	AAC3351	0–1	Soil	21529	21529	21529
35-2176	AAC3333	2–3	Soil	21529	21529	21529
35-2177	AAC3334	0–0.5	Soil	21529	21529	21529
35-2178	AAC3335	0–0.5	Soil	21529	21529	21529
35-2179	AAC3336	0–1	Soil	21529	21529	21529
35-2179	AAC3337	1–2	Soil	21529	NR	NR
35-2179	AAC3338	2–3	Soil	21529	21529	NR
35-2180	AAC3339	0–1	Soil	21529	21529	21529
35-2180	AAC3340	1–2	Soil	21529	NR	NR
35-2180	AAC3341	2–3	Soil	21529	21529	NR
Part 1						
Location ID	Sample ID	Depth (ft)	Media	XRF Mobile Lab	Alpha Spec Fixed Lab	Gamma Spec Mobile Lab
35-2172	AAC3350	0–1	Soil	21530	NR	21528
35-2172	AAC3329	1–2	Soil	21530	NR	21528
35-2173	AAC3330	0–0.5	Soil	21530	NR	21528
35-2174	AAC3331	0–0.5	Soil	21530	21508	21528
35-2174	AAC3349	0–0.5	Soil	NR	21508	NR
35-2175	AAC3332	0–0.5	Soil	21530	NR	21528
35-2176	AAC3351	0–1	Soil	21530	NR	21528
35-2176	AAC3333	2–3	Soil	21530	NR	21528
35-2177	AAC3334	0–0.5	Soil	21530	NR	21528
35-2178	AAC3335	0–0.5	Soil	21530	NR	21528
35-2179	AAC3336	0–1	Soil	21530	NR	21528
35-2179	AAC3337	1–2	Soil	21530	NR	21528
35-2179	AAC3338	2–3	Soil	21530	NR	21528
35-2180	AAC3339	0–1	Soil	21530	NR	21528
35-2180	AAC3340	1–2	Soil	21530	NR	21528
35-2180	AAC3341	2–3	Soil	21530	NR	21528

a. The numbers in the analytical suite columns are analytical request numbers.

b. Not requested

TABLE 2.5.1-1 (continued)

SUMMARY OF RFI SAMPLES TAKEN AT PRS No. 35-015(a)[a]

Part 1							
Location ID	**Sample ID**	**Depth (ft)**	**Media**	**VOCs Mobile Lab**	**SVOCs Fixed Lab**	**PAH Mobile Lab**	**PCBs Mobile Lab**
35-2181	AAC3342	0–0.5	Soil	21529	NR[b]	21529	21529
35-2181	AAC3343	0–0.5	Soil	21529	NR	21529	NR
35-2182	AAC3344	0–1	Soil	21529	NR	21529	21529
35-2182	AAC3345	1–2	Soil	21529	NR	NR	NR
35-2182	AAC3346	2–3	Soil	21529	NR	NR	NR
35-2285	0435-95-0198	1–1.8	Soil	NR	1678	NR	NR
35-2286	0435-95-0199	1–2	Soil	NR	1678	NR	NR
35-2286	0435-95-0200	2–3	Soil	NR	1678	NR	NR
Part 2							
Location ID	**Sample ID**	**Depth (ft)**	**Media**	**TPH Fixed Lab**	**XRF Mobile Lab**	**Inorganic Fixed Lab**	**Gamma Spec Mobile Lab**
35-2181	AAC3342	0–0.5	Soil	NR	21530	NR	21528
35-2181	AAC3343	0–0.5	Soil	NR	21530	NR	21528
35-2182	AAC3344	0–1	Soil	NR	21530	NR	21528
35-2182	AAC3345	1–2	Soil	NR	21530	NR	21528
35-2182	AAC3346	2–3	Soil	NR	21530	21505	21528
35-2285	0435-95-0198	1–1.8	Soil	1678	NR	NR	NR
35-2286	0435-95-0199	1–2	Soil	1678	NR	1679	NR
35-2286	0435-95-0200	2–3	Soil	1678	NR	NR	NR

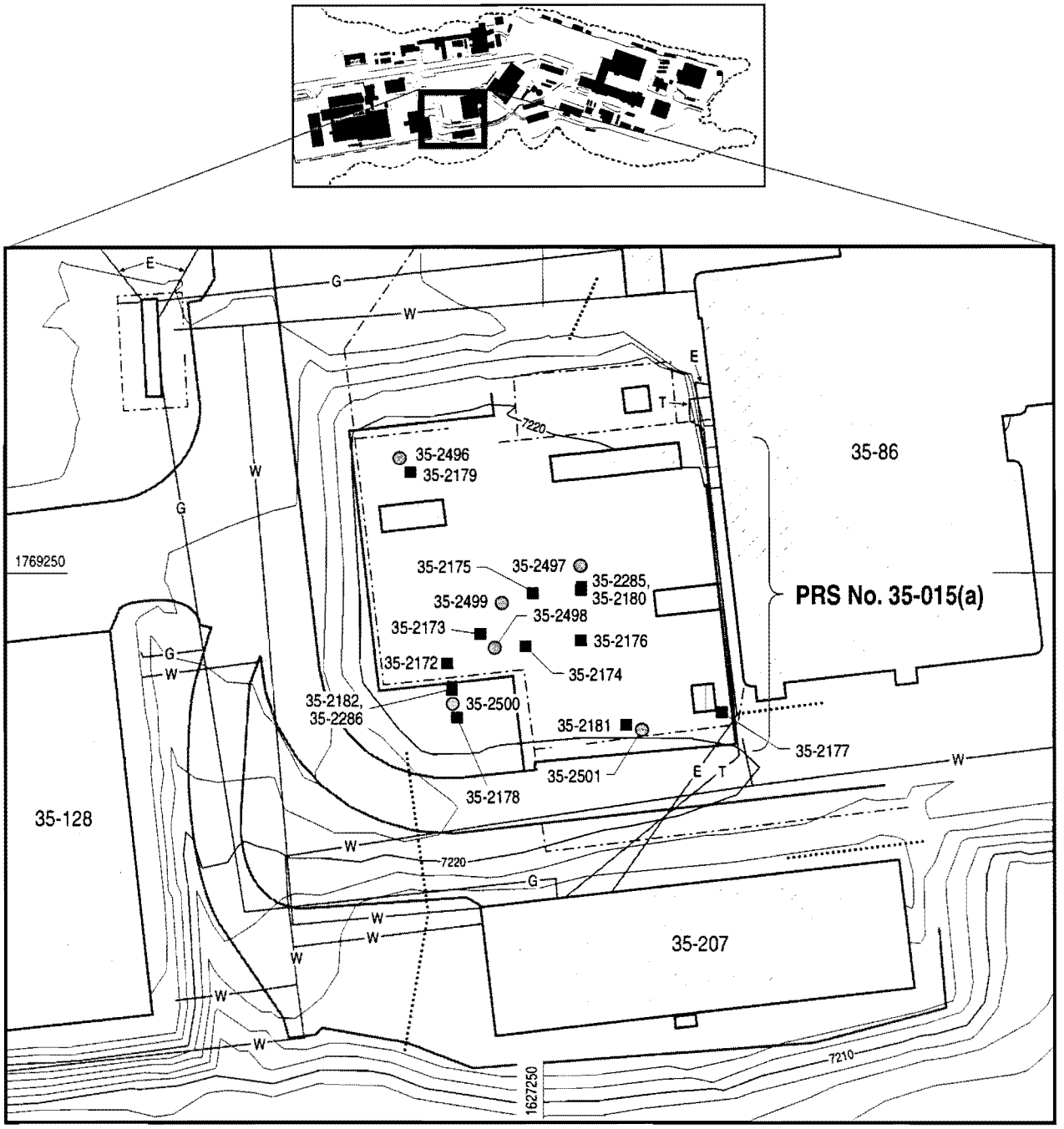
a. The numbers in the analytical suite columns are analytical request numbers.
b. Not requested

The following analyses were performed.

- Nineteen samples were analyzed for inorganic chemicals using XRF. Two samples were analyzed for inorganic chemicals using EPA SW-846 methods. Table A-12 in the attachment of this SAP contains the results for inorganic chemical analysis.

- Two samples were analyzed for alpha-emitting radionuclides at a fixed-site laboratory. Table A-13 in the attachment of this SAP contains the fixed-site laboratory results for radionuclides.

- Twenty samples were analyzed for VOCs in the mobile laboratory. Fifteen samples were analyzed for PAHs in the mobile laboratory. Three samples were analyzed for SVOCs at a fixed-site laboratory. Thirteen samples were analyzed for PCBs in the mobile laboratory. There were no fixed-site laboratory analyses for VOCs or PCBs. See Table 2.5.1-1 for specific samples. Table A-14 in the attachment of this SAP contains the results for organic chemical analysis.



Source: FIMAD 105244

F2.5.1-1 / TA-35 SAP / 031797

0 50 100

FEET

Coordinates are NMSP NAD-83
Contour interval = 2 ft

▭	Building or structure location	— · · —	Fence
■	Existing sample location	—G—	Gas line
◎	Proposed sample location	—E—	Power line
——	Paved area	—T—	Telephone line
·····	Sewer or waste line/storm drain	—W—	Water line

Figure 2.5.1-1. Existing and proposed sample locations for PRS No. 35-015(a).

The inorganic chemicals antimony, barium, calcium, chromium, copper, iron, lead, nickel, thorium, uranium, and zinc were detected above background UTL values. The multiple constituent evaluation exceeded unity for the additive toxic effects calculation. The radionuclide ^{235}U was detected above the background UTL value. Supplemental samples collected in 1995 contained up to 44,000 parts per million (ppm) TPH. SVOC analysis was performed only for the three supplemental samples. These samples had a 10- and 25-fold dilution because of hydrocarbon contamination; therefore, the data are estimated. The organic chemicals anthracene, benz[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, bis(2-ethylhexyl)phthalate, chrysene, fluoranthene, pyrene, and phenanthrene were detected. No VOCs were detected by the mobile laboratory.

2.5.2 Problem Statement

The following questions will be addressed by collecting supplemental data.

- Are alpha- and gamma-emitting radionuclides present above background levels at PRS No. 35-015(a)?
- What is the nature of SVOC, TPH, and inorganic chemical contamination at PRS No. 35-015(a)?
- Could contaminants represent a potential threat to human health or the environment?

Collection of additional data for PRS No. 35-015(a) is necessary to supplement the alpha spectrometry, inorganic chemical, VOC, PCB, and TPH data; to confirm the presence of SVOCs; and to replace the mobile laboratory radionuclide data. Several inorganic chemicals were detected above background levels, and the multiple constituent evaluation exceeded unity for the toxic effects calculation. Supplemental samples collected in 1995 contained up to 44,000 ppm TPH. Only three supplemental samples were analyzed for SVOCs (these samples had 10- and 25-fold dilution because of hydrocarbon contamination). Only two samples were analyzed by alpha spectrometry. It was determined that mobile laboratory radionuclide results from the Phase I RFI are not usable to determine the nature of gamma-emitting radionuclide contamination. Therefore, additional data will be collected.

2.5.3 Sampling and Analysis Plan Design

The locations of proposed samples to be collected under this SAP are shown in Figure 2.5.1-1. Six hand-auger holes are proposed to be drilled in areas where potential contaminants were identified, in the area of reported seeping oil, and in areas of visible staining. Three samples will be collected at each location, one from each of the following depth intervals: 0 to 1 ft, 2 to 3 ft, and at the backfill/tuff interface. If the depth to tuff is between 2 and 3 ft, one interval may be eliminated and, if the backfill depth is less than 2 ft, the second sampling intervals may be reduced to less than 1 ft. A summary of the proposed samples and the associated analyses is presented in Table 2.5.3-1.

Hand-auger holes are proposed for locations where contaminants were identified during the 1995 sampling. Samples will be analyzed for SVOCs, TPH, inorganic chemicals, and alpha- and gamma-emitting radionuclides. The presence of visible staining will ideally determine sample locations. If hand-auger locations cannot be field biased in this manner (because of recent backfilling at the site) hand-auger holes will be located near Location ID Nos. 35-2173, 35-2175, 35-2181, and 35-2182.

Four samples will be collected and analyzed for VOCs and PCBs because there was no analysis for VOCs or PCBs at a fixed-site laboratory. These analyses will help define whether there are hazardous constituents associated with the TPH contamination.

TABLE 2.5.3-1

SUMMARY OF PROPOSED SAMPLING FOR PRS No. 35-015(a)

Location ID	Planned Depth (ft)	Media	VOCs	SVOCs	TPH	PCBs	Inorganic Fixed Lab	Alpha Spectrometry	Gamma Spectroscopy
35-2496	0–1	Soil	0	1	1	0	1	1	1
35-2496	2–3	Soil	1	1	1	1	1	1	1
35-2496	Interface	Backfill/tuff	0	1	1	0	1	1	1
35-2497	0–1	Soil	0	1	1	0	1	1	1
35-2497	2–3	Soil	1	1	1	1	1	1	1
35-2497	Interface	Backfill/tuff	0	1	1	0	1	1	1
35-2498	0–1	Soil	0	1	1	0	1	1	1
35-2498	2–3	Soil	1	1	1	1	1	1	1
35-2498	Interface	Backfill/tuff	0	1	1	0	1	1	1
35-2499	0–1	Soil	0	1	1	0	1	1	1
35-2499	2–3	Soil	0	1	1	0	1	1	1
35-2499	Interface	Backfill/tuff	0	1	1	0	1	1	1
35-2500	0–1	Soil	0	1	1	0	1	1	1
35-2500	2–3	Soil	0	1	1	0	1	1	1
35-2500	Interface	Backfill/tuff	1	1	1	1	1	1	1
35-2501	0–1	Soil	0	1	1	0	1	1	1
35-2501	2–3	Soil	0	1	1	0	1	1	1
35-2501	Interface	Backfill/tuff	0	1	1	0	1	1	1

2.6 PRS Nos. 35-016(k and l)

PRS No. 35-016(k) is a formerly permitted inactive outfall that handled cooling water from the Gas Laser Building (TA-35-29), which is located near the east end of Ten Site Mesa. PRS No. 35-016(l) is an active daylight discharge channel that was established in 1961 to handle rainwater runoff from TA-35-29 and sterilized water leaks from an ultraviolet water sterilizer in Room 001A of TA-35-29.

The outfall (former NPDES Permit No. 04A116) was installed in 1961 and deactivated in 1987 (LANL 1990, 7511). It handled once-through cooling water from a closed heat-exchange system that served a gas laser in TA-35-29 (LANL 1991, 12451). The drain line runs eastward and discharges into a shallow tributary of Ten Site Canyon informally known as Pratt Canyon, which has been identified as PRS No. 35-003(r). During the 1988 ER Program site visit, the concrete catch basin for these drains had gamma radiation readings that measured 50% higher than background levels (LANL 1990, 7511).

Several daylight drainage areas and corrugated metal pipes (CMPs) associated with a surface drainage from TA-35-29 run into the drainage channel for PRS No. 35-016(k). Staining from past oil spills is present in the source areas for these drains. One of the areas at the head of the channel is PRS No. 35-018(a), the site of a transformer near the southwest corner of TA-35-29 that leaked PCB-contaminated oil. The area

near the transformer was subject to a voluntary corrective action during which PCB-contaminated soil was removed (LANL 1996, 55063). PRS No. 35-018(a) was also contaminated with TPH and PAHs (LANL 1996, 55063). The drainages flow eastward to a 24-in.-diameter CMP outfall located on the north side of the security fence southeast of building TA-35-27. A 3-ft-high concrete diversion channel directs surface flow from the PRS into the CMP. The outfall discharges into a steep channel lined with a riprap apron, which drains into Pratt Canyon.

2.6.1 Summary of Historical Data

PRS Nos. 35-016(k and l) and the existing sample locations are shown in Figure 2.6.1-1. Phase I sampling was performed on February 27, 1995. Five soil samples were collected from three locations. For PRS No. 35-016(k), one surface soil sample (Location ID No. 35-2112) was collected, and one hand-auger hole (Location ID No. 35-2113) was drilled to a depth of 3 ft. The sample collection intervals are shown in Table 2.6.1-1. For PRS No. 35-016(l), one surface sample was collected within Pratt Canyon at the outfall location. Beta/gamma radiation measurements obtained during field screening of the samples ranged from 200 to 430 cpm, which are within background levels. Table 2.6.1-1 summarizes the existing sampling for PRS Nos. 35-016(k and l).

The following analyses were performed.

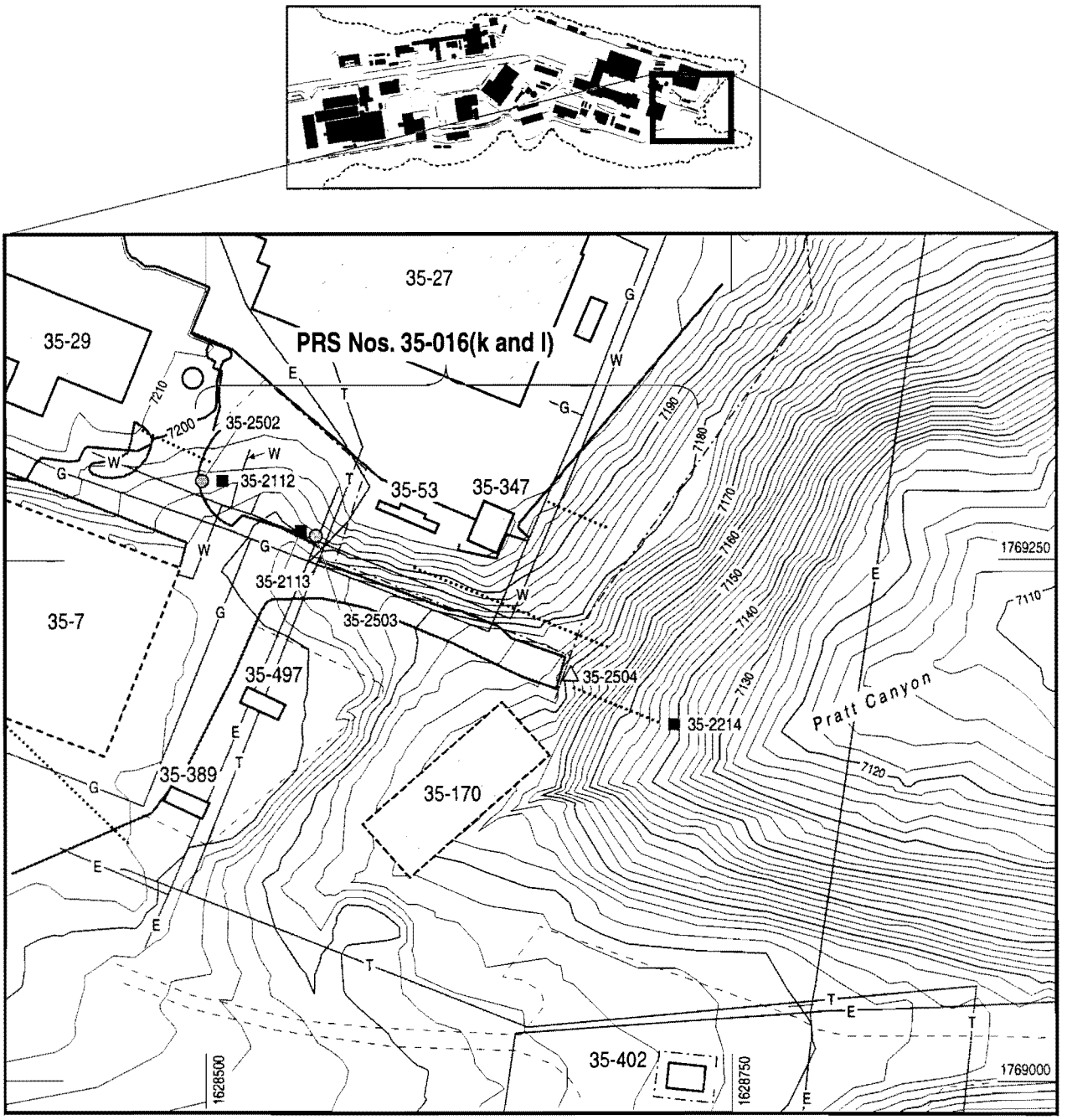
- All samples were analyzed using XRF. One sample was analyzed for inorganic chemicals using EPA SW-846 methods. Table A-15 in the attachment of this SAP contains the results for inorganic chemical analysis.
- At a fixed-site laboratory, one sample was analyzed for alpha-emitting radionuclides, and one sample was analyzed by gamma spectroscopy. Table A-16 in the attachment of this SAP contains the fixed-site laboratory results for radionuclides.
- Five samples were analyzed for VOCs in the mobile laboratory. There was no fixed-site laboratory analysis for VOCs. Five samples were analyzed for PAHs in the mobile laboratory. One sample was analyzed for SVOCs at a fixed-site laboratory. See Table 2.6.1-1 for specific samples. Table A-17 in the attachment of this SAP contains the results for organic chemical analysis.

The inorganic chemicals copper, lead, thorium, uranium, and zinc were detected above background UTL values. No radionuclides were detected above background levels in the sample analyzed. The organic chemicals benz[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, dibenz[a,h]anthracene, and indeno[1,2,3-cd]pyrene were detected above SAL values. The organic chemicals acenaphthene, acenaphthylene, anthracene, benzo[g,h,i]perylene, benzo[k]fluoranthene, dibenzofuran, fluoranthene, fluorene, naphthalene, phenanthrene, and pyrene were also detected. No fixed-site laboratory analysis was performed for PCBs, VOCs, or TPH.

2.6.2 Problem Statement

The following questions will be addressed by collecting supplemental data.

- Are alpha- and gamma-emitting radionuclides, PCBs, VOCs, or TPH present above background levels at PRS Nos. 35-016(k and l)?
- Could contaminants, if any, represent a potential threat to human health or the environment?
- Could contaminants present in soil, if any, pose a potential threat to surface water quality?



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FEET

Coordinates are NMSP NAD-83

Contour interval = 2 ft

N

▭	Building or structure location	====	Unpaved road
■	Existing sample location	—G—	Gas line
○	Proposed sample location	—E—	Power line
△	Water sampling station	—T—	Telephone line
——	Paved area	—W—	Water line
·····	Sewer or waste line/storm drain		

Figure 2.6.1-1. Existing and proposed sample locations for PRS Nos. 35-016(k and l).

TABLE 2.6.1-1

SUMMARY OF RFI SAMPLES TAKEN AT PRS Nos. 35-016(k and l)[a]

Part 1								
PRS	Location ID	Sample ID	Depth (ft)	Media	VOCs Mobile Lab	SVOCs Fixed Lab	PAH Mobile Lab	XRF Mobile Lab
35-016(k)	35-2112	AAC1133	0–0.5	Soil	21451	NR[b]	21451	21452
35-016(k)	35-2113	AAC1134	0–1	Soil	21451	NR	21451	21452
35-016(k)	35-2113	AAC1135	1–2	Soil	21451	NR	21451	21452
35-016(k)	35-2113	AAC1136	2–3	Soil	21451	NR	21451	21452
35-016(l)	35-2214	AAC1140	0–1	Soil	21434	21434	21434	21450
Part 2								
PRS	Location ID	Sample ID	Depth (ft)	Media	Inorganic Fixed Lab	Alpha Spec Fixed Lab	Gamma Spec Mobile Lab	Gamma Spec Fixed Lab
35-016(k)	35-2112	AAC1133	0–0.5	Soil	21435	21436	21450	21436
35-016(k)	35-2113	AAC1134	0–1	Soil	NR	NR	21450	NR
35-016(k)	35-2113	AAC1135	1–2	Soil	NR	NR	21450	NR
35-016(k)	35-2113	AAC1136	2–3	Soil	NR	NR	21450	NR
35-016(l)	35-2214	AAC1140	0–1	Soil	NR	NR	21450	NR

a. The numbers in the analytical suite columns are analytical request numbers.
b. Not requested

Collection of additional data for PRS Nos. 35-016(k and l) is necessary to determine the presence or absence of PCBs, VOCs, and TPH and to replace the mobile laboratory radionuclide data. Samples collected in 1995 were not analyzed for PCBs, VOCs, or TPH at a fixed-site laboratory. It was determined that mobile laboratory radionuclide results from the Phase I RFI are not usable to determine the nature of gamma-emitting radionuclide contamination. Also, additional samples for organic and inorganic chemical analysis are necessary to confirm the chemicals that were detected above background levels by XRF techniques and by mobile laboratory PAH analysis. Therefore, additional data will be collected.

Collection of runoff water samples at the drainage discharge point will allow the identification of potential surface water problems.

Section 5.1.10, "Sampling and Analysis Plan for PRS Nos. 35-003(d, e, f, g, l, m, o, q, and r)" in the *RFI Report for Potential Release Sites 35-003(d, e, f, g, l, m, o, q, and r) 35-016(g and h)* (LANL 1996, 54422) addresses sampling in Pratt Canyon. Seven samples are proposed to be collected down the slope from PRS Nos. 35-016(k and l). Because that SAP addresses the investigation within Pratt Canyon, this SAP will address only the potential contamination on the mesa top. After both SAPs have been implemented, the entire site will be evaluated. All the data collected to address these PRSs will be presented in the RFI report, and a recommendation will be made.

2.6.3 Sampling and Analysis Plan Design

The locations of proposed samples to be collected under this SAP are shown in Figure 2.6.1-1. Two hand-auger holes are proposed to be drilled in the areas shown in Figure 2.6.1-1. Three samples will be collected at each location, one from each of the following depth intervals: 0 to 1 ft, 2 to 3 ft, and at the backfill/tuff interface. If the depth to tuff is between 2 and 3 ft, one interval may be eliminated and, if the backfill depth is less than 2 ft, the second sampling intervals may be reduced to less than 1 ft. A summary of the proposed samples and the associated analyses is presented in Table 2.6.3-1.

TABLE 2.6.3-1

SUMMARY OF PROPOSED SAMPLING FOR PRS Nos. 35-016(k and l)

Location ID	Planned Depth (ft)	Media	VOCs	SVOCs	TPH	PCBs	Inorganic Fixed Lab	Alpha Spectrometry	Gamma Spectroscopy
35-2502	0–1	Soil	0	1	1	1	1	1	1
35-2502	2–3	Soil	1	1	1	1	1	1	1
35-2502	Interface	Backfill/tuff	0	1	1	1	1	1	1
35-2503	0–1	Soil	0	1	1	1	1	1	1
35-2503	2–3	Soil	1	1	1	1	1	1	1
35-2503	Interface	Backfill/tuff	0	1	1	1	1	1	1
35-2504	N/A	Water	0	1	1	1	1	0	0

Hand-auger holes are proposed for locations where contaminants were identified during the 1995 sampling. Data from these locations will be used to evaluate whether gamma-emitting radionuclides, PCBs, VOCs, and TPH are present and to confirm the presence of organic and inorganic chemicals. Samples collected in 1995 were analyzed for VOCs in the mobile laboratory, and no chemicals were identified. Therefore, only two samples will be collected and analyzed for VOCs to verify the mobile laboratory VOC results. The presence of visible staining will ideally determine sample locations. If hand-auger locations cannot be field biased in this manner (because of recent backfilling at the site) two hand-auger holes will be drilled near Location ID Nos. 35-2112 and 35-2113.

Surface water samples will be collected from runoff during a storm event. Precipitation or snow melt runoff is the only source of surface water at this PRS. A single-stage sampler will be installed at the point of discharge from the drainage channel into Pratt Canyon. Figure 2.6.1-1 shows the approximate location of the single-stage sampler. Surface water runoff will be collected and analyzed for SVOCs, TPH, PCBs, and inorganic chemicals.

The locations of the proposed samples will allow for identification of contaminants present in the drainage, if any.

2.7 PRS No. 35-016(o)

PRS No. 35-016(o) includes three active storm drains that handle rainwater runoff and floor-drain effluents from the original Ten Site laboratory and office buildings located near the east end of Ten Site Mesa.

The storm drains in PRS No. 35-016(o) were established in 1951 to handle rainwater runoff from building TA-35-2. Floor-drain effluents from TA-35-2, in which radioactive and acidic liquids and drums of PCB-containing oil are handled, possibly discharge into this system. The storm drains travel approximately 125 ft northward from TA-35-2 and discharge into Mortandad Canyon. Engineering surveys have identified an additional outfall, which handles runoff from TA-35-27, that may be associated with this PRS. In addition, overflow from the septic system designated as PRS No. 35-009(c) was discharged into Mortandad Canyon from two outfalls located at the east and west ends of the leach fields. The results of the investigation at PRS No. 35-009(c) are presented in the RFI report (LANL 1996, 54402). The septic tank at PRS No. 35-009(c) was also the subject of a voluntary corrective action, which included removing and disposing of the septic tank contents and filling the septic tank, distribution box, dosing chamber, and manhole with concrete (LANL 1996, 54967). The outfall in the east end coincides with one of the drainage channels from PRS No. 35-016(o); therefore, the samples collected in the drainage channel to characterize the outflows from the septic system at PRS No. 35-009(c) were reallocated to PRS No. 35-016(o). Potential contaminants identified in the drainage channel will be characterized with PRS No. 35-016(o).

Two of the outfalls in PRS No. 35-016(o) are located north of trailer buildings TA-35-261 and TA-35-262, as described in the work plan (LANL 1992, 7666). The third outfall is located north of TA-35-27. All the outfalls are cast iron drainpipes located on the steep northern slope of Ten Site Mesa approximately 20 ft below the mesa edge. Vegetation near two of the outfalls appears normal and healthy; however, four dead ponderosa trees are present in one of the drainage channels in front of the trailer building TA-35-261.

2.7.1 Summary of Historical Data

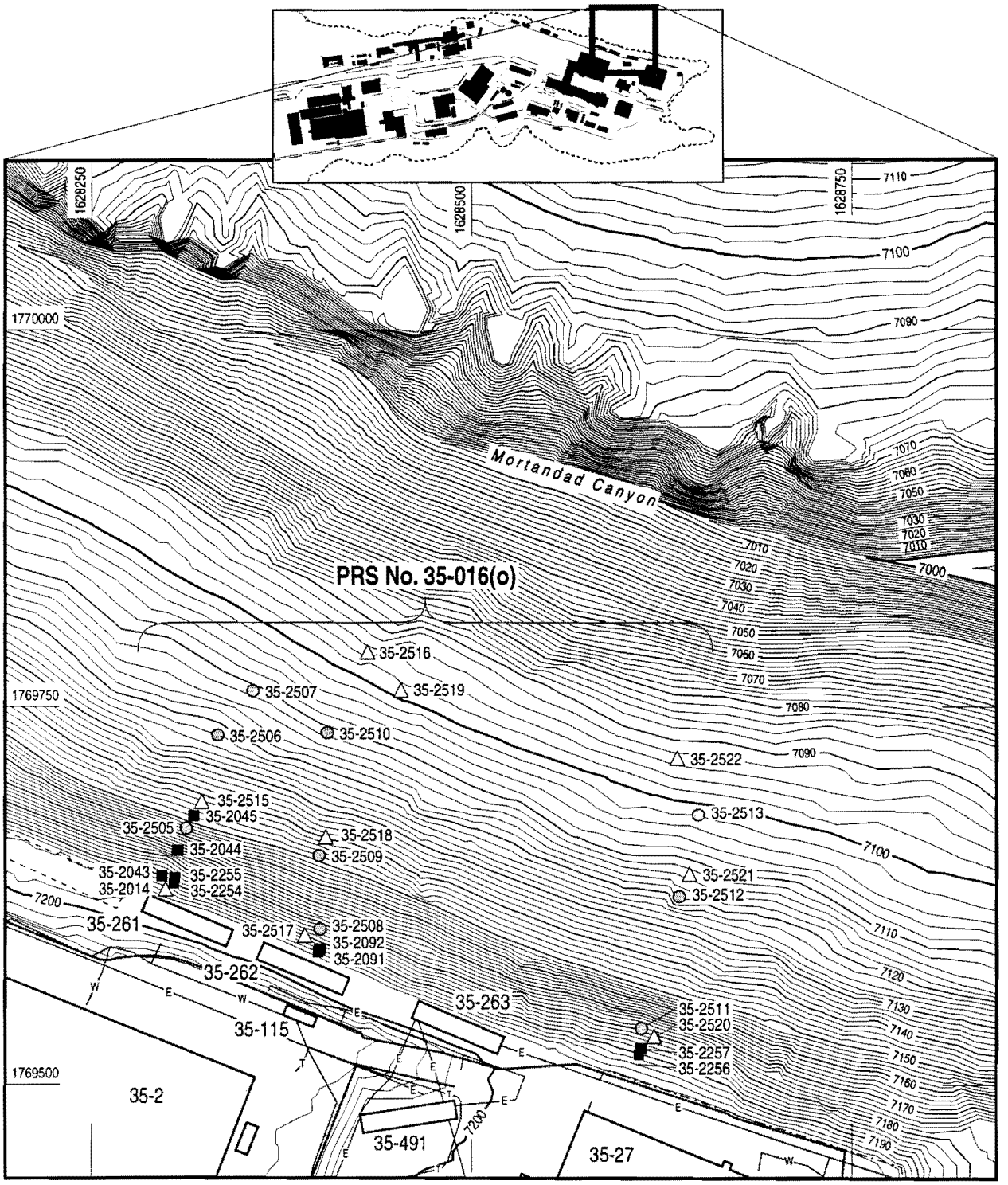
PRS No. 35-016(o) and the existing sample locations are shown in Figure 2.7.1-1. Phase I sampling was performed on January 25, 1994, and October 27, 1994. Fifteen soil samples were collected from nine locations (not including duplicate QA/QC samples). Six surface soil samples (Location ID Nos. 35-2043, 35-2044, 35-2045, 35-2091, 35-2254, and 35-2256) were collected, and three hand-auger holes (Location ID Nos. 35-2092, 35-2255, and 35-2257) were drilled to a depth of 3 ft. The sample collection intervals are shown in Table 2.7.1-1. Beta/gamma radiation measurements obtained during field screening of the samples ranged from 200 to 300 cpm, which are within background levels. Table 2.7.1-1 summarizes the existing sampling for PRS No. 35-016(o).

The following analyses were performed.

- All samples were analyzed using XRF. Three samples were analyzed for inorganic chemicals using EPA SW-846 methods. Table A-18 in the attachment of this SAP contains the results for inorganic chemical analysis.

- At a fixed-site laboratory, eight samples were analyzed for alpha-emitting radionuclides, and three samples were analyzed by gamma spectroscopy. Table A-19 in the attachment of this SAP contains the fixed-site laboratory results for radionuclides.

- Three samples were analyzed for SVOCs in the mobile laboratory. Fourteen samples were analyzed for SVOCs at a fixed-site laboratory. Ten samples were analyzed for PCBs at a fixed-site laboratory. Nine samples were analyzed for pesticides at a fixed-site laboratory. No analyses were performed for VOCs. See Table 2.1.1-1 for specific samples. Table A-20 in the attachment of this SAP contains the results for organic chemical analysis.



Source: FIMAD 105243

F2.7.1-1 / TA-35 SAP / 031797

0 50 100 150

FEET

Coordinates are NMSP NAD-83

Contour interval = 2 ft

▭	Building or structure location	△	Water sampling station	—E—	Power line
■	Existing sample location	——	Paved area	—T—	Telephone line
○	Proposed sample location	═══	Unpaved road	—W—	Water line

Figure 2.7.1-1. Existing and proposed sample locations for PRS No. 35-016(o).

TABLE 2.7.1-1

SUMMARY OF RFI SAMPLES TAKEN AT PRS No. 35-016(o)[a]

Part 1

Location ID	Sample ID	Depth (ft)	Media	SVOCs Mobile Lab	SVOCs Fixed Lab	Pest Fixed Lab	PCBs Fixed Lab	XRF Mobile Lab
35-2043	AAA6489	0–0.5	Soil	16670	NR[b]	NR	NR	16706
35-2044	AAA6490	0–0.5	Soil	16670	16672	NR	16672	16706
35-2045	AAA6491	0–0.5	Soil	16670	NR	NR	NR	16706
35-2091	AAB4241	0–0.5	Soil	NR	19803	19803	19803	20587
35-2092	AAB4242	0–1	Soil	NR	19803	19803	19803	20587
35-2092	AAB4243	1–2	Soil	NR	19803	19803	19803	20587
35-2092	AAB4250	1–2	Soil	NR	19803	19803	19803	20587
35-2092	AAB4244	2–3	Soil	NR	19803	19803	19803	20587
35-2254	AAB4257	0–0.5	Soil	NR	19803	19803	19803	20587
35-2255	AAB4258	0–1	Soil	NR	19803	19803	19803	20587
35-2255	AAB4259	1–2	Soil	NR	19803	19803	19803	20587
35-2255	AAB4260	2–3	Qbt3	NR	19803	19803	19803	20587
35-2256	AAB4261	0–0.5	Soil	NR	19803	NR	NR	20587
35-2257	AAB4262	0–1	Soil	NR	19803	NR	NR	20587
35-2257	AAB4263	1–2	Soil	NR	19803	NR	NR	20587
35-2257	AAB4264	2–3	Qbt3	NR	19803	NR	NR	20587

Part 2

Location ID	Sample ID	Depth (ft)	Media	Inorganic Fixed Lab	Alpha Spec Fixed Lab	Gamma Spec Mobile Lab	Gamma Spec Fixed Lab
35-2043	AAA6489	0–0.5	Soil	NR	16669	16666	NR
35-2044	AAA6490	0–0.5	Soil	NR	16669	16666	16669
35-2045	AAA6491	0–0.5	Soil	NR	16669	16666	NR
35-2091	AAB4241	0–0.5	Soil	NR	20284	NR	NR
35-2092	AAB4242	0–1	Soil	NR	NR	21582	NR
35-2092	AAB4243	1–2	Soil	20292	NR	NR	NR
35-2092	AAB4250	1–2	Soil	NR	NR	21582	NR
35-2092	AAB4244	2–3	Soil	NR	20284	NR	20284
35-2254	AAB4257	0–0.5	Soil	19653	20284	NR	NR
35-2255	AAB4258	0–1	Soil	NR	NR	NR	NR
35-2255	AAB4259	1–2	Soil	NR	20284	NR	20284
35-2255	AAB4260	2–3	Qbt3	NR	NR	NR	NR
35-2256	AAB4261	0–0.5	Soil	NR	20284	21020	NR
35-2257	AAB4262	0–1	Soil	20292	NR	21020	NR
35-2257	AAB4263	1–2	Soil	NR	NR	21020	NR
35-2257	AAB4264	2–3	Qbt3	NR	NR	21020	NR

a. The numbers in the analytical suite columns are analytical request numbers.

b. Not requested

The inorganic chemicals chromium, copper, iron, lead, thorium, uranium, and zinc were detected above background UTL values. The radionuclides ^{40}K, ^{226}Ra, and ^{228}Th were detected above SAL values. The radionuclide ^{235}U was detected above its UTL value. The organic chemicals Aroclor 1254, Aroclor 1260, benz[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenz[a,h]anthracene, and indeno[1,2,3-cd]pyrene were detected above SAL values. The organic chemicals acenaphthene, anthracene, benzo[g,h,i]perylene, bis(2-ethylhexyl)phthalate, dibenzofuran, 2,4-dinitrotoluene, fluoranthene, fluorene, 2-methylnaphthalene, naphthalene, phenanthrene, and pyrene were also detected. The SVOC results from mobile laboratory analyses should be regarded as estimates because the concentration of several reported compounds exceeded the linear range of the instrument, and no sample dilution was performed. Nontarget analytes were present in some of the samples analyzed for SVOCs, and some samples analyzed at the fixed-site laboratory required up to 50-fold dilution because of the presence of matrix interferences. The interferences indicate that PCBs and PAHs may be associated with hydrocarbon contamination.

2.7.2 Problem Statement

The following questions will be addressed, as applicable at each of the three separate drainage channels, by collecting supplemental data.

- What is the extent of alpha- and gamma-emitting radionuclide, organic chemical, and inorganic chemical contamination at PRS No. 35-016(o)?
- Could contaminants, if any, represent a potential threat to human health or the environment?
- Are contaminants present that could pose a potential threat to surface water quality?

Collection of additional data for PRS No. 35-016(o) is necessary to determine the extent of alpha-emitting radionuclides, organic and inorganic chemicals and to replace the mobile laboratory radionuclide data. It was determined that mobile laboratory radionuclide results from the Phase I RFI are not usable to determine the nature of gamma-emitting radionuclide contamination. Therefore, additional data will be collected. Finally, sampling for ^{90}Sr and tritium is proposed because these radionuclides are positively associated with the processes at the buildings that contributed runoff to these outfalls.

Collection of runoff water samples in the three drainage channels that contain the outfalls will allow the identification of potential surface water problems.

2.7.3 Sampling and Analysis Plan Design

The locations of proposed samples to be collected under this SAP are shown in Figure 2.7.1-1. Three hand-auger holes per outfall are proposed to be drilled in areas where potential contaminants were identified and/or in areas of sediment accumulation. Three samples will be collected at each location, one from each of the following depth intervals: 0 to 1 ft, 2 to 3 ft, and at the soil/tuff interface. If the depth to tuff is between 2 and 3 ft, one interval may be eliminated and, if the sediment depth is less than 2 ft, the second sampling intervals may be reduced to less than 1 ft. A summary of the proposed samples and the associated analyses is presented in Table 2.7.3-1.

Three hand-auger holes are proposed for each outfall on the bench directly below the area of the discharge. Data from these locations will be used to evaluate whether contaminants have accumulated at the break in the slope where sediments have deposited. The location of the hand-auger holes will be biased to areas of sediment accumulation. If hand-auger locations cannot be field biased in this manner,

one hand-auger hole will be drilled in the drainage channel below the slope break, and another will be drilled approximately 10 or 20 ft farther down the slope.

TABLE 2.7.3-1

SUMMARY OF PROPOSED SAMPLING FOR PRS No. 35-016(o)

Location ID	Planned Depth (ft)	Media	SVOCs	TPH	PCBs	Inorganic Fixed Lab	Tritium	Sr-90	Alpha Spectrometry	Gamma Spectroscopy
35-2505	0–1	Soil	1	1	1	1	1	1	1	1
35-2505	2–3	Soil	1	1	1	1	1	1	1	1
35-2505	Interface	Soil/tuff	1	0	1	1	1	1	1	1
35-2506	0–1	Soil	1	1	1	1	1	1	1	1
35-2506	2–3	Soil	1	1	1	1	1	1	1	1
35-2506	Interface	Soil/tuff	1	0	1	1	1	1	1	1
35-2507	0–1	Soil	1	1	1	1	1	1	1	1
35-2507	2–3	Soil	1	1	1	1	1	1	1	1
35-2507	Interface	Soil/tuff	1	0	1	1	1	1	1	1
35-2508	0–1	Soil	1	1	1	1	0	0	1	1
35-2508	2–3	Soil	1	1	1	1	0	0	1	1
35-2508	Interface	Soil/tuff	1	0	1	1	0	0	1	1
35-2509	0–1	Soil	1	1	1	1	0	0	1	1
35-2509	2–3	Soil	1	1	1	1	0	0	1	1
35-2509	Interface	Soil/tuff	1	0	1	1	0	0	1	1
35-2510	0–1	Soil	1	1	1	1	0	0	1	1
35-2510	2–3	Soil	1	1	1	1	0	0	1	1
35-2510	Interface	Soil/tuff	1	0	1	1	0	0	1	1
35-2511	0–1	Soil	1	1	1	1	0	0	1	1
35-2511	2–3	Soil	1	1	1	1	0	0	1	1
35-2511	Interface	Soil/tuff	1	0	1	1	0	0	1	1
35-2512	0–1	Soil	1	1	1	1	0	0	1	1
35-2512	2–3	Soil	1	1	1	1	0	0	1	1
35-2512	Interface	Soil/tuff	1	0	1	1	0	0	1	1
35-2513	0–1	Soil	1	1	1	1	0	0	1	1
35-2513	2–3	Soil	1	1	1	1	0	0	1	1
35-2513	Interface	Soil/tuff	1	0	1	1	0	0	1	1
35-2514	N/A	Water	1	1	1	1	0	0	1	0
35-2515	N/A	Water	1	1	1	1	0	0	1	0
35-2516	N/A	Water	1	1	1	1	0	0	1	0
35-2517	N/A	Water	1	1	1	1	0	0	1	0
35-2518	N/A	Water	1	1	1	1	0	0	1	0
35-2519	N/A	Water	1	1	1	1	0	0	1	0
35-2520	N/A	Water	1	1	1	1	0	0	1	0
35-2521	N/A	Water	1	1	1	1	0	0	1	0
35-2522	N/A	Water	1	1	1	1	0	0	1	0

Hand-auger holes are proposed for locations on the slope in areas where contaminants were identified during the 1995 sampling and in areas where samples were collected but had incomplete analytical suites. All samples will be analyzed for gamma-emitting radionuclides, PCBs, SVOCs, and inorganic chemicals. Samples from two intervals at each sample location will be analyzed for TPH.

Surface water samples will be collected from runoff during a storm event. Precipitation or snow melt runoff is the main source of surface water at this PRS. Single-stage samplers will be installed in three locations at each of the three drainage channels. At each drainage channel one single-stage sampler will be installed at the head of the drainage by the outfall outlet, a second half way down the mesa slope, and a third at the toe of the slope where the slope breaks. Figure 2.7.1-1 shows the approximate locations of the single-stage samplers. Surface water runoff will be collected and analyzed for SVOCs, TPH, PCBs, and inorganic chemicals.

The location of the proposed samples will allow not only identification of a release but also a preliminary evaluation of the extent of the release. The samples will provide information on the type of sedimentary processes that have been active on the slope during the period of releases. Whether contaminants are present in the drainage channels or on the bench below the drainage channels, the depths where they are present, and the relative concentrations among depths and locations will allow the technical team to infer (1) if any significant release has occurred and (2) if the extent of contamination, if any, is likely to have been spatially bound. Based on the interpretation of these data, recommendations for additional action, if any, will be made.

3.0 DATA USE AND DATA QUALITY REQUIREMENTS

3.1 Use of Data To Meet SAP Objectives

Soil sample analytical data for inorganic and organic chemicals and/or radionuclides will be evaluated according to the methodology outlined in *Risk-Based Corrective Action Process* (Environmental Restoration Decision Support Council 1996, 53751). Levels of inorganic chemicals and radionuclides will be compared with Laboratory-specific background 95th percentile (95% confidence) UTL values or maximum values for the appropriate geological background unit (Longmire et al. 1995, 48818; Longmire et al. 1995, 52227). Because UTL values are not available for global fallout radionuclides, the maximum reported value for these radionuclides from regional sites published in Laboratory environmental surveillance reports will be used for background comparisons of surface samples collected from undisturbed sites. Assumptions of secular equilibrium among specific radionuclides (for example, decay products of ^{238}U such as ^{226}Ra) may be used to extend the applicability of the Laboratory background data set for radionuclides.

Levels of inorganic chemicals and radionuclides that exceed background UTL values and all detected organic chemicals will be compared with risk-based SAL values. Distributional shift tests may also be employed to determine if a chemical is present at a PRS at levels greater than background. The maximum observed level will be compared with SAL values to identify COPCs. The SAL values for organic and inorganic chemicals are based on EPA Region IX preliminary remediation goals for residential soil and tap water (EPA 1995, 53970). The SAL values for radionuclides are based on an annual effective dose of 10 mrem/yr and are calculated using RESRAD computer code. The potential for additive toxic effects will be evaluated by conducting multiple chemical evaluations for carcinogens, noncarcinogens, and radionuclides.

Water data and water quality issues will be evaluated with the consensus of Field Unit 4 personnel, Decision Support Council personnel, the Environmental Restoration (ER) Project Office, and technical experts from the Laboratory Water Quality and Hydrology Group (ESH-18). If a site is found not to be in compliance with an applicable state standard, ESH-18 personnel will be informed. ESH-18 personnel will determine if a Release Reporting Notification must be submitted to the state and will take the appropriate actions.

3.2 Requirements for Data Quality

In accordance with the ER Project risk-based corrective action process as well as guidance given in *Risk Assessment Guidance for Superfund, Volume I* (EPA 1989, 8021), appropriate analytical chemistry methods must be chosen to maximize the ability to detect chemicals present in soil samples at or below background levels and risk-based screening levels. Field measurement and analytical techniques may be used where appropriate. In accordance with the ER Project risk-based corrective action process, if field analytical techniques are not sufficient to detect chemicals at SAL concentrations, EPA-approved fixed-site laboratory methods or equivalent must be employed. Field measurements of gross radioactivity and organic vapors are appropriate for biasing sample locations and depth intervals but are not equivalent to a fixed-site laboratory analysis.

For example, if VOCs are suspected contaminants at a site but specific chemicals have not yet been identified, an analytical method that allows low-level detection, identification, and reliable quantitation must be employed. Field screening instruments for organic vapors (for example, flame ionization detectors or photoionization detectors [PIDs]) generally have higher detection limits than fixed-site laboratory instruments and cannot identify specific chemicals. Therefore, to meet the detection limit requirements and provide chemical-specific data, an appropriate field measurement method for organic vapors must employ a gas chromatograph with heated sampler and PID detection, at a minimum.

For analysis of inorganic and organic chemicals in soil samples, fixed-site laboratory analyses will employ the EPA SW-846 methods (EPA 1986, 31732; EPA 1986, 31733) that are cited in Appendix IV of the ER Project *Quality Assurance Project Plan Requirements for Sampling and Analysis* (QAPP) (LANL 1996, 53450). The required EPA SW-846 methods allow reliable detection and quantitation of all target inorganic analytes at levels less than the all-soils horizon background values except for antimony. The estimated detection limit (EDL) for analysis of antimony by inductively coupled plasma emission spectroscopy (ICPES) is 12 mg/kg, which is greater than the ER Project all-soils background value (1 mg/kg) but less than the soil SAL value (31 mg/kg).

The EPA SW-846 methods allow reliable detection and quantitation of all VOC and SVOC target analytes at levels less than the soil SAL values, except for seven SVOCs. The following SVOC analytes have soil estimated quantitation limits (EQLs) for the EPA SW-846 analysis (0.330 mg/kg) that are greater than the soil SAL value: m-benzidine (0.0019 mg/kg), benzo[a]pyrene (0.061 mg/kg), bis(2-chloroethyl) ether (0.074 mg/kg), dibenz[a,h]anthracene (0.061 mg/kg), hexachlorobenzene (0.280 mg/kg), N-nitrosodi-n-propylamine (0.063 mg/kg), and N-nitrosodimethylamine (0.0087 mg/kg). No standard, readily available method exists that could achieve EQLs as low as several parts per billion in soil for these compounds.

For analysis of radionuclides in soil samples, the Laboratory-approved methods cited in the ER Project QAPP (LANL 1996, 53450) will be employed. The detection limits for the approved methods are below background levels for those radionuclides for which background values are available. For radionuclides for which no ER Project background values are available, including plutonium isotopes, fission and activation products, and many naturally occurring radionuclides, the detection limits are below the soil SAL values.

The bias and precision of fixed-site laboratory analyses for inorganic and organic chemicals will be assessed using the standard quality control (QC) procedures described in the EPA SW-846 methods. For radiological measurements, QC procedures similar to the EPA SW-846 procedures will be employed. Negative bias may result in the need to resample if reported concentrations are near action levels.

Surface runoff water samples will be analyzed using the approved analytical methods cited in Section 1103 of *State of New Mexico Standards for Interstate and Intrastate Streams* (New Mexico Water Quality Commission 1995, 50265). The dissolved concentration of inorganic chemicals will be measured except for mercury, for which the total recoverable concentration will be measured. When the dissolved concentration is to be determined, the sample must be filtered through a 0.45-micron membrane filter, and the filtrate will be analyzed for the chemicals of interest. Analysis for organic chemicals will be performed on the total (nonfiltered) portion of the samples.

4.0 SAMPLING AND ANALYSIS PLAN IMPLEMENTATION

The field and laboratory measurement methods proposed for sample collection and analysis are discussed in the following sections. Field QA/QC samples, such as field blanks and collocated samples, will be collected according to the most recent ER Project guidance (LANL 1996, 53450).

4.1 Field Methods

An initial health and safety (H&S) survey of the sites to be sampled will be performed by the site safety officer and/or the ER Project site safety officer before sampling activities. No other personnel will be allowed to enter the sites until the sites are surveyed for H&S issues. The sites will be monitored for alpha, beta, and gamma radiation and for safety hazards including confined space entry, slips, trips, and falls according to the site-specific health and safety plan (SSHASP). The results of the H&S survey will be documented by the site safety officer on the ESH-1 Direct Survey Results Form and by the field team leader (FTL) in the Daily Activity Log.

The initial survey will take many short count-time (1 to 10 seconds) measurements. The short count-time measurements will provide low-resolution, qualitative data over a large area and will allow rapid identification of specific point sources of near-surface radioactivity ("hot spots"). Longer count-time (60 seconds or longer) measurements will be taken at locations where radiological anomalies are detected and at selected representative locations within each site to be sampled to achieve higher resolution data. The "hot spot" radiological measurements will be recorded onto site maps with a resolution of at least 1 in:25 ft. The radiometric measurements and maps will be documented by the FTL in the Daily Activity Log.

Planned sample locations will be determined in the field before sampling and will be described and documented by the FTL in the Daily Activity Log. The actual sample site and sampling conditions will be described and documented on the Sample Collection Log. The sample material will be described on the Sample Collection Log and/or on the Core Description Log, when applicable. Sample collection methods will be documented on the Sample Collection Log. Surface samples and hand-auger hole methods will be used to collect soil samples as described below.

The soil and sediment samples will be field screened for gross-alpha, -beta, and -gamma radiation and for volatile organic vapors at the time of sampling. The field screening data will be recorded by the site safety officer on the Direct Survey Results Form and by the FTL on the Sample Collection Log. Information about

the field screening equipment calibration will be recorded by the site radiological control technician (RCT) on the Direct Survey Results Form and by the FTL in the Daily Activity Log.

If other field screening methods are identified that appropriately detect contamination, those field screening methods will be considered for use during sample collection. Appropriate field screening methods (such as head-space screening for VOCs) may be used to select sample locations from borehole samples and to screen samples for fixed-site laboratory analyses, as necessary. The implementation of field screening methods will be documented by the FTL in the Daily Activity Log.

Soil and sediment samples will be collected using the methods and ER Project standard operating procedures (SOPs) listed in Table 4.1-1 (LANL 1991, 21556). The tools used to collect surface and subsurface soil samples will be determined by the FTL with consideration given for the accessibility of the specific sampling site, the depth of samples to be collected, safety concerns, and the presence of flowing or standing surface water. A scoop or spade will be used to collect surface sediment samples at depths of 0 to 0.5 ft. A hand auger will generally be used to collect samples ranging from 1 to 5 ft depth. If surface water is present at the sampling location, a scoop, trowel, or hand corer will be used to collect grab sediment samples.

TABLE 4.1-1

SUMMARY OF REQUIREMENTS FOR SOIL AND WATER SAMPLING METHODS

Sampling Tools	Sample Types	Sampling Depth (ft)	LANL-ER-SOP
Spade and scoop	Surface grab	0–1	06.09
Hand auger	Surface or subsurface grab	0–5	06.10
Ring sampler	Undisturbed surface soil grab	0–1	06.11
Scoop and trowel	Grab (under surface water)	0–0.5	06.14
Hand corer	Grab (under surface water)	0–0.5	06.14
Single-stage sampler	Runoff water	N/A	06.29
Logging tools	Borehole logging	0–10	04.04
Core barrel	Core-barrel sampling for subsurface earth materials	0–10	06.26
N/A	Field logging, handling, and documentation of borehole samples	N/A	12.01

Hand-auger surface and subsurface grab sampling methods are described in LANL-ER-SOP-06.10, R0, "Hand Auger and Thin-Wall Tube Sampler." Grab sampling is described in LANL-ER-SOP-06.09, R0, "Spade and Scoop Method of Collection of Soil Samples." Other applicable SOPs for subsurface sampling are listed in Table 4.1-1.

Single-stage surface water runoff samples will be collected using the methods and ER Project SOPs listed in Table 4.1-1 (LANL 1991, 21556). Surface water runoff sampling is described in LANL-ER-SOP-06.29, R0, "Single-Stage Sampling for Surface Water Runoff." Single-stage samplers are used to obtain surface water runoff samples. The samplers are designed to collect water when the water level rises to a selected stage. Installation may involve digging a hole for the bottle, placing a bottle at the end of a weir, or other techniques that allow the bottle to fill with surface water runoff. When setting up the samples, consideration will be given to controlling runoff from other sites or PRSs onto the site where samplers are

installed. Diversions may be used to ensure that only surface water runoff from the area of influence of the PRS is collected. The specific design for the single-stage sampler will be determined and documented by the FTL with consideration given for the configuration of the specific sampling site. After a storm event, the bottles will be checked for water as soon as possible. If the bottles contain water, they will be removed and submitted for analysis.

All samples will be collected in accordance with the applicable ER Project SOPs (LANL 1991, 21556) for the collection, preservation, identification, storage, transport, and documentation of environmental samples, as described in the ER Project QAPP (LANL 1996, 53450). Decontamination of sampling equipment will be performed in accordance with LANL-ER-SOP-01.08, R0, "Field Decontamination of Drilling and Sampling Equipment." Wash water and other wastes generated during the sampling operation will be managed and disposed of in accordance with LANL-ER-AP-05.3, R0, "Management of Environmental Restoration Waste" (LANL 1995, 49708).

Each sample location will be marked or permanently monumented (where possible), photographed, and assigned a unique ER Project sample location identification number. All samples will be field screened using hand-held instruments at the point of collection for gross radioactivity and organic vapors. When the samples are submitted to the Sample Management Office (SMO), gross-alpha, -beta, and -gamma radiation measurements will be taken on each sample before they are transported to a fixed-site laboratory.

4.2 Measurement Methods

Soil and water samples collected in accordance with criteria outlined in Section 2.0 will undergo full-suite analyses for organic chemicals, inorganic chemicals, and/or radionuclides. All analyses will be performed at ER Project-approved fixed-site laboratories. The analytical suites and methods for analysis of organic chemicals are listed in Table 4.2-1. The analytical suites include VOCs, SVOCs, PCBs, and diesel-range TPH that will be analyzed in selected samples. Analysis for VOCs also will be performed on any sample for which a significant organic vapor measurement is obtained by field screening. All analyses for organic chemicals will be performed in accordance with EPA SW-846 protocols (EPA 1986, 31733). The detailed analyte lists, EQLs, required QC procedures, and the acceptance criteria for the VOC, SVOC, and PCB suites are found in the ER Project analytical services statement of work (LANL 1995, 49738).

TABLE 4.2-1

ANALYTE SUITES AND ANALYTICAL METHODS FOR ANALYSIS OF ORGANIC CHEMICALS IN SOIL AND WATER SAMPLES

Analyte Suite	Analytical Method	Analytical Protocol
PCBs	GC/ECD	SW-8081A or SW-8082
VOCs	GC/MS	SW-8260
SVOCs	GC/MS	SW-8270
TPH	GC/FID	SW-8015 (modified)

The target analytes, EDLs, and analytical methods for inorganic chemicals are listed in Table 4.2-2. All analyses for inorganic chemicals will be performed in accordance with EPA SW-846 protocols using

mineral acid sample extraction procedures for the ICPES, graphite furnace atomic absorption (GFAA), and inductively coupled plasma mass spectrometry (ICPMS) techniques.

The target analytes and their half-lives, detected emission, EQLs, and analytical methods for radionuclides are listed in Table 4.2-3. Before chemical separation and counting for alpha emissions, soil samples will undergo a complete digestion or fusion procedure. The analyte list for the gamma spectroscopy analysis includes long-lived activation and fission products, as well as their shorter lived (half-life less than 180 days) daughter products. The shorter lived daughter products are usually included in the analyte list to verify the presence of the longer lived parents. The shorter lived radionuclides are not considered to be COPCs. Soil and sediment samples will be prepared for gamma spectroscopy measurements by homogenization and drying; no sample extraction will be performed. The required QC procedures and acceptance criteria for both the inorganic chemical and radionuclide analyses are found in the ER Project analytical services statement of work (LANL 1995, 49738).

TABLE 4.2-2

ANALYTE LIST, ESTIMATED DETECTION LIMITS, AND ANALYTICAL METHODS FOR INORGANIC CHEMICALS IN SOIL AND SURFACE RUNOFF WATER SAMPLES

Analyte	EDL (µg/L)	EDL (mg/kg)	Analytical Method
Aluminum	200	40	ICPES
Antimony	3	12	GFAA or ICPMS
Arsenic	10	2	GFAA or ICPMS
Barium	200	40	ICPES
Beryllium	5	1	ICPES
Cadmium	5	1	ICPES
Calcium	5000	500	ICPES
Chromium	10	2	ICPES
Cobalt	50	10	ICPES
Copper	25	5	ICPES
Iron	20	20	ICPES
Lead	3	0.6	GFAA or ICPMS
Magnesium	5000	1000	ICPES
Manganese	15	3	ICPES
Mercury	0.2	0.1	CVAA
Nickel	40	8	ICPES
Potassium	5000	500	ICPES
Selenium	5	1	GFAA or ICPMS
Silver	10	2	ICPES
Sodium	5000	500	ICPES
Thallium	10	2	GFAA or ICPMS
Vanadium	50	10	ICPES
Zinc	20	4	ICPES

TABLE 4.2-3

ANALYTE LIST, ESTIMATED QUANTITATION LIMITS, AND ANALYTICAL METHODS FOR RADIONUCLIDES IN SOIL SAMPLES

Analyte	Half-Life (yr)	Detected Emission	EQL (pCi/g)	Analytical Method
^{238}Pu	87.7	α	0.1	α-Spectrometry
$^{239,240}Pu^{a}$	2.410×10^{4}	α	0.1	α-Spectrometry
^{234}U	2.46×10^{5}	α	0.1	α-Spectrometry
^{235}U	7.04×10^{8}	α	0.1	α-Spectrometry
^{238}U	4.47×10^{9}	α	0.1	α-Spectrometry
Gamma spectroscopy analytes	–	γ	1[b]	γ-Spectroscopy

a. The ^{239}Pu and ^{240}Pu isotopes cannot be distinguished by alpha spectrometry. The half-life of ^{239}Pu is given.
b. The contract-required EQL for ^{241}Am and ^{137}Cs is 1 pCi/g; the value for other analytes will vary.

4.3 Field Decisions

The sampling design described in Section 2.0 requires that field decisions be made at several points. More details are provided in this section.

4.3.1 Biased Sampling from Borehole Cores Based on Geological Criteria

4.3.1.1 Backfill/Tuff Interface

In most locations sampled during the Phase I RFI, the backfill material was described as sand and/or clay with tuff cobbles, whereas the top of the tuff was nonwelded and soft but usually consolidated and relatively homogeneous. The field team geologist will identify the boundary. The first foot of tuff below the backfill/tuff interface will be sampled in some of the boreholes.

4.3.1.2 Fracture Fill Material

Fill material that lines fractures in the tuff is of particular interest in modeling contaminant transport. The field team geologist will examine all cores to identify discrete fractures or fracture zones from which sufficient fill material can be recovered for analysis. Samples of fracture fill material for chemical analyses will be collected if deemed appropriate by the field team geologist.

4.3.2 Biased Sampling from Borehole Cores Based on Field Beta/Gamma Radiation Measurements

Background beta/gamma radiation activity levels may be slightly higher in tuff than in backfill material, but they are generally in the range of 200 to 400 cpm as measured with a GM pancake probe meter. Media-specific background activity levels will be established in the field. If above-background levels are measured in the core from a given borehole, the backfill material sample and/or the tuff will be collected within 1 ft of the point where the highest measurements are observed.

Default sampling depths, which will be used if no above-background beta/gamma radiation activity levels are reported, are provided in Section 2.0.

4.4 Sample Handling

All samples will be identified in accordance with LANL-ER-SOP-01.04, R3, "Sample Control and Field Documentation." Chain-of-custody requirements described in LANL-ER-SOP-01.04, R3 will be implemented. The SMO will be consulted regarding the appropriate sample containers and preservation. Samples will be packaged and shipped in accordance with LANL-ER-SOP-01.03, R1, "Handling, Packaging and Shipping of Samples." All samples will be shipped from the SMO to fixed-site laboratories for analysis. Samples will be screened for gross radiation at a mobile radiological van before shipment. The results of radiological screening conducted in the mobile radiological van will be documented and sent to the SMO along with the samples.

4.5 Data Tracking

The data management scheme described in Sections A10 and B10 of the ER Project QAPP (LANL 1996, 53450) will be followed. Manually recorded data will be reviewed by the field team as required by LANL-ER-SOP-1.01, R0, "General Instructions for Field Investigations"; LANL-ER-SOP-01.04, R3; and LANL-ER-SOP-03.12, R0, "Field and Laboratory Notebook Documentation for Environmental Restoration Earth Science Studies." Data generated by the analytical laboratories will be submitted to the SMO in accordance with the requirements of the ER Project analytical services statement of work (LANL 1995, 49738). The reporting requirements include electronic and hard copy deliverables for routine analyses. The SMO is responsible for data verification, validation, and transmittal to the Facility for Information Management, Analysis, and Display (FIMAD).

5.0 DATA ASSESSMENT

5.1 Verification and Routine Validation

Data generated by the analytical laboratories will undergo the verification and baseline validation procedures described in Sections D1 and D2 of the ER Project QAPP (LANL 1996, 53450). Field data will be reviewed for accuracy and completeness by the field team at the time of collection.

5.2 Data Quality Assessment

Reconciliation of the data with the investigation objectives will be accomplished using the qualitative data quality assessment methods described in Section D3 of the ER Project QAPP (LANL 1996, 53450). The assessment team will evaluate the sufficiency of the data set for decision-making purposes using their best professional judgment. The assessment team shall consist of a geologist, human health risk assessor, ecological risk assessor, statistician, and chemist (at a minimum). The data quality assessment process outlined in Figure D-3 of the ER Project QAPP (LANL 1996, 53450) will be followed.

6.0 ADMINISTRATION

6.1 Project Task Organization

The Field Unit 4 project task organization for implementing the field activities described in this SAP is shown in Table 6.1-1.

TABLE 6.1-1

FIELD UNIT 4 KEY PERSONNEL

Functional Role	Organization	Phone
Field Project Management		
Field Project Leader	EES-13	667-4308
Technical Team Leader	EES-1	667-2492
Field Team Manager	ERM/Golder	662-3700
Management Support Leader	LATA	662-9080
Field Team		
Field Team Leader (FTL)	SAIC	672-3666
Geologist	SAIC	672-3666
Site Safety Officer	SAIC	672-3666
Field Technician/Sampler	ERM/Golder	662-3700
Field Technician/Sampler	ERM/Golder	662-3700
Technical/Assessment Team		
Assessment Team Leader	LATA	662-9080
Human Health Risk Assessor	Neptune	662-0707
Ecological Risk Assessor	EES-15	665-3742
Statistician	Neptune	662-0707
Chemist	LATA	662-9080
Alternate Personnel		
Alternate FTL/Geologist	SAIC	672-3666
Alternate Site Safety Officer/Sampler	SAIC	672-3666
Coordinator		
Field Project Coordinator	DOE/LAAO	667-5101

6.2 Training

All ER Project personnel involved with the execution of this SAP will have fulfilled the required training for applicable roles in accordance with the ER Project worker positions matrix in administrative procedure LANL-ER-AP-05.2, R1, "Determination, Completion, and Documentation of Environmental Restoration Worker Training" (LANL 1995, 49708). ER Project personnel training records are located on-site during field activities and will be available for inspection. ER Project personnel will not perform tasks under site conditions that require special training beyond that documented in their training records.

6.3 Records

Field records will document sample collection and tracking, H&S briefings and checks of monitoring equipment performance, and nonsampling activities such as site inspections and walkovers, which are documented as engineering surveys in Daily Activity Logs. Table 6.3-1 is a summary of required field documents, the appropriate requirement reference, and document recipients. All original documents will be transferred to the ER Project Records-Processing Facility (RPF) in accordance with administrative

procedure LANL-ER-AP-02.1, R1, "Procedure for LANL ER Records Management" (LANL 1995, 49708).

TABLE 6.3-1

FIELD ACTIVITY DOCUMENTATION

Document	Requirement Reference	Document Recipients
Sample Collection and Tracking		
Daily Activity Log	LANL-ER-SOP-01.04, R3* Attachment E	FU4 file, RPF
Sample Collection Log	LANL-ER-SOP-01.04, R3* Attachment B	FU4 file, RPF
Core Sample Log	LANL-ER-SOP-12.01, R1* Attachment E	FU4 file, RPF
Daily Drilling Summary	LANL-ER-SOP-12.01, R1* Section 8	FU4 file, RPF
Daily Report Form	FU4 Guidance	FU4 file, RPF
Chain of Custody/Request for Analysis Forms	LANL-ER-SOP-01.04, R3* Attachment C	FU4 file, RPF
Electronic Follower (Chain of Custody/Request for Analysis)	LANL-ER-SOP-01.04, R3* Section 6.1.5	SMO
Health and Safety		
Tailgate Safety Meeting/Meeting Attendees	FU4 Guidance	FU4 file, RPF
Flame Ionization Detector Field Data Form	FU4 Guidance	FU4 file, RPF
Direct Survey Form	ESH-1 Guidance	FU4 file, RPF
Smear Survey Form	ESH-1 Guidance	FU4 file, RPF
LAS Survey Form	ESH-1 Guidance	FU4 file, RPF
Survey Form	FU4 Guidance	FU4 file, RPF
Daily Safety Inspection Checklist	FU4 Guidance	FU4 file, RPF
Daily Drill Rig Inspection Checklist	FU4 Guidance	FU4 file, RPF
PPE Inspection Checklist	FU4 Guidance	FU4 file, RPF
Equipment and Item Removal Log	FU4 Guidance	FU4 file, RPF
Site Access List	FU4 Guidance	FU4 file, RPF
Engineering Surveys		
Daily Activity Log	ER-SOP-01.04, R3* Attachment E	FU4 file, RPF
*LANL 1991, 21556		

Photographs and videotapes may be used to document observations and sample collection activities. Site visit photographic documentation will be referenced in a Daily Activity Log in accordance with ER-SOP-01.04, R3.

6.4 Oversight

Oversight, review, and approval of ER Project field activities are provided by the following Laboratory groups.

- ESH-1 for RCT support and oversight

- ESH-5 for review, approval, and oversight of the SSHASP
- ESH-19 for oversight of the waste management plan and/or the Waste Characterization Strategy Form
- CST-5 and CST-17 for review and approval of the waste management plan and/or the Waste Characterization Strategy Form

The ER Project Office may schedule an audit of sampling activities to ensure the quality of field performance. Such audits will conform to the ER Project quality procedures LANL-ER-QP-01.1Q, R0, "Audits" and LANL-ER-QP-01.2Q, R0, "Surveys" (LANL 1995, 49708). ESH-5 will evaluate the ER Project field operations to determine compliance with H&S requirements.

6.5 Inspection and Acceptance Policies

All activities associated with this SAP will follow Laboratory policies on inspections and acceptance. All sampling equipment, including sample containers, rinsate water, and sample preservation reagents, will be inspected by the FTL upon receipt. The SMO provides the sample containers used for sample collection. The sample containers are certified by the manufacturer for prescribed cleanliness and quality. Sample preservation reagents are received from reputable chemical suppliers with reagent purity certification on the container label.

6.6 Reports to Management

The FTL will submit daily activity reports to the field team manager during field activities.

7.0 REFERENCES

CEARP (Comprehensive Environmental Assessment and Response Program), October 29, 1986. "Los Alamos CEARP Phase I" (final), Los Alamos National Laboratory, Los Alamos, New Mexico. **(CEARP 1986, ER ID Number 8657)**

DOE (US Department of Energy), April 30, 1987. DOE Environmental Problem 25, Los Alamos, New Mexico. **(DOE 1987, ER ID Number 21511)**

DOE (US Department of Energy), October 1987. "Phase I: Installation Assessment, Los Alamos National Laboratory," Vol. I (draft), Comprehensive Environmental Assessment and Response Program, Albuquerque Operations Office, Albuquerque, New Mexico. **(DOE 1987, ER ID Number 8663)**

Emelity, L. A., November 22, 1974. "Design Data and Preliminary Plans, TA-35 Sewage Lagoons," Los Alamos National Laboratory Memorandum H7-LAE-521 to R. Connellee (Eng DO) from L. A. Emelity (H-7), Los Alamos, New Mexico. **(Emelity 1974, ER ID Number 55116)**

Environmental Restoration Decision Support Council, January 2, 1996. "Risk-Based Corrective Action Process," Los Alamos National Laboratory Report LA-UR-96-111, Los Alamos, New Mexico. **(Environmental Restoration Decision Support Council 1996, ER ID Number 53751)**

EPA (US Environmental Protection Agency), November 1986. "Test Methods for Evaluating Solid Waste, Volume IA: Laboratory Manual, Physical/Chemical Methods," SW-846, Third Edition, Washington, DC. **(EPA 1986, ER ID Number 31732)**

EPA (US Environmental Protection Agency), November 1986. "Test Methods for Evaluating Solid Waste, Volume IB: Laboratory Manual, Physical/Chemical Methods," SW-846, Third Edition, Washington, DC. **(EPA 1986, ER ID Number 31733)**

EPA (US Environmental Protection Agency), December 1989. "Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part A)," Interim Final, EPA 540/1-89/002, Office of Emergency and Remedial Response, Washington, DC. **(EPA 1989, ER ID Number 8021)**

EPA (US Environmental Protection Agency), April 10, 1990. Module VIII of RCRA Permit No. NM0890010515, EPA Region VI, issued to Los Alamos National Laboratory, Los Alamos, New Mexico, effective May 23, 1990, EPA Region VI, Hazardous Waste Management Division, Dallas, Texas. **(EPA 1990, ER ID Number 1585)**

EPA (US Environmental Protection Agency), September 1, 1995. "Region IX Preliminary Remediation Goals (PRGs) Second Half 1995," EPA Region IX, Technical Support Section, San Francisco, California. **(EPA 1995, ER ID Number 53970)**

LANL (Los Alamos National Laboratory), November 1990. "Solid Waste Management Units Report," Vol. I–IV, Los Alamos National Laboratory Report LA-UR-90-3400, prepared by International Technology Corporation, Contract No. 9-XS8-0062R-1, Los Alamos, New Mexico. **(LANL 1990, ER ID Number 7511)**

LANL (Los Alamos National Laboratory), 1991. "Waste Stream Characterization Reports," Los Alamos National Laboratory Reports (preliminary), prepared by International Technology Corporation, Project No. 301215.06.03, Los Alamos, New Mexico. **(LANL 1991, ER ID Number 12451)**

LANL (Los Alamos National Laboratory), May 1991. "Environmental Restoration Standard Operating Procedures," Vol. I–II, Los Alamos, New Mexico. **(LANL 1991, ER ID Number 21556)**

LANL (Los Alamos National Laboratory), May 1992. "RFI Work Plan for Operable Unit 1129," Los Alamos National Laboratory Report LA-UR-92-800, Los Alamos, New Mexico. **(LANL 1992, ER ID Number 7666)**

LANL (Los Alamos National Laboratory), July 1995. "Statement of Work – Analytical Support," Revision 2, RFP No. 9-XS1-Q4257, Los Alamos, New Mexico. **(LANL 1995, ER ID Number 49738)**

LANL (Los Alamos National Laboratory), August 21, 1995. "Administrative and Quality Procedures for Environmental Restoration," Los Alamos, New Mexico. **(LANL 1995, ER ID Number 49708)**

LANL (Los Alamos National Laboratory), March 1996. "Quality Assurance Project Plan Requirements for Sampling and Analysis," Los Alamos National Laboratory Report LA-UR-96-441, Los Alamos, New Mexico. **(LANL 1996, ER ID Number 53450)**

LANL (Los Alamos National Laboratory), May 1996. "RFI Report for Potential Release Sites 35-003(h, j, and k) 35-004(b) 35-008 35-009(a through d) 35-014(a, b, d, e_1, e_2, and f) 35-015(b) 35-016(e, f, and i)," Los Alamos National Laboratory Report LA-UR-96-1293, Los Alamos, New Mexico. **(LANL 1996, ER ID Number 54402)**

LANL (Los Alamos National Laboratory), May 6, 1996. Letter to Benito Garcia (NMED-HRMB) from Jorg Jansen (Program Manager, Environmental Restoration) and Theodore J. Taylor (Program Manager, Los Alamos Area Office), Los Alamos, New Mexico. **(LANL 1996, ER ID Number 54448)**

LANL (Los Alamos National Laboratory), June 1996. "RFI Report for Potential Release Sites 35-003(d, e, f, g, l, o, q, and r) 35-016(g and h)," Los Alamos National Laboratory Report LA-UR-96-1605, Los Alamos, New Mexico. **(LANL 1996, ER ID Number 54422)**

LANL (Los Alamos National Laboratory), July 1996. "Voluntary Corrective Action Completion Report for Potential Release Sites 35-009(b, c, and d) Abandoned Septic Tanks," Los Alamos National Laboratory Report LA-UR-96-2449, Los Alamos, New Mexico. **(LANL 1996, ER ID Number 54967)**

LANL (Los Alamos National Laboratory), September 1996. "RFI Report for Potential Release Sites 35-016(a, c, d, m, and p) C-35-007," Los Alamos National Laboratory Report LA-UR-96-2828, Los Alamos, New Mexico. **(LANL 1996, ER ID Number 55075)**

LANL (Los Alamos National Laboratory), September 1996. "Voluntary Corrective Action Completion Report for Potential Release Site 35-018(a)," Los Alamos National Laboratory Report LA-UR-96-3271, Los Alamos, New Mexico. **(LANL 1996, ER ID Number 55063)**

Longmire, P. A., D. E. Broxton, and S. L. Reneau, October 1995. "Natural Background Geochemistry and Statistical Analysis of Selected Soil Profiles, Sediments, and Bandelier Tuff, Los Alamos, New Mexico," Los Alamos National Laboratory Report LA-UR-95-3468, Los Alamos, New Mexico. **(Longmire et al. 1995, ER ID Number 52227)**

Longmire, P., S. Reneau, P. Watt, L. McFadden, J. Gardner, C. Duffy, and R. Ryti, January 1995. "Natural Background Geochemistry, Geomorphology, and Pedogenesis of Selected Soil Profiles and Bandelier Tuff, Los Alamos, NM" (draft), Los Alamos National Laboratory Report LA-12913-MS, Los Alamos, New Mexico. **(Longmire et al. 1995, ER ID Number 48818)**

New Mexico Water Quality Control Commission, January 23, 1995. *State of New Mexico Standards for Interstate and Intrastate Streams*, Report 20 NMAC 6.1, Santa Fe, New Mexico. **(New Mexico Water Quality Control Commission 1995, ER ID Number 50265)**

New Mexico Water Quality Control Commission, December 1, 1995. *State of New Mexico Ground and Surface Water Quality Protection Regulations*, Report 20 NMAC 6.2, and Utility Operator Certification Regulations, Report 20 NMAC 7.4, Santa Fe, New Mexico. **(New Mexico Water Quality Control Commission 1995, ER ID Number 54406)**

NMED (New Mexico Environment Department), January 1, 1995. "Drinking Water Regulations," Title 20, Chapter 7, Part 1, Drinking Water Bureau, Santa Fe, New Mexico. **(NMED 1995, ER ID Number 55501)**

Pratt, A., May 17, 1994. "Final SAP Documentation and Changes for Aggregate G, SWMU Nos. 35-010(a through c)," Los Alamos National Laboratory Memorandum EES-13-ER-05-94-001 to OU 1129 File from Allyn Pratt (EES-13), Los Alamos, New Mexico. **(Pratt 1994, ER ID Number 38746)**

Pratt, A., June 2, 1994. "Addendum to the OU 1129 RFI Work Plan," Los Alamos National Laboratory Memorandum EES-13-ER-05-94-011 to Tracy Glatzmaier (EES-5) from Allyn Pratt (EES-13), Los Alamos, New Mexico. **(Pratt 1994, ER ID Number 43475)**

Pratt, A., June 21, 1994. "Final SAP Documentation and Changes for Aggregate E, SWMU No. 35-008," Los Alamos National Laboratory Memorandum EES-13-ER-06-94-009 to OU 1129 File from Allyn Pratt (EES-13), Los Alamos, New Mexico. **(Pratt 1994, ER ID Number 46026)**

Pratt, A., January 3, 1995. "Final SAP Documentation and Changes for Aggregate U; SWMU Nos. 35-004(b); 35-014(e_1, e_2, and f); and 35-016(e, f, g, h, and i)," Los Alamos National Laboratory Memorandum EES-13-ER-12-94-003 to OU 1129 File from Allyn Pratt (EES-13), Los Alamos, New Mexico. **(Pratt 1995, ER ID Number 43528)**

Pratt, A., April 5, 1995. "Final SAP Documentation and Changes for Aggregate W, SWMU Nos. 35-010(d and e) and AOC No. C-35-007," Los Alamos National Laboratory Memorandum EES-13-ER-03-95-005 to OU 1129 File from Allyn Pratt (EES-13), Los Alamos, New Mexico. **(Pratt 1995, ER ID Number 45981)**

Roberson, K., August 5, 1991. Notes recorded during site inspection of TA-35 on International Technology (IT) Corporation Field Activity Daily Log, Los Alamos, New Mexico. **(Roberson 1991, ER ID Number 21576)**

Shafer, S. B., April 13, 1988. ER Program Site Visits, Roy F. Weston, Inc., Field Notebook (handwritten), Control No. 52, pp. 8–11, 15–24, 27, 28, 30–37, 42, 44, 52, 168–169; Los Alamos, New Mexico. **(Shafer 1988, ER ID Number 41150)**

Attachment

Data Tables

TABLE A-1

RFI RESULTS FOR INORGANIC CHEMICALS AT PRS Nos. 35-008 AND 35-014(e_1)*

Part 1

PRS	Location ID	Sample ID	Depth (ft)	Media	Ag	Al	As	As,XRF	Ba	Ba,XRF
SAL	N/A	N/A	N/A	N/A	383	77000	N.A.	N.A.	5300	5300
All-soils UTL	N/A	N/A	N/A	N/A	N.A.	38700	7.82	18.1	315	561
35-008	35-2032	AAB4269	0–0.5	Soil	<.95	5830	<3.9	<4	70.9	243
35-008	35-2032	AAB4270	1–2	Soil	NA	NA	NA	<4	NA	100
35-008	35-2032	AAB4271	2–3	Soil	NA	NA	NA	4.95	NA	133
35-008	35-2213	AAB4272	0–0.5	Soil	NA	NA	NA	<4	NA	286
35-008	35-2213	AAB4273	0–0.5	Soil	NA	NA	NA	<4	NA	49
35-008	35-2213	AAB4275	2–3	Soil	NA	NA	NA	<4	NA	108
35-008	35-2250	AAB4276	0–0.5	Soil	NA	NA	NA	<15	NA	142
35-008	35-2250	AAB4277	1–2	Soil	NA	NA	NA	<15	NA	63
35-008	35-2250	AAB4278	2–3	Soil	NA	NA	NA	<15	NA	81
35-008	35-2251	XAAB4257	0–0.5	Soil	<.97	4770	<3.9	<4	66.1	205
35-008	35-2251	XAAB4258	1–2	Soil	NA	NA	NA	<4	NA	33.7
35-008	35-2251	XAAB4259	2–3	Soil	NA	NA	NA	<4	NA	58.4
35-008	35-2252	XAAB4260	0–0.5	Soil	NA	NA	NA	<15	NA	171
35-008	35-2252	XAAB4261	1–2	Soil	NA	NA	NA	<15	NA	93
35-008	35-2252	XAAB4262	2–3	Soil	NA	NA	NA	<15	NA	95
35-008	35-2253	XAAB4263	0–0.5	Soil	NA	NA	NA	<15	NA	238
35-008	35-2253	XAAB4264	1–2	Soil	NA	NA	NA	<15	NA	278
35-008	35-2253	XAAB4265	2–3	Soil	NA	NA	NA	<15	NA	212
35-008	35-2282	0435-95-0203	1–2	Soil	<1.1	2490	1.6	NA	47.7	NA

Part 2

PRS	Location ID	Sample ID	Depth (ft)	Media	Be	Ca	Ca,XRF	Cd	Cd,XRF	Co
SAL	N/A	N/A	N/A	N/A	N.A.	N.A.	N.A.	38	38	4600
All-soils UTL	N/A	N/A	N/A	N/A	1.95	6120	10900	2.7	N.A.	19.2
35-008	35-2032	AAB4269	0–0.5	Soil	<.61	1730	5320	<.44	<3	<2.8
35-008	35-2032	AAB4270	1–2	Soil	NA	NA	3080	NA	<3	NA
35-008	35-2032	AAB4271	2–3	Soil	NA	NA	2370	NA	<3	NA
35-008	35-2213	AAB4272	0–0.5	Soil	NA	NA	4840	NA	<3	NA
35-008	35-2213	AAB4273	0–0.5	Soil	NA	NA	3480	NA	<3	NA
35-008	35-2213	AAB4275	2–3	Soil	NA	NA	3250	NA	<3	NA
35-008	35-2250	AAB4276	0–0.5	Soil	NA	NA	4300	NA	<3	NA
35-008	35-2250	AAB4277	1–2	Soil	NA	NA	1700	NA	<3	NA
35-008	35-2250	AAB4278	2–3	Soil	NA	NA	1400	NA	<3	NA
35-008	35-2251	XAAB4257	0–0.5	Soil	<.71	2250	6180	2.1	<3	<2.2
35-008	35-2251	XAAB4258	1–2	Soil	NA	NA	1400	NA	<3	NA
35-008	35-2251	XAAB4259	2–3	Soil	NA	NA	1750	NA	<3	NA
35-008	35-2252	XAAB4260	0–0.5	Soil	NA	NA	6500	NA	<3	NA
35-008	35-2252	XAAB4261	1–2	Soil	NA	NA	2800	NA	<3	NA
35-008	35-2252	XAAB4262	2–3	Soil	NA	NA	1900	NA	<3	NA
35-008	35-2253	XAAB4263	0–0.5	Soil	NA	NA	3800	NA	<3	NA
35-008	35-2253	XAAB4264	1–2	Soil	NA	NA	4400	NA	<3	NA
35-008	35-2253	XAAB4265	2–3	Soil	NA	NA	4100	NA	<3	NA
35-008	35-2282	0435-95-0203	1–2	Soil	0.58	988	NA	<.85	NA	3.6

*mg/kg

TABLE A-1 (continued)

RFI RESULTS FOR INORGANIC CHEMICALS AT PRS Nos. 35-008 AND 35-014(e_1)*

Part 1

PRS	Location ID	Sample ID	Depth (ft)	Media	Cr	Cr,XRF	Cu	Cu,XRF	Fe	Fe,XRF
SAL	N/A	N/A	N/A	N/A	210	210	2800	2800	N.A.	N.A.
All-soils UTL	N/A	N/A	N/A	N/A	19.3	45.1	15.5	16.7	21300	27400
35-008	35-2032	AAB4269	0–0.5	Soil	3.4	34.9	6.7	13.6	7170	16300
35-008	35-2032	AAB4270	1–2	Soil	NA	20.7	NA	11.1	NA	19400
35-008	35-2032	AAB4271	2–3	Soil	NA	21.4	NA	12.8	NA	19800
35-008	35-2213	AAB4272	0–0.5	Soil	NA	21.7	NA	10	NA	17200
35-008	35-2213	AAB4273	0–0.5	Soil	NA	27.7	NA	<8	NA	11800
35-008	35-2213	AAB4275	2–3	Soil	NA	43.6	NA	10.1	NA	12300
35-008	35-2250	AAB4276	0–0.5	Soil	NA	<12	NA	<8	NA	13900
35-008	35-2250	AAB4277	1–2	Soil	NA	<12	NA	<8	NA	10900
35-008	35-2250	AAB4278	2–3	Soil	NA	<12	NA	<8	NA	10300
35-008	35-2251	XAAB4257	0–0.5	Soil	3.7	27.6	25.2	19.9	5670	14500
35-008	35-2251	XAAB4258	1–2	Soil	NA	<12	NA	8.47	NA	10900
35-008	35-2251	XAAB4259	2–3	Soil	NA	24.2	NA	<8	NA	11000
35-008	35-2252	XAAB4260	0–0.5	Soil	NA	<12	NA	13	NA	15300
35-008	35-2252	XAAB4261	1–2	Soil	NA	<12	NA	17	NA	12500
35-008	35-2252	XAAB4262	2–3	Soil	NA	<12	NA	<8	NA	12400
35-008	35-2253	XAAB4263	0–0.5	Soil	NA	<12	NA	9	NA	13800
35-008	35-2253	XAAB4264	1–2	Soil	NA	22	NA	12	NA	17100
35-008	35-2253	XAAB4265	2–3	Soil	NA	<12	NA	11	NA	14200
35-008	35-2282	0435-95-0203	1–2	Soil	4.5	NA	9.8	NA	4140	NA

Part 2

PRS	Location ID	Sample ID	Depth (ft)	Media	Hg	Hg,XRF	K	K,XRF	Li	Mg
SAL	N/A	N/A	N/A	N/A	23	23	N.A.	N.A.	1500	N.A.
All-soils UTL	N/A	N/A	N/A	N/A	0.1	N.A.	3410	38700	N.A.	4610
35-008	35-2032	AAB4269	0–0.5	Soil	NA	<5	<983	25100	6.5	<1010
35-008	35-2032	AAB4270	1–2	Soil	NA	<5	NA	31800	NA	NA
35-008	35-2032	AAB4271	2–3	Soil	NA	<5	NA	31900	NA	NA
35-008	35-2213	AAB4272	0–0.5	Soil	NA	<5	NA	2750	NA	NA
35-008	35-2213	AAB4273	0–0.5	Soil	NA	<5	NA	35400	NA	NA
35-008	35-2213	AAB4275	2–3	Soil	NA	<5	NA	32200	NA	NA
35-008	35-2250	AAB4276	0–0.5	Soil	NA	<5	NA	32700	NA	NA
35-008	35-2250	AAB4277	1–2	Soil	NA	<5	NA	33600	NA	NA
35-008	35-2250	AAB4278	2–3	Soil	NA	<5	NA	34800	NA	NA
35-008	35-2251	XAAB4257	0–0.5	Soil	NA	<5	<907	25900	6.8	<876
35-008	35-2251	XAAB4258	1–2	Soil	NA	<5	NA	32400	NA	NA
35-008	35-2251	XAAB4259	2–3	Soil	NA	<5	NA	36500	NA	NA
35-008	35-2252	XAAB4260	0–0.5	Soil	NA	<5	NA	30000	NA	NA
35-008	35-2252	XAAB4261	1–2	Soil	NA	<5	NA	33000	NA	NA
35-008	35-2252	XAAB4262	2–3	Soil	NA	<5	NA	37400	NA	NA
35-008	35-2253	XAAB4263	0–0.5	Soil	NA	<5	NA	29900	NA	NA
35-008	35-2253	XAAB4264	1–2	Soil	NA	<5	NA	28300	NA	NA
35-008	35-2253	XAAB4265	2–3	Soil	NA	<5	NA	31600	NA	NA
35-008	35-2282	0435-95-0203	1–2	Soil	<.06	NA	470	NA	NA	476

*mg/kg

TABLE A-1 (continued)

RFI RESULTS FOR INORGANIC CHEMICALS AT PRS Nos. 35-008 AND 35-014(e_1)*

Part 1

PRS	Location ID	Sample ID	Depth (ft)	Media	Mn	Mn,XRF	Mo	Na	Ni
SAL	N/A	N/A	N/A	N/A	N.A.	N.A.	380	N.A.	1500
All-soils UTL	N/A	N/A	N/A	N/A	714	681	N.A.	915	15.2
35-008	35-2032	AAB4269	0–0.5	Soil	249	368	<.85	<62.1	<4.7
35-008	35-2032	AAB4270	1–2	Soil	NA	267	NA	NA	NA
35-008	35-2032	AAB4271	2–3	Soil	NA	354	NA	NA	NA
35-008	35-2213	AAB4272	0–0.5	Soil	NA	422	NA	NA	NA
35-008	35-2213	AAB4273	0–0.5	Soil	NA	475	NA	NA	NA
35-008	35-2213	AAB4275	2–3	Soil	NA	327	NA	NA	NA
35-008	35-2250	AAB4276	0–0.5	Soil	NA	359	NA	NA	NA
35-008	35-2250	AAB4277	1–2	Soil	NA	363	NA	NA	NA
35-008	35-2250	AAB4278	2–3	Soil	NA	351	NA	NA	NA
35-008	35-2251	XAAB4257	0–0.5	Soil	243	375	<.86	<87.9	<3
35-008	35-2251	XAAB4258	1–2	Soil	NA	431	NA	NA	NA
35-008	35-2251	XAAB4259	2–3	Soil	NA	447	NA	NA	NA
35-008	35-2252	XAAB4260	0–0.5	Soil	NA	505	NA	NA	NA
35-008	35-2252	XAAB4261	1–2	Soil	NA	481	NA	NA	NA
35-008	35-2252	XAAB4262	2–3	Soil	NA	527	NA	NA	NA
35-008	35-2253	XAAB4263	0–0.5	Soil	NA	295	NA	NA	NA
35-008	35-2253	XAAB4264	1–2	Soil	NA	348	NA	NA	NA
35-008	35-2253	XAAB4265	2–3	Soil	NA	435	NA	NA	NA
35-008	35-2282	0435-95-0203	1–2	Soil	822	NA	NA	117	4.6

Part 2

PRS	Location ID	Sample ID	Depth (ft)	Media	Ni,XRF	Pb	Pb,XRF	Sb	Sb,XRF
SAL	N/A	N/A	N/A	N/A	1500	400	400	31	31
All-soils UTL	N/A	N/A	N/A	N/A	22.5	23.3	28.4	N.A.	1.45
35-008	35-2032	AAB4269	0–0.5	Soil	<13	7.6	24.2	<5.4	<4
35-008	35-2032	AAB4270	1–2	Soil	<13	NA	25.7	NA	<4
35-008	35-2032	AAB4271	2–3	Soil	<13	NA	21.4	NA	<4
35-008	35-2213	AAB4272	0–0.5	Soil	<13	NA	23.8	NA	<4
35-008	35-2213	AAB4273	0–0.5	Soil	<13	NA	14.6	NA	<4
35-008	35-2213	AAB4275	2–3	Soil	<13	NA	15.6	NA	<4
35-008	35-2250	AAB4276	0–0.5	Soil	<13	NA	24	NA	<4
35-008	35-2250	AAB4277	1–2	Soil	<13	NA	19	NA	<4
35-008	35-2250	AAB4278	2–3	Soil	<13	NA	17	NA	<4
35-008	35-2251	XAAB4257	0–0.5	Soil	<13	18.5	37.4	<5.5	<4
35-008	35-2251	XAAB4258	1–2	Soil	13.7	NA	19.6	NA	<4
35-008	35-2251	XAAB4259	2–3	Soil	<13	NA	18.5	NA	<4
35-008	35-2252	XAAB4260	0–0.5	Soil	<13	NA	30	NA	<4
35-008	35-2252	XAAB4261	1–2	Soil	<13	NA	16	NA	<4
35-008	35-2252	XAAB4262	2–3	Soil	<13	NA	20	NA	<4
35-008	35-2253	XAAB4263	0–0.5	Soil	<13	NA	21	NA	<4
35-008	35-2253	XAAB4264	1–2	Soil	<13	NA	23	NA	<4
35-008	35-2253	XAAB4265	2–3	Soil	<13	NA	21	NA	<4
35-008	35-2282	0435-95-0203	1–2	Soil	NA	7.6	NA	<10.8	NA

*mg/kg

TABLE A-1 (continued)

RFI RESULTS FOR INORGANIC CHEMICALS AT PRS Nos. 35-008 AND 35-014(e_1)*

Part 1

PRS	Location ID	Sample ID	Depth (ft)	Media	Se	Se,XRF	Sr	Th,XRF	Ti,XRF
SAL	N/A	N/A	N/A	N/A	380	380	46000	N.A.	N.A.
All-soils UTL	N/A	N/A	N/A	N/A	1.7	N.A.	N.A.	22.1	N.A.
35-008	35-2032	AAB4269	0–0.5	Soil	<8.5	<4	14.2	15.8	1687
35-008	35-2032	AAB4270	1–2	Soil	NA	<4	NA	17.7	1062
35-008	35-2032	AAB4271	2–3	Soil	NA	<4	NA	17.1	1050
35-008	35-2213	AAB4272	0–0.5	Soil	NA	<4	NA	22.2	1925
35-008	35-2213	AAB4273	0–0.5	Soil	NA	<4	NA	17.1	799
35-008	35-2213	AAB4275	2–3	Soil	NA	<4	NA	16.7	1030
35-008	35-2250	AAB4276	0–0.5	Soil	NA	<4	NA	16	1150
35-008	35-2250	AAB4277	1–2	Soil	NA	<4	NA	16	649
35-008	35-2250	AAB4278	2–3	Soil	NA	<4	NA	16	642
35-008	35-2251	XAAB4257	0–0.5	Soil	<8.6	<4	15.2	18	1299
35-008	35-2251	XAAB4258	1–2	Soil	NA	<4	NA	18.6	521
35-008	35-2251	XAAB4259	2–3	Soil	NA	<4	NA	28.7	663
35-008	35-2252	XAAB4260	0–0.5	Soil	NA	<4	NA	17	1520
35-008	35-2252	XAAB4261	1–2	Soil	NA	<4	NA	14	913
35-008	35-2252	XAAB4262	2–3	Soil	NA	<4	NA	15	813
35-008	35-2253	XAAB4263	0–0.5	Soil	NA	<4	NA	16	1610
35-008	35-2253	XAAB4264	1–2	Soil	NA	<4	NA	17	2060
35-008	35-2253	XAAB4265	2–3	Soil	NA	<4	NA	10	1350
35-008	35-2282	0435-95-0203	1–2	Soil	<3.5	NA	NA	NA	NA

Part 2

PRS	Location ID	Sample ID	Depth (ft)	Media	Tl	U,XRF	V	Zn	Zn,XRF
SAL	N/A	N/A	N/A	N/A	N.A.	230	540	23000	23000
All-soils UTL	N/A	N/A	N/A	N/A	1	5.33	41.9	50.8	76.6
35-008	35-2032	AAB4269	0–0.5	Soil	<30.1	<8	<9.7	NA	51.6
35-008	35-2032	AAB4270	1–2	Soil	NA	8.4	NA	NA	68.2
35-008	35-2032	AAB4271	2–3	Soil	NA	<8	NA	NA	67.3
35-008	35-2213	AAB4272	0–0.5	Soil	NA	16.8	NA	NA	48.1
35-008	35-2213	AAB4273	0–0.5	Soil	NA	<8	NA	NA	56.5
35-008	35-2213	AAB4275	2–3	Soil	NA	<8	NA	NA	45
35-008	35-2250	AAB4276	0–0.5	Soil	NA	<8	NA	NA	65
35-008	35-2250	AAB4277	1–2	Soil	NA	<8	NA	NA	60
35-008	35-2250	AAB4278	2–3	Soil	NA	<8	NA	NA	64
35-008	35-2251	XAAB4257	0–0.5	Soil	<30.6	<8	<8.6	NA	100
35-008	35-2251	XAAB4258	1–2	Soil	NA	10.4	NA	NA	42
35-008	35-2251	XAAB4259	2–3	Soil	NA	<8	NA	NA	49.9
35-008	35-2252	XAAB4260	0–0.5	Soil	NA	<8	NA	NA	70
35-008	35-2252	XAAB4261	1–2	Soil	NA	<8	NA	NA	51
35-008	35-2252	XAAB4262	2–3	Soil	NA	12	NA	NA	56
35-008	35-2253	XAAB4263	0–0.5	Soil	NA	<8	NA	NA	45
35-008	35-2253	XAAB4264	1–2	Soil	NA	<8	NA	NA	49
35-008	35-2253	XAAB4265	2–3	Soil	NA	<8	NA	NA	91
35-008	35-2282	0435-95-0203	1–2	Soil	<.38	NA	7.3	41.8	NA

*mg/kg

TABLE A-2

FIXED-SITE LABORATORY RADIONUCLIDE RESULTS FOR PRS Nos. 35-008 AND 35-014(e_1)*

Part 1

PRS	Location ID	Sample ID	Depth (ft)	Media	Ac-228	Am-241	Bi-211	Ce-144	Co-60	Cs-137
SAL	N/A	N/A	N/A	N/A	N.A.	22	N.A.	56	1.1	5.1
All-soils UTL	N/A	N/A	N/A	N/A	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
35-008	35-2032	AAB4269	0–0.5	Soil	NA	NA	NA	NA	NA	NA
35-008	35-2032	AAB4270	1–2	Soil	NA	NA	NA	NA	NA	NA
35-008	35-2032	AAB4271	2–3	Soil	NA	NA	NA	NA	NA	NA
35-008	35-2213	AAB4272	0–0.5	Soil	NA	NA	NA	NA	NA	NA
35-008	35-2213	AAB4274	1–2	Soil	NA	NA	NA	NA	NA	NA
35-008	35-2213	AAB4275	2–3	Soil	NA	NA	NA	NA	NA	NA
35-008	35-2250	AAB4276	0–0.5	Soil	NA	NA	NA	NA	NA	NA
35-008	35-2250	AAB4277	1–2	Soil	2.46 J+	<.415	3.44	<.616	<.104	<.105
35-008	35-2250	AAB4278	2–3	Soil	NA	NA	NA	NA	NA	NA
35-008	35-2251	XAAB4257	0–0.5	Soil	NA	NA	NA	NA	NA	NA
35-008	35-2251	XAAB4258	1–2	Soil	NA	NA	NA	NA	NA	NA
35-008	35-2251	XAAB4259	2–3	Soil	NA	NA	NA	NA	NA	NA
35-008	35-2252	XAAB4260	0–0.5	Soil	NA	NA	NA	NA	NA	NA
35-008	35-2252	XAAB4261	1–2	Soil	NA	NA	NA	NA	NA	NA
35-008	35-2252	XAAB4262	2–3	Soil	NA	NA	NA	NA	NA	NA
35-008	35-2253	XAAB4263	0–0.5	Soil	NA	NA	NA	NA	NA	NA
35-008	35-2253	XAAB4264	1–2	Soil	NA	NA	NA	NA	NA	NA
35-008	35-2253	XAAB4265	2–3	Soil	NA	NA	NA	NA	NA	NA

Part 2

PRS	Location ID	Sample ID	Depth (ft)	Media	Eu-152	H-3	K-40	Na-22	Np-237	Pb-212
SAL	N/A	N/A	N/A	N/A	2.6	260	12	1.3	1.9	N.A.
All-soils UTL	N/A	N/A	N/A	N/A	N.A.	N.A.	28.6	N.A.	N.A.	N.A.
35-008	35-2032	AAB4269	0–0.5	Soil	NA	NA	NA	NA	NA	NA
35-008	35-2032	AAB4270	1–2	Soil	NA	NA	NA	NA	NA	NA
35-008	35-2032	AAB4271	2–3	Soil	NA	NA	NA	NA	NA	NA
35-008	35-2213	AAB4272	0–0.5	Soil	NA	0.012	NA	NA	NA	NA
35-008	35-2213	AAB4274	1–2	Soil	NA	NA	NA	NA	NA	NA
35-008	35-2213	AAB4275	2–3	Soil	NA	NA	NA	NA	NA	NA
35-008	35-2250	AAB4276	0–0.5	Soil	NA	NA	NA	NA	NA	NA
35-008	35-2250	AAB4277	1–2	Soil	<.223	NA	8.1 J-	<.0522	<.601	1.71
35-008	35-2250	AAB4278	2–3	Soil	NA	NA	NA	NA	NA	NA
35-008	35-2251	XAAB4257	0–0.5	Soil	NA	NA	NA	NA	NA	NA
35-008	35-2251	XAAB4258	1–2	Soil	NA	NA	NA	NA	NA	NA
35-008	35-2251	XAAB4259	2–3	Soil	NA	NA	NA	NA	NA	NA
35-008	35-2252	XAAB4260	0–0.5	Soil	NA	NA	NA	NA	NA	NA
35-008	35-2252	XAAB4261	1–2	Soil	NA	NA	NA	NA	NA	NA
35-008	35-2252	XAAB4262	2–3	Soil	NA	NA	NA	NA	NA	NA
35-008	35-2253	XAAB4263	0–0.5	Soil	NA	NA	NA	NA	NA	NA
35-008	35-2253	XAAB4264	1–2	Soil	NA	NA	NA	NA	NA	NA
35-008	35-2253	XAAB4265	2–3	Soil	NA	NA	NA	NA	NA	NA

*pCi/g

TABLE A-2 (continued)

FIXED-SITE LABORATORY RADIONUCLIDE RESULTS FOR PRS Nos. 35-008 AND 35-014(e_1)*

Part 1

PRS	Location ID	Sample ID	Depth (ft)	Media	Pb-214	Pu-238	Pu-239	Ra-223	Ra-224	Ra-226
SAL	N/A	N/A	N/A	N/A	N.A.	27	24	N.A.	N.A.	0.1
All-soils UTL	N/A	N/A	N/A	N/A	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
35-008	35-2032	AAB4269	0–0.5	Soil	NA	-0.016 J+	0.054 J+	NA	NA	NA
35-008	35-2032	AAB4270	1–2	Soil	NA	-0.014 J+	0.050 J+	NA	NA	NA
35-008	35-2032	AAB4271	2–3	Soil	NA	0.020 J+	0.005 J+	NA	NA	NA
35-008	35-2213	AAB4272	0–0.5	Soil	NA	0.011 J+	0.020 J+	NA	NA	NA
35-008	35-2213	AAB4274	1–2	Soil	NA	0.002 J+	0.007 J+	NA	NA	NA
35-008	35-2213	AAB4275	2–3	Soil	NA	0.005 J+	0.014 J+	NA	NA	NA
35-008	35-2250	AAB4276	0–0.5	Soil	NA	0.003	0.015	NA	NA	NA
35-008	35-2250	AAB4277	1–2	Soil	0.32	0.001	0.030	0.86	3.03	1.61
35-008	35-2250	AAB4278	2–3	Soil	NA	0.001	0.004	NA	NA	NA
35-008	35-2251	XAAB4257	0–0.5	Soil	NA	0.034 J+	0.041 J+	NA	NA	NA
35-008	35-2251	XAAB4258	1–2	Soil	NA	0.014 J+	0.014 J+	NA	NA	NA
35-008	35-2251	XAAB4259	2–3	Soil	NA	-0.002 J+	0.016 J+	NA	NA	NA
35-008	35-2252	XAAB4260	0–0.5	Soil	NA	0.003	0.032	NA	NA	NA
35-008	35-2252	XAAB4261	1–2	Soil	NA	0.002	0.006	NA	NA	NA
35-008	35-2252	XAAB4262	2–3	Soil	NA	0.002	0.009	NA	NA	NA
35-008	35-2253	XAAB4263	0–0.5	Soil	NA	0.001	0.014	NA	NA	NA
35-008	35-2253	XAAB4264	1–2	Soil	NA	0.002	0.004	NA	NA	NA
35-008	35-2253	XAAB4265	2–3	Soil	NA	0.002	0.024	NA	NA	NA

Part 2

PRS	Location ID	Sample ID	Depth (ft)	Media	Ru-106	Th-227	Th-234	Tl-208	U-234	U-235	U-238
SAL	N/A	N/A	N/A	N/A	13	N.A.	N.A.	N.A.	13	10	67
All-soils UTL	N/A	N/A	N/A	N/A	N.A.	N.A.	N.A.	N.A.	1.94	0.084	1.82
35-008	35-2032	AAB4269	0–0.5	Soil	NA	NA	NA	NA	1.014	0.054	1.077
35-008	35-2032	AAB4270	1–2	Soil	NA	NA	NA	NA	0.682	0.052	0.613
35-008	35-2032	AAB4271	2–3	Soil	NA	NA	NA	NA	0.759	0.063	0.752
35-008	35-2213	AAB4272	0–0.5	Soil	NA	NA	NA	NA	1.02	0.065	0.996
35-008	35-2213	AAB4274	1–2	Soil	NA	NA	NA	NA	0.811	0.047	0.851
35-008	35-2213	AAB4275	2–3	Soil	NA	NA	NA	NA	0.631	0.043	0.698
35-008	35-2250	AAB4276	0–0.5	Soil	NA	NA	NA	NA	1.95 J+	0.11	1.93 J+
35-008	35-2250	AAB4277	1–2	Soil	<.806	1.75	3.58	0.56	1.62 J+	0.07	1.59 J+
35-008	35-2250	AAB4278	2–3	Soil	NA	NA	NA	NA	1.76 J+	0.15	1.76 J+
35-008	35-2251	XAAB4257	0–0.5	Soil	NA	NA	NA	NA	0.937	0.065	1.108
35-008	35-2251	XAAB4258	1–2	Soil	NA	NA	NA	NA	0.80	0.061	0.736
35-008	35-2251	XAAB4259	2–3	Soil	NA	NA	NA	NA	0.536	0.029	0.619
35-008	35-2252	XAAB4260	0–0.5	Soil	NA	NA	NA	NA	3.07 J+	0.17	3.33 J+
35-008	35-2252	XAAB4261	1–2	Soil	NA	NA	NA	NA	2.05 J+	0.11	2.02 J+
35-008	35-2252	XAAB4262	2–3	Soil	NA	NA	NA	NA	1.62 J+	0.04	1.78 J+
35-008	35-2253	XAAB4263	0–0.5	Soil	NA	NA	NA	NA	1.76 J+	0.19	1.86 J+
35-008	35-2253	XAAB4264	1–2	Soil	NA	NA	NA	NA	1.32 J+	0.06	1.31 J+
35-008	35-2253	XAAB4265	2–3	Soil	NA	NA	NA	NA	1.78 J+	0.08	1.94 J+

*pCi/g

TABLE A-3

RFI RESULTS FOR ORGANIC CHEMICALS AT PRS Nos. 35-008 AND 35-014(e_1)*

Part 1

PRS	Location ID	Sample ID	Depth (ft)	Media	Acenaphthene	Acenaphthylene	Anthracene	Azobenzene
SAL	N/A	N/A	N/A	N/A	360	N.A.	19	4
35-008	35-2032	AAB4269	0–0.5	Soil	1.9 S	ND	6.1 S	ND
35-008	35-2032	AAB4271	2–3	Soil	ND	ND	6.8 S	ND
35-008	35-2250	AAB4276	0–0.5	Soil	ND	2.8 S	2.8 S	5.8 S
35-008	35-2251	XAAB4257	0–0.5	Soil	ND	ND	1.1 S	2.3 S
35-008	35-2251	XAAB4258	1–2	Soil	ND	ND	1.9 S	6.4 S
35-008	35-2251	XAAB4259	2–3	Soil	ND	ND	ND	6.1 S
35-008	35-2252	XAAB4260	0–0.5	Soil	ND	ND	2.8 S	11.1 S
35-008	35-2252	XAAB4261	1–2	Soil	ND	ND	3.9 S	7.2 S
35-008	35-2253	XAAB4264	1–2	Soil	ND	ND	1.2 S	0.65 S
35-008	35-2253	XAAB4265	2–3	Soil	ND	ND	3.3 S	4.5 S
35-008	35-2282	0435-95-0203	0–0.5	Soil	ND	ND	ND	ND
35-008	35-2282	0435-95-0203	1–2	Soil	ND	ND	ND	ND
35-008	35-2283	0435-95-0204	1–2	Soil	ND	ND	ND	ND
35-014(e_1)	35-2136	AAC1259	1–2	Soil	ND	ND	ND	ND

Part 2

PRS	Location ID	Sample ID	Depth (ft)	Media	Bis(2-ethyl-hexyl)phthalate	Fluor-anthene	Fluorene	Phen-anthrene	TPH
SAL	N/A	N/A	N/A	N/A	32	2600	300	N.A.	N.A.
35-008	35-2032	AAB4269	0–0.5	Soil	ND	ND	2.3 S	ND	NA
35-008	35-2032	AAB4271	2–3	Soil	ND	5.1 S	ND	ND	NA
35-008	35-2250	AAB4276	0–0.5	Soil	ND	0.76 S	1.7 S	ND	NA
35-008	35-2251	XAAB4257	0–0.5	Soil	ND	0.49 S	ND	ND	NA
35-008	35-2251	XAAB4258	1–2	Soil	ND	ND	ND	3.6 S	NA
35-008	35-2251	XAAB4259	2–3	Soil	ND	2 S	ND	1.5 S	NA
35-008	35-2252	XAAB4260	0–0.5	Soil	ND	0.84 S	ND	2.4 S	NA
35-008	35-2252	XAAB4261	1–2	Soil	ND	ND	ND	1.9 S	NA
35-008	35-2253	XAAB4264	1–2	Soil	ND	ND	ND	0.64 S	NA
35-008	35-2253	XAAB4265	2–3	Soil	ND	ND	ND	1.8 S	NA
35-008	35-2282	0435-95-0203	0–0.5	Soil	8.2	ND	ND	ND	25000
35-008	35-2282	0435-95-0203	1–2	Soil	2.5 J	ND	ND	ND	15000
35-008	35-2283	0435-95-0204	1–2	Soil	4.1 J	ND	ND	ND	27000
35-014(e_1)	35-2136	AAC1259	1–2	Soil	ND	ND	ND	ND	10 S

*mg/kg

TABLE A-4

RFI RESULTS FOR INORGANIC CHEMICALS AT PRS Nos. 35-010(a, b, and c)*

PRS	Location ID	Sample ID	Depth	Media	Ag	Al	As	As, XRF	Ba
Soil SAL	N/A	N/A	N/A	N/A	383	77000	N.A.	N.A.	5300
All-soils UTL	N/A	N/A	N/A	N/A	N.A.	38700	7.82	18.1	315
Qbt2 UTL	N/A	N/A	N/A	N/A	N.A.	3700	2	18.1	28
Qbt3 UTL	N/A	N/A	N/A	N/A	1.9	3700	5	18.1	28
35-010(a)	35-2063	AAA6557	Top	Sludge	NA	NA	NA	<4	NA
35-010(a)	35-2063	AAA6558	Bottom	Sludge	NA	NA	NA	5.1	NA
35-010(a)	35-2064	AAA6560	Top	Sludge	NA	NA	NA	<4	NA
35-010(a)	35-2064	AAA6585	Bottom	Sludge	NA	NA	NA	<4	NA
35-010(a)	35-2216	AAB1517	5.7–6.4 ft	Soil	<.74	2060	<3	<4	<27.4
35-010(a)	35-2216	AAB1518	9.9–10.6 ft	Soil	NA	NA	NA	<4	NA
35-010(a)	35-2216	AAB1519	13.4–14.1 ft	Qbt3	NA	NA	NA	<4	NA
35-010(a)	35-2216	AAB1520	17.0–17.7 ft	Qbt3	NA	NA	NA	<4	NA
35-010(a)	35-2216	AAB1521	20.5–21.2 ft	Qbt3	NA	NA	NA	<4	NA
35-010(a)	35-2216	AAB1522	20.5–21.2 ft	Qbt3	NA	NA	NA	<4	NA
35-010(a)	35-2216	AAB1523	24.0–24.7 ft	Qbt3	NA	NA	NA	<4	NA
35-010(a)	35-2216	AAB1524	27.6–28.3 ft	Qbt2	NA	NA	NA	<4	NA
35-010(a)	35-2216	AAB1525	34.6–35.4 ft	Qbt2	NA	NA	NA	<4	NA
35-010(a)	35-2237	AAA6559	N/A	Water, total	<9.2 UJ	2890 J	<15 UJ	NA	427 J
35-010(a)	35-2238	AAA6586	N/A	Water, total	<3.7 UJ	399 J	<15 UJ	NA	<194 UJ
35-010(a)	35-2238	AAA6587	N/A	Water, total	<3.7 UJ	439 J	<15 UJ	NA	<197 UJ
35-010(b)	35-2067	AAB1537	Top	Sludge	NA	NA	NA	<4	NA
35-010(b)	35-2067	AAB1538	Bottom	Sludge	NA	NA	NA	<4	NA
35-010(b)	35-2067	AAB1539	Bottom	Sludge	NA	NA	NA	<4	NA
35-010(b)	35-2068	AAB1541	Top	Sludge	NA	NA	NA	9.71	NA
35-010(b)	35-2068	AAB1542	Bottom	Sludge	NA	NA	NA	7.85	NA
35-010(b)	35-2069	AAB1509	6.4–7.1 ft	Qbt3	<.74	1500	<3	<4	<11.8
35-010(b)	35-2069	AAB1510	9.2–9.9 ft	Qbt3	NA	NA	NA	<4	NA
35-010(b)	35-2069	AAB1511	13.4–14.1 ft	Qbt3	NA	NA	NA	<4	NA
35-010(b)	35-2069	AAB1512	16.2–17.0 ft	Qbt3	NA	NA	NA	<4	NA
35-010(b)	35-2069	AAB1513	20.5–21.2 ft	Qbt2	NA	NA	NA	<4	NA
35-010(b)	35-2069	AAB1515	24.0–24.7 ft	Qbt2	NA	NA	NA	<4	NA
35-010(b)	35-2069	AAB1514	27.6–28.3 ft	Qbt2	NA	NA	NA	<4	NA
35-010(b)	35-2069	AAB1516	34.6–35.4 ft	Qbt2	NA	NA	NA	<4	NA
35-010(b)	35-2239	AAB1533	N/A	Water, total	130 J	15100 J	40.7 J	NA	645 J
35-010(b)	35-2240	AAB1536	N/A	Water, total	993 J	89300 J	225 J	NA	2800 J
35-010(c)	35-2065	AAA6588	Top	Sludge	NA	NA	NA	<33	NA
35-010(c)	35-2065	AAB1532	Bottom	Sludge	18.6	11272	2.8	<33	131
35-010(c)	35-2066	AAB1534	Top	Sludge	NA	NA	NA	<33	NA
35-010(c)	35-2066	AAB1535	Bottom	Sludge	NA	NA	NA	<33	NA

*mg/kg or µg/L

TABLE A-4 (continued)

RFI RESULTS FOR INORGANIC CHEMICALS AT PRS Nos. 35-010(a, b, and c)*

PRS	Location ID	Sample ID	Depth	Media	Ba, XRF	Be	Ca	Ca, XRF	Cd
Soil SAL	N/A	N/A	N/A	N/A	5300	N.A.	N.A.	N.A.	38
All-soils UTL	N/A	N/A	N/A	N/A	561	1.95	6120	10900	2.7
Qbt2 UTL	N/A	N/A	N/A	N/A	561	1.53	1520	10900	N.A.
Qbt3 UTL	N/A	N/A	N/A	N/A	561	1.53	1520	10900	N.A.
35-010(a)	35-2063	AAA6557	Top	Sludge	514	NA	NA	8810	NA
35-010(a)	35-2063	AAA6558	Bottom	Sludge	496	NA	NA	6320	NA
35-010(a)	35-2064	AAA6560	Top	Sludge	522	NA	NA	10800	NA
35-010(a)	35-2064	AAA6585	Bottom	Sludge	487	NA	NA	7350	NA
35-010(a)	35-2216	AAB1517	5.7–6.4 ft	Soil	174	<.6	1030	4730	<.34
35-010(a)	35-2216	AAB1518	9.9–10.6 ft	Soil	44.3	NA	NA	1490	NA
35-010(a)	35-2216	AAB1519	13.4–14.1 ft	Qbt3	65.8	NA	NA	1500	NA
35-010(a)	35-2216	AAB1520	17.0–17.7 ft	Qbt3	63.9	NA	NA	1320	NA
35-010(a)	35-2216	AAB1521	20.5–21.2 ft	Qbt3	44.9	NA	NA	1360	NA
35-010(a)	35-2216	AAB1522	20.5–21.2 ft	Qbt3	68.4	NA	NA	1150	NA
35-010(a)	35-2216	AAB1523	24.0–24.7 ft	Qbt3	90.6	NA	NA	1880	NA
35-010(a)	35-2216	AAB1524	27.6–28.3 ft	Qbt2	67	NA	NA	1420	NA
35-010(a)	35-2216	AAB1525	34.6–35.4 ft	Qbt2	53.2	NA	NA	1520	NA
35-010(a)	35-2237	AAA6559	N/A	Water, total	NA	<.54 UJ	34400 J	NA	<1.7 UJ
35-010(a)	35-2238	AAA6586	N/A	Water, total	NA	<.2 UJ	28600 J	NA	<1.7 UJ
35-010(a)	35-2238	AAA6587	N/A	Water, total	NA	<.2 UJ	28800 J	NA	<1.7 UJ
35-010(b)	35-2067	AAB1537	Top	Sludge	314	NA	NA	8790	NA
35-010(b)	35-2067	AAB1538	Bottom	Sludge	382	NA	NA	5320	NA
35-010(b)	35-2067	AAB1539	Bottom	Sludge	415	NA	NA	6090	NA
35-010(b)	35-2068	AAB1541	Top	Sludge	242	NA	NA	12300	NA
35-010(b)	35-2068	AAB1542	Bottom	Sludge	527	NA	NA	7910	NA
35-010(b)	35-2069	AAB1509	6.4–7.1 ft	Qbt3	50.8	<.58	<237	2040	<.34
35-010(b)	35-2069	AAB1510	9.2–9.9 ft	Qbt3	69.2	NA	NA	1880	NA
35-010(b)	35-2069	AAB1511	13.4–14.1 ft	Qbt3	60.2	NA	NA	1790	NA
35-010(b)	35-2069	AAB1512	16.2–17.0 ft	Qbt3	47.2	NA	NA	1240	NA
35-010(b)	35-2069	AAB1513	20.5–21.2 ft	Qbt2	91.1	NA	NA	1880	NA
35-010(b)	35-2069	AAB1515	24.0–24.7 ft	Qbt2	42.3	NA	NA	1520	NA
35-010(b)	35-2069	AAB1514	27.6–28.3 ft	Qbt2	63.1	NA	NA	1660	NA
35-010(b)	35-2069	AAB1516	34.6–35.4 ft	Qbt2	63.3	NA	NA	1620	NA
35-010(b)	35-2239	AAB1533	N/A	Water, total	NA	<1.3 UJ	41700 J	NA	10.4 J
35-010(b)	35-2240	AAB1536	N/A	Water, total	NA	10.2 J	115000 J	NA	60.8 J
35-010(c)	35-2065	AAA6588	Top	Sludge	256	NA	NA	7800	NA
35-010(c)	35-2065	AAB1532	Bottom	Sludge	533	1.1	1630	6400	<.51
35-010(c)	35-2066	AAB1534	Top	Sludge	297	NA	NA	12300	NA
35-010(c)	35-2066	AAB1535	Bottom	Sludge	221	NA	NA	8800	NA

*mg/kg or µg/L

TABLE A-4 (continued)

RFI RESULTS FOR INORGANIC CHEMICALS AT PRS Nos. 35-010(a, b, and c)*

PRS	Location ID	Sample ID	Depth	Media	Cd, XRF	Co	Cr	Cr, XRF	Cu
Soil SAL	N/A	N/A	N/A	N/A	38	4600	210	210	2800
All-soils UTL	N/A	N/A	N/A	N/A	N.A.	19.2	19.3	45.1	15.5
Qbt2 UTL	N/A	N/A	N/A	N/A	N.A.	107	1.6	45.1	2
Qbt3 UTL	N/A	N/A	N/A	N/A	N.A.	27.4	2.1	45.1	2
35-010(a)	35-2063	AAA6557	Top	Sludge	9.58	NA	NA	161	NA
35-010(a)	35-2063	AAA6558	Bottom	Sludge	<3	NA	NA	61.3	NA
35-010(a)	35-2064	AAA6560	Top	Sludge	10.7	NA	NA	171	NA
35-010(a)	35-2064	AAA6585	Bottom	Sludge	5.98	NA	NA	132	NA
35-010(a)	35-2216	AAB1517	5.7–6.4 ft	Soil	<3	<1	<1.5	<12	<1.3
35-010(a)	35-2216	AAB1518	9.9–10.6 ft	Soil	<3	NA	NA	<12	NA
35-010(a)	35-2216	AAB1519	13.4–14.1 ft	Qbt3	<3	NA	NA	<12	NA
35-010(a)	35-2216	AAB1520	17.0–17.7 ft	Qbt3	<3	NA	NA	<12	NA
35-010(a)	35-2216	AAB1521	20.5–21.2 ft	Qbt3	<3	NA	NA	<12	NA
35-010(a)	35-2216	AAB1522	20.5–21.2 ft	Qbt3	<3	NA	NA	<12	NA
35-010(a)	35-2216	AAB1523	24.0–24.7 ft	Qbt3	<3	NA	NA	13.6	NA
35-010(a)	35-2216	AAB1524	27.6–28.3 ft	Qbt2	<3	NA	NA	15.7	NA
35-010(a)	35-2216	AAB1525	34.6–35.4 ft	Qbt2	<3	NA	NA	17.5	NA
35-010(a)	35-2237	AAA6559	N/A	Water, total	NA	<3.5 UJ	20.5 J	NA	116 J
35-010(a)	35-2238	AAA6586	N/A	Water, total	NA	<3.5 UJ	<6.6 UJ	NA	25.7 J
35-010(a)	35-2238	AAA6587	N/A	Water, total	NA	<3.5 UJ	<5.5 UJ	NA	25.5 J
35-010(b)	35-2067	AAB1537	Top	Sludge	4	NA	NA	126	NA
35-010(b)	35-2067	AAB1538	Bottom	Sludge	4.85	NA	NA	93.3	NA
35-010(b)	35-2067	AAB1539	Bottom	Sludge	<3	NA	NA	81.2	NA
35-010(b)	35-2068	AAB1541	Top	Sludge	4.93	NA	NA	224	NA
35-010(b)	35-2068	AAB1542	Bottom	Sludge	10	NA	NA	133	NA
35-010(b)	35-2069	AAB1509	6.4–7.1 ft	Qbt3	<3	<.7	<1.4	<12	<1.1
35-010(b)	35-2069	AAB1510	9.2–9.9 ft	Qbt3	<3	NA	NA	<12	NA
35-010(b)	35-2069	AAB1511	13.4–14.1 ft	Qbt3	<3	NA	NA	<12	NA
35-010(b)	35-2069	AAB1512	16.2–17.0 ft	Qbt3	<3	NA	NA	<12	NA
35-010(b)	35-2069	AAB1513	20.5–21.2 ft	Qbt2	<3	NA	NA	<12	NA
35-010(b)	35-2069	AAB1515	24.0–24.7 ft	Qbt2	<3	NA	NA	14.6	NA
35-010(b)	35-2069	AAB1514	27.6–28.3 ft	Qbt2	<3	NA	NA	<12	NA
35-010(b)	35-2069	AAB1516	34.6–35.4 ft	Qbt2	<3	NA	NA	<12	NA
35-010(b)	35-2239	AAB1533	N/A	Water, total	NA	<9 UJ	155 J	NA	1020 J
35-010(b)	35-2240	AAB1536	N/A	Water, total	NA	<48.4 UJ	906 J	NA	5970 J
35-010(c)	35-2065	AAA6588	Top	Sludge	3	NA	NA	89	NA
35-010(c)	35-2065	AAB1532	Bottom	Sludge	<2	3	16	52	68.2
35-010(c)	35-2066	AAB1534	Top	Sludge	20	NA	NA	195	NA
35-010(c)	35-2066	AAB1535	Bottom	Sludge	9	NA	NA	133	NA

*mg/kg or µg/L

TABLE A-4 (continued)

RFI RESULTS FOR INORGANIC CHEMICALS AT PRS Nos. 35-010(a, b, and c)*

PRS	Location ID	Sample ID	Depth	Media	Cu, XRF	Fe	Fe, XRF	Hg	Hg, XRF
Soil SAL	N/A	N/A	N/A	N/A	2800	N.A.	N.A.	23	23
All-soils UTL	N/A	N/A	N/A	N/A	16.7	21300	27400	0.1	N.A.
Qbt2 UTL	N/A	N/A	N/A	N/A	16.7	9040	27400	N.A.	N.A.
Qbt3 UTL	N/A	N/A	N/A	N/A	16.7	9040	27400	N.A.	N.A.
35-010(a)	35-2063	AAA6557	Top	Sludge	726	NA	20100	NA	<5
35-010(a)	35-2063	AAA6558	Bottom	Sludge	99.8	NA	19300	NA	<5
35-010(a)	35-2064	AAA6560	Top	Sludge	803	NA	20300	NA	<5
35-010(a)	35-2064	AAA6585	Bottom	Sludge	391	NA	17100	NA	<5
35-010(a)	35-2216	AAB1517	5.7–6.4 ft	Soil	<8	2410	13200	NA	<5
35-010(a)	35-2216	AAB1518	9.9–10.6 ft	Soil	<8	NA	9850	NA	<5
35-010(a)	35-2216	AAB1519	13.4–14.1 ft	Qbt3	<8	NA	10200	NA	<5
35-010(a)	35-2216	AAB1520	17.0–17.7 ft	Qbt3	<8	NA	9960	NA	<5
35-010(a)	35-2216	AAB1521	20.5–21.2 ft	Qbt3	<8	NA	8870	NA	<5
35-010(a)	35-2216	AAB1522	20.5–21.2 ft	Qbt3	<8	NA	9910	NA	<5
35-010(a)	35-2216	AAB1523	24.0–24.7 ft	Qbt3	<8	NA	9840	NA	<5
35-010(a)	35-2216	AAB1524	27.6–28.3 ft	Qbt2	<8	NA	8840	NA	<5
35-010(a)	35-2216	AAB1525	34.6–35.4 ft	Qbt2	<8	NA	8900	NA	<5
35-010(a)	35-2237	AAA6559	N/A	Water, total	NA	6490 J	NA	NA	NA
35-010(a)	35-2238	AAA6586	N/A	Water, total	NA	3120 J	NA	NA	NA
35-010(a)	35-2238	AAA6587	N/A	Water, total	NA	3170 J	NA	NA	NA
35-010(b)	35-2067	AAB1537	Top	Sludge	632	NA	18500	NA	<5
35-010(b)	35-2067	AAB1538	Bottom	Sludge	356	NA	17800	NA	<5
35-010(b)	35-2067	AAB1539	Bottom	Sludge	193	NA	18800	NA	<5
35-010(b)	35-2068	AAB1541	Top	Sludge	1324	NA	24200	NA	<5
35-010(b)	35-2068	AAB1542	Bottom	Sludge	560	NA	21500	NA	<5
35-010(b)	35-2069	AAB1509	6.4–7.1 ft	Qbt3	<8	953	10900	NA	<5
35-010(b)	35-2069	AAB1510	9.2–9.9 ft	Qbt3	<8	NA	11400	NA	<5
35-010(b)	35-2069	AAB1511	13.4–14.1 ft	Qbt3	<8	NA	11000	NA	<5
35-010(b)	35-2069	AAB1512	16.2–17.0 ft	Qbt3	<8	NA	11700	NA	<5
35-010(b)	35-2069	AAB1513	20.5–21.2 ft	Qbt2	<8	NA	9850	NA	<5
35-010(b)	35-2069	AAB1515	24.0–24.7 ft	Qbt2	<8	NA	9610	NA	<5
35-010(b)	35-2069	AAB1514	27.6–28.3 ft	Qbt2	<8	NA	9990	NA	<5
35-010(b)	35-2069	AAB1516	34.6–35.4 ft	Qbt2	<8	NA	11200	NA	<5
35-010(b)	35-2239	AAB1533	N/A	Water, total	NA	22300 J	NA	NA	NA
35-010(b)	35-2240	AAB1536	N/A	Water, total	NA	252000 J	NA	NA	NA
35-010(c)	35-2065	AAA6588	Top	Sludge	371	NA	15900	NA	<10
35-010(c)	35-2065	AAB1532	Bottom	Sludge	23	12590	18800	0.46	<10
35-010(c)	35-2066	AAB1534	Top	Sludge	1140	NA	20100	NA	<10
35-010(c)	35-2066	AAB1535	Bottom	Sludge	638	NA	14600	NA	<10

*mg/kg or µg/L

TABLE A-4 (continued)

RFI RESULTS FOR INORGANIC CHEMICALS AT PRS Nos. 35-010(a, b, and c)*

PRS	Location ID	Sample ID	Depth	Media	K	K, XRF	Li	Mg	Mn
Soil SAL	N/A	N/A	N/A	N/A	N.A.	N.A.	1500	N.A.	N.A.
All-soils UTL	N/A	N/A	N/A	N/A	3410	38700	N.A.	4610	714
Qbt2 UTL	N/A	N/A	N/A	N/A	2730	38700	N.A.	548	533
Qbt3 UTL	N/A	N/A	N/A	N/A	735	38700	N.A.	628	426
35-010(a)	35-2063	AAA6557	Top	Sludge	NA	17000	NA	NA	NA
35-010(a)	35-2063	AAA6558	Bottom	Sludge	NA	27300	NA	NA	NA
35-010(a)	35-2064	AAA6560	Top	Sludge	NA	16100	NA	NA	NA
35-010(a)	35-2064	AAA6585	Bottom	Sludge	NA	21700	NA	NA	NA
35-010(a)	35-2216	AAB1517	5.7–6.4 ft	Soil	<543	33300	2.5	<568	134
35-010(a)	35-2216	AAB1518	9.9–10.6 ft	Soil	NA	38600	NA	NA	NA
35-010(a)	35-2216	AAB1519	13.4–14.1 ft	Qbt3	NA	38300	NA	NA	NA
35-010(a)	35-2216	AAB1520	17.0–17.7 ft	Qbt3	NA	38100	NA	NA	NA
35-010(a)	35-2216	AAB1521	20.5–21.2 ft	Qbt3	NA	34600	NA	NA	NA
35-010(a)	35-2216	AAB1522	20.5–21.2 ft	Qbt3	NA	37100	NA	NA	NA
35-010(a)	35-2216	AAB1523	24.0–24.7 ft	Qbt3	NA	36900	NA	NA	NA
35-010(a)	35-2216	AAB1524	27.6–28.3 ft	Qbt2	NA	35500	NA	NA	NA
35-010(a)	35-2216	AAB1525	34.6–35.4 ft	Qbt2	NA	36000	NA	NA	NA
35-010(a)	35-2237	AAA6559	N/A	Water, total	30700 J	NA	24.1 J	8730 J	342 J
35-010(a)	35-2238	AAA6586	N/A	Water, total	24900 J	NA	21.3 J	6810 J	269 J
35-010(a)	35-2238	AAA6587	N/A	Water, total	25000 J	NA	19.8 J	6910 J	272 J
35-010(b)	35-2067	AAB1537	Top	Sludge	NA	21400	NA	NA	NA
35-010(b)	35-2067	AAB1538	Bottom	Sludge	NA	24000	NA	NA	NA
35-010(b)	35-2067	AAB1539	Bottom	Sludge	NA	23100	NA	NA	NA
35-010(b)	35-2068	AAB1541	Top	Sludge	NA	15400	NA	NA	NA
35-010(b)	35-2068	AAB1542	Bottom	Sludge	NA	20200	NA	NA	NA
35-010(b)	35-2069	AAB1509	6.4–7.1 ft	Qbt3	<566	37000	<.8	<97.7	115
35-010(b)	35-2069	AAB1510	9.2–9.9 ft	Qbt3	NA	36700	NA	NA	NA
35-010(b)	35-2069	AAB1511	13.4–14.1 ft	Qbt3	NA	37100	NA	NA	NA
35-010(b)	35-2069	AAB1512	16.2–17.0 ft	Qbt3	NA	33600	NA	NA	NA
35-010(b)	35-2069	AAB1513	20.5–21.2 ft	Qbt2	NA	36800	NA	NA	NA
35-010(b)	35-2069	AAB1515	24.0–24.7 ft	Qbt2	NA	35100	NA	NA	NA
35-010(b)	35-2069	AAB1514	27.6–28.3 ft	Qbt2	NA	35000	NA	NA	NA
35-010(b)	35-2069	AAB1516	34.6–35.4 ft	Qbt2	NA	35100	NA	NA	NA
35-010(b)	35-2239	AAB1533	N/A	Water, total	26500 J	NA	39.8 J	11200 J	695 J
35-010(b)	35-2240	AAB1536	N/A	Water, total	109000 J	NA	241 J	85000 J	6090 J
35-010(c)	35-2065	AAA6588	Top	Sludge	NA	21800	NA	NA	NA
35-010(c)	35-2065	AAB1532	Bottom	Sludge	2029	21600	NA	1839	97.2
35-010(c)	35-2066	AAB1534	Top	Sludge	NA	15700	NA	NA	NA
35-010(c)	35-2066	AAB1535	Bottom	Sludge	NA	23200	NA	NA	NA

*mg/kg or µg/L

TABLE A-4 (continued)

RFI RESULTS FOR INORGANIC CHEMICALS AT PRS Nos. 35-010(a, b, and c)*

PRS	Location ID	Sample ID	Depth	Media	Mn, XRF	Mo	Na	Ni	Ni, XRF
Soil SAL	N/A	N/A	N/A	N/A	N.A.	380	N.A.	1500	1500
All-soils UTL	N/A	N/A	N/A	N/A	681	N.A.	915	15.2	22.5
Qbt2 UTL	N/A	N/A	N/A	N/A	681	N.A.	1940	N.A.	22.5
Qbt3 UTL	N/A	N/A	N/A	N/A	681	N.A.	1940	2.6	22.5
35-010(a)	35-2063	AAA6557	Top	Sludge	142	NA	NA	NA	26.4
35-010(a)	35-2063	AAA6558	Bottom	Sludge	489	NA	NA	NA	34.3
35-010(a)	35-2064	AAA6560	Top	Sludge	189	NA	NA	NA	59.8
35-010(a)	35-2064	AAA6585	Bottom	Sludge	305	NA	NA	NA	35.1
35-010(a)	35-2216	AAB1517	5.7–6.4 ft	Soil	459	<.66	<170	<1.2	<13
35-010(a)	35-2216	AAB1518	9.9–10.6 ft	Soil	395	NA	NA	NA	<13
35-010(a)	35-2216	AAB1519	13.4–14.1 ft	Qbt3	386	NA	NA	NA	<13
35-010(a)	35-2216	AAB1520	17.0–17.7 ft	Qbt3	346	NA	NA	NA	<13
35-010(a)	35-2216	AAB1521	20.5–21.2 ft	Qbt3	476	NA	NA	NA	<13
35-010(a)	35-2216	AAB1522	20.5–21.2 ft	Qbt3	484	NA	NA	NA	<13
35-010(a)	35-2216	AAB1523	24.0–24.7 ft	Qbt3	645	NA	NA	NA	<13
35-010(a)	35-2216	AAB1524	27.6–28.3 ft	Qbt2	522	NA	NA	NA	<13
35-010(a)	35-2216	AAB1525	34.6–35.4 ft	Qbt2	395	NA	NA	NA	<13
35-010(a)	35-2237	AAA6559	N/A	Water, total	NA	373 J	57500 J	<13.7 UJ	NA
35-010(a)	35-2238	AAA6586	N/A	Water, total	NA	325 J	59300 J	<9 UJ	NA
35-010(a)	35-2238	AAA6587	N/A	Water, total	NA	327 J	58600 J	<5.9 UJ	NA
35-010(b)	35-2067	AAB1537	Top	Sludge	286	NA	NA	NA	39.7
35-010(b)	35-2067	AAB1538	Bottom	Sludge	224	NA	NA	NA	<13
35-010(b)	35-2067	AAB1539	Bottom	Sludge	261	NA	NA	NA	16.6
35-010(b)	35-2068	AAB1541	Top	Sludge	285	NA	NA	NA	148
35-010(b)	35-2068	AAB1542	Bottom	Sludge	224	NA	NA	NA	20
35-010(b)	35-2069	AAB1509	6.4–7.1 ft	Qbt3	426	<.66	<421	<1.2	<13
35-010(b)	35-2069	AAB1510	9.2–9.9 ft	Qbt3	340	NA	NA	NA	<13
35-010(b)	35-2069	AAB1511	13.4–14.1 ft	Qbt3	729	NA	NA	NA	<13
35-010(b)	35-2069	AAB1512	16.2–17.0 ft	Qbt3	323	NA	NA	NA	<13
35-010(b)	35-2069	AAB1513	20.5–21.2 ft	Qbt2	639	NA	NA	NA	<13
35-010(b)	35-2069	AAB1515	24.0–24.7 ft	Qbt2	592	NA	NA	NA	<13
35-010(b)	35-2069	AAB1514	27.6–28.3 ft	Qbt2	470	NA	NA	NA	<13
35-010(b)	35-2069	AAB1516	34.6–35.4 ft	Qbt2	550	NA	NA	NA	<13
35-010(b)	35-2239	AAB1533	N/A	Water, total	NA	1430 J	48400 J	88.9 J	NA
35-010(b)	35-2240	AAB1536	N/A	Water, total	NA	9070 J	61000 J	911 J	NA
35-010(c)	35-2065	AAA6588	Top	Sludge	229	NA	NA	NA	<28
35-010(c)	35-2065	AAB1532	Bottom	Sludge	202	NA	134	5.98	<28
35-010(c)	35-2066	AAB1534	Top	Sludge	299	NA	NA	NA	190
35-010(c)	35-2066	AAB1535	Bottom	Sludge	251	NA	NA	NA	87

*mg/kg or µg/L

TABLE A-4 (continued)

RFI RESULTS FOR INORGANIC CHEMICALS AT PRS Nos. 35-010(a, b, and c)*

PRS	Location ID	Sample ID	Depth	Media	Pb	Pb, XRF	Sb	Sb, XRF	Se
Soil SAL	N/A	N/A	N/A	N/A	400	400	31	31	380
All-soils UTL	N/A	N/A	N/A	N/A	23.3	28.4	1	1.45	1.7
Qbt2 UTL	N/A	N/A	N/A	N/A	16.2	28.4	0.3	1.45	N.A.
Qbt3 UTL	N/A	N/A	N/A	N/A	16.2	28.4	0.4	1.45	N.A.
35-010(a)	35-2063	AAA6557	Top	Sludge	NA	165	NA	<4	NA
35-010(a)	35-2063	AAA6558	Bottom	Sludge	NA	34.9	NA	<4	NA
35-010(a)	35-2064	AAA6560	Top	Sludge	NA	169	NA	<4	NA
35-010(a)	35-2064	AAA6585	Bottom	Sludge	NA	109	NA	4.6	NA
35-010(a)	35-2216	AAB1517	5.7–6.4 ft	Soil	6.8	15.4	<4.2	<4	<6.6
35-010(a)	35-2216	AAB1518	9.9–10.6 ft	Soil	NA	19.2	NA	<4	NA
35-010(a)	35-2216	AAB1519	13.4–14.1 ft	Qbt3	NA	16.7	NA	<4	NA
35-010(a)	35-2216	AAB1520	17.0–17.7 ft	Qbt3	NA	19.4	NA	<4	NA
35-010(a)	35-2216	AAB1521	20.5–21.2 ft	Qbt3	NA	18.9	NA	<4	NA
35-010(a)	35-2216	AAB1522	20.5–21.2 ft	Qbt3	NA	20.1	NA	<4	NA
35-010(a)	35-2216	AAB1523	24.0–24.7 ft	Qbt3	NA	18.5	NA	<4	NA
35-010(a)	35-2216	AAB1524	27.6–28.3 ft	Qbt2	NA	17.7	NA	<4	NA
35-010(a)	35-2216	AAB1525	34.6–35.4 ft	Qbt2	NA	18.5	NA	<4	NA
35-010(a)	35-2237	AAA6559	N/A	Water, total	<28 UJ	NA	<21 UJ	NA	<33 UJ
35-010(a)	35-2238	AAA6586	N/A	Water, total	<28 UJ	NA	<21 UJ	NA	<33 UJ
35-010(a)	35-2238	AAA6587	N/A	Water, total	<28 UJ	NA	<21 UJ	NA	<33 UJ
35-010(b)	35-2067	AAB1537	Top	Sludge	NA	143	NA	<4	NA
35-010(b)	35-2067	AAB1538	Bottom	Sludge	NA	70.3	NA	<4	NA
35-010(b)	35-2067	AAB1539	Bottom	Sludge	NA	52	NA	<4	NA
35-010(b)	35-2068	AAB1541	Top	Sludge	NA	259	NA	3.73	NA
35-010(b)	35-2068	AAB1542	Bottom	Sludge	NA	116	NA	<4	NA
35-010(b)	35-2069	AAB1509	6.4–7.1 ft	Qbt3	<5.6	12.5	<4.2	<4	<6.6
35-010(b)	35-2069	AAB1510	9.2–9.9 ft	Qbt3	NA	<7	NA	<4	NA
35-010(b)	35-2069	AAB1511	13.4–14.1 ft	Qbt3	NA	19	NA	<4	NA
35-010(b)	35-2069	AAB1512	16.2–17.0 ft	Qbt3	NA	92.5	NA	<4	NA
35-010(b)	35-2069	AAB1513	20.5–21.2 ft	Qbt2	NA	63.7	NA	<4	NA
35-010(b)	35-2069	AAB1515	24.0–24.7 ft	Qbt2	NA	18.9	NA	<4	NA
35-010(b)	35-2069	AAB1514	27.6–28.3 ft	Qbt2	NA	12.3	NA	<4	NA
35-010(b)	35-2069	AAB1516	34.6–35.4 ft	Qbt2	NA	16	NA	<4	NA
35-010(b)	35-2239	AAB1533	N/A	Water, total	235 J	NA	<21 UJ	NA	<33 UJ
35-010(b)	35-2240	AAB1536	N/A	Water, total	3040 J	NA	<54.9 UJ	NA	125 J
35-010(c)	35-2065	AAA6588	Top	Sludge	NA	74	NA	<3	NA
35-010(c)	35-2065	AAB1532	Bottom	Sludge	20.4	25	<4.11	<3	<.45
35-010(c)	35-2066	AAB1534	Top	Sludge	NA	178	NA	4	NA
35-010(c)	35-2066	AAB1535	Bottom	Sludge	NA	114	NA	5	NA

*mg/kg or µg/L

TABLE A-4 (continued)

RFI RESULTS FOR INORGANIC CHEMICALS AT PRS Nos. 35-010(a, b, and c)*

PRS	Location ID	Sample ID	Depth	Media	Se, XRF	Sr	Th, XRF	Ti, XRF	Tl
Soil SAL	N/A	N/A	N/A	N/A	380	46000	N.A.	N.A.	N.A.
All-soils UTL	N/A	N/A	N/A	N/A	N.A.	N.A.	22.1	N.A.	1
Qbt2 UTL	N/A	N/A	N/A	N/A	N.A.	N.A.	22.1	N.A.	1.3
Qbt3 UTL	N/A	N/A	N/A	N/A	N.A.	N.A.	22.1	N.A.	1.7
35-010(a)	35-2063	AAA6557	Top	Sludge	<4	NA	35.6	6143	NA
35-010(a)	35-2063	AAA6558	Bottom	Sludge	<4	NA	13.3	3214	NA
35-010(a)	35-2064	AAA6560	Top	Sludge	<4	NA	16.1	6604	NA
35-010(a)	35-2064	AAA6585	Bottom	Sludge	<4	NA	20.1	3735	NA
35-010(a)	35-2216	AAB1517	5.7–6.4 ft	Soil	<4	7	10	1233	<23.4
35-010(a)	35-2216	AAB1518	9.9–10.6 ft	Soil	<4	NA	25	384	NA
35-010(a)	35-2216	AAB1519	13.4–14.1 ft	Qbt3	<4	NA	16.9	531	NA
35-010(a)	35-2216	AAB1520	17.0–17.7 ft	Qbt3	<4	NA	26.7	458	NA
35-010(a)	35-2216	AAB1521	20.5–21.2 ft	Qbt3	<4	NA	16.6	435	NA
35-010(a)	35-2216	AAB1522	20.5–21.2 ft	Qbt3	<4	NA	19.6	354	NA
35-010(a)	35-2216	AAB1523	24.0–24.7 ft	Qbt3	<4	NA	22.7	525	NA
35-010(a)	35-2216	AAB1524	27.6–28.3 ft	Qbt2	<4	NA	18.7	334	NA
35-010(a)	35-2216	AAB1525	34.6–35.4 ft	Qbt2	<4	NA	18.2	377	NA
35-010(a)	35-2237	AAA6559	N/A	Water, total	NA	181 J	NA	NA	<117 UJ
35-010(a)	35-2238	AAA6586	N/A	Water, total	NA	126 J	NA	NA	<117 UJ
35-010(a)	35-2238	AAA6587	N/A	Water, total	NA	127 J	NA	NA	<117 UJ
35-010(b)	35-2067	AAB1537	Top	Sludge	<4	NA	26.3	4579	NA
35-010(b)	35-2067	AAB1538	Bottom	Sludge	<4	NA	13.3	3040	NA
35-010(b)	35-2067	AAB1539	Bottom	Sludge	<4	NA	9.15	3013	NA
35-010(b)	35-2068	AAB1541	Top	Sludge	<4	NA	25.6	7151	NA
35-010(b)	35-2068	AAB1542	Bottom	Sludge	<4	NA	<8	4129	NA
35-010(b)	35-2069	AAB1509	6.4–7.1 ft	Qbt3	<4	2.3	23.8	501	<23.4
35-010(b)	35-2069	AAB1510	9.2–9.9 ft	Qbt3	<4	NA	18	615	NA
35-010(b)	35-2069	AAB1511	13.4–14.1 ft	Qbt3	<4	NA	21.7	436	NA
35-010(b)	35-2069	AAB1512	16.2–17.0 ft	Qbt3	<4	NA	22.3	598	NA
35-010(b)	35-2069	AAB1513	20.5–21.2 ft	Qbt2	<4	NA	21.7	419	NA
35-010(b)	35-2069	AAB1515	24.0–24.7 ft	Qbt2	<4	NA	16.9	420	NA
35-010(b)	35-2069	AAB1514	27.6–28.3 ft	Qbt2	<4	NA	18.2	314	NA
35-010(b)	35-2069	AAB1516	34.6–35.4 ft	Qbt2	<4	NA	17.1	451	NA
35-010(b)	35-2239	AAB1533	N/A	Water, total	NA	209 J	NA	NA	<117 UJ
35-010(b)	35-2240	AAB1536	N/A	Water, total	NA	1150 J	NA	NA	<117 UJ
35-010(c)	35-2065	AAA6588	Top	Sludge	<5	NA	<8	3320	NA
35-010(c)	35-2065	AAB1532	Bottom	Sludge	<5	NA	13	3600	<.84
35-010(c)	35-2066	AAB1534	Top	Sludge	<5	NA	27	5030	NA
35-010(c)	35-2066	AAB1535	Bottom	Sludge	<5	NA	11	3370	NA

*mg/kg or µg/L

TABLE A-4 (continued)

RFI RESULTS FOR INORGANIC CHEMICALS AT PRS Nos. 35-010(a, b, and c)*

PRS	Location ID	Sample ID	Depth	Media	U, XRF	V	Zn	Zn, XRF
Soil SAL	N/A	N/A	N/A	N/A	230	540	23000	23000
All-soils UTL	N/A	N/A	N/A	N/A	5.33	41.9	50.8	76.6
Qbt2 UTL	N/A	N/A	N/A	N/A	5.33	4.01	55.5	76.6
Qbt3 UTL	N/A	N/A	N/A	N/A	5.33	4.01	55.5	76.6
35-010(a)	35-2063	AAA6557	Top	Sludge	<8	NA	NA	1593
35-010(a)	35-2063	AAA6558	Bottom	Sludge	<8	NA	NA	203
35-010(a)	35-2064	AAA6560	Top	Sludge	<8	NA	NA	1848
35-010(a)	35-2064	AAA6585	Bottom	Sludge	<8	NA	NA	897
35-010(a)	35-2216	AAB1517	5.7–6.4 ft	Soil	<8	<2.4	NA	43.5
35-010(a)	35-2216	AAB1518	9.9–10.6 ft	Soil	16.6	NA	NA	49.5
35-010(a)	35-2216	AAB1519	13.4–14.1 ft	Qbt3	<8	NA	NA	54.4
35-010(a)	35-2216	AAB1520	17.0–17.7 ft	Qbt3	9.47	NA	NA	48.3
35-010(a)	35-2216	AAB1521	20.5–21.2 ft	Qbt3	11.2	NA	NA	47
35-010(a)	35-2216	AAB1522	20.5–21.2 ft	Qbt3	10.9	NA	NA	55.5
35-010(a)	35-2216	AAB1523	24.0–24.7 ft	Qbt3	15.6	NA	NA	42.9
35-010(a)	35-2216	AAB1524	27.6–28.3 ft	Qbt2	<8	NA	NA	43.8
35-010(a)	35-2216	AAB1525	34.6–35.4 ft	Qbt2	<8	NA	NA	52.6
35-010(a)	35-2237	AAA6559	N/A	Water, total	NA	26.6 J	NA	NA
35-010(a)	35-2238	AAA6586	N/A	Water, total	NA	7.6 J	NA	NA
35-010(a)	35-2238	AAA6587	N/A	Water, total	NA	6.6 J	NA	NA
35-010(b)	35-2067	AAB1537	Top	Sludge	<8	NA	NA	1138
35-010(b)	35-2067	AAB1538	Bottom	Sludge	<8	NA	NA	513
35-010(b)	35-2067	AAB1539	Bottom	Sludge	<8	NA	NA	401
35-010(b)	35-2068	AAB1541	Top	Sludge	<8	NA	NA	2405
35-010(b)	35-2068	AAB1542	Bottom	Sludge	<8	NA	NA	984
35-010(b)	35-2069	AAB1509	6.4–7.1 ft	Qbt3	<8	<1.4	NA	36
35-010(b)	35-2069	AAB1510	9.2–9.9 ft	Qbt3	<8	NA	NA	34.5
35-010(b)	35-2069	AAB1511	13.4–14.1 ft	Qbt3	10.8	NA	NA	37.6
35-010(b)	35-2069	AAB1512	16.2–17.0 ft	Qbt3	<8	NA	NA	55.8
35-010(b)	35-2069	AAB1513	20.5–21.2 ft	Qbt2	13.6	NA	NA	79.2
35-010(b)	35-2069	AAB1515	24.0–24.7 ft	Qbt2	<8	NA	NA	50.4
35-010(b)	35-2069	AAB1514	27.6–28.3 ft	Qbt2	<8	NA	NA	45.9
35-010(b)	35-2069	AAB1516	34.6–35.4 ft	Qbt2	10.7	NA	NA	62.4
35-010(b)	35-2239	AAB1533	N/A	Water, total	NA	207 J	NA	NA
35-010(b)	35-2240	AAB1536	N/A	Water, total	NA	2600 J	NA	NA
35-010(c)	35-2065	AAA6588	Top	Sludge	<8	NA	NA	794
35-010(c)	35-2065	AAB1532	Bottom	Sludge	<8	25	71.7	60
35-010(c)	35-2066	AAB1534	Top	Sludge	<8	NA	NA	5600
35-010(c)	35-2066	AAB1535	Bottom	Sludge	<8	NA	NA	2610

*mg/kg or µg/L

TABLE A-5

FIXED-SITE LABORATORY RADIONUCLIDE RESULTS FOR PRS Nos. 35-010(a, b, and c)*

PRS	Location ID	Sample ID	Depth	Media	Am-241	Ba-140	Ce-144	Co-60	Cs-137
Soil SAL	N/A	N/A	N/A	N/A	22	N.A.	56	1.1	5.1
All-soils UTL	N/A	N/A	N/A	N/A	N.A.	N.A.	N.A.	N.A.	N.A.
Qbt 2 UTL	N/A	N/A	N/A	N/A	N.A.	N.A.	N.A.	N.A.	N.A.
Qbt 3 UTL	N/A	N/A	N/A	N/A	N.A.	N.A.	N.A.	N.A.	N.A.
35-010(a)	35-2063	AAA6557	Top	Sludge	NA	NA	NA	NA	NA
35-010(a)	35-2063	AAA6558	Bottom	Sludge	NA	NA	NA	NA	NA
35-010(a)	35-2064	AAA6560	Top	Sludge	NA	NA	NA	NA	NA
35-010(a)	35-2064	AAA6585	Bottom	Sludge	NA	NA	NA	NA	NA
35-010(a)	35-2216	AAB1517	5.7–6.4 ft	Soil	NA	NA	NA	NA	NA
35-010(a)	35-2216	AAB1518	9.9–10.6 ft	Soil	NA	NA	NA	NA	NA
35-010(a)	35-2216	AAB1519	13.4–14.1 ft	Qbt3	NA	NA	NA	NA	NA
35-010(a)	35-2216	AAB1520	17.0–17.7 ft	Qbt3	NA	NA	NA	NA	NA
35-010(a)	35-2216	AAB1521	20.5–21.2 ft	Qbt3	NA	NA	NA	NA	NA
35-010(a)	35-2216	AAB1522	20.5–21.2 ft	Qbt3	NA	NA	NA	NA	NA
35-010(a)	35-2216	AAB1523	24.0–24.7 ft	Qbt3	NA	NA	NA	NA	NA
35-010(a)	35-2216	AAB1524	27.6–28.3 ft	Qbt2	NA	NA	NA	NA	NA
35-010(a)	35-2216	AAB1525	34.6–35.4 ft	Qbt2	NA	NA	NA	NA	NA
35-010(a)	35-2237	AAA6559	N/A	Water, total	NA	NA	NA	NA	NA
35-010(a)	35-2238	AAA6586	N/A	Water, total	NA	NA	NA	NA	NA
35-010(a)	35-2238	AAA6587	N/A	Water, total	NA	NA	NA	NA	NA
35-010(b)	35-2067	AAB1537	Top	Sludge	NA	NA	NA	NA	NA
35-010(b)	35-2067	AAB1538	Bottom	Sludge	NA	NA	NA	NA	NA
35-010(b)	35-2067	AAB1539	Bottom	Sludge	NA	NA	NA	NA	NA
35-010(b)	35-2068	AAB1541	Top	Sludge	NA	NA	NA	NA	NA
35-010(b)	35-2068	AAB1542	Bottom	Sludge	NA	NA	NA	NA	NA
35-010(b)	35-2069	AAB1509	6.4–7.1 ft	Qbt3	NA	NA	NA	NA	NA
35-010(b)	35-2069	AAB1510	9.2–9.9 ft	Qbt3	NA	NA	NA	NA	NA
35-010(b)	35-2069	AAB1511	13.4–14.1 ft	Qbt3	NA	NA	NA	NA	NA
35-010(b)	35-2069	AAB1512	16.2–17.0 ft	Qbt3	-0.074	3.28	0.016	-0.002	-0.003
35-010(b)	35-2069	AAB1513	20.5–21.2 ft	Qbt2	NA	NA	NA	NA	NA
35-010(b)	35-2069	AAB1515	24.0–24.7 ft	Qbt2	NA	NA	NA	NA	NA
35-010(b)	35-2069	AAB1514	27.6–28.3 ft	Qbt2	NA	NA	NA	NA	NA
35-010(b)	35-2069	AAB1516	34.6–35.4 ft	Qbt2	NA	NA	NA	NA	NA
35-010(b)	35-2239	AAB1533	N/A	Water, total	NA	NA	NA	NA	NA
35-010(b)	35-2240	AAB1536	N/A	Water, total	NA	NA	NA	NA	NA
35-010(c)	35-2065	AAA6588	Top	Sludge	NA	NA	NA	NA	NA
35-010(c)	35-2065	AAB1532	Bottom	Sludge	NA	NA	NA	NA	NA
35-010(c)	35-2066	AAB1534	Top	Sludge	NA	NA	NA	NA	NA
35-010(c)	35-2066	AAB1535	Bottom	Sludge	NA	NA	NA	NA	NA

*pCi/g or pCi/L

TABLE A-5 (continued)

FIXED-SITE LABORATORY RADIONUCLIDE RESULTS FOR PRS Nos. 35-010(a, b, and c)*

PRS	Location ID	Sample ID	Depth	Media	Eu-152	Na-22	Np-237	Pu-238	Pu-239
Soil SAL	N/A	N/A	N/A	N/A	2.6	1.3	1.9	27	24
All-soils UTL	N/A	N/A	N/A	N/A	N.A.	N.A.	N.A.	N.A.	N.A.
Qbt 2 UTL	N/A	N/A	N/A	N/A	N.A.	N.A.	N.A.	N.A.	N.A.
Qbt 3 UTL	N/A	N/A	N/A	N/A	N.A.	N.A.	N.A.	N.A.	N.A.
35-010(a)	35-2063	AAA6557	Top	Sludge	NA	NA	NA	0.32	3.46
35-010(a)	35-2063	AAA6558	Bottom	Sludge	NA	NA	NA	0.05	0.39
35-010(a)	35-2064	AAA6560	Top	Sludge	NA	NA	NA	0.29	2.49
35-010(a)	35-2064	AAA6585	Bottom	Sludge	NA	NA	NA	0.15	1.44
35-010(a)	35-2216	AAB1517	5.7–6.4 ft	Soil	NA	NA	NA	0.018	0.004 J
35-010(a)	35-2216	AAB1518	9.9–10.6 ft	Soil	NA	NA	NA	0.002	0.004 J
35-010(a)	35-2216	AAB1519	13.4–14.1 ft	Qbt3	NA	NA	NA	0.011 J	0.207 J
35-010(a)	35-2216	AAB1520	17.0–17.7 ft	Qbt3	NA	NA	NA	0.02	0.011 J
35-010(a)	35-2216	AAB1521	20.5–21.2 ft	Qbt3	NA	NA	NA	-0.002	0.011 J
35-010(a)	35-2216	AAB1522	20.5–21.2 ft	Qbt3	NA	NA	NA	0.002	0.016 J
35-010(a)	35-2216	AAB1523	24.0–24.7 ft	Qbt3	NA	NA	NA	-0.002	0.002 J
35-010(a)	35-2216	AAB1524	27.6–28.3 ft	Qbt2	NA	NA	NA	0.009	0.041 J+
35-010(a)	35-2216	AAB1525	34.6–35.4 ft	Qbt2	NA	NA	NA	-0.002	0.005 J+
35-010(a)	35-2237	AAA6559	N/A	Water, total	NA	NA	NA	0.03	0.02
35-010(a)	35-2238	AAA6586	N/A	Water, total	NA	NA	NA	0.01	0.05
35-010(a)	35-2238	AAA6587	N/A	Water, total	NA	NA	NA	0.03	0.02
35-010(b)	35-2067	AAB1537	Top	Sludge	NA	NA	NA	0.17	1.21
35-010(b)	35-2067	AAB1538	Bottom	Sludge	NA	NA	NA	0.05	0.2
35-010(b)	35-2067	AAB1539	Bottom	Sludge	NA	NA	NA	0.04	0.32
35-010(b)	35-2068	AAB1541	Top	Sludge	NA	NA	NA	0.27	2.15
35-010(b)	35-2068	AAB1542	Bottom	Sludge	NA	NA	NA	0.09	0.8
35-010(b)	35-2069	AAB1509	6.4–7.1 ft	Qbt3	NA	NA	NA	0.009	0.034
35-010(b)	35-2069	AAB1510	9.2–9.9 ft	Qbt3	NA	NA	NA	0.007	0.002
35-010(b)	35-2069	AAB1511	13.4–14.1 ft	Qbt3	NA	NA	NA	0.011	0
35-010(b)	35-2069	AAB1512	16.2–17.0 ft	Qbt3	0.177	-0.017	0.015	0.009	0.007
35-010(b)	35-2069	AAB1513	20.5–21.2 ft	Qbt2	NA	NA	NA	0.023	0.011
35-010(b)	35-2069	AAB1515	24.0–24.7 ft	Qbt2	NA	NA	NA	0.023	0.007
35-010(b)	35-2069	AAB1514	27.6–28.3 ft	Qbt2	NA	NA	NA	0.004	0.002
35-010(b)	35-2069	AAB1516	34.6–35.4 ft	Qbt2	NA	NA	NA	-0.002	0
35-010(b)	35-2239	AAB1533	N/A	Water, total	NA	NA	NA	0.05	0.19
35-010(b)	35-2240	AAB1536	N/A	Water, total	NA	NA	NA	0.04	0.31
35-010(c)	35-2065	AAA6588	Top	Sludge	NA	NA	NA	0.06	0.6
35-010(c)	35-2065	AAB1532	Bottom	Sludge	NA	NA	NA	0.06	0.42
35-010(c)	35-2066	AAB1534	Top	Sludge	NA	NA	NA	0.06	0.75
35-010(c)	35-2066	AAB1535	Bottom	Sludge	NA	NA	NA	0.06	0.8

*pCi/g or pCi/L

TABLE A-5 (continued)

FIXED-SITE LABORATORY RADIONUCLIDE RESULTS FOR PRS Nos. 35-010(a, b, and c)*

PRS	Location ID	Sample ID	Depth	Media	Ru-106	U-234	U-235	U-238
Soil SAL	N/A	N/A	N/A	N/A	13	13	10	67
All-soils UTL	N/A	N/A	N/A	N/A	N.A.	1.94	0.084	1.82
Qbt 2 UTL	N/A	N/A	N/A	N/A	N.A.	2.53	0.109	2.37
Qbt 3 UTL	N/A	N/A	N/A	N/A	N.A.	1.55	0.067	1.46
35-010(a)	35-2063	AAA6557	Top	Sludge	NA	4.06	0.12	2.66
35-010(a)	35-2063	AAA6558	Bottom	Sludge	NA	1.42	0.06	1.2
35-010(a)	35-2064	AAA6560	Top	Sludge	NA	3.4 J	0.1 J	3.09 J
35-010(a)	35-2064	AAA6585	Bottom	Sludge	NA	3.09	0.09	2.08
35-010(a)	35-2216	AAB1517	5.7–6.4 ft	Soil	NA	0.705	0.029	0.734
35-010(a)	35-2216	AAB1518	9.9–10.6 ft	Soil	NA	0.953	0.041	0.982
35-010(a)	35-2216	AAB1519	13.4–14.1 ft	Qbt3	NA	0.788	0.059	0.788
35-010(a)	35-2216	AAB1520	17.0–17.7 ft	Qbt3	NA	0.775	0.034	0.775
35-010(a)	35-2216	AAB1521	20.5–21.2 ft	Qbt3	NA	0.831	0.036	0.847
35-010(a)	35-2216	AAB1522	20.5–21.2 ft	Qbt3	NA	0.86	0.052	0.779
35-010(a)	35-2216	AAB1523	24.0–24.7 ft	Qbt3	NA	0.82	0.054	0.865
35-010(a)	35-2216	AAB1524	27.6–28.3 ft	Qbt2	NA	0.908	0.052	0.919 J+
35-010(a)	35-2216	AAB1525	34.6–35.4 ft	Qbt2	NA	1.052	0.043	1.014 J+
35-010(a)	35-2237	AAA6559	N/A	Water, total	NA	0.69	0.09	0.36
35-010(a)	35-2238	AAA6586	N/A	Water, total	NA	0.41 R	-0.04 R	0.35 R
35-010(a)	35-2238	AAA6587	N/A	Water, total	NA	0.5 R	0.13 R	0 R
35-010(b)	35-2067	AAB1537	Top	Sludge	NA	4.6 R	0.32 R	2.52 R
35-010(b)	35-2067	AAB1538	Bottom	Sludge	NA	1.45	0.08	1.51
35-010(b)	35-2067	AAB1539	Bottom	Sludge	NA	1.5	0.07	1.35
35-010(b)	35-2068	AAB1541	Top	Sludge	NA	4.45	0.16	3.5
35-010(b)	35-2068	AAB1542	Bottom	Sludge	NA	2.18	0.11	2.28
35-010(b)	35-2069	AAB1509	6.4–7.1 ft	Qbt3	NA	0.959	0.034	1.016
35-010(b)	35-2069	AAB1510	9.2–9.9 ft	Qbt3	NA	0.736	0.025	0.773
35-010(b)	35-2069	AAB1511	13.4–14.1 ft	Qbt3	NA	0.82	0.034	0.73
35-010(b)	35-2069	AAB1512	16.2–17.0 ft	Qbt3	0.158	0.876	0.032	0.944
35-010(b)	35-2069	AAB1513	20.5–21.2 ft	Qbt2	NA	0.964	0.036	0.957
35-010(b)	35-2069	AAB1515	24.0–24.7 ft	Qbt2	NA	0.887	0.056	0.905
35-010(b)	35-2069	AAB1514	27.6–28.3 ft	Qbt2	NA	0.966	0.027	0.912
35-010(b)	35-2069	AAB1516	34.6–35.4 ft	Qbt2	NA	1.004	0.068	0.806
35-010(b)	35-2239	AAB1533	N/A	Water, total	NA	4.9 R	0.22 R	2.8 R
35-010(b)	35-2240	AAB1536	N/A	Water, total	NA	2.31 J	0.08 J	1.16 J
35-010(c)	35-2065	AAA6588	Top	Sludge	NA	1.7	0.06	1.55
35-010(c)	35-2065	AAB1532	Bottom	Sludge	NA	1.82	0.07	1.77
35-010(c)	35-2066	AAB1534	Top	Sludge	NA	1.73	0.07	1.77
35-010(c)	35-2066	AAB1535	Bottom	Sludge	NA	1.76	0.05	1.58

*pCi/g or pCi/L

TABLE A-6

RFI RESULTS FOR ORGANIC CHEMICALS AT PRS Nos. 35-010(a, b, and c)*

Part 1

PRS	Location ID	Sample ID	Depth	Media	Acetone	Aroclor 1254	Aroclor 1260
Soil SAL	N/A	N/A	N/A	N/A	2000	1.4	1.0
35-010(a)	35-2063	AAA6557	Top	Sludge	ND	ND	ND
35-010(a)	35-2063	AAA6558	Bottom	Sludge	2.6 S	ND	ND
35-010(a)	35-2064	AAA6560	Top	Sludge	ND	0.58	0.32 J
35-010(a)	35-2064	AAA6585	Bottom	Sludge	ND	ND	ND
35-010(a)	35-2216	AAB1519	13.4–14.1 ft	Qbt3	ND	ND	ND
35-010(a)	35-2216	AAB1525	34.6–35.4 ft	Qbt2	ND	ND	ND
35-010(a)	35-2237	AAA6559	N/A	Water, total	32 S	ND	ND
35-010(b)	35-2067	AAB1537	Top	Sludge	ND	ND	2.8 J

Part 2

PRS	Location ID	Sample ID	Depth	Media	4-Isopropyltoluene	Toluene	1,2,4-Trimethylbenzene
Soil SAL					N.A.	1900	8
35-010(a)	35-2063	AAA6557	Top	Sludge	0.027 S	0.157 S	0.033 S
35-010(a)	35-2063	AAA6558	Bottom	Sludge	0.284 S	ND	0.044 S
35-010(a)	35-2064	AAA6560	Top	Sludge	ND	0.16 S	0.083 S
35-010(a)	35-2064	AAA6585	Bottom	Sludge	0.034 S	ND	0.129 S
35-010(a)	35-2216	AAB1519	13.4–14.1 ft	Qbt3	ND	ND	ND
35-010(a)	35-2216	AAB1525	34.6–35.4 ft	Qbt2	ND	ND	ND
35-010(a)	35-2237	AAA6559	N/A	Water, total	ND	ND	ND
35-010(b)	35-2067	AAB1537	Top	Sludge	ND	ND	ND

*mg/kg or µg/L

TABLE A-7

RFI RESULTS FOR INORGANIC CHEMICALS AT PRS Nos. 35-010(d and e)*

Part 1

PRS	Location ID	Sample ID	Depth (ft)	Media	Ag	Al	As	As,XRF	Ba
SAL	N/A	N/A	N/A	N/A	383	77000	N.A.	N.A.	5300
All-soils UTL	N/A	N/A	N/A	N/A	N.A.	38700	7.82	18.1	315
35-010(d)	35-2193	0435-95-0112	0–1	Soil	NA	NA	NA	<4	NA
35-010(d)	35-2193	0435-95-0113	1–2	Soil	NA	NA	NA	<4	NA
35-010(d)	35-2193	0435-95-0115	2–3	Soil	<1.5	2500	1.2 J	<4	22.3 J
35-010(d)	35-2194	0435-95-0118	0–1	Soil	NA	NA	NA	<4	NA
35-010(d)	35-2194	0435-95-0120	1–2	Soil	NA	NA	NA	<4	NA
35-010(d)	35-2194	0435-95-0122	2–2.4	Soil	NA	NA	NA	<4	NA
35-010(e)	35-2195	0435-95-0123	0–0.5	Soil	NA	NA	NA	5	NA
35-010(e)	35-2196	0435-95-0124	0–0.5	Soil	NA	NA	NA	<4	NA
35-010(e)	35-2197	0435-95-0127	0–1	Soil	NA	NA	NA	<4	NA
35-010(e)	35-2197	0435-95-0128	1–2	Soil	NA	NA	NA	<4	NA
35-010(e)	35-2197	0435-95-0129	2–3	Soil	NA	NA	NA	<4	NA

Part 2

PRS	Location ID	Sample ID	Depth (ft)	Media	Ba,XRF	Be	Ca	Ca,XRF	Cd
SAL	N/A	N/A	N/A	N/A	5300	N.A.	N.A.	N.A.	38
All-soils UTL	N/A	N/A	N/A	N/A	561	1.95	6120	10900	2.7
35-010(d)	35-2193	0435-95-0112	0–1	Soil	71	NA	NA	1810	NA
35-010(d)	35-2193	0435-95-0113	1–2	Soil	71	NA	NA	1900	NA
35-010(d)	35-2193	0435-95-0115	2–3	Soil	77	0.47 J	570 J	1700	<.07
35-010(d)	35-2194	0435-95-0118	0–1	Soil	91	NA	NA	1800	NA
35-010(d)	35-2194	0435-95-0120	1–2	Soil	72	NA	NA	1200	NA
35-010(d)	35-2194	0435-95-0122	2–2.4	Soil	74	NA	NA	6600	NA
35-010(e)	35-2195	0435-95-0123	0–0.5	Soil	226	NA	NA	4100	NA
35-010(e)	35-2196	0435-95-0124	0–0.5	Soil	394	NA	NA	8280	NA
35-010(e)	35-2197	0435-95-0127	0–1	Soil	274	NA	NA	6340	NA
35-010(e)	35-2197	0435-95-0128	1–2	Soil	199	NA	NA	4600	NA
35-010(e)	35-2197	0435-95-0129	2–3	Soil	99.1	NA	NA	1740	NA

Part 3

PRS	Location ID	Sample ID	Depth (ft)	Media	Cd,XRF	Co	Cr	Cr,XRF	Cu
SAL	N/A	N/A	N/A	N/A	38	4600	210	210	2800
All-soils UTL	N/A	N/A	N/A	N/A	N.A.	19.2	19.3	45.1	15.5
35-010(d)	35-2193	0435-95-0112	0–1	Soil	<3	NA	NA	<12	NA
35-010(d)	35-2193	0435-95-0113	1–2	Soil	<3	NA	NA	<12	NA
35-010(d)	35-2193	0435-95-0115	2–3	Soil	<3	<.14	2 J	<12	1.6 J
35-010(d)	35-2194	0435-95-0118	0–1	Soil	<3	NA	NA	<12	NA
35-010(d)	35-2194	0435-95-0120	1–2	Soil	<3	NA	NA	<12	NA
35-010(d)	35-2194	0435-95-0122	2–2.4	Soil	<3	NA	NA	13	NA
35-010(e)	35-2195	0435-95-0123	0–0.5	Soil	<3	NA	NA	22	NA
35-010(e)	35-2196	0435-95-0124	0–0.5	Soil	<3	NA	NA	23.7	NA
35-010(e)	35-2197	0435-95-0127	0–1	Soil	<3	NA	NA	29.7	NA
35-010(e)	35-2197	0435-95-0128	1–2	Soil	<3	NA	NA	36	NA
35-010(e)	35-2197	0435-95-0129	2–3	Soil	<3	NA	NA	<12	NA

*mg/kg

TABLE A-7 (continued)

RFI RESULTS FOR INORGANIC CHEMICALS AT PRS Nos. 35-010(d and e)*

Part 1

PRS	Location ID	Sample ID	Depth (ft)	Media	Cu,XRF	Fe	Fe,XRF	Hg	Hg,XRF
SAL	N/A	N/A	N/A	N/A	2800	N.A.	N.A.	23	23
All-soils UTL	N/A	N/A	N/A	N/A	16.7	21300	27400	0.1	N.A.
35-010(d)	35-2193	0435-95-0112	0–1	Soil	10	NA	10800	NA	<5
35-010(d)	35-2193	0435-95-0113	1–2	Soil	<8	NA	10730	NA	<5
35-010(d)	35-2193	0435-95-0115	2–3	Soil	<8	4300	11060	<.11	<5
35-010(d)	35-2194	0435-95-0118	0–1	Soil	<8	NA	10850	NA	<5
35-010(d)	35-2194	0435-95-0120	1–2	Soil	<8	NA	10060	NA	<5
35-010(d)	35-2194	0435-95-0122	2–2.4	Soil	<8	NA	10480	NA	<5
35-010(e)	35-2195	0435-95-0123	0–0.5	Soil	9	NA	13300	NA	<5
35-010(e)	35-2196	0435-95-0124	0–0.5	Soil	10.5	NA	16000	NA	<5
35-010(e)	35-2197	0435-95-0127	0–1	Soil	13.9	NA	16700	NA	<5
35-010(e)	35-2197	0435-95-0128	1–2	Soil	<8	NA	13340	NA	<5
35-010(e)	35-2197	0435-95-0129	2–3	Soil	<8	NA	10800	NA	<5

Part 2

PRS	Location ID	Sample ID	Depth (ft)	Media	K	K,XRF	Mg	Mn	Mn,XRF
SAL	N/A	N/A	N/A	N/A	N.A.	N.A.	N.A.	N.A.	N.A.
All-soils UTL	N/A	N/A	N/A	N/A	3410	38700	4610	714	681
35-010(d)	35-2193	0435-95-0112	0–1	Soil	NA	34100	NA	NA	415
35-010(d)	35-2193	0435-95-0113	1–2	Soil	NA	34900	NA	NA	400
35-010(d)	35-2193	0435-95-0115	2–3	Soil	291 J	35700	184 J	238	431
35-010(d)	35-2194	0435-95-0118	0–1	Soil	NA	35300	NA	NA	440
35-010(d)	35-2194	0435-95-0120	1–2	Soil	NA	34900	NA	NA	508
35-010(d)	35-2194	0435-95-0122	2–2.4	Soil	NA	34600	NA	NA	372
35-010(e)	35-2195	0435-95-0123	0–0.5	Soil	NA	31000	NA	NA	395
35-010(e)	35-2196	0435-95-0124	0–0.5	Soil	NA	29500	NA	NA	432
35-010(e)	35-2197	0435-95-0127	0–1	Soil	NA	28100	NA	NA	411
35-010(e)	35-2197	0435-95-0128	1–2	Soil	NA	30500	NA	NA	321
35-010(e)	35-2197	0435-95-0129	2–3	Soil	NA	34900	NA	NA	222

Part 3

PRS	Location ID	Sample ID	Depth (ft)	Media	Na	Ni	Ni,XRF	Pb	Pb,XRF
SAL	N/A	N/A	N/A	N/A	N.A.	1500	1500	400	400
All-soils UTL	N/A	N/A	N/A	N/A	915	15.2	22.5	23.3	28.4
35-010(d)	35-2193	0435-95-0112	0–1	Soil	NA	NA	<13	NA	16
35-010(d)	35-2193	0435-95-0113	1–2	Soil	NA	NA	<13	NA	13
35-010(d)	35-2193	0435-95-0115	2–3	Soil	120 J	2 J	<13	5.2	18
35-010(d)	35-2194	0435-95-0118	0–1	Soil	NA	NA	19	NA	19
35-010(d)	35-2194	0435-95-0120	1–2	Soil	NA	NA	<13	NA	22
35-010(d)	35-2194	0435-95-0122	2–2.4	Soil	NA	NA	<13	NA	15
35-010(e)	35-2195	0435-95-0123	0–0.5	Soil	NA	NA	24	NA	14
35-010(e)	35-2196	0435-95-0124	0–0.5	Soil	NA	NA	<13	NA	23.8
35-010(e)	35-2197	0435-95-0127	0–1	Soil	NA	NA	<13	NA	24.7
35-010(e)	35-2197	0435-95-0128	1–2	Soil	NA	NA	26	NA	22
35-010(e)	35-2197	0435-95-0129	2–3	Soil	NA	NA	<13	NA	12.8

*mg/kg

TABLE A-7 (continued)

RFI RESULTS FOR INORGANIC CHEMICALS AT PRS Nos. 35-010(d and e)*

Part 1

PRS	Location ID	Sample ID	Depth (ft)	Media	Sb	Sb,XRF	Se	Se,XRF	Th,XRF	Ti,XRF
SAL	N/A	N/A	N/A	N/A	31	31	380	380	N.A.	N.A.
All-soils UTL	N/A	N/A	N/A	N/A	N.A.	1.45	1.7	N.A.	22.1	N.A.
35-010(d)	35-2193	0435-95-0112	0–1	Soil	NA	<4	NA	<4	18	461
35-010(d)	35-2193	0435-95-0113	1–2	Soil	NA	<4	NA	<4	19	484
35-010(d)	35-2193	0435-95-0115	2–3	Soil	<.62	<4	<1.3	<4	22	357
35-010(d)	35-2194	0435-95-0118	0–1	Soil	NA	<4	NA	<4	17	398
35-010(d)	35-2194	0435-95-0120	1–2	Soil	NA	<4	NA	<4	26	455
35-010(d)	35-2194	0435-95-0122	2–2.4	Soil	NA	<4	NA	<4	15	408
35-010(e)	35-2195	0435-95-0123	0–0.5	Soil	NA	<4	NA	<4	15	1130
35-010(e)	35-2196	0435-95-0124	0–0.5	Soil	NA	<4	NA	<4	17.7	1716
35-010(e)	35-2197	0435-95-0127	0–1	Soil	NA	<4	NA	<4	16.8	1790
35-010(e)	35-2197	0435-95-0128	1–2	Soil	NA	<4	NA	<4	18	1179
35-010(e)	35-2197	0435-95-0129	2–3	Soil	NA	<4	NA	<4	19	577

Part 2

PRS	Location ID	Sample ID	Depth (ft)	Media	Tl	U,XRF	V	Zn	Zn,XRF
SAL	N/A	N/A	N/A	N/A	N.A.	230	540	23000	23000
All-soils UTL	N/A	N/A	N/A	N/A	1	5.33	41.9	50.8	76.6
35-010(d)	35-2193	0435-95-0112	0–1	Soil	NA	9	NA	NA	52
35-010(d)	35-2193	0435-95-0113	1–2	Soil	NA	<8	NA	NA	39
35-010(d)	35-2193	0435-95-0115	2–3	Soil	<1.5	<8	2.8 J	29.4	50
35-010(d)	35-2194	0435-95-0118	0–1	Soil	NA	9	NA	NA	47
35-010(d)	35-2194	0435-95-0120	1–2	Soil	NA	<8	NA	NA	44
35-010(d)	35-2194	0435-95-0122	2–2.4	Soil	NA	11	NA	NA	53
35-010(e)	35-2195	0435-95-0123	0–0.5	Soil	NA	<8	NA	NA	54
35-010(e)	35-2196	0435-95-0124	0–0.5	Soil	NA	<8	NA	NA	58.2
35-010(e)	35-2197	0435-95-0127	0–1	Soil	NA	9.37	NA	NA	54.3
35-010(e)	35-2197	0435-95-0128	1–2	Soil	NA	<8	NA	NA	53
35-010(e)	35-2197	0435-95-0129	2–3	Soil	NA	<8	NA	NA	45.6

*mg/kg

TABLE A-8

FIXED-SITE LABORATORY RADIONUCLIDE RESULTS FOR PRS Nos. 35-010(d and e)*

Part 1

PRS	Location ID	Sample ID	Depth (ft)	Media	Am-241	Ce-144	Co-60	Cs-137	Eu-152	Na-22
SAL	N/A	N/A	N/A	N/A	22	56	1.1	5.1	2.6	1.3
All-soils UTL	N/A	N/A	N/A	N/A	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
35-010(d)	35-2193	0435-95-0112	0–1	Soil	NA	NA	NA	NA	NA	NA
35-010(d)	35-2193	0435-95-0113	1–2	Soil	NA	NA	NA	NA	NA	NA
35-010(d)	35-2193	0435-95-0115	2–3	Soil	0.128	0.022	0.008	0.068	0.259	0.03
35-010(d)	35-2194	0435-95-0118	0–1	Soil	NA	NA	NA	NA	NA	NA
35-010(d)	35-2194	0435-95-0120	1–2	Soil	NA	NA	NA	NA	NA	NA
35-010(d)	35-2194	0435-95-0122	2–2.4	Soil	NA	NA	NA	NA	NA	NA
35-010(d)	35-2207	0435-95-0103	0–0.5	Soil	ND	ND	0.052	ND	0.141	ND
35-010(e)	35-2195	0435-95-0123	0–0.5	Soil	NA	NA	NA	NA	NA	NA
35-010(e)	35-2196	0435-95-0124	0–0.5	Soil	NA	NA	NA	NA	NA	NA
35-010(e)	35-2197	0435-95-0127	0–1	Soil	NA	NA	NA	NA	NA	NA
35-010(e)	35-2197	0435-95-0128	1–2	Soil	NA	NA	NA	NA	NA	NA
35-010(e)	35-2197	0435-95-0129	2–3	Soil	NA	NA	NA	NA	NA	NA

Part 2

PRS	Location ID	Sample ID	Depth (ft)	Media	Pu-238	Pu-239	Ru-106	U-234	U-235	U-238
SAL	N/A	N/A	N/A	N/A	27	24	13	13	10	67
All-soils UTL	N/A	N/A	N/A	N/A	N.A.	N.A.	N.A.	1.94	0.084	1.82
35-010(d)	35-2193	0435-95-0112	0–1	Soil	0.023	0.059	NA	0.959	0.023	0.980
35-010(d)	35-2193	0435-95-0113	1–2	Soil	-0.002	0.005	NA	0.782	0.038	0.932
35-010(d)	35-2193	0435-95-0115	2–3	Soil	-0.002	0.009	0.105	0.894	0.052	1.011
35-010(d)	35-2194	0435-95-0118	0–1	Soil	0.016	0.007	NA	0.903	0.023	0.982
35-010(d)	35-2194	0435-95-0120	1–2	Soil	0.005	0.0	NA	0.928	0.036	0.964
35-010(d)	35-2194	0435-95-0122	2–2.4	Soil	-0.020	-0.007	NA	0.892	0.038	0.867
35-010(d)	35-2207	0435-95-0103	0–0.5	Soil	0.016	0.002	ND	1.047	0.034	0.917
35-010(e)	35-2195	0435-95-0123	0–0.5	Soil	0.005	0.009	NA	0.676	0.011	0.685
35-010(e)	35-2196	0435-95-0124	0–0.5	Soil	0.171	0.054	NA	0.592	0.059	0.626
35-010(e)	35-2197	0435-95-0127	0–1	Soil	0.164	0.083	NA	0.592	0.029	0.615
35-010(e)	35-2197	0435-95-0128	1–2	Soil	0.128	0.063	NA	0.705	0.029	0.651
35-010(e)	35-2197	0435-95-0129	2–3	Soil	0.047	0.023	NA	0.867	0.027	0.899

*pCi/g

TABLE A-9

RFI RESULTS FOR INORGANIC CHEMICALS AT PRS Nos. 35-014(g_3)*

Part 1

Location ID	Sample ID	Depth (ft)	Media	Ag	Al	As	As,XRF	Ba	Ba,XRF	Be
SAL	N/A	N/A	N/A	383	77000	N.A.	N.A.	5300	5300	N.A.
All-soils UTL	N/A	N/A	N/A	N.A.	38700	7.82	18.1	315	561	1.95
35-2183	0435-95-0032	0–1	Soil	NA	NA	NA	<4	NA	116	NA
35-2183	0435-95-0033	2–3	Soil	<1.4	1620	1.6 J	<4	31.9 J	88.1	0.5 J
35-2184	0435-95-0037	0–1	Soil	NA	NA	NA	<4	NA	216	NA
35-2184	0435-95-0039	2–3	Soil	NA	NA	NA	<4	NA	77.5	NA
35-2185	0435-95-0040	0–1	Soil	NA	NA	NA	<4	NA	68.3	NA
35-2185	0435-95-0043	2–3	Soil	NA	NA	NA	<4	NA	70.8	NA
35-2186	0435-95-0045	0–0.5	Soil	NA	NA	NA	4.31	NA	256	NA
35-2186	0435-95-0047	0–0.5	Soil	NA	NA	NA	<4	NA	202	NA
35-2187	0435-95-0048	0–1	Soil	<1.4	2480	2.1 J	5.06	16.40 J	74.3	0.93 J
35-2188	0435-95-0052	0–1	Soil	NA	NA	NA	<4	NA	77.9	NA
35-2188	0435-95-0054	2–3	Soil	NA	NA	NA	<4	NA	74.3	NA

Part 2

Location ID	Sample ID	Depth (ft)	Media	Ca	Ca,XRF	Cd	Cd,XRF	Co	Cr	Cr,XRF
SAL	N/A	N/A	N/A	N.A.	N.A.	38	38	4600	210	210
All-soils UTL	N/A	N/A	N/A	6120	10900	2.7	N.A.	19.2	19.3	45.1
35-2183	0435-95-0032	0–1	Soil	NA	3100	NA	<3	NA	NA	12.6
35-2183	0435-95-0033	2–3	Soil	2880	6790	0.07 J	<3	<.14	7.5	50.8
35-2184	0435-95-0037	0–1	Soil	NA	4120	NA	<3	NA	NA	17.9
35-2184	0435-95-0039	2–3	Soil	NA	2360	NA	<3	NA	NA	60.2
35-2185	0435-95-0040	0–1	Soil	NA	1180	NA	<3	NA	NA	13.2
35-2185	0435-95-0043	2–3	Soil	NA	1150	NA	<3	NA	NA	70.2
35-2186	0435-95-0045	0–0.5	Soil	NA	5290	NA	<3	NA	NA	<12
35-2186	0435-95-0047	0–0.5	Soil	NA	4360	NA	<3	NA	NA	23
35-2187	0435-95-0048	0–1	Soil	237 J	1120	<.07	<3	0.33 J	2.4	<12
35-2188	0435-95-0052	0–1	Soil	NA	1800	NA	<3	NA	NA	<12
35-2188	0435-95-0054	2–3	Soil	NA	1180	NA	<3	NA	NA	<12

Part 3

Location ID	Sample ID	Depth (ft)	Media	Cu	Cu,XRF	Fe	Fe,XRF	Hg	Hg,XRF	K
SAL	N/A	N/A	N/A	2800	2800	N.A.	N.A.	23	23	N.A.
All-soils UTL	N/A	N/A	N/A	15.5	16.7	21300	27400	0.1	N.A.	3410
35-2183	0435-95-0032	0–1	Soil	NA	<8	NA	16000	NA	<5	NA
35-2183	0435-95-0033	2–3	Soil	3 J	<8	6410	11100	<.11	<5	248 J
35-2184	0435-95-0037	0–1	Soil	NA	9.19	NA	15000	NA	<5	NA
35-2184	0435-95-0039	2–3	Soil	NA	<8	NA	13100	NA	<5	NA
35-2185	0435-95-0040	0–1	Soil	NA	<8	NA	10200	NA	<5	NA
35-2185	0435-95-0043	2–3	Soil	NA	<8	NA	10200	NA	<5	NA
35-2186	0435-95-0045	0–0.5	Soil	NA	14.3	NA	15000	NA	<5	NA
35-2186	0435-95-0047	0–0.5	Soil	NA	<8	NA	14800	NA	<5	NA
35-2187	0435-95-0048	0–1	Soil	2.1 J	<8	7860	11500	<.11	<5	337 J
35-2188	0435-95-0052	0–1	Soil	NA	<8	NA	14400	NA	<5	NA
35-2188	0435-95-0054	2–3	Soil	NA	8.88	NA	10900	NA	<5	NA

*mg/kg

TABLE A-9 (continued)

RFI RESULTS FOR INORGANIC CHEMICALS AT PRS Nos. 35-014(g_3)*

Part 1

Location ID	Sample ID	Depth (ft)	Media	K,XRF	Mg	Mn	Mn,XRF	Na	Ni	Ni,XRF
SAL	N/A	N/A	N/A	N.A.	N.A.	N.A.	N.A.	N.A.	1500	1500
All-soils UTL	N/A	N/A	N/A	38700	4610	714	681	915	15.2	22.5
35-2183	0435-95-0032	0–1	Soil	32500	NA	NA	223	NA	NA	<13
35-2183	0435-95-0033	2–3	Soil	33900	646 J	209	317	139 J	4.7 J	<13
35-2184	0435-95-0037	0–1	Soil	29200	NA	NA	322	NA	NA	<13
35-2184	0435-95-0039	2–3	Soil	31300	NA	NA	87.3	NA	NA	<13
35-2185	0435-95-0040	0–1	Soil	32500	NA	NA	313	NA	NA	24.7
35-2185	0435-95-0043	2–3	Soil	33200	NA	NA	304	NA	NA	37.6
35-2186	0435-95-0045	0–0.5	Soil	30600	NA	NA	415	NA	NA	<13
35-2186	0435-95-0047	0–0.5	Soil	30600	NA	NA	342	NA	NA	<13
35-2187	0435-95-0048	0–1	Soil	32800	195 J	249	326	191 J	2.7 J	16
35-2188	0435-95-0052	0–1	Soil	34600	NA	NA	544	NA	NA	<13
35-2188	0435-95-0054	2–3	Soil	34400	NA	NA	475	NA	NA	<13

Part 2

Location ID	Sample ID	Depth (ft)	Media	Pb	Pb,XRF	Sb	Sb,XRF	Se	Se,XRF	Th,XRF
SAL	N/A	N/A	N/A	400	400	31	31	380	380	N.A.
All-soils UTL	N/A	N/A	N/A	23.3	28.4	N.A.	1.45	1.7	N.A.	22.1
35-2183	0435-95-0032	0–1	Soil	NA	15.6	NA	<4	NA	<4	16.9
35-2183	0435-95-0033	2–3	Soil	2.4	10.5	<.61	<4	<1.3	<4	18.9
35-2184	0435-95-0037	0–1	Soil	NA	24	NA	<4	NA	<4	8.67
35-2184	0435-95-0039	2–3	Soil	NA	15.2	NA	<4	NA	<4	16.8
35-2185	0435-95-0040	0–1	Soil	NA	16.1	NA	<4	NA	<4	15.5
35-2185	0435-95-0043	2–3	Soil	NA	10.9	NA	<4	NA	<4	16.3
35-2186	0435-95-0045	0–0.5	Soil	NA	25.1	NA	<4	NA	<4	9.96
35-2186	0435-95-0047	0–0.5	Soil	NA	22.9	NA	<4	NA	<4	12.5
35-2187	0435-95-0048	0–1	Soil	7.9	12.3	<.61	<4	<1.3	<4	8.28
35-2188	0435-95-0052	0–1	Soil	NA	22.6	NA	<4	NA	<4	21.2
35-2188	0435-95-0054	2–3	Soil	NA	21	NA	<4	NA	<4	21.5

Part 3

Location ID	Sample ID	Depth (ft)	Media	Ti,XRF	Tl	U,XRF	V	Zn	Zn,XRF
SAL	N/A	N/A	N/A	N.A.	N.A.	230	540	23000	23000
All-soils UTL	N/A	N/A	N/A	N.A.	1	5.33	41.9	50.8	76.6
35-2183	0435-95-0032	0–1	Soil	744	NA	<8	NA	NA	47.6
35-2183	0435-95-0033	2–3	Soil	452	<1.5	9.67	2.9 J	26.6	30.3
35-2184	0435-95-0037	0–1	Soil	1346	NA	<8	NA	NA	47
35-2184	0435-95-0039	2–3	Soil	838	NA	9.5	NA	NA	26.8
35-2185	0435-95-0040	0–1	Soil	593	NA	<8	NA	NA	47.1
35-2185	0435-95-0043	2–3	Soil	537	NA	<8	NA	NA	33.7
35-2186	0435-95-0045	0–0.5	Soil	1675	NA	11.2	NA	NA	86.7
35-2186	0435-95-0047	0–0.5	Soil	1511	NA	8.39	NA	NA	70.6
35-2187	0435-95-0048	0–1	Soil	538	<1.4	<8	3.5 J	41.5	47.5
35-2188	0435-95-0052	0–1	Soil	756	NA	12.6	NA	NA	83.2
35-2188	0435-95-0054	2–3	Soil	516	NA	<8	NA	NA	65.1

*mg/kg

TABLE A-10

FIXED-SITE LABORATORY RADIONUCLIDE RESULTS FOR PRS No. 35-014(g_3)*

Part 1

Location ID	Sample ID	Depth (ft)	Media	Bi-212	Bi-214	K-40	Pb-210	Pb-212	Pb-214	Pu-238
SAL	N/A	N/A	N/A	N.A.	N.A.	12	N.A.	N.A.	N.A.	27
All-soils UTL	N/A	N/A	N/A	N.A.	N.A.	28.6	N.A.	N.A.	N.A.	N.A.
35-2183	0435-95-0033	2–3	Soil	ND	ND	30.37	ND	1.376	1.299	NA
35-2185	0435-95-0040	0–1	Soil	1.208	0.927	33.01	1.382	1.271	0.953	0.0
35-2185	0435-95-0043	2–3	Soil	NA	NA	NA	NA	NA	NA	0.002
35-2186	0435-95-0045	0–0.5	Soil	1.396	ND	27.13	2.386	1.464	1.232	NA

Part 2

Location ID	Sample ID	Depth (ft)	Media	Pu-239	Ra-226	Ra-228	Tl-208	U-234	U-235	U-238
SAL	N/A	N/A	N/A	24	0.1	1.3	N.A.	13	10	67
All-soils UTL	N/A	N/A	N/A	N.A.	N.A.	N.A.	N.A.	1.94	0.084	1.82
35-2183	0435-95-0033	2–3	Soil	NA	1.112	1.831	0.57	NA	NA	NA
35-2185	0435-95-0040	0–1	Soil	0.002	0.956	1.416	0.576	0.687	0.034	0.716
35-2185	0435-95-0043	2–3	Soil	-0.002	NA	NA	NA	0.694	0.011	0.696
35-2186	0435-95-0045	0–0.5	Soil	NA	1.114	1.635	0.486	NA	NA	NA

*pCi/g

TABLE A-11

RFI RESULTS FOR ORGANIC CHEMICALS AT PRS No. 35-014(g_3)*

Part 1

Location ID	Sample ID	Depth (ft)	Media	Acetone	Bis(2-ethylhexyl)-phthalate	2-Butanone	2-Hexanone	4-Methyl-2-pentanone
SAL	N/A	N/A	N/A	2000	32	8700	N.A.	5200
35-2185	0435-95-0043	2–3	Soil	ND	2.5 J	0.696 S	1.739 S	0.126 S
35-2187	0435-95-0050	2–3	Soil	0.18	ND	0.049	0.013 J	ND
35-2188	0435-95-0052	0–1	Soil	ND	ND	ND	ND	ND
35-2188	0435-95-0054	2–3	Soil	ND	0.8	ND	ND	ND

Part 2

Location ID	Sample ID	Depth (ft)	Media	Methylene chloride	Phenanthrene	Toluene	1,2,4-Trimethylbenzene	Mixed Xylenes
SAL	N/A	N/A	N/A	11	N.A.	1900	8	990
35-2185	0435-95-0043	2–3	Soil	0.074 S	2.4 J	0.019 S	0.015 S	0.031 S
35-2187	0435-95-0050	2–3	Soil	ND	ND	0.004 J	ND	ND
35-2188	0435-95-0052	0–1	Soil	0.042 S	ND	ND	ND	ND
35-2188	0435-95-0054	2–3	Soil	0.079 S	ND	ND	ND	ND

*mg/kg

TABLE A-12

RFI RESULTS FOR INORGANIC CHEMICALS AT PRS No. 35-015(a)*

Part 1

Location ID	Sample ID	Depth (ft)	Media	Ag	Al	As	As,XRF	Ba	Ba,XRF	Be
SAL	N/A	N/A	N/A	383	77000	N.A.	N.A.	5300	5300	N.A.
All-soils UTL	N/A	N/A	N/A	N.A.	38700	7.82	18.1	315	561	1.95
35-2172	AAC3350	0–1	Soil	NA	NA	NA	7.39	NA	377	NA
35-2172	AAC3329	1–2	Soil	NA	NA	NA	<4	NA	303	NA
35-2173	AAC3330	0–0.5	Soil	NA	NA	NA	<4	NA	862	NA
35-2174	AAC3331	0–0.5	Soil	NA	NA	NA	<4	NA	607	NA
35-2175	AAC3332	0–0.5	Soil	NA	NA	NA	<4	NA	647	NA
35-2176	AAC3351	0–1	Soil	NA	NA	NA	<4	NA	393	NA
35-2176	AAC3333	2–3	Soil	NA	NA	NA	<4	NA	104	NA
35-2177	AAC3334	0–0.5	Soil	NA	NA	NA	<4	NA	513	NA
35-2178	AAC3335	0–0.5	Soil	NA	NA	NA	<4	NA	731	NA
35-2179	AAC3336	0–1	Soil	NA	NA	NA	6.75	NA	348	NA
35-2179	AAC3337	1–2	Soil	NA	NA	NA	<4	NA	60.4	NA
35-2179	AAC3338	2–3	Soil	NA	NA	NA	7.75	NA	89.3	NA
35-2180	AAC3339	0–1	Soil	NA	NA	NA	<4	NA	151	NA
35-2180	AAC3340	1–2	Soil	NA	NA	NA	<4	NA	153	NA
35-2180	AAC3341	2–3	Soil	NA	NA	NA	16	NA	113	NA
35-2181	AAC3342	0–0.5	Soil	NA	NA	NA	<4	NA	628	NA
35-2181	AAC3343	0–0.5	Soil	NA	NA	NA	<4	NA	516	NA
35-2182	AAC3344	0–1	Soil	NA	NA	NA	<4	NA	26.7	NA
35-2182	AAC3345	1–2	Soil	NA	NA	NA	4.77	NA	45.7	NA
35-2182	AAC3346	2–3	Soil	<.19	488	<.87	<4	<8.1	25.6	<.26
35-2286	0435-95-0199	1–2	Soil	<.98	356	0.43	NA	10.1	NA	0.42

Part 2

Location ID	Sample ID	Depth (ft)	Media	Ca	Ca,XRF	Cd	Cd,XRF	Co	Cr	Cr,XRF
SAL	N/A	N/A	N/A	N.A.	N.A.	38	38	4600	210	210
All-soils UTL	N/A	N/A	N/A	6120	10900	2.7	N.A.	19.2	19.3	45.1
35-2172	AAC3350	0–1	Soil	NA	22200	NA	<3	NA	NA	36
35-2172	AAC3329	1–2	Soil	NA	13100	NA	<3	NA	NA	<12
35-2173	AAC3330	0–0.5	Soil	NA	18600	NA	<3	NA	NA	20.3
35-2174	AAC3331	0–0.5	Soil	NA	16800	NA	<3	NA	NA	<12
35-2175	AAC3332	0–0.5	Soil	NA	21800	NA	3.1	NA	NA	31.7
35-2176	AAC3351	0–1	Soil	NA	11400	NA	<3	NA	NA	17.5
35-2176	AAC3333	2–3	Soil	NA	2220	NA	<3	NA	NA	16
35-2177	AAC3334	0–0.5	Soil	NA	8920	NA	<3	NA	NA	17.8
35-2178	AAC3335	0–0.5	Soil	NA	7750	NA	<3	NA	NA	19.5
35-2179	AAC3336	0–1	Soil	NA	7660	NA	<3	NA	NA	<12
35-2179	AAC3337	1–2	Soil	NA	2500	NA	<3	NA	NA	21
35-2179	AAC3338	2–3	Soil	NA	1920	NA	<3	NA	NA	40.7
35-2180	AAC3339	0–1	Soil	NA	1580	NA	<3	NA	NA	50.1
35-2180	AAC3340	1–2	Soil	NA	2840	NA	<3	NA	NA	<12
35-2180	AAC3341	2–3	Soil	NA	2040	NA	<3	NA	NA	<12
35-2181	AAC3342	0–0.5	Soil	NA	10700	NA	5.53	NA	NA	26.8
35-2181	AAC3343	0–0.5	Soil	NA	9200	NA	9.11	NA	NA	22.3
35-2182	AAC3344	0–1	Soil	NA	1900	NA	<3	NA	NA	56.6
35-2182	AAC3345	1–2	Soil	NA	1780	NA	<3	NA	NA	61.5
35-2182	AAC3346	2–3	Soil	<235	1410	<.09	<3	<.16	11.1	61.6
35-2286	0435-95-0199	1–2	Soil	250	NA	<.76	NA	<.6	18.3	NA

*mg/kg

TABLE A-12 (continued)

RFI RESULTS FOR INORGANIC CHEMICALS AT PRS No. 35-015(a)*

Part 1

Location ID	Sample ID	Depth (ft)	Media	Cu	Cu,XRF	Fe	Fe,XRF	Hg	Hg,XRF	K
SAL	N/A	N/A	N/A	2800	2800	N.A.	N.A.	23	23	N.A.
All-soils UTL	N/A	N/A	N/A	15.5	16.7	21300	27400	0.1	N.A.	3410
35-2172	AAC3350	0–1	Soil	NA	11	NA	22000	NA	<5	NA
35-2172	AAC3329	1–2	Soil	NA	14.9	NA	17900	NA	<5	NA
35-2173	AAC3330	0–0.5	Soil	NA	20	NA	24000	NA	<5	NA
35-2174	AAC3331	0–0.5	Soil	NA	74.4	NA	20900	NA	<5	NA
35-2175	AAC3332	0–0.5	Soil	NA	39.6	NA	29800	NA	<5	NA
35-2176	AAC3351	0–1	Soil	NA	20	NA	19300	NA	<8	NA
35-2176	AAC3333	2–3	Soil	NA	<8	NA	12000	NA	<5	NA
35-2177	AAC3334	0–0.5	Soil	NA	17.4	NA	19500	NA	<5	NA
35-2178	AAC3335	0–0.5	Soil	NA	12	NA	20100	NA	<5	NA
35-2179	AAC3336	0–1	Soil	NA	18.5	NA	18200	NA	<5	NA
35-2179	AAC3337	1–2	Soil	NA	<8	NA	11400	NA	<5	NA
35-2179	AAC3338	2–3	Soil	NA	<8	NA	11200	NA	<5	NA
35-2180	AAC3339	0–1	Soil	NA	<8	NA	9280	NA	<5	NA
35-2180	AAC3340	1–2	Soil	NA	8.86	NA	13200	NA	<5	NA
35-2180	AAC3341	2–3	Soil	NA	<8	NA	13500	NA	<5	NA
35-2181	AAC3342	0–0.5	Soil	NA	31.8	NA	25100	NA	<5	NA
35-2181	AAC3343	0–0.5	Soil	NA	31.1	NA	23000	NA	5.6	NA
35-2182	AAC3344	0–1	Soil	NA	<8	NA	10900	NA	<5	NA
35-2182	AAC3345	1–2	Soil	NA	<8	NA	11700	NA	<5	NA
35-2182	AAC3346	2–3	Soil	<1.1	<8	4660	10600	<.1	<5	<178
35-2286	0435-95-0199	1–2	Soil	2.3	NA	2930	NA	<.06	NA	<191

Part 2

Location ID	Sample ID	Depth (ft)	Media	K,XRF	Mg	Mn	Mn,XRF	Na	Ni	Ni,XRF
SAL	N/A	N/A	N/A	N.A.	N.A.	N.A.	N.A.	N.A.	1500	1500
All-soils UTL	N/A	N/A	N/A	38700	4610	714	681	915	15.2	22.5
35-2172	AAC3350	0–1	Soil	27000	NA	NA	429	NA	NA	11.5
35-2172	AAC3329	1–2	Soil	29500	NA	NA	390	NA	NA	<13
35-2173	AAC3330	0–0.5	Soil	30400	NA	NA	489	NA	NA	<13
35-2174	AAC3331	0–0.5	Soil	24700	NA	NA	451	NA	NA	<13
35-2175	AAC3332	0–0.5	Soil	23900	NA	NA	506	NA	NA	<13
35-2176	AAC3351	0–1	Soil	27400	NA	NA	378	NA	NA	<13
35-2176	AAC3333	2–3	Soil	32900	NA	NA	272	NA	NA	<13
35-2177	AAC3334	0–0.5	Soil	23400	NA	NA	543	NA	NA	<13
35-2178	AAC3335	0–0.5	Soil	19700	NA	NA	444	NA	NA	<13
35-2179	AAC3336	0–1	Soil	30100	NA	NA	606	NA	NA	<13
35-2179	AAC3337	1–2	Soil	30800	NA	NA	146	NA	NA	<13
35-2179	AAC3338	2–3	Soil	29700	NA	NA	124	NA	NA	<13
35-2180	AAC3339	0–1	Soil	31900	NA	NA	133	NA	NA	19.7
35-2180	AAC3340	1–2	Soil	33100	NA	NA	303	NA	NA	<13
35-2180	AAC3341	2–3	Soil	32400	NA	NA	267	NA	NA	<13
35-2181	AAC3342	0–0.5	Soil	25000	NA	NA	479	NA	NA	<13
35-2181	AAC3343	0–0.5	Soil	25300	NA	NA	433	NA	NA	15.7
35-2182	AAC3344	0–1	Soil	30600	NA	NA	104	NA	NA	19.7
35-2182	AAC3345	1–2	Soil	31300	NA	NA	149	NA	NA	17.4
35-2182	AAC3346	2–3	Soil	33600	<194	136	272	<121	<6	47.4
35-2286	0435-95-0199	1–2	Soil	NA	152	123	NA	133	8	NA

*mg/kg

TABLE A-12 (continued)

RFI RESULTS FOR INORGANIC CHEMICALS AT PRS No. 35-015(a)*

Part 1

Location ID	Sample ID	Depth (ft)	Media	Pb	Pb,XRF	Sb	Sb,XRF	Se	Se,XRF	Th,XRF
SAL	N/A	N/A	N/A	400	400	31	31	380	380	N.A.
All-soils UTL	N/A	N/A	N/A	23.3	28.4	N.A.	1.45	1.7	N.A.	22.1
35-2172	AAC3350	0–1	Soil	NA	21	NA	<4	NA	<4	18.5
35-2172	AAC3329	1–2	Soil	NA	24.4	NA	<4	NA	<4	15.2
35-2173	AAC3330	0–0.5	Soil	NA	33.9	NA	<4	NA	<4	<8
35-2174	AAC3331	0–0.5	Soil	NA	27.1	NA	4.34	NA	<4	<8
35-2175	AAC3332	0–0.5	Soil	NA	36.1	NA	<4	NA	<4	9.4
35-2176	AAC3351	0–1	Soil	NA	20.3	NA	<4	NA	<4	<8
35-2176	AAC3333	2–3	Soil	NA	17.4	NA	<4	NA	<4	20.7
35-2177	AAC3334	0–0.5	Soil	NA	28.4	NA	<4	NA	<4	<8
35-2178	AAC3335	0–0.5	Soil	NA	18.6	NA	<4	NA	<4	9.45
35-2179	AAC3336	0–1	Soil	NA	26.8	NA	<4	NA	<4	13
35-2179	AAC3337	1–2	Soil	NA	17.1	NA	<4	NA	<4	13.1
35-2179	AAC3338	2–3	Soil	NA	15.4	NA	<4	NA	<4	17.2
35-2180	AAC3339	0–1	Soil	NA	13	NA	<4	NA	<4	<8
35-2180	AAC3340	1–2	Soil	NA	20.5	NA	<4	NA	<4	20.9
35-2180	AAC3341	2–3	Soil	NA	21	NA	<4	NA	<4	23.8
35-2181	AAC3342	0–0.5	Soil	NA	44.2	NA	<4	NA	<4	15
35-2181	AAC3343	0–0.5	Soil	NA	37.9	NA	<4	NA	<4	13
35-2182	AAC3344	0–1	Soil	NA	14.3	NA	<4	NA	<4	11.4
35-2182	AAC3345	1–2	Soil	NA	11.5	NA	<4	NA	<4	24.6
35-2182	AAC3346	2–3	Soil	2.8	22.6	<.49	<4	<1.1	<4	32.6
35-2286	0435-95-0199	1–2	Soil	2.28	NA	<9.7	NA	<3.5	NA	NA

Part 2

Location ID	Sample ID	Depth (ft)	Media	Ti,XRF	Tl	U,XRF	V	Zn	Zn,XRF
SAL	N/A	N/A	N/A	N.A.	N.A.	230	540	23000	23000
All-soils UTL	N/A	N/A	N/A	N.A.	1	5.33	41.9	50.8	76.6
35-2172	AAC3350	0–1	Soil	2372	NA	8.24	NA	NA	50
35-2172	AAC3329	1–2	Soil	1622	NA	8.61	NA	NA	73.4
35-2173	AAC3330	0–0.5	Soil	2795	NA	<8	NA	NA	71.9
35-2174	AAC3331	0–0.5	Soil	2914	NA	<8	NA	NA	90.1
35-2175	AAC3332	0–0.5	Soil	3350	NA	<8	NA	NA	136
35-2176	AAC3351	0–1	Soil	2157	NA	<8	NA	NA	61.8
35-2176	AAC3333	2–3	Soil	812	NA	<8	NA	NA	46.5
35-2177	AAC3334	0–0.5	Soil	3448	NA	9.62	NA	NA	39.5
35-2178	AAC3335	0–0.5	Soil	4606	NA	<8	NA	NA	35.2
35-2179	AAC3336	0–1	Soil	2627	NA	55.1	NA	NA	65.6
35-2179	AAC3337	1–2	Soil	658	NA	<8	NA	NA	28.7
35-2179	AAC3338	2–3	Soil	611	NA	10.3	NA	NA	33.9
35-2180	AAC3339	0–1	Soil	628	NA	9.41	NA	NA	29.5
35-2180	AAC3340	1–2	Soil	966	NA	<8	NA	NA	47.1
35-2180	AAC3341	2–3	Soil	719	NA	<8	NA	NA	176
35-2181	AAC3342	0–0.5	Soil	2931	NA	<8	NA	NA	185
35-2181	AAC3343	0–0.5	Soil	2708	NA	<8	NA	NA	189
35-2182	AAC3344	0–1	Soil	690	NA	<8	NA	NA	39
35-2182	AAC3345	1–2	Soil	582	NA	<8	NA	NA	33.2
35-2182	AAC3346	2–3	Soil	554	<1.1	8.11	<1.7	24.9	43.6
35-2286	0435-95-0199	1–2	Soil	NA	<.34	NA	0.93	15.8	NA

*mg/kg

TABLE A-13

FIXED-SITE LABORATORY RADIONUCLIDE RESULTS FOR PRS No. 35-015(a)*

Location ID	Sample ID	Depth (ft)	Media	Pu-238	Pu-239	U-234	U-235	U-238
SAL	N/A	N/A	N/A	27	24	13	10	67
All-soils UTL	N/A	N/A	N/A	N.A.	N.A.	1.94	0.084	1.82
35-2174	AAC3331	0–0.5	Soil	-0.002	0.002	0.69	0.09	0.64
35-2174	AAC3349	0–0.5	Soil	0.002	0.002	0.70	0.08	0.65

*pCi/g

TABLE A-14

RFI RESULTS FOR ORGANIC CHEMICALS AT PRS No. 35-015(a)*

Part 1

Location ID	Sample ID	Depth (ft)	Media	Anthracene	Benz[a]anthracene	Benzo[a]pyrene
SAL	N/A	N/A	N/A	19	0.61	0.061
35-2285	0435-95-0198	1–2	Soil	0.057 J	0.053 J	0.047 J
35-2286	0435-95-0199	1–2	Soil	<3.8 U	<3.8 U	<3.8 U
35-2286	0435-95-0200	2–3	Soil	<9.5 U	<9.5 U	<9.5 U

Part 2

Location ID	Sample ID	Depth (ft)	Media	Benzo[b]fluoranthene	Benzo[k]fluoranthene	Bis(2-ethylhexyl)-phthalate
SAL	N/A	N/A	N/A	0.61	6.1	32
35-2285	0435-95-0198	1–2	Soil	0.029 J	0.043 J	<.37 U
35-2286	0435-95-0199	1–2	Soil	<3.8 U	<3.8 U	3.0 J
35-2286	0435-95-0200	2–3	Soil	<9.5 U	<9.5 U	3.8 J

Part 3

Location ID	Sample ID	Depth (ft)	Media	Chrysene	Fluoranthene	Phenanthrene
SAL	N/A	N/A	N/A	24	2600	N.A.
35-2285	0435-95-0198	1–2	Soil	0.055 J	0.14 J	0.18 J
35-2286	0435-95-0199	1–2	Soil	<3.8 U	<3.8 U	<3.8 U
35-2286	0435-95-0200	2–3	Soil	<9.5 U	<9.5 U	<9.5 U

Part 4

Location ID	Sample ID	Depth (ft)	Media	Pyrene	TPH
SAL	N/A	N/A	N/A	2000	N.A.
35-2285	0435-95-0198	1–2	Soil	0.13 J	55
35-2286	0435-95-0199	1–2	Soil	<3.8 U	44000
35-2286	0435-95-0200	2–3	Soil	<9.5 U	43000

*mg/kg

TABLE A-15

RFI RESULTS FOR INORGANIC CHEMICALS AT PRS Nos. 35-016(k and l)*

Part 1

PRS	Location ID	Sample ID	Depth (ft)	Media	Ag	Al	As	As,XRF	Ba	Ba,XRF
SAL	N/A	N/A	N/A	N/A	383	77000	N.A.	N.A.	5300	5300
All-soils UTL	N/A	N/A	N/A	N/A	N.A.	38700	7.82	18.1	315	561
35-016(k)	35-2112	AAC1133	0–0.5	Soil	<.37	6980	<1.5	6.04	62.6	296
35-016(k)	35-2113	AAC1134	0–1	Soil	NA	NA	NA	<4	NA	188
35-016(k)	35-2113	AAC1135	1–2	Soil	NA	NA	NA	<4	NA	167.4
35-016(k)	35-2113	AAC1136	2–3	Soil	NA	NA	NA	<4	NA	75.7
35-016(l)	35-2214	AAC1140	0–1	Soil	NA	NA	NA	<4	NA	248

Part 2

PRS	Location ID	Sample ID	Depth (ft)	Media	Be	Ca	Ca,XRF	Cd	Cd,XRF	Co
SAL	N/A	N/A	N/A	N/A	N.A.	N.A.	N.A.	38	38	4600
All-soils UTL	N/A	N/A	N/A	N/A	1.95	6120	10900	2.7	N.A.	19.2
35-016(k)	35-2112	AAC1133	0–0.5	Soil	<.56	2370	5260	<1.2	<3	<2.6
35-016(k)	35-2113	AAC1134	0–1	Soil	NA	NA	4220	NA	<3	NA
35-016(k)	35-2113	AAC1135	1–2	Soil	NA	NA	2690	NA	<3	NA
35-016(k)	35-2113	AAC1136	2–3	Soil	NA	NA	1380	NA	<3	NA
35-016(l)	35-2214	AAC1140	0–1	Soil	NA	NA	5690	NA	<3	NA

Part 3

PRS	Location ID	Sample ID	Depth (ft)	Media	Cr	Cr,XRF	Cu	Cu,XRF	Fe	Fe,XRF
SAL	N/A	N/A	N/A	N/A	210	210	2800	2800	N.A.	N.A.
All-soils UTL	N/A	N/A	N/A	N/A	19.3	45.1	15.5	16.7	21300	27400
35-016(k)	35-2112	AAC1133	0–0.5	Soil	5.8	<12	54.1	60.4	7100	19600
35-016(k)	35-2113	AAC1134	0–1	Soil	NA	14.9	NA	45.7	NA	17500
35-016(k)	35-2113	AAC1135	1–2	Soil	NA	14.3	NA	9.81	NA	14600
35-016(k)	35-2113	AAC1136	2–3	Soil	NA	26.6	NA	<8	NA	10800
35-016(l)	35-2214	AAC1140	0–1	Soil	NA	<12	NA	18.3	NA	15600

Part 4

PRS	Location ID	Sample ID	Depth (ft)	Media	Hg	Hg,XRF	K	K,XRF	Mg	Mn
SAL	N/A	N/A	N/A	N/A	23	23	N.A.	N.A.	N.A.	N.A.
All-soils UTL	N/A	N/A	N/A	N/A	0.1	N.A.	3410	38700	4610	714
35-016(k)	35-2112	AAC1133	0–0.5	Soil	<.12	<5	<1010	28200	<1020	233
35-016(k)	35-2113	AAC1134	0–1	Soil	NA	<5	NA	31600	NA	NA
35-016(k)	35-2113	AAC1135	1–2	Soil	NA	<5	NA	31900	NA	NA
35-016(k)	35-2113	AAC1136	2–3	Soil	NA	<5	NA	34400	NA	NA
35-016(l)	35-2214	AAC1140	0–1	Soil	NA	5.43	NA	30500	NA	NA

*mg/kg

TABLE A-15 (continued)

RFI RESULTS FOR INORGANIC CHEMICALS AT PRS Nos. 35-016(k and l)*

Part 1

PRS	Location ID	Sample ID	Depth (ft)	Media	Mn,XRF	Na	Ni	Ni,XRF	Pb	Pb,XRF
SAL	N/A	N/A	N/A	N/A	N.A.	N.A.	1500	1500	400	400
All-soils UTL	N/A	N/A	N/A	N/A	681	915	15.2	22.5	23.3	28.4
35-016(k)	35-2112	AAC1133	0–0.5	Soil	401	<97.8	<5.8	<13	29.2	42
35-016(k)	35-2113	AAC1134	0–1	Soil	366	NA	NA	<13	NA	50.9
35-016(k)	35-2113	AAC1135	1–2	Soil	234	NA	NA	17.2	NA	31.1
35-016(k)	35-2113	AAC1136	2–3	Soil	189	NA	NA	<13	NA	50.2
35-016(l)	35-2214	AAC1140	0–1	Soil	480	NA	NA	14.3	NA	40.3

Part 2

PRS	Location ID	Sample ID	Depth (ft)	Media	Sb	Sb,XRF	Se	Se,XRF	Th,XRF	Ti,XRF
SAL	N/A	N/A	N/A	N/A	31	31	380	380	N.A.	N.A.
All-soils UTL	N/A	N/A	N/A	N/A	N.A.	1.45	1.7	N.A.	22.1	N.A.
35-016(k)	35-2112	AAC1133	0–0.5	Soil	<.52	<4	<1.2	<4	17.4	2065
35-016(k)	35-2113	AAC1134	0–1	Soil	NA	<4	NA	<4	22.1	1660
35-016(k)	35-2113	AAC1135	1–2	Soil	NA	<4	NA	<4	25.3	1296
35-016(k)	35-2113	AAC1136	2–3	Soil	NA	<4	NA	<4	17.7	686
35-016(l)	35-2214	AAC1140	0–1	Soil	NA	<4	NA	<4	27.5	1660

Part 3

PRS	Location ID	Sample ID	Depth (ft)	Media	Tl	U,XRF	V	Zn	Zn,XRF
SAL	N/A	N/A	N/A	N/A	N.A.	230	540	23000	23000
All-soils UTL	N/A	N/A	N/A	N/A	1	5.33	41.9	50.8	76.6
35-016(k)	35-2112	AAC1133	0–0.5	Soil	<1.2	<8	<11.1	573	677
35-016(k)	35-2113	AAC1134	0–1	Soil	NA	<8	NA	NA	149
35-016(k)	35-2113	AAC1135	1–2	Soil	NA	<8	NA	NA	78.6
35-016(k)	35-2113	AAC1136	2–3	Soil	NA	13.6	NA	NA	57.3
35-016(l)	35-2214	AAC1140	0–1	Soil	NA	14.5	NA	NA	117

*mg/kg

TABLE A-16

FIXED-SITE LABORATORY RADIONUCLIDE RESULTS FOR PRS Nos. 35-016(k and l)*

Part 1

PRS	Location ID	Sample ID	Depth (ft)	Media	Am-241	Ba-140	Ce-144	Co-60	Cs-137	Eu-152	Na-22
SAL	N/A	N/A	N/A	N/A	22	N.A.	56	1.1	5.1	2.6	1.3
All-soils UTL	N/A	N/A	N/A	N/A	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
35-106(k)	35-2112	AAC1133	0–0.5	Soil	0.03	-0.068	-0.115	0.022	0.182	0.041	-0.023

Part 2

PRS	Location ID	Sample ID	Depth (ft)	Media	Np-237	Pu-238	Pu-239	Ru-106	U-234	U-235	U-238
SAL	N/A	N/A	N/A	N/A	1.9	27	24	13	13	10	67
All-soils UTL	N/A	N/A	N/A	N/A	N.A.	N.A.	N.A.	N.A.	1.94	0.084	1.82
35-106(k)	35-2112	AAC1133	0–0.5	Soil	0.037	-0.01	0.03	-0.219	0.72	0.05	0.78

*pCi/g

TABLE A-17

RFI RESULTS FOR ORGANIC CHEMICALS AT PRS Nos. 35-016(k and l)*

Part 1

PRS	Location ID	Sample ID	Depth (ft)	Media	Acenaphthene	Acenaphthylene	Anthracene
SAL	N/A	N/A	N/A	N/A	360	N.A.	19
35-016(k)	35-2112	AAC1133	0–0.5	Soil	<.1 U	<.1 U	<.1 U
35-016(k)	35-2113	AAC1134	0–1	Soil	<.1 U	0.886 S	<.1 U
35-016(k)	35-2113	AAC1135	1–2	Soil	<.1 U	<.1 U	<.1 U
35-016(k)	35-2113	AAC1136	2–3	Soil	<.1 U	0.203 S	<.1 U
35-016(l)	35-2214	AAC1140	0–1	Soil	1.7	9.4	1.4

Part 2

PRS	Location ID	Sample ID	Depth (ft)	Media	Benz[a]anthracene	Benzo[a]pyrene	Benzo[b]fluoranthene
SAL	N/A	N/A	N/A	N/A	0.61	0.061	0.61
35-016(k)	35-2112	AAC1133	0–0.5	Soil	<.1 U	<.1 U	<.1 U
35-016(k)	35-2113	AAC1134	0–1	Soil	<.1 U	0.472 S	0.101 S
35-016(k)	35-2113	AAC1135	1–2	Soil	<.1 U	<.1 U	<.1 U
35-016(k)	35-2113	AAC1136	2–3	Soil	<.1 U	<.1 U	<.1 U
35-106(l)	35-2214	AAC1140	0–1	Soil	2.4	2.5	2.6

Part 3

PRS	Location ID	Sample ID	Depth (ft)	Media	Benzo[g,h,i]-perylene	Benzo[k]-fluoranthene	Dibenz[a,h]-anthracene
SAL	N/A	N/A	N/A	N/A	N.A.	6.1	0.061
35-016(k)	35-2112	AAC1133	0–0.5	Soil	<.1 U	<.1 U	<.1 U
35-016(k)	35-2113	AAC1134	0–1	Soil	0.274 S	0.366 S	0.342 S
35-016(k)	35-2113	AAC1135	1–2	Soil	0.201 S	<.1 U	0.169 S
35-016(k)	35-2113	AAC1136	2–3	Soil	<.1 U	<.1 U	<.1 U
35-016(l)	35-2214	AAC1140	0–1	Soil	1.9	2.2	0.86

Part 4

PRS	Location ID	Sample ID	Depth (ft)	Media	Dibenzofuran	Fluoranthene	Fluorene
SAL	N/A	N/A	N/A	N/A	260	2600	300
35-016(k)	35-2112	AAC1133	0–0.5	Soil	<.1 U	<.1 U	<.1 U
35-016(k)	35-2113	AAC1134	0–1	Soil	<.1 U	<.1 U	<.1 U
35-016(k)	35-2113	AAC1135	1–2	Soil	<.1 U	<.1 U	<.1 U
35-016(k)	35-2113	AAC1136	2–3	Soil	<.1 U	<.1 U	0.589 S
35-106(l)	35-2214	AAC1140	0–1	Soil	0.8	5.4	1.2

Part 5

PRS	Location ID	Sample ID	Depth (ft)	Media	Indeno[1,2,3-cd]pyrene	Naphthalene	Phenanthrene	Pyrene
SAL	N/A	N/A	N/A	N/A	0.61	800	N.A.	2000
35-016(k)	35-2112	AAC1133	0–0.5	Soil	<.1 U	0.275 S	<.1 U	<.1 U
35-016(k)	35-2113	AAC1134	0–1	Soil	<.1 U	<.1 U	<.1 U	<.1 U
35-016(k)	35-2113	AAC1135	1–2	Soil	0.18 S	<.1 U	<.1 U	<.1 U
35-016(k)	35-2113	AAC1136	2–3	Soil	<.1 U	<.1 U	<.1 U	<.1 U
35-016(l)	35-2214	AAC1140	0–1	Soil	1.9	1.2	5.7	5.3

*mg/kg

TABLE A-18

RFI RESULTS FOR INORGANIC CHEMICALS AT PRS No. 35-016(o)*

Part 1

Location ID	Sample ID	Depth (ft)	Media	Ag	Al	As	As,XRF	Ba	Ba,XRF	Be
SAL	N/A	N/A	N/A	383	77000	N.A.	N.A.	5300	5300	N.A.
All-soils UTL	N/A	N/A	N/A	N.A.	38700	7.82	18.1	315	561	1.95
35-2043	AAA6489	0–0.5	Soil	NA	NA	NA	<4	NA	202	NA
35-2044	AAA6490	0–0.5	Soil	NA	NA	NA	<4	NA	194	NA
35-2045	AAA6491	0–0.5	Soil	NA	NA	NA	<4	NA	160	NA
35-2091	AAB4241	0–0.5	Soil	NA	NA	NA	<33	NA	304	NA
35-2092	AAB4242	0–1	Soil	NA	NA	NA	<33	NA	189	NA
35-2092	AAB4243	1–2	Soil	<.87	2310	<1.6	<33	<25.4	110	<.44
35-2092	AAB4250	1–2	Soil	NA	NA	NA	<33	NA	164	NA
35-2092	AAB4244	2–3	Soil	NA	NA	NA	<33	NA	342	NA
35-2254	AAB4257	0–0.5	Soil	<.97	4770	<3.9	<33	66.1	152	<.71
35-2255	AAB4258	0–1	Soil	NA	NA	NA	<33	NA	173	NA
35-2255	AAB4259	1–2	Soil	NA	NA	NA	<33	NA	124	NA
35-2255	AAB4260	2–3	Qbt3	NA	NA	NA	<33	NA	104	NA
35-2256	AAB4261	0–0.5	Soil	NA	NA	NA	<33	NA	139	NA
35-2257	AAB4262	0–1	Soil	<.83	1930	<1.8	<33	<21.5	126	<.43
35-2257	AAB4263	1–2	Soil	NA	NA	NA	<33	NA	138	NA
35-2257	AAB4264	2–3	Qbt3	NA	NA	NA	<33	NA	125	NA

Part 2

Location ID	Sample ID	Depth (ft)	Media	Ca	Ca,XRF	Cd	Cd,XRF	Co	Cr	Cr,XRF
SAL	N/A	N/A	N/A	N.A.	N.A.	38	38	4600	210	210
All-soils UTL	N/A	N/A	N/A	6120	10900	2.7	N.A.	19.2	19.3	45.1
35-2043	AAA6489	0–0.5	Soil	NA	7500	NA	<3	NA	NA	43
35-2044	AAA6490	0–0.5	Soil	NA	8200	NA	<3	NA	NA	22
35-2045	AAA6491	0–0.5	Soil	NA	6000	NA	<3	NA	NA	15
35-2091	AAB4241	0–0.5	Soil	NA	9000	NA	<2	NA	NA	26
35-2092	AAB4242	0–1	Soil	NA	3700	NA	<2	NA	NA	17
35-2092	AAB4243	1–2	Soil	<1080	2700	<.87	<2	<.82	9	19
35-2092	AAB4250	1–2	Soil	NA	3000	NA	<2	NA	NA	12
35-2092	AAB4244	2–3	Soil	NA	6700	NA	<2	NA	NA	53
35-2254	AAB4257	0–0.5	Soil	2250	3800	2.1	<2	<2.2	3.7	17
35-2255	AAB4258	0–1	Soil	NA	4400	NA	<2	NA	NA	50
35-2255	AAB4259	1–2	Soil	NA	2900	NA	<2	NA	NA	44
35-2255	AAB4260	2–3	Qbt3	NA	1300	NA	<2	NA	NA	21
35-2256	AAB4261	0–0.5	Soil	NA	4100	NA	<2	NA	NA	<11
35-2257	AAB4262	0–1	Soil	4350	4700	<.83	<2	<2.9	11.3	23
35-2257	AAB4263	1–2	Soil	NA	3300	NA	<2	NA	NA	<11
35-2257	AAB4264	2–3	Qbt3	NA	3000	NA	<2	NA	NA	16

*mg/kg

TABLE A-18 (continued)

RFI RESULTS FOR INORGANIC CHEMICALS AT PRS No. 35-016(o)*

Part 1

Location ID	Sample ID	Depth (ft)	Media	Cu	Cu,XRF	Fe	Fe,XRF	Hg	Hg,XRF	K
SAL	N/A	N/A	N/A	2800	2800	N.A.	N.A.	23	23	N.A.
All-soils UTL	N/A	N/A	N/A	15.5	16.7	21300	27400	0.1	N.A.	3410
35-2043	AAA6489	0–0.5	Soil	NA	85	NA	32400	NA	<5	NA
35-2044	AAA6490	0–0.5	Soil	NA	49	NA	13600	NA	<5	NA
35-2045	AAA6491	0–0.5	Soil	NA	37	NA	13100	NA	<5	NA
35-2091	AAB4241	0–0.5	Soil	NA	49	NA	13000	NA	<10	NA
35-2092	AAB4242	0–1	Soil	NA	19	NA	11700	NA	<10	NA
35-2092	AAB4243	1–2	Soil	7.5	<13	4890	11800	<.06	<10	<456
35-2092	AAB4244	2–3	Soil	NA	<13	NA	15700	NA	<10	NA
35-2092	AAB4250	1–2	Soil	NA	16	NA	12400	NA	<10	NA
35-2254	AAB4257	0–0.5	Soil	25.2	25	5670	10700	NA	<10	<907
35-2255	AAB4258	0–1	Soil	NA	88	NA	15700	NA	<10	NA
35-2255	AAB4259	1–2	Soil	NA	34	NA	14600	NA	<10	NA
35-2255	AAB4260	2–3	Qbt3	NA	<13	NA	7000	NA	<10	NA
35-2256	AAB4261	0–0.5	Soil	NA	<13	NA	11500	NA	<10	NA
35-2257	AAB4262	0–1	Soil	<4.9	<13	8700	16900	<.06	<10	<434
35-2257	AAB4263	1–2	Soil	NA	<13	NA	10800	NA	<10	NA
35-2257	AAB4264	2–3	Qbt3	NA	<13	NA	9800	NA	<10	NA

Part 2

Location ID	Sample ID	Depth (ft)	Media	K,XRF	Li	Mg	Mn	Mn,XRF	Mo	Na	Ni
SAL	N/A	N/A	N/A	N.A.	1500	N.A.	N.A.	N.A.	380	N.A.	1500
All-soils UTL	N/A	N/A	N/A	38700	N.A.	4610	714	681	N.A.	915	15.2
35-2043	AAA6489	0–0.5	Soil	30600	NA	NA	NA	601	NA	NA	NA
35-2044	AAA6490	0–0.5	Soil	27100	NA	NA	NA	349	NA	NA	NA
35-2045	AAA6491	0–0.5	Soil	30500	NA	NA	NA	382	NA	NA	NA
35-2091	AAB4241	0–0.5	Soil	27400	NA	NA	NA	501	NA	NA	NA
35-2092	AAB4242	0–1	Soil	32400	NA	NA	NA	369	NA	NA	NA
35-2092	AAB4243	1–2	Soil	33000	NA	<453	150	330	NA	<97.7	<6.3
35-2092	AAB4244	2–3	Soil	29500	NA	NA	NA	376	NA	NA	NA
35-2092	AAB4250	1–2	Soil	33600	NA	NA	NA	335	NA	NA	NA
35-2254	AAB4257	0–0.5	Soil	32700	6.8	<876	243	330	<.86	<87.9	<3.0
35-2255	AAB4258	0–1	Soil	31000	NA	NA	NA	368	NA	NA	NA
35-2255	AAB4259	1–2	Soil	33900	NA	NA	NA	388	NA	NA	NA
35-2255	AAB4260	2–3	Qbt3	28700	NA	NA	NA	244	NA	NA	NA
35-2256	AAB4261	0–0.5	Soil	34000	NA	NA	NA	348	NA	NA	NA
35-2257	AAB4262	0–1	Soil	33400	NA	<513	223	402	NA	<105	9.7
35-2257	AAB4263	1–2	Soil	34600	NA	NA	NA	359	NA	NA	NA
35-2257	AAB4264	2–3	Qbt3	34800	NA	NA	NA	354	NA	NA	NA

*mg/kg

TABLE A-18 (continued)

RFI RESULTS FOR INORGANIC CHEMICALS AT PRS No. 35-016(o)*

Part 1

Location ID	Sample ID	Depth (ft)	Media	Ni,XRF	Pb	Pb,XRF	Sb	Sb,XRF	Se	Se,XRF	Sr
SAL	N/A	N/A	N/A	1500	400	400	31	31	380	380	46000
All-soils UTL	N/A	N/A	N/A	22.5	23.3	28.4	N.A.	1.45	1.7	N.A.	N.A.
35-2043	AAA6489	0–0.5	Soil	16	NA	37	NA	<4	NA	<4	NA
35-2044	AAA6490	0–0.5	Soil	<13	NA	53	NA	<4	NA	<4	NA
35-2045	AAA6491	0–0.5	Soil	<13	NA	38	NA	<4	NA	<4	NA
35-2091	AAB4241	0–0.5	Soil	<28	NA	60	NA	<3	NA	<5	NA
35-2092	AAB4242	0–1	Soil	<28	NA	30	NA	<3	NA	<5	NA
35-2092	AAB4243	1–2	Soil	<28	11.9	27	<.56	<3	<.84	<5	NA
35-2092	AAB4244	2–3	Soil	<28	NA	30	NA	<3	NA	<5	NA
35-2092	AAB4250	1–2	Soil	<28	NA	22	NA	<3	NA	<5	NA
35-2254	AAB4257	0–0.5	Soil	<28	18.5	21	<5.5	<3	<8.6	<5	15.2
35-2255	AAB4258	0–1	Soil	<28	NA	51	NA	<3	NA	<5	NA
35-2255	AAB4259	1–2	Soil	<28	NA	31	NA	<3	NA	<5	NA
35-2255	AAB4260	2–3	Qbt3	<28	NA	16	NA	<3	NA	<5	NA
35-2256	AAB4261	0–0.5	Soil	<28	NA	25	NA	<3	NA	<5	NA
35-2257	AAB4262	0–1	Soil	<28	10.5	23	<.54	<3	<.8	<5	NA
35-2257	AAB4263	1–2	Soil	<28	NA	17	NA	<3	NA	<5	NA
35-2257	AAB4264	2–3	Qbt3	<28	NA	14	NA	<3	NA	<5	NA

Part 2

Location ID	Sample ID	Depth (ft)	Media	Th,XRF	Ti,XRF	Tl	U,XRF	V	Zn	Zn,XRF
SAL	N/A	N/A	N/A	N.A.	N.A.	N.A.	230	540	23000	23000
All-soils UTL	N/A	N/A	N/A	22.1	N.A.	1	5.33	41.9	50.8	76.6
35-2043	AAA6489	0–0.5	Soil	30	1180	NA	<8	NA	NA	87
35-2044	AAA6490	0–0.5	Soil	16	1600	NA	<8	NA	NA	152
35-2045	AAA6491	0–0.5	Soil	19	1520	NA	<8	NA	NA	140
35-2091	AAB4241	0–0.5	Soil	<8	1410	NA	<8	NA	NA	657
35-2092	AAB4242	0–1	Soil	10	1070	NA	<8	NA	NA	175
35-2092	AAB4243	1–2	Soil	20	922	<.92	<8	<5.7	55.7	86
35-2092	AAB4244	2–3	Soil	9	1830	NA	<8	NA	NA	103
35-2092	AAB4250	1–2	Soil	16	905	NA	11	NA	NA	86
35-2254	AAB4257	0–0.5	Soil	<8	971	<30.6	<8	<8.6	NA	116
35-2255	AAB4258	0–1	Soil	11	1150	NA	10	NA	NA	223
35-2255	AAB4259	1–2	Soil	17	936	NA	9	NA	NA	132
35-2255	AAB4260	2–3	Qbt3	9	403	NA	13	NA	NA	33
35-2256	AAB4261	0–0.5	Soil	11	966	NA	<8	NA	NA	52
35-2257	AAB4262	0–1	Soil	17	2060	<1.3	11	29.5	32.5	76
35-2257	AAB4263	1–2	Soil	16	668	NA	<8	NA	NA	43
35-2257	AAB4264	2–3	Qbt3	<8	659	NA	<8	NA	NA	38

*mg/kg

TABLE A-19

FIXED-SITE LABORATORY RADIONUCLIDE RESULTS FOR PRS No. 35-016(o)*

Part 1

Location ID	Sample ID	Depth (ft)	Media	Am-241	Ba-140	Ce-144	Co-60	Cs-137	Eu-152	K-40	Na-22
SAL	N/A	N/A	N/A	22	N.A.	56	1.1	5.1	2.6	12	1.3
All-soils UTL	N/A	N/A	N/A	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	28.6	N.A.
35-2043	AAA6489	0–0.5	Soil	NA	NA	NA	NA	NA	NA	NA	NA
35-2044	AAA6490	0–0.5	Soil	-0.292 J	0.349	0.11	0.115	0.139	0.165	NA	-0.052
35-2045	AAA6491	0–0.5	Soil	NA	NA	NA	NA	NA	NA	NA	NA
35-2091	AAB4241	0–0.5	Soil	NA	NA	NA	NA	NA	NA	NA	NA
35-2092	AAB4244	2–3	Soil	ND	ND	ND	ND	0.302	ND	NA	ND
35-2254	AAB4257	0–0.5	Soil	NA	NA	NA	NA	NA	NA	NA	NA
35-2255	AAB4259	1–2	Soil	ND	ND	ND	ND	ND	ND	33.75	ND
35-2256	AAB4261	0–0.5	Soil	NA	NA	NA	NA	NA	NA	NA	NA

Part 2

Location ID	Sample ID	Depth (ft)	Media	Np-237	Pb-210	Pb-212	Pb-214	Pu-238	Pu-239	Ra-226
SAL	N/A	N/A	N/A	1.9	N.A.	N.A.	N.A.	27	24	0.1
All-soils UTL	N/A	N/A	N/A	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
35-2043	AAA6489	0–0.5	Soil	NA	NA	NA	NA	0.002	0.018	NA
35-2044	AAA6490	0–0.5	Soil	-0.151	NA	NA	NA	0.032	0.045	NA
35-2045	AAA6491	0–0.5	Soil	NA	NA	NA	NA	0.014	0.009	NA
35-2091	AAB4241	0–0.5	Soil	NA	NA	NA	NA	0.001 J-	0.044 J-	NA
35-2092	AAB4244	2–3	Soil	ND	1.619	1.38	0.884	NA	NA	0.92
35-2254	AAB4257	0–0.5	Soil	NA	NA	NA	NA	0.004 J-	0.009 J-	NA
35-2255	AAB4259	1–2	Soil	ND	1.975	1.338	1.08	NA	NA	1.021
35-2256	AAB4261	0–0.5	Soil	NA	NA	NA	NA	-0.000 J-	0.01 J-	NA

Part 3

Location ID	Sample ID	Depth (ft)	Media	Ru-106	Th-228	Th-229	Th-234	Tl-208	U-234	U-235	U-238
SAL	N/A	N/A	N/A	13	1.7	N.A.	N.A.	N.A.	13	10	67
All-soils UTL	N/A	N/A	N/A	N.A.	N.A.	N.A.	N.A.	N.A.	1.94	0.084	1.82
35-2043	AAA6489	0–0.5	Soil	NA	NA	NA	NA	NA	0.739	0.027	0.748
35-2044	AAA6490	0–0.5	Soil	0.662	NA	NA	NA	NA	0.856	0.036	0.851
35-2045	AAA6491	0–0.5	Soil	NA	NA	NA	NA	NA	0.914	0.045	0.802
35-2091	AAB4241	0–0.5	Soil	NA	NA	NA	NA	NA	0.579	0.057	1.124
35-2092	AAB4244	2–3	Soil	ND	3.706	0.126	0.711	0.368	NA	0.178	NA
35-2254	AAB4257	0–0.5	Soil	NA	NA	NA	NA	NA	0.745	0.03	0.719
35-2255	AAB4259	1–2	Soil	ND	ND	ND	ND	ND	NA	0.119	NA
35-2256	AAB4261	0–0.5	Soil	NA	NA	NA	NA	NA	0.503	0.023	0.548

*pCi/g

TABLE A-20

RFI RESULTS FOR ORGANIC CHEMICALS AT PRS No. 35-016(o)*

Part 1

Location ID	Sample ID	Depth (ft)	Media	Acenaphthene	Anthracene	Aroclor 1254	Aroclor 1260
SAL	N/A	N/A	N/A	360	19	1.4	1.0
35-2043	AAA6489	0–0.5	Soil	<1 U	<1 U	NA	NA
35-2044	AAA6490	0–0.5	Soil	<.33 U	<.33 U	1.1 J	<.016 U
35-2045	AAA6491	0–0.5	Soil	2.8 S	3.1 S	NA	NA
35-2091	AAB4241	0–0.5	Soil	5.1 J	9.4 J	0.13	<.015 U
35-2092	AAB4242	0–1	Soil	4.1	5.3 J	<.015 U	0.045
35-2092	AAB4243	1–2	Soil	0.22 J	0.3 J	<.016 U	0.031
35-2092	AAB4244	2–3	Soil	0.2 J	0.34 J	<.016 U	0.480
35-2092	AAB4250	1–2	Soil	0.11 J	0.18 J	<.016 U	0.073 J+
35-2254	AAB4257	0–0.5	Soil	9.2	13 J	0.36	<.016 U
35-2255	AAB4258	0–1	Soil	6.4 J	13 J	1.88	<.017 U
35-2255	AAB4259	1–2	Soil	0.8 J	1.3 J	0.39	<.016 U
35-2255	AAB4260	2–3	Soil	<.38 U	<.38 U	<.015 U	<.015 U
35-2256	AAB4261	0–0.5	Soil	0.074 J	0.13	NA	NA
35-2257	AAB4262	0–1	Soil	<.37 U	<.37 U	NA	NA
35-2257	AAB4263	1–2	Soil	<.37 U	<.37 U	NA	NA
35-2257	AAB4264	2–3	Soil	<.36 U	<.36 U	NA	NA

Part 2

Location ID	Sample ID	Depth (ft)	Media	Benz[a]-anthracene	Benzo[a]-pyrene	Benzo[b]-fluoranthene	Benzo[g,h,i]-perylene
SAL	N/A	N/A	N/A	0.61	0.061	0.61	N.A.
35-2043	AAA6489	0–0.5	Soil	<1 U	<1 U	<1 U	<1 U
35-2044	AAA6490	0–0.5	Soil	<.33 U	<.33 U	<.33 U	<.33 U
35-2045	AAA6491	0–0.5	Soil	<1 U	6 S	<1 U	3.4 S
35-2091	AAB4241	0–0.5	Soil	26	41 J	52	21
35-2092	AAB4242	0–1	Soil	12	14 J	19	6.6
35-2092	AAB4243	1–2	Soil	0.37 J	0.6 J	0.58	0.41
35-2092	AAB4244	2–3	Soil	0.33 J	0.53 J	0.52	0.27 J
35-2092	AAB4250	1–2	Soil	0.26 J	0.45 J	0.53	0.16 J
35-2254	AAB4257	0–0.5	Soil	18	23 J	26	12
35-2255	AAB4258	0–1	Soil	17 J	29 J	31 J	12 J
35-2255	AAB4259	1–2	Soil	2.2	4.1 J	4.3	1.9
35-2255	AAB4260	2–3	Soil	0.04 J	0.065 J	0.069 J	0.049 J
35-2256	AAB4261	0–0.5	Soil	<.37 U	0.076 J	0.093 J	0.043 J
35-2257	AAB4262	0–1	Soil	<.37 U	<.37 U	<.37 U	<.37 U
35-2257	AAB4263	1–2	Soil	<.37 U	<.37 U	<.37 U	<.37 U
35-2257	AAB4264	2–3	Soil	<.36 U	<.36 U	<.36 U	<.36 U

*mg/kg

TABLE A-20 (continued)

RFI RESULTS FOR ORGANIC CHEMICALS AT PRS No. 35-016(o)*

Part 1

Location ID	Sample ID	Depth (ft)	Media	Benzo[k]-fluoranthene	Bis(2-ethylhexyl)-phthalate	Chrysene	Dibenz[a,h]-anthracene
SAL	N/A	N/A	N/A	6.1	32	24	0.061
35-2043	AAA6489	0–0.5	Soil	<1 U	<1 U	<1 U	<1 U
35-2044	AAA6490	0–0.5	Soil	<.33 U	<.33 U	<.33 U	<.33 U
35-2045	AAA6491	0–0.5	Soil	12.1 S	0.52 S	17.9 S	<1 U
35-2091	AAB4241	0–0.5	Soil	22	<18 U	35	5.3 J
35-2092	AAB4242	0–1	Soil	7.3	<3.7 U	14	1.7 J
35-2092	AAB4243	1–2	Soil	0.34 J	0.16 J	0.53	0.091 J
35-2092	AAB4244	2–3	Soil	0.29 J	0.22 J	0.47	0.065 J
35-2092	AAB4250	1–2	Soil	0.31 J	0.43	0.42	0.043 J
35-2254	AAB4257	0–0.5	Soil	12	0.92 J	20	2.9 J
35-2255	AAB4258	0–1	Soil	16 J	3.1 J	25 J	3.3 J
35-2255	AAB4259	1–2	Soil	2.4	0.42 J	3.4	0.49 J
35-2255	AAB4260	2–3	Soil	0.05 J	<.38 U	0.064 J	<.38 U
35-2256	AAB4261	0–0.5	Soil	0.049 J	<.37 U	0.088 J	<.37 U
35-2257	AAB4262	0–1	Soil	<.37 U	<.37 U	<.37 U	<.37 U
35-2257	AAB4263	1–2	Soil	<.37 U	<.37 U	<.37 U	<.37 U
35-2257	AAB4264	2–3	Soil	<.36 U	<.36 U	<.36 U	<.36 U

Part 2

Location ID	Sample ID	Depth (ft)	Media	Dibenzofuran	2,4-Dinitrotoluene	Fluoranthene	Fluorene
SAL	N/A	N/A	N/A	260	130	2600	300
35-2043	AAA6489	0–0.5	Soil	<1 U	<1 U	<1 U	<1 U
35-2044	AAA6490	0–0.5	Soil	<.33 U	<.33 U	0.72	<.33 U
35-2045	AAA6491	0–0.5	Soil	1.5 S	<1 U	10.7 S	2.4 S
35-2091	AAB4241	0–0.5	Soil	1.9 J	<18 U	66	4 J
35-2092	AAB4242	0–1	Soil	1.9 J	<3.7 U	33	3.1 J
35-2092	AAB4243	1–2	Soil	0.095 J	<.39 U	1.4	0.18 J
35-2092	AAB4244	2–3	Soil	0.096 J	0.14 J	1.2	0.18 J
35-2092	AAB4250	1–2	Soil	0.045 J	<.39 U	1.1	0.091 J
35-2254	AAB4257	0–0.5	Soil	4.2	<8.2 U	53	7.4 J
35-2255	AAB4258	0–1	Soil	2.8	<16 U	61 J	5.6
35-2255	AAB4259	1–2	Soil	0.33 J	<1.6 U	8.2	0.64
35-2255	AAB4260	2–3	Soil	<.38 U	<.38 U	0.13 J	<.38 U
35-2256	AAB4261	0–0.5	Soil	<.37 U	<.37 U	0.18 J	<.37 U
35-2257	AAB4262	0–1	Soil	<.37 U	<.37 U	<.37 U	<.37 U
35-2257	AAB4263	1–2	Soil	<.37 U	<.37 U	<.37 U	<.37 U
35-2257	AAB4264	2–3	Soil	<.36 U	<.36 U	<.36 U	<.36 U

*mg/kg

TABLE A-20 (continued)

RFI RESULTS FOR ORGANIC CHEMICALS AT PRS No. 35-016(o)*

Location ID	Sample ID	Depth (ft)	Media	Indeno[1,2,3-cd]-pyrene	2-Methyl-naphthalene	Naphthalene	Phenanthrene	Pyrene
SAL	N/A	N/A	N/A	0.61	N.A.	800	N.A.	2000
35-2043	AAA6489	0–0.5	Soil	<1 U	<1 U	<1 U	<1 U	<1 U
35-2044	AAA6490	0–0.5	Soil	<.33 U	<.33 U	<.33 U	<.33 U	0.76
35-2045	AAA6491	0–0.5	Soil	3.9 S	0.72 S	2.1 S	11.4 S	9.5 S
35-2091	AAB4241	0–0.5	Soil	24	<18 U	2.3 J	36	70
35-2092	AAB4242	0–1	Soil	7.4	0.74 J	2.4 J	26	30
35-2092	AAB4243	1–2	Soil	0.40	0.048 J	0.18 J	1.2	1.0
35-2092	AAB4244	2–3	Soil	0.28 J	0.043 J	0.14 J	1.1	0.95
35-2092	AAB4250	1–2	Soil	0.18 J	<.39 U	0.051 J	0.80	0.76
35-2254	AAB4257	0–0.5	Soil	12	2 J	7.7 J	48	51
35-2255	AAB4258	0–1	Soil	13 J	<16 U	4.5 J	44 J	46 J
35-2255	AAB4259	1–2	Soil	2.0	<1.6 U	0.49 J	5.3	6.1
35-2255	AAB4260	2–3	Soil	0.043 J	<.38 U	<.38 U	0.09 J	0.12 J
35-2256	AAB4261	0–0.5	Soil	0.046 J	<.37 U	<.37 U	0.11 J	0.18 J
35-2257	AAB4262	0–1	Soil	<.37 U	<.37 U	<.37 U	<.37 U	<.37 U
35-2257	AAB4263	1–2	Soil	<.37 U	<.37 U	<.37 U	<.37 U	<.37 U
35-2257	AAB4264	2–3	Soil	<.36 U	<.36 U	<.36 U	<.36 U	<.36 U

*mg/kg