

3-1-2005

Justification for Class III Permit Modification March2005 SWMU96 Operable Unit 1302 Storm Drain System at Technical Area I

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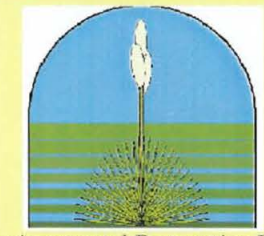
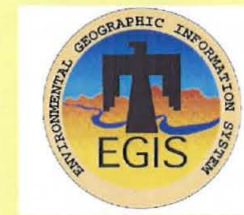
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This work supported by the United States Department of Energy under contract DE-AC04-94AL85000.



SWMU 96 Storm Drain System



Environmental Restoration Project

Site History

- SWMU 96 consists of a storm drain system servicing TA-I, -II and -IV. The original storm drain system was constructed between 1948 and 1950. Runoff water first flows east to west with the terrain and, then is collected and conveyed through a series of open channels and underground lines from north to south to the Tijeras Arroyo.
- The site boundaries were determined to be the limits of the areas where potential COCs were detected near breaks in the lines or at the outfall locations.
- Storm water flowing within the system is not addressed as part of SWMU 96. Storm water flow within the storm drain system is regulated under the NPDES amendments to the Clean Water Act.
- During the CEARP investigation the storm drain system was reported to have received contaminants from various activities. System discharges were reported to include nonpoint source surface runoff from TA-I, blowdown from an incinerator scrubbing system, and cooling tower blowdown water.
- There were several specific documented releases to the storm drains from facilities in TA-I, including
 - an estimated 1000 gal of hydrochloric acid in 1983,
 - debris believed to be contaminated with chromium from a fire in 1983,
 - an estimated 200 gal of sodium hydroxide in 1984, and
 - an estimated 500 gal of fuel oil (date not recorded).
- Because the original systems were old and deteriorated, a multi-year infrastructure project was undertaken to upgrade the storm drain, sanitary sewer, and domestic water systems. This project was completed in September 2003.

Depth to Groundwater

- The regional aquifer is approximately 535 ft bgs, and a perched aquifer (not a source of drinking water) is approximately 275 ft bgs

Constituents of Concern

- VOCs
- SVOCs
- PCBs
- Metals
- Radionuclides

Investigations

- Several pre-RFI investigations were conducted and documented in the RFI Workplan.
 - A routine environmental surveillance program started in 1992. Sediments and soil samples were collected in discharge and channel areas.
 - In 1992, current and historic discharge areas were sampled near TA-II.
 - In 1993, an in-line camera survey was conducted.
 - Several cross-connects or inadvertent tie-ins from the sanitary sewer to the storm sewer were identified. Soil samples near the cross-connects were collected and analyzed.
 - Pipe deficiencies were identified, and used to define the RFI sampling locations for SWMU 96.
 - In 1993 and 1994, soil samples were collected and analyzed near Building 870 as part of a major renovation of that building.
- RFI site characterization for SWMU 96 was conducted in 1995. Using the results of the 1993 in-line camera survey, soil and sediment samples were collected from storm drain inlets and outlets, and near breaks in the underground lines. Fifty-five soil samples were collected and analyzed for VOCs, SVOCs, PCBs, metals and radionuclides.
- In 1998, twenty-nine additional soil samples were collected at two storm-drain inlets and five storm-drain outfall areas. The samples were analyzed for VOC, SVOCs, PCBs, metals and radionuclides.
- In 2002, 22 soil samples were collected in the vicinity of the old sampling locations. The samples were analyzed for VOCs, SVOCs, PCBs, RCRA metals, and radionuclides but the specific COCs analyzed at each location varied.
- Also in 2002, 33 locations were sampled for a systematic plutonium survey of the surface soil. There were no detection of plutonium.

Summary of Data Used for NFA Justification

- Results of the 1995, 1998, and 2002 activities were combined and indicated that VOCs, SVOCs and total PCBs were detected. Numerous metals were detected above background values, and background activities for tritium and U-238 were exceeded. Pu-238 and Pu-239 were detected.

Recommended Future Land Use

- Industrial land use was established for this site.

Results of Risk Analysis

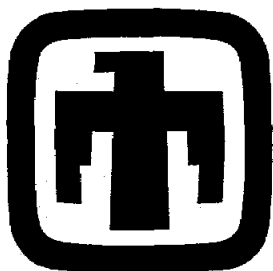
- Risk assessment results for the residential scenario are calculated per NMED risk assessment guidance as presented in "Supplemental Risk Document Supporting Class 3 Permit Modification Process" (SNL October 2003).
- Because COCs were present in concentrations greater than background-screening levels or because constituents were present that did not have background-screening numbers, it was necessary to perform a risk assessment for the site. The risk assessment analysis evaluated the potential for adverse health effects for the residential land-use scenario.
- The maximum concentration for total PCBs was 0.36 mg/kg. This concentration is less than the EPA screening level of 1 mg/kg (40 CFR §761). Because the maximum concentration for PCBs at this site is less than the screening level, PCBs were eliminated from further consideration in the human health risk assessment.
- The total human health HI was 11.19 for the residential land-use scenario, which is greater than the NMED guideline of 1. The total estimated excess cancer risk was 2E-4 for the residential land-use scenario, which is above the NMED guideline of 1E-5. However using the UCL of the average concentrations for the main contributors to risk (arsenic, barium, cadmium, silver, thallium, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(k)fluoranthene, indeno(1,2,3-c,d) pyrene, naphthalene, and phenanthrene), the total HI was reduced to 0.97 and the total estimated excess cancer risk was reduced to 9.9E-6. Thus, by using realistic concentrations in the risk calculations that more accurately depict actual site conditions, the total risk calculations are below NMED guidelines.
- The residential land-use scenario incremental TEDE was 1.2E-1 mrem/yr, which is below the EPA numerical guideline of 75 mrem/yr. Therefore, SWMU 96 is eligible for unrestricted radiological release.
- Using the SNL predictive ecological risk assessment methodology, the ecological risk for SWMU 96 is predicted to be low.
- In conclusion, human health and ecological risks are acceptable per NMED guidance. Thus, SWMU 96 is proposed for CAC without institutional controls.

COC Name	Maximum Concentration UCL (mg/kg)	Screening Level		Cancer Risk
		Background	IF + Below Background	
Arsenic	7.37 E-05	0.17	0.17	1.1E-05
Barium	1.00 E-01	0.17	0.17	1.1E-05
Cadmium	1.1 E-05	0.17	0.17	1.1E-05
Chromium VI	0.05	0.17	0.17	1.1E-05
Cobalt	0.17	0.17	0.17	1.1E-05
Copper	0.17	0.17	0.17	1.1E-05
Mercury	0.17	0.17	0.17	1.1E-05
Nickel	0.17	0.17	0.17	1.1E-05
Selenium	0.17	0.17	0.17	1.1E-05
Silver	0.17	0.17	0.17	1.1E-05
Thallium	0.17	0.17	0.17	1.1E-05
Vanadium	0.17	0.17	0.17	1.1E-05
Zinc	0.17	0.17	0.17	1.1E-05
Antimony	0.17	0.17	0.17	1.1E-05
Asbestos	0.17	0.17	0.17	1.1E-05
Benzene	0.17	0.17	0.17	1.1E-05
Chlorobenzene	0.17	0.17	0.17	1.1E-05
Dibenz(a,h)anthracene	0.17	0.17	0.17	1.1E-05
Dibenz(a,k)anthracene	0.17	0.17	0.17	1.1E-05
Dibenz(b,h)anthracene	0.17	0.17	0.17	1.1E-05
Dibenz(k)fluoranthene	0.17	0.17	0.17	1.1E-05
Indeno(1,2,3-c,d)pyrene	0.17	0.17	0.17	1.1E-05
Naphthalene	0.17	0.17	0.17	1.1E-05
Phenanthrene	0.17	0.17	0.17	1.1E-05
Pyrene	0.17	0.17	0.17	1.1E-05
Benzo(a)anthracene	0.17	0.17	0.17	1.1E-05
Benzo(a)pyrene	0.17	0.17	0.17	1.1E-05
Benzo(b)fluoranthene	0.17	0.17	0.17	1.1E-05
Benzo(k)fluoranthene	0.17	0.17	0.17	1.1E-05
Fluorene	0.17	0.17	0.17	1.1E-05
Acenaphthylene	0.17	0.17	0.17	1.1E-05
Acenaphthene	0.17	0.17	0.17	1.1E-05
Fluoranthene	0.17	0.17	0.17	1.1E-05
Pyrene	0.17	0.17	0.17	1.1E-05
Benzo(a)anthracene	0.17	0.17	0.17	1.1E-05
Benzo(a)pyrene	0.17	0.17	0.17	1.1E-05
Benzo(b)fluoranthene	0.17	0.17	0.17	1.1E-05
Benzo(k)fluoranthene	0.17	0.17	0.17	1.1E-05
Indeno(1,2,3-c,d)pyrene	0.17	0.17	0.17	1.1E-05
Naphthalene	0.17	0.17	0.17	1.1E-05
Phenanthrene	0.17	0.17	0.17	1.1E-05
Pyrene	0.17	0.17	0.17	1.1E-05
Total	11.19	0.17	0.17	1.1E-05

For More Information Contact

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Sandia National Laboratories

**Justification for Class III Permit Modification
March 2005**

**SWMU 96
Operable Unit 1302
Storm Drain System at Technical Area I**

NFA Originally Submitted May 1997

RSI Response June 1998

Expanded Response to Technical Comments December 2003

RSI Response September 2004

**Environmental
Restoration
Project**



**United States Department of Energy
Sandia Site Office**



ER/REQ/MAW

Department of Energy

Field Office, Albuquerque
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P.O. Box 5400
Albuquerque, New Mexico 87115

MAY 22 1997

INFORMATION COPY

SHEARS # 30068

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Benito Garcia, Bureau Chief
New Mexico Environment Department
Hazardous and Radioactive Materials Bureau
2044 Galisteo Street
P.O. Box 26110
Santa Fe, NM 87505-2100

Dear Mr. Garcia:

Enclosed are two copies of the seventh submission of No Further Action (NFA) proposals for Sandia National Laboratories/New Mexico (SNL/NM), ID Number NM5890110518-1. Nine SNL/NM environmental restoration sites are included in this package:

OU 1295

- Site 144 Building 9980 Septic System
- Site 145 Building 9981/9982 Septic System
- Site 147 Building 9925 Septic System

OU 1302

- Site 42 Acid Spill Water Treatment Facility
- Site 96 Storm Drain System
- Site 187 TA-I Sanitary Sewer Lines
- Site 226 Old Acid Waste Line

OU 1333

- Site 12A Open Dump: Lurance Canyon Burn Site

OU 1335

- Site 112 Explosive Contaminated Sump (Building 9956)

Ecological risk assessments are not included with these proposals, but will be submitted as addenda following an agreement between NMED and DOE regarding how these assessments will be conducted and presented.

Three of the sites listed above (Sites 96, 187, and 226) are expected to be impacted by a Tech Area I storm and sanitary sewer system upgrade. Both systems, which are 30 to 50 years old, are deteriorated and undersized, and upgrading of the systems will be environmentally beneficial. This project has been funded in the amount of \$15.4 million by the US Congress as a line item in the federal budget. The majority of the repairs on these systems can be achieved in-situ by slip-lining portions of degraded lines. However, excavation and removal for access and partial replacement will be required at several locations throughout the systems during the upgrade project, and this work will be greatly affected by the regulatory status of the ER sites. It is very possible that a delay in proceeding with the project would result in a loss of funding due to intense competition for funds among various Federal agencies. As a result, we request that these sites be given a priority for review so that we may address any comments as expeditiously as possible.

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MAY 22 1997

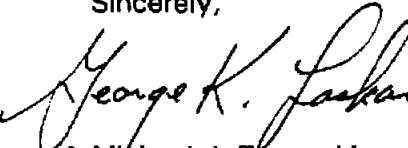
Mr. Benito Garcia

(2)

We are willing to meet with your staff at their convenience to give them a short briefing on the NFA proposals and answer any questions they may have on the upgrade project's potential impacts on the ER sites.

If you have any questions, or would like to schedule a meeting, please contact John Gould at (505) 845-6089, or Mark Jackson at (505) 845-6288.

Sincerely,


Michael J. Zamorski
Acting Area Manager

Enclosures

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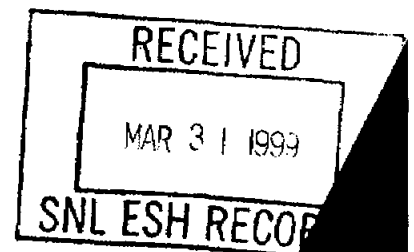
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SUBMISSION OF NO FURTHER ACTION NFA PROPOSALS
FOR SANDIA NATIONAL LABORATORIES NEW MEXICO
ID NUMBER NMS890110518 1



**PROPOSAL FOR
RISK-BASED NO FURTHER ACTION
ENVIRONMENTAL RESTORATION SITE 96
STORM DRAIN SYSTEM
OPERABLE UNIT 1302
May 1997**

Prepared by
Sandia National Laboratories/New Mexico
Environmental Restoration Project
Albuquerque, New Mexico

Prepared for
U.S. Department of Energy

TABLE OF CONTENT

1.0 INTRODUCTION.....	1-1
1.1 ER Site Identification Number and Name	1-1
1.2 SNL/NM NFA Process	1-1
1.3 Local Setting	1-1
2.0 HISTORY OF THE SWMU.....	2-1
2.1 Sources of Supporting Information	2-1
2.2 Previous Audits, Inspections, and Findings	2-1
2.3 Historical Operations	2-2
3.0 EVALUATION OF RELEVANT EVIDENCE.....	3-1
3.1 Unit Characteristics	3-1
3.2 Operating Practices	3-1
3.3 Presence or Absence of Visual Evidence	3-1
3.4 Results of Previous Sampling Surveys.....	3-1
3.5 Assessment of Gaps in Information	3-2
3.6 Confirmatory Sampling	3-2
3.6.1 Project Summary.....	3-2
3.6.1.1 Health and Safety Monitoring	3-2
3.6.1.2 In-Line Camera Survey	3-2
3.6.1.3 Drilling Program	3-3
3.6.1.4 Soil Collection.....	3-3
3.6.1.5 Sample Packaging and Shipping	3-4
3.6.1.6 Survey Soil Borehole Locations	3-4
3.6.1.7 Field Quality Control Samples	3-4
3.6.2 Data Management.....	3-5
3.6.3 Analytical Data Summary.....	3-6
3.6.3.1 Analytical Methods.....	3-6
3.6.1.2 Subsurface Soil Sample Results	3-6

3.6.1.3 Sediment Sample Results	3-7
3.6.1.4 Quality Control Samples.....	3-8
3.6.2 Statistical Analysis/Evaluation of Concentrations.....	3-9
3.6.2.1 Subsurface Soil Evaluation	3-10
3.6.2.2 Sediment Evaluation	3-11
3.7 Risk Analysis.....	3-13
3.7.1 Human Risk Analysis	3-13
3.7.2 Ecological Risk Analysis	3-14
3.8 Rationale for Pursuing a Risk-Based NFA Decision	3-14
4.0 CONCLUSION.....	4-1
5.0 REFERENCES.....	5-1

APPENDICES

Appendix A: ER Site 96 Figure

Appendix B: Section 5.10 of the TA-I RFI Work Plan (SNL/NM, 1995)

Appendix C: ER Site 96 Tables

Appendix D: ER Site 96 Risk Assessment Analysis Report

ACRONYMS

ARCOC	Analysis Request and Chain of Custody
CAB	cellulose acetate butyrate
CEARP Program	Comprehensive Environmental Assessment and Response
COC	constituents of concern
DOE	Department of Energy
DV	data verification/validation
EPA	Environmental Protection Agency
ER	Environmental Restoration
ERDMS	ER data management system
FID	flame ionization detector
GPS	global positioning system
LAL	Lockheed Analytical Laboratory
MDA	minimum detectable activity
ml	milliliter
mrem	millirem
MS	matrix spike
MSD	matrix spike duplicate
NEPA	National Environmental Policy Act
NFA	No Further Action
NMED	New Mexico Environmental Department
NPDES	National Pollutants Discharge Elimination System
PCB	polychlorinated biiphenyl
pCi/g	picocuries per gram
PID	photoionization detector
PIP	Program Implementation Plan
ppb	parts per billion
ppm	parts per million
PRS	potential release site
Pu	plutonium
QC	quality control
RCRA	Resource Conservation and Recovery Act

RFI	RCRA Facility Investigation
RL	reporting limit
SMO	SNL/NM Sample Management Office
SNL/NM	Sandia National Laboratories/New Mexico
SVOC	semi-volatile organic compound
SWMU	solid waste management unit
TA	technical area
TAL	target analyte list
U	uranium
UTL	upper tolerance limit
VCM	Voluntary Corrective Measure
VOC	volatile organic compound
yr	year

1.0 INTRODUCTION

Sandia National Laboratories/New Mexico (SNL/NM) is proposing a No Further Action (NFA) decision for Environmental Restoration (ER) Site 96 determined by risk based analysis with confirmatory sampling (NFA Criterion 5; NMED et al. 1995).

1.1 ER Site Identification Number and Name

ER Site 96 (herein referred to as the site) is the Storm Drain System, and is included in Operable Unit 1302. The Storm Drain System was listed as Site 96 based on information obtained during the Comprehensive Environmental Assessment and Response Program (CEARP) Phase I interviews. (DOE, 1987). The original ER site name was the Storm Drain System (Active). The ER site name was changed to the Storm Drain System during the development of the TA-I RFI Work Plan (SNL/NM, 1995).

1.2 SNL/NM NFA Process

The basis for proposing an NFA is thoroughly described in Section 4.5.3 of the Draft *Program Implementation Plan (PIP) for Albuquerque Potential Release Sites* (SNL/NM, 1994a), and in Annex B of the *Environmental Restoration Document of Understanding* (NMED et al., 1995). ER Site 96 is being proposed for a risk based, confirmatory sampling NFA decision based on NFA Criterion 5. The potential release site (PRS) has been characterized in accordance with current applicable state or federal regulations, and the available data indicate that contaminants pose an acceptable level of risk under current and projected future land use.

1.3 Local Setting

The original storm drain system was constructed between 1948 and 1950. The system collects storm water runoff from TA-I, -II, and -IV. The majority of the storm water flows from east to west with the terrain across SNL/NM. For TA-I, the water is conveyed through a series of open channels and underground lines from north to south to the Tijeras Arroyo. The system was developed in three watersheds and is described in a drainage system analysis (Bohannon-Huston, Inc., 1993). ER Site 96 only covers the storm drain system in and around TA-I (Appendix A, Plate 1-1). The site boundaries are assumed to be the limits of areas where potential constituents of concern (COCs) have been detected near breaks in the lines or at the outfall locations. Any storm water flowing within the system will not be addressed in this NFA. Storm water flow within the storm drain system is

regulated under the National Pollutant Discharge Elimination System (NPDES) amendments to the Clean Water Act (SNL/NM, 1993). The NPDES Permit application was submitted to the EPA on October 1, 1992.

2.0 HISTORY OF THE SWMU

This section provides a summary of the historical information that has been obtained at the site.

2.1 Sources of Supporting Information

Detailed information regarding the site is provided in the following documents.

- *Comprehensive Environmental Assessment and Response Program (CEARP), Phase I: Installation Assessment, Sandia National Laboratories, Albuquerque, New Mexico [DRAFT] (DOE, 1987).*
- *Final RCRA Facilities Assessment Report of Solid Waste Management Units at Sandia National Laboratories, Albuquerque, New Mexico (EPA, 1987).*
- *Program Implementation Plan for Albuquerque Potential Release Sites [Draft] (SNL/NM, 1994a).*
- *Technical Area I (ADS 1302) RCRA Facility Investigation Work Plan (SNL/NM, 1995).*

2.2 Previous Audits, Inspections, and Findings

The site was first listed as a potential SWMU by the *Comprehensive Environmental Assessment and Response Program (CEARP), Phase I: Installation Assessment, Sandia National Laboratories, Albuquerque, New Mexico [DRAFT] (DOE, 1987)*. The listing resulted from information collected during the Phase I interviews in which the system was reported to have received contaminants from various activities. System discharges were reported to include nonpoint source surface runoff from TA-1, blowdown from an incinerator scrubbing system, and cooling tower blowdown water (possibly containing chromates and other antifoulants). There were several specific releases to the storm drains recorded in the CEARP report (DOE, 1987).

- An estimated 200 gal of 20 percent sodium hydroxide spilled from an aboveground tank at ER Site 42, Wastewater Treatment Facility for discharges from Building 870, in 1984.

- An estimated 1000 gal of 30 percent hydrochloric acid was released from an aboveground tank at the Wastewater Treatment Facility near Building 870, ER Site 42, in 1983.
- A cooling tower on the roof of Building 806 caught fire in 1983 and wood slats that were believed to have been contaminated with chromium burned. Much of the debris was reported to have been washed down the drain.
- An estimated 500 gal of Number 2 fuel oil from a tank overflow was released to the storm drain system; the location of the tank was not reported.

2.3 Historical Operations

The storm drain system has been in continuous operation since its construction in 1950.

3.0 EVALUATION OF RELEVANT EVIDENCE

The section summarizes the data collected and evaluated from operational practices, previous investigations, and the RFI investigation.

3.1 Unit Characteristics

The storm drain system is an operational unit within TA-I. All operational safeguards are overseen by TA-I facility personnel.

3.2 Operating Practices

Hazardous wastes were not managed or contained at the site. However, hazardous wastes have entered through the lines and may have been released to the surrounding soils from breaks in the lines.

3.3 Presence or Absence of Visual Evidence

No visual evidence of hazardous waste constituents was seen on the surface or in soil samples collected for chemical and radionuclide analyses during the ER Site 96 RFI field investigation.

3.4 Results of Previous Sampling Surveys

Several previous investigations have been conducted in and around the storm drain system. These investigations have included a soil sampling program associated with cross-connections between the storm drain system and sanitary sewer system (IT Corp., 1993); sediment and soil sampling in discharge and channel areas west of TA-II (IT Corp., 1992); and soil sampling during the removal (and relocation) of the storm drain system at Building 870 (PCR, 1993).

All sample results and documentation associated with the investigations that had previously been conducted were documented in the TA-I RFI Work Plan (SNL/NM, 1995). In summary, the data gathered prior to the TA-I RFI indicated no contamination associated with the cross-connections investigation; radionuclides were detected, but the values were consistent with SNL/NM background levels at the discharge and channel areas investigation; and several metals were detected, but below SNL/NM background levels at Building 870.

3.5 Assessment of Gaps in Information

The RFI field investigation was designed to fully characterize each area of potential concern within the site. The RFI Sampling and Analysis Plan for this site is provided in Appendix B.

3.6 Confirmatory Sampling

The following subsection provides a summary of the RFI field investigation and the evaluation of the data collected/analyzed during the investigation.

3.6.1 Project Summary

The objectives of the field investigation were to determine the potential vertical and horizontal extent of soil contamination at breaks in the underground lines and at the system's inlet and outfall locations. The potential constituents of concern are acids, bases, petroleum hydrocarbons, metals, chlorinated solvents, alcohols, PCB's, and radionuclides. These COCs were determined by past spills, tank overflows, operational discharges, sanitary sewer system cross-connections, and nonpoint source runoff.

The ER Site 96 field investigation began June 13, 1995 and was completed July 11, 1995. The field activities included an in-line camera survey of the sewer lines, drilling soil boreholes, collecting sediment samples from storm drain inlets and outfalls for chemical and radionuclide analysis, collecting subsurface soil samples for chemical and radionuclide analysis, collecting waste samples for chemical and radionuclide analysis, handling the waste generated during drilling, and surveying borehole locations.

3.6.1.1 Health and Safety Monitoring

A photoionization detector (PID) and/or flame ionization detector (FID) was used to monitor the breathing zone around the drilling operations and the general background area for organic vapors during soil borehole activities. In addition, a pancake probe was used to monitor the alpha and beta/gamma radiation. The PID and FID readings for the breathing zone and the general area were no greater than background readings for all soil boreholes. The pancake probe readings ranged from 25 to 75 counts per minute and were within normal background levels.

3.6.1.2 In-Line Camera Survey

During the spring of 1993, an in-line camera survey was conducted in the storm drain system. These data were used to identify pipe deficiencies along

the storm drain system. This was a major tool for the placement of soil boreholes as discussed in the Work Plan (SNL/NM, 1995). For this field investigation, an in-line camera survey was conducted to confirm the exact location of the pipe deficiency for soil borehole placement. The camera crew located the in-line problem and then marked aboveground the location/depth of the pipe deficiency. This survey placement ensured that the location to be sampled was accurately identified.

3.6.1.3 Drilling Program

The drilling program was conducted using a truck mounted Geoprobe® drill rig. A portable auger drill rig was used at two locations where the Geoprobe® could not gain access. A total of 55 soil borings (T1096-GP-001 through T1096-GP-055) were placed along the storm drain system (Appendix A, Plate 1-1).

- Boreholes T1096-GP-001 through T1096-GP-043 and T1096-GP-046 through T1096-GP-055 were drilled with the Geoprobe® rig.
- Boreholes T1096-GP-044 and T1096-GP-045 were drilled with the portable auger drill rig.
- Soil borehole numbers T1096-GP-012, T1096-GP-032, and T1096-GP -049 were used to identify duplicate soil samples collected during the project and are not shown on Plate 1-1 (Appendix A).

3.6.1.4 Soil Collection

Soil samples were collected approximately 18 inches below the storm drain at each borehole using the Geoprobe® rig and/or portable auger rig equipped with a 2.5 inch outside diameter by 24 inches long core sampler which was lined with a cellulose acetate butyrate (CAB) sleeve. Samples were collected at a depth ranging from 3 to 10 feet bgs. Upon removal of the CAB liner from the sampler, one 6-inch section was cut from the liner. This section was sealed with tape and prepared for shipment to the off-site laboratory for VOC analyses. The remaining sample was composited, placed into appropriate containers, and also prepared for shipment to the off-site for SVOC, PCB, Target Analyte List (TAL) metals, isotopic uranium, plutonium, and tritium. A container was sent to the on-site laboratory for gamma spectroscopy analyses. Usually two sampling runs with the Geoprobe® were required to collect enough soil sample for these analyses.

The samples collected and the analyses performed on these samples are provided in Appendix C, Table 1. Fifty-five soil samples were collected and

sent to the off-site laboratory for VOC, SVOC, PCB, TAL metal, isotopic uranium, isotopic plutonium, and tritium analyses. Fifty-three samples were sent to the on-site laboratory for gamma spectroscopy.

An additional 29 sediment samples (TI096-SD-001 to TI096-SD-029) were collected at two storm drain inlets and five storm drain outfall areas (Appendix A, Plate 1-1). One sediment sample was collected from each inlet area and five sediment samples were collected at each of the outfall areas. Sediment sample numbers TI096-SD-008 and TI096-SD-024 were used to identify duplicate sediment samples collected during the project. These samples were sent to the same laboratories and analyzed for the same parameters as the subsurface soil samples.

3.6.1.5 Sample Packaging and Shipping

Soil samples sent to the off-site laboratory for VOC analysis were collected in CAB liners or glass bottles containing 125 ml of soil; for SVOCs, PCBs, TAL metals analysis, soils were collected into 500 ml glass bottles; and for isotopic uranium and isotopic plutonium analysis, soils were collected into 500 ml plastic bottles. Soil samples sent to the off-site laboratory for tritium analysis were collected in one liter amber glass bottles. Soil samples sent to the on-site laboratory for gamma spectroscopy analysis were collected in 500 ml Marenelli beakers. All liner and bottle sets were labeled, sealed with custody tape, and placed in a protective bubble-wrap Ziplock bag. The soil samples were placed on ice in the field and cooled to 4°C.

Samples were delivered to the SNL/NM Sample Management Office (SMO) on a daily basis. SMO personnel performed cross-checking of the information on the sample labels against the data on the ARCOCs, and prepared samples for shipment. Samples were shipped by overnight delivery to the off-site laboratories for chemical and radionuclide analyses. The gamma spectroscopy samples were delivered to the on-site laboratory the same day as delivery to SMO.

3.6.1.6 Survey Soil Borehole Locations

Soil borehole and sediment locations were surveyed with global positioning system (GPS) equipment. The GPS data included northing and easting coordinates for each borehole. The soil boring elevations were determined by topographic maps.

3.6.1.7 Field Quality Control Samples

Four types of field QC samples were shipped for analysis during the field investigation: field duplicate subsurface soil and sediment samples, equipment rinsate blank samples, soil and water trip blank samples, and field soil blank samples. Additional soils were collected for matrix spike/matrix spike duplicate (MS/MSD) analysis. Sample number, date/time of sample event, location, and analysis performed are presented in Appendix C, Table 1.

Five (three subsurface soil and two sediment) field duplicate samples were collected and analyzed for the same parameters as their corresponding samples. The subsurface soil samples were collected by splitting the CAB sleeve crosswise in two pieces for VOC analysis. For the remaining analysis, soils were removed from the CAB sleeves into a stainless steel bowl and composited, then transferred into appropriate containers. The sediment samples were collected by scooping up the dirt, compositing, and placing it in the appropriate containers.

Five equipment rinsate blank samples were collected from deionized water poured over the equipment after decontamination of the sampling equipment. The samples were analyzed for all parameters for which soil samples were analyzed.

Five field blank soil samples were exposed (open jar) to atmospheric conditions around the drilling/sampling operation and analyzed for VOCs only. The field blanks, which consisted of glass bottles filled with clean soils were supplied by the SMO field office.

Trip blank samples were submitted with each shipment which contained samples for VOC analysis. Twenty trip blanks (14 soil and 6 water) accompanied the sample containers to the field and back to the laboratory.

3.6.2 Data Management

Upon sample shipment to the off-site laboratories, sample information was entered into a database to track the status of each sample. Upon completion of the laboratory analyses, SMO received analytical results in a summary data report and laboratory QC report.

The data summary (Certificate of Analysis) reports were reviewed by the SMO for completeness and accuracy as required by SNL/NM TOP 94-03 (SNL/NM, 1994b). Data validation was performed using SNL/NM Data Verification/Validation (DV) Level 1 (DV1) and Level 2 (DV2) checklists.

SMO submitted the original ARCOs, the Certificate of Analysis Reports, and the DV1/DV2 review reports to the Environmental Operations Record Center. In addition, the laboratories submitted analytical data in an electronic format for loading into the ER data management system (ERDMS). All chemical analytical data tables generated for this report were downloaded through the ERDMS except gamma spectroscopy data.

3.6.3 Analytical Data Summary

This section discusses the analytical methods and the analytical results of the subsurface soil and sediment samples.

3.6.3.1 Analytical Methods

Subsurface soil and sediment samples sent to the off-site laboratory were analyzed by the following approved EPA methods: Method 8240/8260 for VOCs, Method 8270 for SVOCs, Method 8080 for PCBs, Method 6010 for TAL metals, and Methods 7471/7470 for mercury. For the radionuclide samples, the off-site laboratory used EPIA-011/-011B for isotopic uranium, EPIA-012/-012B for isotopic plutonium, and isotopic thorium (waste sample only). The tritium samples were analyzed by the off-site laboratory using method LAL-91-SOP-0067. In addition, the gamma spectroscopy were analyzed by SNL/NM approved analytical procedures by the on-site laboratory.

Analytical results for organic compounds listed "J" values for some compounds. A "J" indicates an estimated value for a compound detected at a level less than the reporting limit but greater than the method detection limit. Data results flagged as "J" values are included in the data summary tables used in this report; however, because "J" values may represent false-positive concentrations, care should be used when evaluating these analytical results.

3.6.1.2 Subsurface Soil Sample Results

A total of 55 subsurface soil samples (includes three field duplicates) were sent to the off-site laboratories for analysis. Table 2 (Appendix C) summarizes the VOC analytical results. Table 3 (Appendix C) summarizes the SVOC analytical results. Table 4 (Appendix C) summarizes the PCB analytical results. Metal analytical results are provided in Table 5 (Appendix C). Table 6 (Appendix C) summarizes the radionuclide analytical results. Gamma spectroscopy analytical results are located in the SNL/NM Environmental Operations Record Center.

- All samples were either non-detect or J values for VOCs except acetone, which had two elevated values at 47.6 and 26.4 ppb. The J value compounds were acetone, methylene chloride, and chloromethane.
- All samples were either non-detect or J values for SVOCs except for 13 compounds with elevated values at three sample locations. The majority of these elevated values are associated with the sample collected at TI096-GP-011.
- All samples were non-detect except for one J value (only one sample) for PCBs.
- A complete discussion of the metal results is provided in Section 3.6.2.1.
- Plutonium (Pu)-238, Pu-233/234, Uranium (U)-233/234, U-238, and tritium were detected with elevated values above reporting limits. Four samples had elevated values of Pu-238 with the highest value at 0.934 ± 0.121 pCi/g. One value of Pu-239/240 was detected at 0.0434 ± 0.0191 pCi/g. Thirty-six samples had elevated values of U-233/234 with the highest value at 1.53 ± 0.184 pCi/g. Thirty-three samples had elevated values of U-238 with the highest value at 1.41 ± 0.139 pCi/g. Seven samples had elevated values of tritium with the highest at $16,200 \pm 1,000$ pCi/L. U-235 was not detected above its reporting limit.
- Gamma spectroscopy results were within background levels.

3.6.1.3 Sediment Sample Results

A total of 29 sediment samples (includes two field duplicates) were sent to the off-site laboratories for analysis. Table 2 (Appendix C) summarizes the VOC analytical results. Table 3 (Appendix C) summarizes the SVOC analytical results. Table 4 (Appendix C) summarizes the PCB analytical results. Metal analytical results are provided in Table 7 (Appendix C). Table 6 (Appendix C) summarizes the radionuclide analytical results. Gamma spectroscopy analytical results are located in the SNL/NM Environmental Operations Record Center.

- All samples were either non-detect and/or J values for VOCs except for acetone and toluene. Toluene had three detects ranging from 12.4 to 39.3 ppb and acetone had five detects ranging from 22.4 to 43.7 ppb.
- All samples were either non-detect and/or J values for SVOCs except for 10 compounds with elevated values at nine sample locations. The

majority of these elevated values are associated with the samples (T1096-SD-001 through T1096-SD-005) collected at the 9th and Hardin Streets outfall.

- Three PCB compounds (Aroclors 1254, 1260, and 1262) were detected with elevated values at four of the five outfall sample locations. At the 9th and Hardin Streets outfall (sample numbers, T1096-SD-001 to -005), Aroclor 1254 was detected once at 164 ppb, Aroclor 1260 had two elevated values at 94.1 and 196 ppb, and Aroclor 1262 was detected twice at 91.7 and 97.6 ppb. At the M Street curve outfall (sample numbers, T1096-SD-006 to -011), Aroclor 1262 had five elevated values ranging from 64.7 to 197 ppb. At the M Street outfall near Building 897 (sample numbers; T1096-SD-012 to -016); Aroclor 1260 had one elevated value at 66.3 ppb and Aroclor 1262 had two elevated values at 62.8 and 70 ppb. At the ditch location east of Buildings T-4, T-24, and T-25 (sample numbers, T1096-SD-017 to -021), Aroclor 1260 had five detections ranging from 47.4 to 163 ppb and Aroclor 1254 was detected once at 45.8 ppb. One outfall (at the corner of 20th and Hardin Streets) and two inlet locations were non-detect for PCBs. All remaining samples were non-detects and J values.
- Only two metals, antimony and selenium, were non-detect for all samples. A complete discussion of the metal results is provided in Section 3.6.2.2.
- Pu-238, (U)-233/234, and U-238 were detected with elevated values above the reporting limit. One elevated value of Pu-238 was detected at 0.0697 ± 0.0641 pCi/g. One elevated value of U-233/234 was detected at 0.903 ± 0.128 pCi/g, and one elevated value of U-238 at 0.905 ± 0.128 pCi/g. U-235 was not detected above its reporting limit (0.09 pCi/g).

Gamma spectroscopy results were within background levels.

3.6.1.4 Quality Control Samples

All trip blanks either yielded non-detect or J values for all VOC analyses except for acetone (eight samples) with values ranging from 21 to 177 ppb (Appendix C, Table 2). Soil sample and associated trip blank results indicate no significant sample contamination by VOCs field and shipment sources.

All equipment rinsate blanks were non-detect for all VOC and PCB analyses. SVOCs were non-detect for all samples except one elevated value (44.5 ppb) of bis(2-ethylhexyl)phthalate (Appendix C, Table 3). Radionuclide compounds were either detected at/or below laboratory reporting limits.

Metals were either non-detect or J values except for low elevated hits for calcium, iron, sodium, magnesium, mercury, nickel, and zinc.

All field blanks either yielded non-detect or J values for all VOC analyses except acetone ranging from 24.1 to 116 ppb (Appendix C, Table 2). In addition, 2-butanone was detected in one sample at 26.2 ppb. The sample results indicate no sample contamination by VOCs during field activities and daily TA-I facility operations.

The subsurface soil and sediment field duplicate sample results were consistent with their corresponding confirmation sample results.

3.6.2 Statistical Analysis/Evaluation of Concentrations

Statistical analysis of the VOC, SVOC, PCB, isotopic plutonium, and tritium results could not be completed, due to the small number of elevated values from Site 96 data and the lack of positive concentrations for the above mentioned compounds from the TA-I background soil investigation (SNL/NM, 1996a).

The chemical and radionuclide data evaluation discussion is provided using the following guidelines: comparing the VOC, SVOC, and PCB analytical results to EPA proposed Subpart S action level for soils (EPA, 1990) and comparing the metal and isotopic uranium analytical results to the background soil data collected during the TA-I field investigation, the site-wide background study for SNL/NM (IT Corp., 1996), and EPA Subpart S action levels for soils (metals only). For updated soil action levels, some values (example, zinc) were taken from "Report of Generic Action Level Assistance for the Sandia National Laboratories/New Mexico Environmental Restoration Program" (IT Corp., 1994). The generic values from this report were made current for guidance through June, 1994 according to RCRA proposed Subpart S methods. Any soil action level used from that report will be referred to as "generic action level for soils". For TA-I background metal and radionuclide analytical results, the UTL/95th values were developed from software package Statgraphics (SNL/NM, 1996a). In addition, the isotopic plutonium results will be compared to the off-site laboratory reporting limit (RL) and the tritium results will be compared to the off-site laboratory minimum detectable activity (MDA).

Based on the soil evaluation (Sections 3.6.2.1 and 3.6.2.2), a risk assessment analysis was completed on certain chemical and radionuclide data that were detected above background levels. Summary of that analysis is provided in Section 3.7.

3.6.2.1 Subsurface Soil Evaluation

VOC results were either non-detect or J values except for acetone for all samples. The two elevated values of acetone (26.4 and 47.6 ppb) were within the range (21 to 177 ppb) of acetone identified in the laboratory trip blank samples. In addition, these levels of acetone are well below the EPA proposed Subpart S action level of 8,000,000 ppb. Based on this data evaluation, VOCs should not be considered COCs for subsurface soils at this site.

SVOC results were either non-detect or J values except in the following 3 categories: compounds detected above the RL, but with no corresponding EPA proposed Subpart S action levels for soils, compounds detected above the RL, but below known proposed Subpart S values, and compounds detected above known proposed Subpart S values (Appendix C, Table 8).

- Seven SVOC compounds were detected above the RL, but with no corresponding proposed Subpart S values: phenanthrene, benzo(k)fluoranthene, chrysene, benzo(a)anthracene, indeno(1,2,3-cd)pyrene, benzo(ghi)perylene, and benzo(b)fluoranthene.
- Five compounds were detected above the RL, but below the proposed Subpart S values: fluorene, fluoranthene, anthracene, pyrene, and bis(2-ethylhexyl)phthalate.
- Only benzo(a)pyrene at 1010 ppb was detected above its proposed Subpart S value of 100 ppb.

These SVOC compounds are commonly associated with asphalt and/or road tars. Due to the heavy construction (i.e.; installing new underground gas lines) associated with the roads inside/around TA-I, pieces of road could have been backfilled around new and/or existing underground utilities. The detected SVOCs could be considered a product of asphalt and/or road tars rather than contamination with leaking pipes. Although these SVOC compounds could be considered products of asphalt and road tars, to better characterize the soil, the SVOCs listed in the three bullets above will be evaluated in the risk assessment analysis.

All PCB results were non-detect (except for one J value result) and should not be considered COCs for subsurface soils at this site.

TAL metals were compared: first, to TA-I background levels; second, to SNL/NM site-wide background levels; and third, to EPA proposed Subpart S action levels and/or the generic action level for soils (Appendix C, Table 9). The metals are within TA-I background levels, SNL/NM background levels,

and/or Subpart S action levels except for common cations: calcium, iron, magnesium, and potassium; and beryllium and cobalt. Although some calcium, iron, magnesium, and potassium values were above background levels, these chemicals are considered essential nutrients and should not be considered COCs for this site. In addition, beryllium was detected below background levels, but above the proposed Subpart S action level for soils. However, beryllium occurs naturally at higher concentrations in the soils within this geologic region and should not be considered a COC for Site 96 (SNL/NM, 1996a). Cobalt will be evaluated in the risk assessment analysis.

Isotopic uranium (U-233/234 and U-238) results were compared first, to TA-I background levels, and second to SNL/NM site-wide background levels (Appendix C, Table 10). These isotopic uranium compounds were within TA-I and SNL/NM background levels except for U-238 at one sample location, TI096-GP-040 with an elevated value of $1.38 \pm .169$ pCi/g. Based on this data evaluation, U233/234 and U-235 should not be considered COCs for soils at this site and U-238 will be evaluated in the risk assessment analysis.

Isotopic plutonium (Pu-238 and Pu-239/240) results were compared to the off-site laboratory RL (Appendix C, Table 6).

- All Pu-238 results were below the RL (0.03 pCi/g) except for 4 samples: TI096-GP-006 ($.136 \pm .0321$ pCi/g), TI096-GP-015 ($.0.331 \pm .0198$ pCi/g), TI096-GP-019 ($.0337 \pm .022$ pCi/g), and TI096-GP-52 ($.094 \pm .121$ pCi/g).
- All Pu-239/240 results were below the RL (0.03 pCi/g) except for one sample, TI096-GP-052, with an elevated value of $0.0434 \pm .0191$ pCi/g.

Based on the data (above the RL), isotopic plutonium will be evaluated in the risk assessment analysis.

Tritium results (Appendix C, Table 6) were compared to the off-site laboratory MDA (ranging from 250 to 820 pCi/L). All tritium results were below the MDA except for 7 samples: TI096-GP-006 ($16,200 \pm 1,000$ pCi/L), TI096-GP-007 ($7,240 \pm 640$ pCi/L), TI096-GP-008 ($11,700 \pm 1,500$ pCi/L), TI096-GP-009 ($6,040 \pm 590$ pCi/L), TI096-GP-010 ($1,300 \pm 320$ pCi/L), TI096-GP-018 (270 ± 230 pCi/L), and TI096-GP-044 (350 ± 230 pCi/L). These tritium sample locations are located in the north to northwest section of TA-I (Appendix A, Plate 1-1). Based on the data (above the MDA), tritium will be evaluated in the risk assessment analysis.

3.6.2.2 Sediment Evaluation

VOC results were either non-detect or J values except for toluene and acetone for all samples. Toluene had three values detected above the RL (10 ppb). The values ranged from 12.4 to 39.4 ppb, but are well below the EPA proposed Subpart S action level of 20,000,000 ppb. The elevated values of acetone, which ranged from 22.4 to 43.7 ppb, were within the range (21 to 177 ppb) of acetone identified in the laboratory trip blank samples.

Therefore, the acetone identified in the sediments were representative of laboratory contamination. In addition, these levels of acetone are well below the EPA proposed Subpart S action level of 8,000,000 ppb. Based on this data (above RL), toluene will be evaluated in the risk assessment analysis.

SVOC results were either non-detect or J values except in the following two categories: compounds detected above the RL, but with no corresponding EPA proposed Subpart S action levels for soils and compounds detected above the RL, but below known proposed Subpart S values (Appendix C, Table 8).

- Seven SVOC compounds were detected above the RL, but with no corresponding proposed Subpart S values: phenanthrene, benzo(k)fluoranthene, chrysene, benzo(a)anthracene, indeno(1,2,3,-cd)pyrene, benzo(ghi)perylene, and benzo(b)fluoranthene.
- Three SVOC compounds were detected above the RL, but below known proposed Subpart S values: fluoranthene, pyrene, and bis(2-ethylhexyl)phthalate.

These SVOC compounds are commonly associated with asphalt and road tars. Due to the heavy construction (i.e.; installing new underground gas lines) associated with the roads inside/around TA-I, pieces of road could have been washed down through the storm drain system and deposited at the outfall locations. The detected SVOCs could be considered a product of asphalt and/or road tars rather than contamination with TA-I building operations. To better characterize the soil, the SVOCs listed in the two bullets above will be evaluated in the risk assessment analysis.

PCB compounds (Aroclor 1254, 1260, and 1262) were detected above RL at four of the five outfall locations. The highest Aroclor 1254 value was 164 ppb, the highest Aroclor 1260 value was 196 ppb, and the highest Aroclor 1262 value was 122 ppb. All these elevated values are above the proposed Subpart S action level for soil of 90 ppb. The SNL/NM ER Project has proposed a cleanup action level of 10,000 ppb for PCB in soils (SNL/NM, 1996b). The regulatory agencies in their review of this plan did not comment on or request a lower action level; however, the agencies have

provided guidance of a numerical cleanup criteria of 10 ppm (10,000 ppb) in a commercial scenario and 1 ppm (10 ppb) in a residential scenario (Klavetter and Knowlton, 1996). Because the levels of PCBs identified in the sediments of the storm drain system fall between these values (with the greatest concentration being 1.9 ppm), PCB's were included in the risk assessment analysis.

TAL metals were compared: first, to TA-I background levels; second, to SNL/NM site-wide background levels; and third, to EPA proposed Subpart S action levels and/or the generic action level for soils (Appendix C, Table 11). The metals are within TA-I background levels, SNL/NM background levels, and/or Subpart S action levels except for beryllium, chromium, and potassium. Although some potassium values were above background levels, this chemical is considered an essential nutrient and should not be considered a COC for this site. In addition, beryllium was detected below background levels, but above the proposed Subpart S action level for soils. However, beryllium occurs naturally at higher concentrations in the soils within this geologic region and should not be considered a COC for Site 96 (SNL/NM, 1996b). Chromium will be evaluated in the risk assessment analysis.

Isotopic uranium (U-234/234, and U-238) results were compared: first, to TA-I background levels; and second, to SNL/NM site-wide background levels (Appendix C, Table 10). These isotopic uranium results were within TA-I background levels and SNL/NM background levels and should not be considered COCs for this site. Isotopic plutonium (Pu-238 and Pu-239/240) results were compared to the off-site laboratory RL. All Pu-238 results were below the RL (0.03 pCi/g) except for one sample: T1096-SD-017 at $.0439 \pm .235$ pCi/g (Appendix C, Table 6). All Pu-239/240 results were below the RL (0.03 pCi/g). Tritium results were compared to the off-site laboratory MDA (ranging from 250 to 820 pCi/L) and all values were below the MDA and should not be considered a COC for this site. Based on the data (above RL), Pu-238 will be evaluated in the risk assessment analysis.

3.7 Risk Analysis

The following subsections summarize the results of the risk assessment process for both human and ecological risk related factors.

3.7.1 Human Risk Analysis

Site 96 has been recommended for industrial land-use (DOE, 1996). A complete discussion of the risk assessment process, results, and uncertainties is provided in Appendix D. Due to the presence of several metals, PCBs, and radionuclides in concentrations greater than background

levels, it was necessary to perform a human health risk assessment analysis for the site. Besides metals, any organics detected above their reporting limits and any radionuclide compounds either detected above background levels and/or MDAs were included in this assessment. The risk assessment process results in a quantitative evaluation of the potential adverse human health effects caused by constituents in the site's soil. The risk assessment report calculated the Hazard Index and excess cancer risk for both an industrial land-use and residential land-use setting. The excess cancer risk from nonradioactive COCs and the radioactive COCs is not additive (EPA, 1989).

In summary, the Hazard Index calculated for chemical compounds is 0.1 and the incremental Hazard Index is 0.06 for an industrial land-use setting, which is less than the numerical standard of 1.0 suggested by risk assessment guidance (EPA, 1989). The excess cancer risk for chemical compounds is estimated to be 2.0×10^{-5} and the incremental excess cancer risk is 1.8×10^{-5} in an industrial land-use setting, which is in the middle of the suggested range of acceptable risk of 10^{-6} and 10^{-4} (EPA, 1989). The excess cancer risk for radionuclides is 7×10^{-7} for industrial land-use scenario, which is much less than risk values calculated due to naturally occurring radiation and from intakes considered background concentration values. In addition, the estimated effective dose equivalent for an industrial land-use setting is 0.06 mrem/yr; this value is well below the standard dose limit of 15 mrem/yr (40CFR196, 1994).

The residential land-use scenarios for this site are provided only for comparison in the risk assessment report (Appendix D). The report concludes that Site 96 does not have significant potential to affect human health under an industrial land-use scenario.

3.7.2 Ecological Risk Analysis

It is unlikely that activities or COCs at Site 96 will have much impact on ecological risk. TA-I is an industrial complex and has been heavily disturbed by humans for over 50 years. Given the amount of known and potential human intrusion, a great diversity or abundance of nonhuman species is unlikely. Much of the relevant ecological information for TA-I can be found in the National Environmental Policy Act (NEPA) compliance document (SNL/NM, 1992).

3.8 Rationale for Pursuing a Risk-Based NFA Decision

Fifty-five soil borehole locations were drilled around the TA-I storm drain system. The data evaluation for the subsurface soil samples shows no VOC

or PCB contamination, but some SVOC, TAL metals, and radionuclide compounds were detected either above background levels, proposed Subpart S values and/or the laboratory RL and MDA.

Twenty-nine sediment samples were collected at two inlet and five outfall locations around the TA-I area. The data evaluation for the sediment samples shows no VOC contamination above background action levels, but some SVOCs, PCBs, TAL metals, and one radionuclide compound were detected either above background levels and/or the laboratory RL and MDA.

Based on the field investigation data and the human health risk assessment analysis, a NFA is being recommended for Site 96 for the following reasons:

- No VOCs and radionuclides were detected during the field screening program.
- Gamma spectroscopy results were within background levels.
- No significant VOCs were detected by the off-site laboratory.
- PCBs were either non-detect and/or J values except at four of the five outfall locations.
- U-235 results were not detected above its reporting limits and SNL/NM background levels.
- No COCs (particularly SVOCs, PCBs, TAL metals, and radionuclides) were present in concentrations considered hazardous to human health for an industrial and/or a residential land-use scenario.

Based on site history and the data evaluated from the field investigation, further investigation and/or a VCM are not required for Site 96.

4.0 CONCLUSION

Based upon the evidence cited above, no potential remains for a release of hazardous and radionuclide waste that pose a threat to human health or the environment. Therefore, ER Site 96 is recommended for an NFA determination based on NFA Criterion 5. The potential release site has been characterized in accordance with current applicable state or federal regulations, and the available data indicated that contaminants pose an acceptable level of risk under current and projected future land use.

5.0 REFERENCES

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Appendix A

ER Site 96 Figure

Appendix B

Section 5.10 of the TA-I RFI Work Plan (SNL/NM, 1995)

5.10 ER Site 96, Storm Drain System

5.10.1 Site Description and History

The original storm drain system was constructed between 1948 and 1950. The system (Plates 5-1 to 5-6) collects storm water runoff from TA-I, -II, and -IV. The majority of the storm water flows from east to west with the terrain across SNL/NM. The water is conveyed through a series of open channels and underground lines from north to south to the Tijeras Arroyo. The system was developed in three watersheds and is described in a drainage system analysis (Bohannon-Huston, Inc. 1993), summarized below.

Watershed A is located north of H Street and west of 12th Street in the northwest corner of TA-I. Storm water flows from east to west across watershed A into KAFB, collecting in underground storm drains along F and G Streets. Flow from KAFB from the north enters the system at F Street west of 14th Street to Wyoming Boulevard. The line running parallel with G Street intercepts flow along G Street and a portion of H Street.

Watershed B is located south of H Street and west of 9th Street in TA-I. Storm water flows from east to west into KAFB west of TA-I; underground storm drain lines convey the flow south of K Street.

Watershed C covers portions of TA-I, -II, and -IV. The storm water flows from east to west with the terrain, as described above, and is conveyed in underground lines and open channels from north to south. Four drainage systems, the 9th, 14th, 17th, and 20th Street systems, described below, comprise the network for Watershed C, all discharging directly or indirectly into the 9th Street channel. The 9th Street channel from O Street south to the outfall at Tijeras Arroyo is earthen with culverts at the cross streets.

The 9th Street system conveys the majority of storm water collected in TA-I, -II, and -IV. The system collects all storm water falling outside watersheds A and B in TA-I, the western half of TA-II, and three-fourths of TA-IV. The system is comprised of the 11th Street and 9th Street storm drains. The 11th Street storm drain is split at L Street with one section extending from H Street to L Street and the other section extending from L Street to just north of O Street. At the southern end of each section, storm water flow joins the 9th Street storm drain. The 9th Street storm drain runs from K Street to O Street where it discharges into the upstream end of the 9th Street channel.

The 14th Street system extends north to the bypass and includes the area north of H Street between 20th and 14th Streets and from H Street to O Street between 17th Street and 14th Street. Flows from KAFB to the north enter the 14th Street at the bypass and are conveyed in an open channel south to H Street. At H Street, flow is collected in the storm drain where it flows south to K Street to the confluence with

a K Street storm drain carrying flow from the area north of K Street between 20th and 14th Streets. At the intersection of 14th and M Streets, the 14th Street storm drain discharges into the 14th Street channel. The channel continues south to O Street where it combines with the 17th/20th Street channel. The 14th Street channel then continues south to southwest through TA-II to approximately 100 ft south of East Ordnance Road, then west to the 9th Street Channel.

The 17th Street system is a combination of open channels and underground lines located in TA-I and -II. The 17th Street system drains runoff primarily from the area between H and O, and 17th Streets. A small storm drain at the intersection of K and 17th Streets diverts flow from north of K Street into the 17th Street channel which runs from K Street to L Street. At L Street the channel discharges into an underground storm drain which runs approximately 270 ft south of M Street where it discharges into the 17th Street Channel. The 17th Street channel joins the 20th Street channel at Q Street.

The 20th Street system occupies the eastern half of TA-I. Flow enters TA-I from KAFB to the north and the City of Albuquerque to the east. The 20th Street channel consists of a large open channel which runs from G Street near the KAFB Eubank Boulevard gate, along the east side of 20th Street, and down to O Street where it combines with the 17th Street Channel.

The storm drain system was listed as ER Site 96 in the CEARP Phase I Report (DOE 1987). The listing resulted from information collected during the Phase I interviews in which the system was reported to have received contaminants from various activities. System discharges were reported to include nonpoint source surface runoff from TA-I, blowdown from an incinerator scrubbing system, and cooling tower blowdown water (possibly containing chromates and other antifoulants) (EPA 1987a). There were several specific releases to the storm drains recorded in the CEARP report (DOE 1987).

- An estimated 200 gal of 20 percent sodium hydroxide spilled from an aboveground tank at ER Site 42, Wastewater Treatment Facility for discharges from Building 870 in 1984.
- An estimated 1000 gal of 30 percent hydrochloric acid was released from an aboveground tank at the Wastewater Treatment Facility near Building 870, ER Site 42, in 1983.
- A cooling tower on the roof of Building 806 caught fire in 1983 and wood slats that were believed to have been contaminated with chromium burned. Much of the debris was reported to have been washed down the drain.
- An estimated 500 gal of Number 2 fuel oil from a tank overflow was released to the storm drain system; the location of the tank was not reported.

Other discharges to the storm drain have also been identified. These include the following:

- In 1965 a 10 ft x 20 ft wash/steam clean area was constructed on the south side of Building 876 at the Motor Pool (ER Site 33, Section 5.3). The wash/steam clean area is comprised of a grated pit with four evenly spaced floor drains which were originally connected to the storm drain system via an oil interceptor east of the wash area. In the early 1990s the interceptor lines were rerouted from the storm drain to the sanitary sewer system. Interview information with current and past Motor Pool employees indicates that various materials may have drained into the wash/steam clean area.
- During dye testing and an in-line camera survey conducted in the spring of 1993 for the SNL/NM National Pollutant Discharge Elimination System (NPDES) Permit, several connections between the storm drain and the sanitary sewer systems, termed cross-connections, were identified (SNL/NM 1993e). At system cross-connections, the constituents in the sanitary sewage and light industrial discharges conveyed in the sanitary sewage system could have entered the storm drain system. (A more detailed description of cross-connections can be found in Section 5.10.2.2.)

The ER Site 96 boundaries are assumed to be the limits of areas where potential COCs have been detected near breaks in the lines. Any stormwater flowing within the line will not be addressed in this ER site investigation. Storm water flow within the storm drain system is regulated under the NPDES amendments to the Clean Water Act which included SIC codes 21 through 39 (SNL/NM 1993f). The NPDES Permit application was submitted to the EPA on October 1, 1992. Construction activities are currently covered by a Notice of Intent to Discharge (NOI) which was also submitted October 1, 1992.

5.10.2 Previous Investigations

5.10.2.1 Environmental Surveillance Monitoring

Environmental monitoring at SNL/NM is described in annual reports. The information described in this section is described in the 1992 report (SNL/NM 1993f). The 1993 report had not been released by the DOE at the time this plan was prepared.

5.10.2.1.1 Stormwater Sampling

In 1992 stormwater was sampled during three storm events from six outfalls in or near TA-I and at the 14th and O Street and 9th and O Street outfalls (SNL/NM 1993f). Samples were analyzed for the

parameters listed in Table 5-23. The analytical results for all storm water and nonstorm water samples collected from the outfalls were well below the COA NPDES limits for sanitary sewer discharges (SNL/NM 1993f).

5.10.2.1.2. *Sediment and Soil Sampling*

To determine whether SNL/NM activities impact soil and sediment quality, soil and sediment samples have been collected under the routine environmental surveillance program since 1992. They are analyzed for uranium, tritium, and cesium-137 (SNL/NM 1993f). Beginning in 1994, samples will be analyzed for metals in addition to the radionuclides (Culp 1994). Sediment samples are collected from three locations (Figure 5-31) (1) a community station (Location No. 68) northeast of the SNL/NM boundary near Placitas serves as a background location; (2) a perimeter station (Location No. 72) in Coyote Arroyo near the confluence of Tijeras and Coyote Arroyos; and (3) an on-site station (Location No. 73) in Tijeras Arroyo where the arroyo enters KAFB. Soil samples are collected from perimeter locations north of SNL/NM in KAFB housing (Location No. 58) and at Tijeras Arroyo (Location No. 60) near the old City Prison Farm (SNL/NM 1993f).

The 1992 analytical results for sediments (Location Nos. 73, 72, and 68) are believed to be consistent with each other. The SNL/NM Environmental Monitoring Report (SNL/NM 1993f) concludes, "Differences in radionuclide concentrations are believed to represent normal sample variation and do not indicate any contaminant loading of the arroyo system due to activities at SNL/NM." Since 1992 the analytical results for soils have been generally consistent with values for community locations and have been lower than community locations in some instances. (SNL/NM 1993f).

5.10.2.2 *Cross-Connects Investigation*

In compliance with the requirements identified in the SNL/NM NPDES permit application, dye testing and an in-line camera survey of lines from buildings to manholes were conducted in the spring of 1993. Several points where cross-connections between the storm drain and sanitary sewer systems were identified (SNL/NM 1993e). These system "cross-connects" are inadvertent tie-ins to the storm drain system from the sanitary system (*e.g.*, sink and floor drains routed to the storm drain rather than to the sanitary sewer lines). At these system cross-connects, the constituents in the sanitary sewage and light industrial discharges usually conveyed in the sanitary sewage system could have

Table 5-23. Stormwater Sampling Parameters for 1992

Parameter	Sample Type	
	Grab	Composite
Oil and grease	X	
Cyanide	X	
Phenolics	X	X
Residual chlorine	X	
VOCs	X	
pH	X	X
Temperature	X	
Total coliform	X	
Fecal coliform	X	
Biological oxygen demand		x
Chemical oxygen demand		X
Total suspended solids		X
Total Kjeldahl nitrogen		X
Nitrate plus nitrite		X
Total phosphorus		X
Fluoride		X
Arsenic		X
Barium		X
Cadmium		X
Chromium		X
Copper		X
Lead		X
Manganese		X
Mercury		X
Nickel		X
Selenium		X
Silver		X
Zinc		X
SVOCs		X
Pesticides		X
Explosives		X
Gross alpha and beta		X
Orthophosphate		X
Total dissolved solids		X

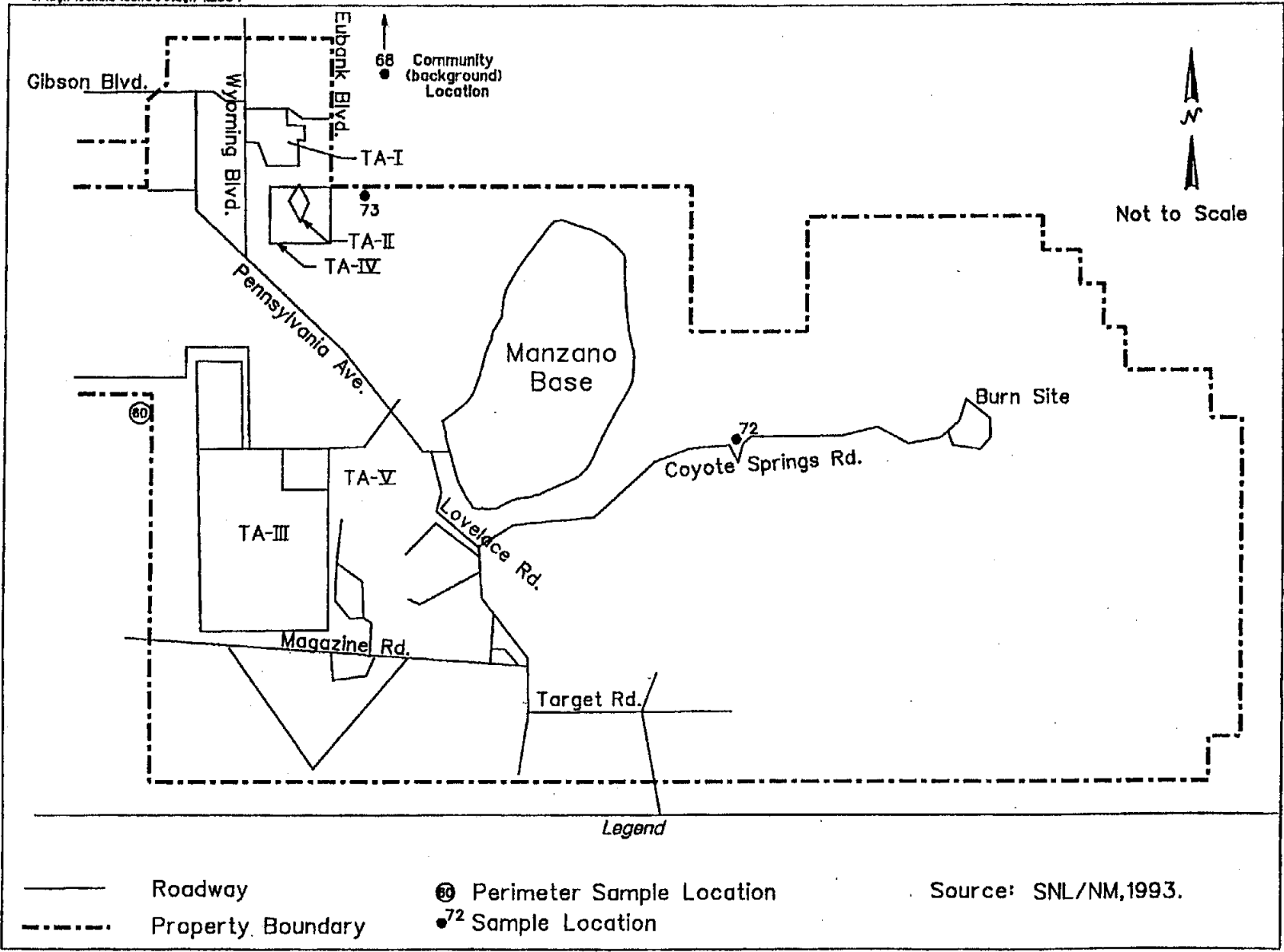


Figure 5-31
ER Site 96: Arroyo and Background Sediment Monitoring Locations

Source: SNL/NM, 1993.

entered the storm drain system. The cross-connections have been corrected to comply with NPDES permit application requirements.

Before undertaking construction activities to eliminate the cross-connects, the cross-connects were evaluated against dye testing and camera survey data, available information on upgradient building(s) functions, and process knowledge to determine if there was a potential release of COCs to the storm drain system. Where there was a potential for release to the storm drain system, the cross-connect was considered to have the potential to be within ER Site 96 boundaries (IT Corp. 1993a). Cross-connects to the storm drain system requiring sampling were identified at the locations shown in Figure 5-32. Soils surrounding system cross-connects that were considered to have the potential to lie within ER Site 96 boundaries — Buildings 892, 840, 867, and 802 — were sampled and analyzed in March 1993 (IT Corp. 1993b). Based on the in-line camera survey and subsequent soil sampling, several cross-connects could be eliminated from ER Site 96 boundaries. The results of this investigation are provided below.

Fourteen soil samples were collected using the Geoprobe from the locations shown in Figure 5-32. Samples were collected within 18 in. of, and from approximately the same horizon as, the system cross-connections, at depths ranging from 4 to 6 in. to 5 to 8 ft bgs. Selected samples were field screened for VOCs, for alpha radiation, and for beta/gamma radiation. Samples were analyzed on site by the SNL/NM Radiation Protection Operations Department for gross alpha/beta, tritium, and gamma-emitting radionuclides. Samples were shipped to an off-site analytical laboratory for total RCRA metals, total cyanide, soil pH, PCB analyses, and, for samples in which VOCs were detected by the field screening, for VOCs and SVOCs (*i.e.*, one sample). Ten percent of the soil samples were shipped to an off-site radiological laboratory for isotopic uranium, plutonium, thorium, and tritium analyses. No compounds were detected in any soil sample at levels greater than proposed Subpart S action levels and DOE guidelines (EPA 1990b). Since no constituents were detected above action levels, a baseline risk assessment was considered unnecessary at the time. Soil pH ranged from 7.0 to 8.4. No cyanide was detected in soil samples above laboratory reporting limits (IT June 1993b). Therefore, based upon the analytical data collected at the cross-connect locations, no COCs were identified and the sewer lines were repaired to ensure effluents were discharged to the appropriate system. Based upon these data, the areas assessed during the cross-connect investigation were eliminated as areas of concern to the ER Project, and no additional site characterization is required at these locations.

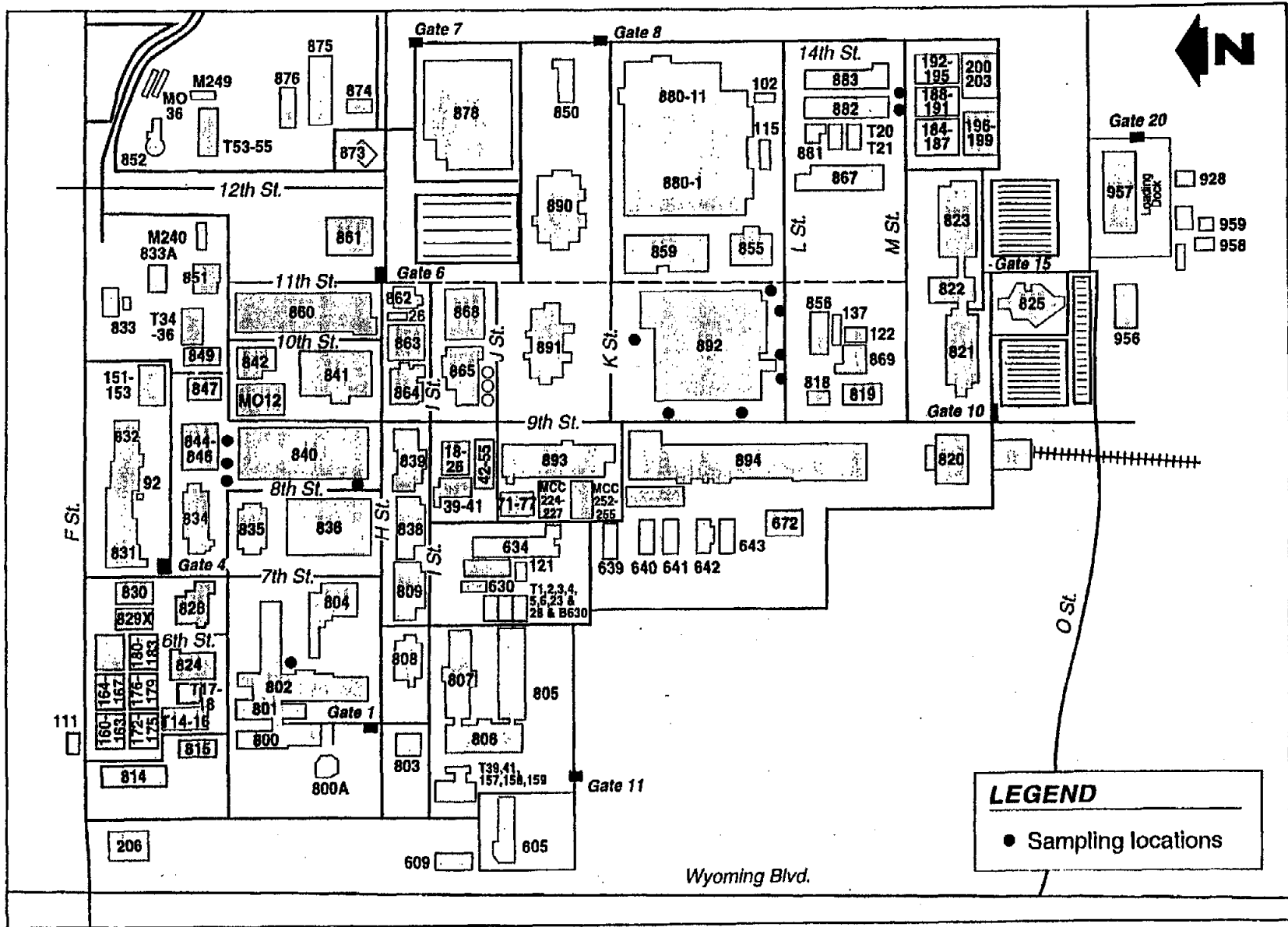


Figure 5-32

ER Site 96: Previous Sampling Locations Related to Storm Drain and Sanitary Sewer Cross-Connections

5.10.2.3 Discharge Area and Channel Surface Soil Sampling

As part of a site investigation at a potential construction site west of TA-II, current and historic discharge areas were sampled in May 1992 (IT Corp. 1992c). The current discharge area is comprised of an eroded, man-made channel that runs in an east-west direction southwest of the main entry gate for TA-II, north of TA-IV, south of East Ordnance Road and east of 9th Street (Figure 5-33). The former channel originally connected with the existing storm channel and discharged into a flat, broad runoff area. Historic photographs indicate that the storm drain system discharged to this location until 1982 when the system was expanded to the south and began discharging to Tijeras Arroyo. Soil within 1 ft of the surface was sampled at 21 locations in the current and historic storm drain discharge areas (Figure 5-33). Five test pits were dug and two samples were collected from each pit at depths of 3 and 6 ft bgs. Samples were analyzed at an off-site analytical laboratory for total RCRA metals, TCLP metals, VOCs, and SVOCs. All samples were analyzed for tritium, gross alpha, gross beta, and gamma spectroscopy with five reported isotopes (cesium-137, potassium-40, radium-224, radium-226, and radium-228) at an off-site radiological laboratory. Additional isotopic results were reported on nine samples for the isotopes americium-241, cobalt-60, ruthenium-106, and thorium-234 (IT Corp. 1992c).

No VOCs, SVOCs, or metals were detected at levels that exceeded risk-based action levels derived using the methodology in the proposed 40 CFR Subpart S and SNL/NM background soil levels (IT Corp. 1994b). Since no constituents were detected above action levels, a baseline risk assessment was considered unnecessary at the time. No TCLP leachate concentrations exceeded the RCRA land disposal restriction levels (40 CFR 268) or the RCRA toxicity characteristic hazardous waste threshold levels (40 CFR 262) (IT Corp. 1992c).

Radiological results for the detected radionuclides are summarized in Table 5-24. Tritium, americium-241, cobalt-60, and ruthenium-106 were not detected in any samples; potassium-40, radium-224, radium-226, and radium-228 were detected in all samples; cesium-137 was detected in 18 samples; and thorium-234 was detected in all nine samples analyzed for that isotope. Comparison of the gamma spectrum results with soil values obtained from the sitewide soil background study indicates that the values are consistent with other soil at SNL/NM (IT Corp. 1994b); the background ranges are shown for comparison purposes in Table 5-25. Based on these results, no additional site investigation is proposed for this portion of the TA-I storm drain system.

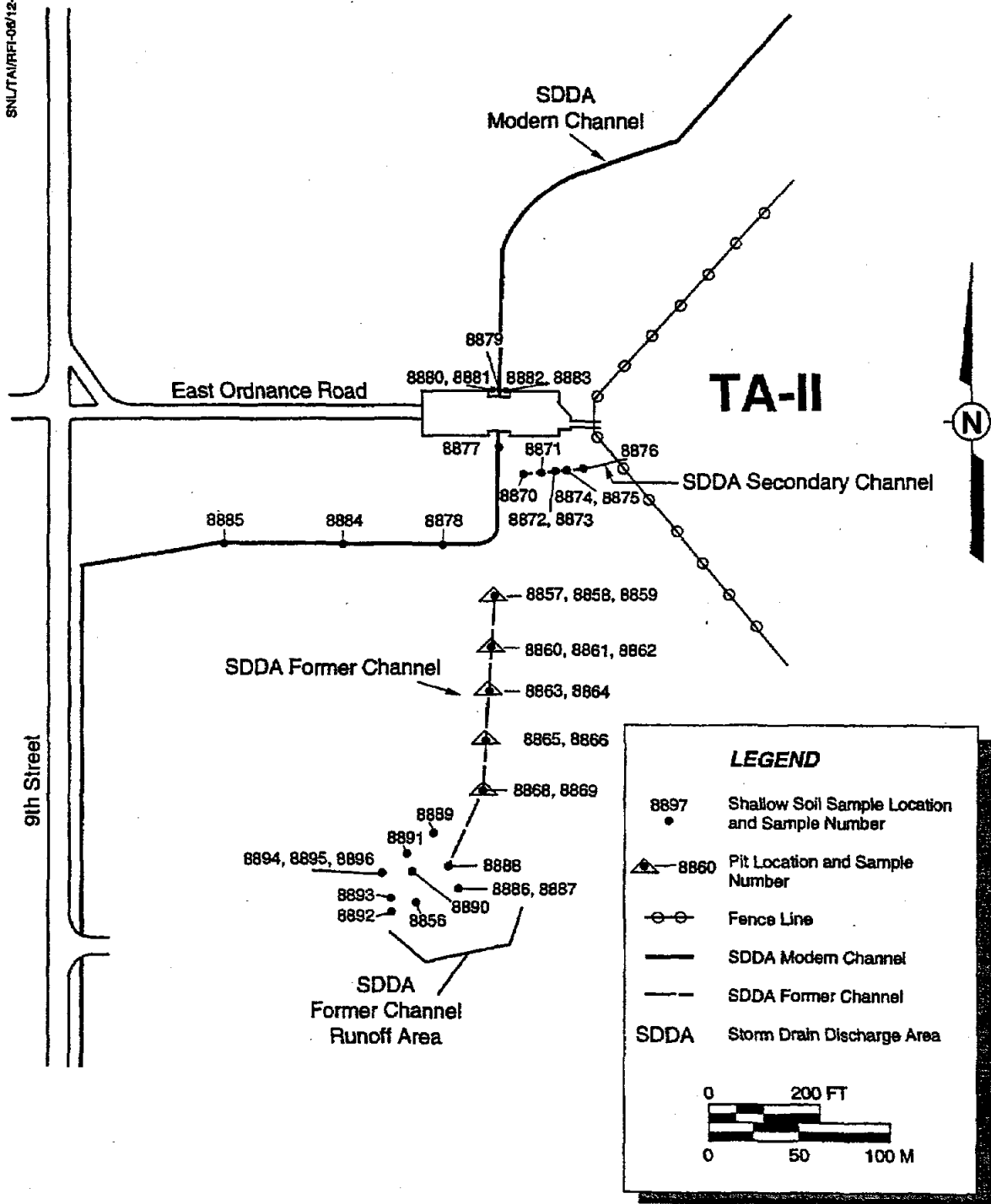


Figure 5-33
ER Site 96: Storm Drain Channels and Discharge Area,
Previous Sample Locations

Table 5-24. Results of 1992 Sampling of Storm Drain Discharge Area and Channel Surface Soil

Analyte	Range of Results	SNL/NM Background
Gross alpha	ND to 26.6 pCi/g	None available
Gross beta	ND to 29.8 pCi/g	None available
Cesium-137	ND to 0.253 ± 0.044 pCi/g	0.92 pCi/g
Potassium-40	16.3 ± 1.8 to 34.9 ± 26 pCi/g	25.34 pCi/g
Radium-224	0.510 ± 0.076 to 0.99 ± 0.14 pCi/g	0.968 pCi/g
Radium-226	0.536 ± 0.053 to 0.973 ± 0.091 pCi/g	1.94 pCi/g;
Radium-228	0.538 ± 0.065 to 1.20 ± 0.12 pCi/g	1.05 pCi/g
Thorium-234	0.569 ± 0.178 to 1.39 ± 0.31 pCi/g	2.89 pCi/g

ND = Not detected

5.10.2.4 Building 870 Investigation

Prior to a major renovation of Building 870 that involves the removal, disposal, or relocation of existing storm drain (and sanitary sewer) lines, soil sampling was carried out to characterized potential release sites near breaks and deficiencies in the storm drain and sanitary sewer lines. The stormwater discharge lines in the vicinity of Building 870 originate locally and receive surface runoff from areas adjacent to Building 870, 870B, 870C, and 884. The stormwater discharge lines in the area of Building 870 may have received rainwater runoff potentially containing a variety of organic and inorganic constituents from the buildings and grounds near Building 870. The storm drain system has also received effluents (NaOH and HCl) during two reported releases from the adjacent ER Site 42 (PRC 1993a). (See Section 5.4).

In October 1993, soil was sampled near storm drain lines at two locations on the east side of Building 870 at 1 to 2 ft below the level of the piping. The two samples were analyzed for ethylene glycol, VOCs, SVOCs, and total RCRA metals by an off-site analytical laboratory. Ethylene glycol, VOCs, and SVOCs were not detected in the soil samples collected adjacent to the storm drain lines. Several metals (arsenic, barium, total chromium, and lead) were detected, but all were below risk-based action levels derived in accordance with the methodology in proposed Subpart S (EPA 1990b) and SNL/NM background metals concentrations (PRC 1993c). Since no constituents were detected above action levels, a baseline risk assessment was considered unnecessary at the time.

Soil samples were also collected in May 1994 at one location near the southwest corner of Building 870, just southeast of Building 884, where a Building 870 lateral extends to the main storm drain line. Samples were collected below the most severe line break in the lateral at two depths: 4 ft bgs (the storm drain line depth) and 9 ft bgs (5 ft below the drain line depth). A duplicate sample was collected at 9 ft bgs. Samples were shipped to an off-site analytical laboratory for VOC, SVOC, and total RCRA metal analyses. No VOCs, SVOCs, or metals were detected above the risk-based action level derived in accordance with the methodology in the proposed 40 CFR Subpart S and SNL/NM background metals concentrations (IT Corp. 1994b; Heimer 1994). Since no constituents were detected above action levels, a baseline risk assessment was considered unnecessary at the time.

5.10.2.5 *In-Line Camera Survey*

The storm drain system was surveyed by an in-line camera in the spring of 1993 to detect breaks in the lines and cross-connections to the sanitary sewer system (Section 5.10.2.2) (SNL/NM 1993e). Abandoned storm drain lines that served the former Hazardous Waste Repackaging/Storage Facility, ER Site 73, were surveyed in the fall of 1993 and those that served Building 870 were surveyed in March of 1993.

When the field work was completed, a quality control review of the video cassette tapes was performed to note pipe deficiencies. Specific pipe deficiencies, exposed gaskets, cracks, and offset joints were noted during the in-line camera survey. In some cases modifiers, such as minor or slight, moderate, or severe were added. For offset joints, the designation was based on deflection, which was estimated based on the light reflection at the joint, typically indicated by a crescent moon shape. The following criteria were used to define pipe deficiencies (Jones 1994):

- A minor crack is a hairline crack which shows no sign of an open void in the pipe material.
- A moderate crack has a visible void in the pipe wall and may have an offset of pipe material at the crack.
- A severe crack was noted in cases where soil was visible through the opening in the pipe.
- A slight offset joint has a deflection of approximately 1/4 in. or less.
- A moderate offset joint has an exposed gasket or a joint deflection greater than 1/4 in.
- A severe offset joint has soil visible through the offset joint.

At locations where a line was plugged with dirt or concrete, it was assumed the line was inactive because of facility requirements. A plugged line is not considered a break in the system. Any crack noted in the system, however, is considered a break.

Once all deficiencies were interpreted, deficiencies which were not previously assigned a slight, moderate, or severe designation were evaluated and assigned a designation. The assumptions noted below form the bases for the slight, moderate, and severe designations.

- Where there are roots in the lines, particularly in clay pipe, there is the potential for a moderate crack.
- Where not specified, offset joints are slight breaks.
- Where an offset joint is noted to be cracked, the break is moderate.
- Where there is either a joint with offset, a joint with roots, a possible old repair, or a cracked joint, the break is moderate.
- Where there is a broken pipe, a bad joint, an old repair, or a hole in the pipe, the break is severe.

The results of the in-line camera survey, shown in Plates 5-1 to 5-6, were used to develop the sampling strategy outlined in detail in Section 5.10.5. All keyed notes are shown in the plate legends; pipe deficiencies or breaks in the line which may have been the source of a release to surrounding soil are shown on the plates. The pipe deficiencies or breaks are shown as slight, moderate, or severe by the thickness of the line around and shading within the keyed note symbol.

5.10.3 Nature and Extent of Contamination

As noted above, there have been at least five documented releases to the storm drain lines during the course of TA-I operations (Section 5.10.1). Where there are pipe deficiencies and at system outfalls, hazardous constituents that entered the storm drain system via releases, building drainage, or cross-connections with the sanitary sewer may have been released to surrounding soil.

Data on the potential extent of any release from the storm drain system are limited. Since 1992, data are collected annually to measure radionuclides in arroyo sediment and soils under the SNL/NM routine environmental surveillance program (SNL/NM 1993f). Also under the SNL/NM routine environmental surveillance program, stormwater has been sampled and analyzed annually since 1992. Other investigations include soils adjacent to selected cross-connects (IT Corp. 1993b), sampling of surface soils in portions of the historic and current discharge channels (IT Corp. 1992c), and sampling of soils adjacent to the Building 870 storm drain lines (PRC 1993c; Heimer 1994).

Available data indicate that releases to the storm drain system have not impacted the soils adjacent to the storm drain system. The results of routine environmental monitoring of sediment and soil indicate that activities have not released radionuclides (SNL/NM 1993f). No COCs were detected above

action levels in soil samples collected adjacent to cross-connections (IT Corp. 1993b) and the current and historic discharge areas in TA-II (IT Corp. 1992c), or near the Building 870 storm drain lines (PRC 1993c).

5.10.4 Conceptual Model

The conceptual model for the storm drain system is based on available information on the historic releases to the system, the sanitary sewer/storm drain cross-connect data, pipe deficiencies identified during dye testing and the in-line camera survey. During the 40-year period of storm drain system operation, chemical and radiological constituents may have been released to the system via the cross-connections to the sanitary sewer, discharges associated with operations, and releases associated with unusual occurrences. These materials may have been released to the soil from pipe deficiencies and at system outfalls. Potential COCs include HCl and NaOH from spills; petroleum hydrocarbons from tank overflows; and chromium, chlorinated solvents, alcohols, metals, PCBs, and radionuclides from operational discharges, sanitary sewer system cross-connections, and nonpoint source runoff.

Based on available data and knowledge of system use, the potential COCs would be expected neither to migrate substantially from the release site nor to be present in concentrations which pose a risk to human health or the environment. There is little potential for lateral contaminant migration. In most cases the lines are buried 4 to 8 ft bgs. There is no grade or local topography, nor surface runoff or overland flow which would contribute to lateral contaminant migration. There is the potential for vertical migration through the vadose zone. During storm events, water flowing through the system provides a constant hydraulic head to transport COCs vertically through the vadose zone at pipe deficiencies, at system outfalls, and in earthen channels. The COCs present in the soil could also migrate vertically through the vadose zone with infiltrating precipitation; however, that migration mechanism is limited because of the extensive paving in TA-I. The recorded releases to the system during unusual occurrences (DOE 1987) and COCs entering the system via building discharges, nonpoint sources, and cross-connections are diluted by the water carried in the system. Thus, only dilute COCs have potentially been released to soil.

In order to develop a strategy for investigating releases from the storm drain system, a model of migration of contaminants through the vadose zone has been assumed. The storm drain system is designed to flow full during a storm event; any crack in the system has the potential to be a release pathway. Cracks or other deficiencies in the line are considered a point source of a release. Because

of the low potential for lateral migration, any release is assumed to migrate downward in a conical configuration. The release is assumed to spread at approximately a 45-degree angle from the vertical as it migrates vertically.

The potential for vertical migration of most metals and radionuclides is limited by their low solubilities and tendency to adsorb to the clay fraction of the soil. Chromium may have been released to the sewer in the hexavalent oxidation state (*i.e.*, as chromate), which is the form of chromium with the highest concern because of its toxicity and high mobility at a near neutral pH (Bartlett and Kimble 1976). However, chromate is quickly reduced to the trivalent form in the presence of soil or sediment organic matter so that chromate released to the soil through a break in the line can potentially be reduced to trivalent chromium. The subsoil of TA-I contains very little organic matter. However, the alkaline nature of the subsoil and its large buffering capacity would drive the chromium to the reduced trivalent state. The mobility of trivalent and hexavalent chromium differ significantly due to their differing solubilities. The solubility of trivalent chromium decreases as the pH is raised, whereas the solubility of the hexavalent form increases. Any hexavalent chromium that is not reduced remains highly mobile in the soil and will continue to migrate downward with infiltrating water from either the sewer or precipitation (Bartlett and Kimble 1976).

Acids released from a deficiency in a pipe would be quickly neutralized by the alkalinity of the native soil. Unlike the situation with an acid release, there is no buffer in the native soil available to neutralize bases that might be released. It is not known how far any bases released might have migrated. Because of the lack of natural neutralizing capabilities, it is possible that bases might have migrated farther than acids released in equal volume and molarity, but these bases would not be considered a COC unless the soil pH exceeds 12.5 (action level based on 40 CFR 261.22 criteria for corrosive hazardous waste).

The mobility and persistence of chlorinated solvents in the environment is well documented (ATSDR 1988; Kloepfer *et al.* 1985; Wilson and Wilson 1985; Cline and Viste 1985; Barrio-Lage *et al.* 1986). The mobility of common solvents through the vadose zone is greater than that of metals. Most chlorinated solvents are considered to have a medium mobility through soil and tend to move in an aqueous phase. However, information gathered at other sites at SNL/NM indicate that these solvents may show significant migration in the gaseous phase in the arid soils at SNL/NM (SNL/NM 1992e). In the absence of biodegradation or volatilization, chlorinated solvents may be

relatively persistent in the environment. Likewise, the mobility and persistence of PCBs is well understood (Erickson 1986; EPA 1979). Because PCBs are relatively inert compounds, dispersion and accumulation in the environment are important factors in the fate of PCB contamination. PCBs released from the lines are not expected to migrate to a great extent. With a low water solubility and a high viscosity in the oil state, the adsorbed phase of PCBs is the most important mechanism affecting migration. PCBs are strongly adsorbed to organic matter, but much less readily to minerals (Schwartz, Cherry, and Roberts 1982).

The potential COCs released from the storm drain system at pipe deficiencies pose no direct human exposure risk. In most cases, the area affected by a break in the line is a minimum of 5 ft bgs. Unless the line is accessed for construction purposes, there should be no direct contact with the affected soil via inhalation, ingestion, or dermal exposure. If construction is required, proper precautions will be taken to protect site workers. Potential COCs released to system outfalls and earthen channels are not suspected to pose a risk to human health or the environment nor are the channels and discharge areas suspected to have received volatile organics in concentrations which would pose an inhalation exposure risk. Five hundred feet separate the potential release source and the local aquifer, therefore COCs are not expected to have migrated to a depth where risk to potable water exists.

Potential corrective measures at the storm drain system are primarily limited to excavation and offsite treatment or disposal. Because of the wide range of contaminants that may be present and the distribution of COCs at break locations, *in situ* and on-site treatment technologies do not appear to be technically or economically feasible during this preliminary review. However, on-site treatment may be feasible if a large soil volume is affected. If data collected indicate that the areal and vertical extent of COCs in a discharge area or earthen channel or the volume of soil to be generated from releases along the lines warrant it, on-site treatment technologies will be evaluated.

5.10.5 Sampling Plan

The sampling strategy selected for the storm drain system is designed to characterize potential releases from the system at the break locations identified by the in-line camera survey and system outfalls.

General DQOs for TA-I RFI are specified in Section 4.3. Specific DQOs for the storm drain system investigation are listed below.

- Determining if any VOCs, SVOCs, metals, PCBs, and/or radionuclides have been released to the soil within 18 in. of identified line breaks in the storm drain system and at system outfalls.
- Producing data of adequate quality (Level III) for all shallow subsurface samples at each break location under investigation so that risk calculations may be performed for an individual break location.
- Characterizing the vertical extent of any COCs detected above action levels near the storm drain lines and outfalls by collecting samples from deep soil borings for analysis (Level II and Level III).
- Producing data of adequate quality (Level III) for 20 percent of deep borehole samples so that risk calculations may be performed and corrective measures may be evaluated.

DOQs will be achieved through implementation of the sampling strategy outlined below. If contaminants are detected in the soil samples at concentrations above the action levels, additional samples (*i.e.*, boreholes) will be collected. Analytical Levels II and III will be required for analytical procedures identified under this plan. Data will be collected during surface and shallow subsurface soil sampling and deep soil boring investigations.

5.10.5.1 Surface and Shallow Subsurface Soil Sampling

5.10.5.1.1. Data Collection

Surface and shallow subsurface soil samples will be collected during the storm drain investigation:

- Shallow subsurface samples within 18 in. at or below a crack in a storm drain line.
- Surface samples from 12 to 18 in. bgs at system outfalls and in earthen channels.

Line Break Locations

Soil samples will be collected adjacent to the breaks identified by the in-line camera survey. In many cases, the breaks are clustered along a segment of the line. Where samples are clustered, a

streamlined sampling approach will be taken. Soil will be sampled at one location, selected to be representative of the potential worst case release to surrounding soil. This streamlined approach has been adopted based on the homogeneous nature of the storm water. Since the system flows west and/or south, the storm water and any COCs which may have entered the system would be the same along a given line or section of line that received discharge from the same source. COCs present would be diluted with discharge from additional lines downstream of each connection and at the confluence of lines. Given the break density and severity designations, the criteria listed below comprise the bases for the selected sample locations.

- Where two or more breaks are located along 100 ft of pipe, the most severe and most upgradient break will be sampled.
- Where there are two or more slight breaks within 100 ft of pipe, the most upgradient break will be sampled.
- Where five or more severe breaks are clustered along 100 ft of pipe, the most upgradient break and that break nearest a downgradient connection will be sampled (*i.e.*, two breaks will be sampled if more than four severe breaks are located within 100 ft).
- Where a break is over 100 ft from other break locations, the break location will be sampled.

One soil sample will be collected within 18 in. directly below or adjacent to the line at the locations shown in Plates 5-1 to 5-6 for field screening, lithologic logging, and laboratory analyses. Additional soil will be collected for screening and logging and then will be disposed of as IDW. The sample locations are indicated on the plates using bolded circles around the keyed note symbol on the figure.

System Outfalls

The investigation of earthen channels will be limited to the area immediately downgradient of the outfalls. Soil samples will be collected at five system outfalls: at the entrance to 9th Street, at 14th Street, at the channel between 14th and 17th Streets, at 17th Street, and at 20th Street. At each outfall, five samples will be collected from 12 to 18 in. bgs, for a total of 20 samples (plus QA/QC samples) at each outfall (Plates 5-1 through 5-6). Two upgradient samples will be collected at the northern end of the 20th Street channel as a baseline for comparison with downgradient samples. Upgradient samples will be collected at the southeastern corner of 20th and G Streets and at the north

base housing SNL/NM routine surveillance monitoring perimeter soil sample location (Location No. 58).

5.10.5.1.2. Analytical Parameters

Environmental, QA/QC, and waste management samples are listed in Table 5-25 for the surface (outfall) and Table 5-26 for the shallow subsurface (line) samples at the end of this subsection. All surface and shallow subsurface samples collected near or below storm drain lines or at the system outfalls will be analyzed by an off-site laboratory (Level III) for VOCs, SVOCs, PCBs, total TAL inorganics, isotopic uranium, isotopic plutonium, and tritium, and by an on-site laboratory by gamma spectroscopy (Level II). Thirty percent of the collected soil samples (chosen on a random basis) will be analyzed for hexavalent as well as total chromium. Field screening for VOCs using a PID or FID and for alpha and beta/gamma radiation using alpha scintillation and Geiger-Mueller pancake probes will be conducted as samples are collected.

5.10.5.2 Borehole Investigation

5.10.5.2.1. Data Collection

At line break and system outfall locations where the shallow subsurface analytical data exceed either risk-based action levels (Section 4.1.2) derived in accordance with the methodology presented in the proposed 40 CFR Subpart S and/or SNL/NM background metals and radionuclide concentrations, boreholes will be drilled and additional soil samples will be collected. At those break locations where the shallow subsurface sampling does not indicate the presence of contamination, boreholes will not be drilled.

One borehole will initially be drilled at the outfall sample location or approximately 18 in. downgradient from the line break sample location. The vertical extent of potential contamination at the borehole will be determined using field screening or on-site laboratory analyses. Three additional boreholes will be located radially around the initial borehole, with one located downgradient from the initial borehole, adjacent to the pipe. The distance of these boreholes from the central borehole will be dependent upon the vertical extent of potential contamination: the distance should equal approximately one-half the vertical extent of the potential contamination, to a maximum of 25 feet. The distance and location of the radial boreholes may be modified based on available screening techniques, site clearance, and access.

At each borehole location, a hollow-stem auger will be used to collect samples for field screening (if available for COCs detected), lithologic logging, and for laboratory analysis (Level II or III).

Borehole sampling will be initiated at the depth of the shallow subsurface sample. Samples will be collected at 5-ft intervals from 5 to 50 ft (depending on the depth of the line), at 10-ft intervals from 50 to 100 ft, and at 20-ft intervals at depths greater than 100 ft. The boreholes will be drilled until two samples are determined to be uncontaminated by means of field screening or on-site analysis, as appropriate, or to the depth limits of the drilling method. Sampling will then be terminated.

Split samples will initially be collected at the two shallowest 5-ft intervals. One split from each depth will be sealed, labeled, and set aside for possible off-site laboratory analysis. The other split will be logged for lithology and field screened or analyzed at the on-site analytical laboratory as appropriate for the COCs under investigation. The samples will also be surveyed for beta/gamma radiation using a Geiger-Mueller pancake probe.

If no COCs are detected, then these two 5-ft samples will be considered uncontaminated and sent for confirmatory off-site laboratory analysis. If one of the first two samples is contaminated, then the borehole will be advanced and sampled at the intervals described above until two consecutive intervals are determined to be uncontaminated. To meet the objectives described above, at least 20 percent of the samples will be submitted for off-site laboratory verification analysis, including the sample showing the highest screening value (to characterize the nature of the COCs) and one sample from each of the two deepest uncontaminated sample intervals (to characterize the vertical extent of COCs). Other samples may be chosen by the field geologist, using professional judgement, to be representative of the sample set. Core not submitted for laboratory analysis will be disposed of as IDW.

If boreholes are determined to be necessary, they will be located as described above. For planning purposes, borehole depth is estimated to be 100 ft, but the depth may be extended based on the field screening data. Actual depth of vertical sampling may vary according to field conditions and the equipment capabilities. At least three soil samples will be collected for Level III analysis from each borehole as well as additional QA/QC samples.

5.10.5.2.2. Analytical Parameters

Table 5-27 at the end of this subsection is an example table; it lists the environmental, geotechnical, QA/QC, and waste management samples for a single borehole. Samples collected from the deep borings will be analyzed only for the parameters detected in the adjacent surface or shallow subsurface samples. Field screening for VOCs using a PID or FID and for alpha and beta/gamma radiation using alpha scintillation and Geiger-Mueller pancake probes will be conducted as samples are collected.

ER SITE 096 : (Storm Drain System)				FIELD SCREENING (a)							ON-SITE LAB ANALYSES (b) (c) (d)				OFF-SITE LAB ANALYSES (e) (f) (g)											
FIELD NUMBER Assign Bar-Coded Sample Number in Field	SAMPLE ID (g) See Plates 5-1 to 5-6 for Locations T1096-	SAMPLE METHOD (e.g. Geoprobe, Soil Boring, Hand Auger, etc.)	SAMPLE TYPE (e.g. Surface Soil, Sediment, Rinsate Blank, Trip Blank, Duplicate, etc.)	SAMPLE DEPTH (ft)	VOCs	TPH	SOIL pH	PCBs	RADIATION (alpha, beta, gamma)	VOCs (by GC)	METALS (by DCP)	GAMMA SPEC	TPH	VOCs (B240)	TPH (B015)	SVOCs (B270)	PCBs (B080)	TAL INORGANICS (f)	ISOTOPIC URANIUM	ISOTOPIC PLUTONIUM	ISOTOPIC THORIUM	TRITIUM (LIQUID SCINE)	TCLP INORGANICS (1311) (f)	TCLP ORGANICS (1311/B270/B240)	HEX CHROMIUM	
	SD-001-	SCOOP	SURFACE SOIL	2	X				X			X		X		X	X	X	X	X	X	X	X			
	SD-002-	SCOOP	SURFACE SOIL	2	X				X			X		X		X	X	X	X	X	X	X	X	X		
	SD-003-	SCOOP	SURFACE SOIL	2	X				X			X		X		X	X	X	X	X	X	X	X	X		
	SD-004-	SCOOP	SURFACE SOIL	2	X				X			X		X		X	X	X	X	X	X	X	X	X		
	SD-005-	SCOOP	SURFACE SOIL	2	X				X			X		X		X	X	X	X	X	X	X	X	X		
	SD-006-	SCOOP	SURFACE SOIL	2	X				X			X		X		X	X	X	X	X	X	X	X	X		
	SD-007-	SCOOP	SURFACE SOIL	2	X				X			X		X		X	X	X	X	X	X	X	X	X		
	SD-008-	SCOOP	SURFACE SOIL	2	X				X			X		X		X	X	X	X	X	X	X	X	X		
	SD-009-	SCOOP	SURFACE SOIL	2	X				X			X		X		X	X	X	X	X	X	X	X	X		
	SD-010-	SCOOP	SURFACE SOIL	2	X				X			X		X		X	X	X	X	X	X	X	X	X		
	SD-011-	SCOOP	SURFACE SOIL	2	X				X			X		X		X	X	X	X	X	X	X	X	X		
	SD-012-	SCOOP	SURFACE SOIL	2	X				X			X		X		X	X	X	X	X	X	X	X	X		
	SD-013-	SCOOP	SURFACE SOIL	2	X				X			X		X		X	X	X	X	X	X	X	X	X		
	SD-014-	SCOOP	SURFACE SOIL	2	X				X			X		X		X	X	X	X	X	X	X	X	X		
	SD-015-	SCOOP	SURFACE SOIL	2	X				X			X		X		X	X	X	X	X	X	X	X	X		
	SD-016-	SCOOP	SURFACE SOIL	2	X				X			X		X		X	X	X	X	X	X	X	X	X		
	SD-017-	SCOOP	SURFACE SOIL	2	X				X			X		X		X	X	X	X	X	X	X	X	X		
	SD-018-	SCOOP	SURFACE SOIL	2	X				X			X		X		X	X	X	X	X	X	X	X	X		
	SD-019-	SCOOP	SURFACE SOIL	2	X				X			X		X		X	X	X	X	X	X	X	X	X		
	SD-020-	SCOOP	SURFACE SOIL	2	X				X			X		X		X	X	X	X	X	X	X	X	X		
	SD-021-	SCOOP	FIELD DUP/S. SOIL	2	X				X			X		X		X	X	X	X	X	X	X	X	X		
	EB-001-	GRAB	EQUIP. BLANK	NA					X			X		X		X	X	X	X	X	X	X	X			
	FB-001-	GRAB	FIELD BLANK	NA					X			X		X		X	X	X	X	X	X	X	X			
	TB-001-	NA	TRIP BLANK	NA					X			X		X		X	X	X	X	X	X	X	X			
	DRM-001-	GRAB	SOLID WASTE	NA	X				X			X		X		X	X	X	X	X	X	X	X	X		

The actual number of waste management samples will be based on the soil analytical results, and types and the containers used.

Table 5-25. ER Site 96: Surface Sample Identification and Analytical Specifications

Table 5-25. (page 2 of 2)

ER SITE 096 : (Storm Drain System)				FIELD SCREENING (a)				ON-SITE LAB ANALYSES (b) (c) (d)				OFF-SITE LAB ANALYSES (e) (f) (g)																
FIELD NUMBER	SAMPLE ID (g)	SAMPLE METHOD	SAMPLE TYPE	SAMPLE DEPTH (ft)	VOCs	TPH	SOIL pH	PCBs	RADIATION (alpha, beta, gamma)	VOCs (by GC)	METALS (by DCP)	GAMMA SPEC	TPH	VOCs (B240)	TPH (B015)	SVOCs (B270)	PCBs (B080)	TOTAL INORGANICS (T)	ISOTOPIC URANIUM	ISOTOPIC PLUTONIUM	ISOTOPIC THORIUM	TITANIUM (LIQUID SCINT.)	TCLP INORGANICS (T)	TCLP INORGANICS (T) (B111) (T)	TCLP INORGANICS (T) (B270/B240)	HEX CHROMIUM		
Assign Bar-Coded Sample Number in Field	See Plates 5-1 to 5-6 for Locations T096-	(e.g. Geoprobe, Soil Boring, Hand Auger, etc.)	(e.g. Surface Soil, Sediment, Rinse Blank, Trip Blank, Duplicate, etc.)																									
TOTAL SAMPLES					22				22			22		22		22	22	22	22	22	22	22	22	22	22	22	22	
Total Samples: Field Screening = 22; On-site Lab = 22 Off-site Lab = 23																												
<p>Notes:</p> <p>(a) Analytical Level I Data: Field screening methods and rationale are discussed in the text.</p> <p>(b) Analytical Level II Data: On-site Lab sample container volume/type requirements will be determined by the on-site laboratory during mobilization.</p> <p>(c) On-site lab analytical methods will be determined at a later date.</p> <p>(d) All geochemical laboratory samples will be preserved on ice unless otherwise noted.</p> <p>(e) Analytical Level III Data: Consists of duplicates of 20% of the on-site laboratory analytical samples.</p> <p>(f) Off-site Lab sample container volume/type requirements for soil and water will be determined by the Sample Management Office during mobilization.</p> <p>(g) The Sample ID contains information regarding location, matrix, depth, etc.; this sample identification scheme is described in Section 4.4.</p> <p>(h) Inorganics analytical methods include 6010 and 7000 series analysis.</p>																												

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SRA/AFTR/WR-510 12/17/94

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Table 5-26.

Shallow Subsurface Soil Sample Identification and Analytical Specifications

ER SITE 096 : (Storm Drain System)					FIELD			ON-SITE LAB				OFF-SITE LAB												
FIELD NUMBER Assign Bar-Coded Sample Number in Field	SAMPLE ID (g) See Plates 5-1 to 5-6 for Locations T1096	SAMPLE METHOD (e.g. Geoprobe, Soil Boring, Hand Auger, etc.)	SAMPLE TYPE (e.g. Surface Soil, Sediment, Rinse/soil Blank, Trip Blank, Duplicate, etc.)	SAMPLE DEPTH (ft)	SCREENING (a)			ANALYSES (b) (c) (d)				ANALYSES (e) (f) (g)												
					VOCs	TPH	SOIL pH	PCBs	RADIATION (alpha, beta, gamma)	VOCs (by GC)	METALS (by DCF)	GAMMA SPEC	TPH	VOCs (B24D)	TPH (B015)	SVOCs (B270)	PCBs (B080)	TAL INORGANICS (N)	ISOTOPIC URANIUM	ISOTOPIC PLUTONIUM	ISOTOPIC THORIUM	TRITIUM (LIQUID SCINT.)	TCLP INORGANICS (1311) (M)	TCLP ORGANICS (1311/8270/8240)
	BH-001-	HAND AUGER	SOIL	LINE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	BH-002-	HAND AUGER	SOIL	LINE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	BH-003-	HAND AUGER	SOIL	LINE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	BH-004-	HAND AUGER	SOIL	LINE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	BH-005-	HAND AUGER	SOIL	LINE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	BH-006-	HAND AUGER	SOIL	LINE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	BH-007-	HAND AUGER	SOIL	LINE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	BH-008-	HAND AUGER	SOIL	LINE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	BH-009-	HAND AUGER	SOIL	LINE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	BH-010-	HAND AUGER	SOIL	LINE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	BH-011-	HAND AUGER	SOIL	LINE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	BH-012-	HAND AUGER	SOIL	LINE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	BH-013-	HAND AUGER	SOIL	LINE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	BH-014-	HAND AUGER	SOIL	LINE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	BH-015-	HAND AUGER	SOIL	LINE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	BH-016-	HAND AUGER	SOIL	LINE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	BH-017-	HAND AUGER	SOIL	LINE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	BH-018-	HAND AUGER	SOIL	LINE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	BH-019-	HAND AUGER	SOIL	LINE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	BH-020-	HAND AUGER	SOIL	LINE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	BH-021-	HAND AUGER	SOIL	LINE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	BH-022-	HAND AUGER	SOIL	LINE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	BH-023-	HAND AUGER	SOIL	LINE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	BH-024-	HAND AUGER	SOIL	LINE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	BH-025-	HAND AUGER	SOIL	LINE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	BH-026-	HAND AUGER	SOIL	LINE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

ER SITE 096 : (Storm Drain System)				FIELD SCREENING (a)					ON-SITE LAB ANALYSES (b) (c) (d)				OFF-SITE LAB ANALYSES (e) (f) (g)												
FIELD NUMBER	SAMPLE ID (g) See Plates 5-1 to 5-6 for Locations	SAMPLE METHOD (e.g. Geoprobe, Soil Boring, Hand Auger, etc.)	SAMPLE TYPE (e.g. Surface Soil, Sediment, Rinsate Blank, Trip Blank, Duplicate, etc.)	SAMPLE DEPTH (ft)	VOCs	TPH	SOIL pH	PCBs	RADIATION (alpha, beta, gamma)	VOCs (by GC)	METALS (by DCP)	GAMMA SPEC	TPH	VOCs (8240)	TPH (8015)	SVOCs (8270)	PCBs (8080)	TOTAL INORGANICS (n)	ISOTOPIC URANIUM	ISOTOPIC PLUTONIUM	ISOTOPIC THORIUM	TRITIUM (LIQUID SCINT.)	TCLP INORGANICS (1311) (n)	TCLP ORGANICS (1311) (8240)	HEX CHROMIUM
	BH-027-	HAND AUGER	SOIL	LINE	X				X			X		X		X	X	X	X	X	X	X	X		
	BH-028-	HAND AUGER	SOIL	LINE	X				X			X		X		X	X	X	X	X	X	X	X		X
	BH-029-	HAND AUGER	SOIL	LINE	X				X			X		X		X	X	X	X	X	X	X	X		
	BH-030-	HAND AUGER	SOIL	LINE	X				X			X		X		X	X	X	X	X	X	X	X		
	BH-031-	HAND AUGER	SOIL	LINE	X				X			X		X		X	X	X	X	X	X	X	X		X
	BH-032-	HAND AUGER	SOIL	LINE	X				X			X		X		X	X	X	X	X	X	X	X		
	BH-033-	HAND AUGER	SOIL	LINE	X				X			X		X		X	X	X	X	X	X	X	X		
	BH-034-	HAND AUGER	SOIL	LINE	X				X			X		X		X	X	X	X	X	X	X	X		X
	BH-035-	HAND AUGER	SOIL	LINE	X				X			X		X		X	X	X	X	X	X	X	X		X
	BH-036-	HAND AUGER	SOIL	LINE	X				X			X		X		X	X	X	X	X	X	X	X		X
	BH-037-	HAND AUGER	SOIL	LINE	X				X			X		X		X	X	X	X	X	X	X	X		X
	BH-038-	HAND AUGER	SOIL	LINE	X				X			X		X		X	X	X	X	X	X	X	X		X
	BH-039-	HAND AUGER	SOIL	LINE	X				X			X		X		X	X	X	X	X	X	X	X		X
	BH-040-	HAND AUGER	SOIL	LINE	X				X			X		X		X	X	X	X	X	X	X	X		X
	BH-041-	HAND AUGER	SOIL	LINE	X				X			X		X		X	X	X	X	X	X	X	X		X
	BH-042-	HAND AUGER	SOIL	LINE	X				X			X		X		X	X	X	X	X	X	X	X		X
	BH-043-	HAND AUGER	SOIL	LINE	X				X			X		X		X	X	X	X	X	X	X	X		X
	BH-044-	HAND AUGER	SOIL	LINE	X				X			X		X		X	X	X	X	X	X	X	X		X
	BH-045-	HAND AUGER	SOIL	LINE	X				X			X		X		X	X	X	X	X	X	X	X		X
	BH-046-	HAND AUGER	SOIL	LINE	X				X			X		X		X	X	X	X	X	X	X	X		X
	BH-047-	HAND AUGER	SOIL	LINE	X				X			X		X		X	X	X	X	X	X	X	X		X
	BH-048-	HAND AUGER	SOIL	LINE	X				X			X		X		X	X	X	X	X	X	X	X		X
	BH-049-	HAND AUGER	SOIL	LINE	X				X			X		X		X	X	X	X	X	X	X	X		X
	BH-050-	HAND AUGER	SOIL	LINE	X				X			X		X		X	X	X	X	X	X	X	X		X
	BH-051-	HAND AUGER	SOIL	LINE	X				X			X		X		X	X	X	X	X	X	X	X		X
	BH-052-	HAND AUGER	SOIL	LINE	X				X			X		X		X	X	X	X	X	X	X	X		X

Table 5-26. (page 2 of 5)

ER SITE 096 : (Storm Drain System)				FIELD SCREENING (a)					ON-SITE LAB ANALYSES (b) (c) (d)				OFF-SITE LAB ANALYSES (e) (f) (g)													
FIELD NUMBER	SAMPLE ID (g) See Plates 6-1 to 5-6 for Locations	SAMPLE METHOD (e.g. Geoprobe, Soil Boring, Hand Auger, etc.)	SAMPLE TYPE (e.g. Surface Soil, Sediment, Rinse Blank, Trip Blank, Duplicate, etc.)	SAMPLE DEPTH (ft)	VOCs	TPH	SOIL pH	PCBs	RADIATION (alpha, beta, gamma)	VOCs (by GC)	METALS (by DCF)	GAMMA SPEC	TPH	VOCs (8240)	TPH (8015)	SVOCs (8270)	PCBs (8080)	TOTAL INORGANICS (f)	ISOTOPIC URANIUM	ISOTOPIC PLUTONIUM	ISOTOPIC THORIUM	TRITIUM (LIQUID SCINT.)	TCLP INORGANICS (1311) (f)	TCLP ORGANICS (1311/8270/8240)	HEX CHROMIUM	
	BH-053-	HAND AUGER	SOIL	LINE	X				X			X		X		X	X	X	X	X						
	BH-054-	HAND AUGER	SOIL	LINE	X				X			X		X		X	X	X	X	X	X					
	BH-055-	HAND AUGER	SOIL	LINE	X				X			X		X		X	X	X	X	X	X					X
	BH-056-	HAND AUGER	SOIL	LINE	X				X			X		X		X	X	X	X	X	X					X
	BH-057-	HAND AUGER	SOIL	LINE	X				X			X		X		X	X	X	X	X	X					X
	BH-058-	HAND AUGER	SOIL	LINE	X				X			X		X		X	X	X	X	X	X					X
	BH-059-	HAND AUGER	SOIL	LINE	X				X			X		X		X	X	X	X	X	X					X
	BH-060-	HAND AUGER	SOIL	LINE	X				X			X		X		X	X	X	X	X	X					X
	BH-061-	HAND AUGER	SOIL	LINE	X				X			X		X		X	X	X	X	X	X					X
	BH-062-	HAND AUGER	SOIL	LINE	X				X			X		X		X	X	X	X	X	X					X
	BH-063-	HAND AUGER	SOIL	LINE	X				X			X		X		X	X	X	X	X	X					X
	BH-064-	HAND AUGER	SOIL	LINE	X				X			X		X		X	X	X	X	X	X					X
	BH-065-	HAND AUGER	SOIL	LINE	X				X			X		X		X	X	X	X	X	X					X
	BH-066-	HAND AUGER	SOIL	LINE	X				X			X		X		X	X	X	X	X	X					X
	BH-067-	HAND AUGER	SOIL	LINE	X				X			X		X		X	X	X	X	X	X					X
	BH-068-	HAND AUGER	SOIL	LINE	X				X			X		X		X	X	X	X	X	X					X
	BH-069-	HAND AUGER	SOIL	LINE	X				X			X		X		X	X	X	X	X	X					X
	BH-070-	HAND AUGER	SOIL	LINE	X				X			X		X		X	X	X	X	X	X					X
	BH-071-	HAND AUGER	SOIL	LINE	X				X			X		X		X	X	X	X	X	X					X
	BH-072-	HAND AUGER	SOIL	LINE	X				X			X		X		X	X	X	X	X	X					X
	BH-073-	HAND AUGER	SOIL	LINE	X				X			X		X		X	X	X	X	X	X					X
	BH-074-	HAND AUGER	SOIL	LINE	X				X			X		X		X	X	X	X	X	X					X
	BH-075-	HAND AUGER	SOIL	LINE	X				X			X		X		X	X	X	X	X	X					X
	BH-076-	HAND AUGER	SOIL	LINE	X				X			X		X		X	X	X	X	X	X					X
	BH-077-	HAND AUGER	SOIL	LINE	X				X			X		X		X	X	X	X	X	X					X
	BH-078-	HAND AUGER	SOIL	LINE	X				X			X		X		X	X	X	X	X	X					X

Table 5-26. (page 3 of 5)

ER SITE 096 : (Storm Drain System)				FIELD SCREENING (a)				ON-SITE LAB ANALYSES (b) (c) (d)				OFF-SITE LAB ANALYSES (e) (f) (g)													
FIELD NUMBER Assign Bar-Coded Sample Number in Field	SAMPLE ID (g) See Plates 5-1 to 5-6 for Locations TIO96	SAMPLE METHOD (e.g. Geoprobe, Soil Boring, Hand Auger, etc.)	SAMPLE TYPE (e.g. Surface Soil, Sediment, Rinstate Blank, Trip Blank, Duplicate, etc.)	SAMPLE DEPTH (ft)	VOCs	TPH	SOIL pH	PCBs	RADIATION (alpha, beta, gamma)	VOCs (by GC)	METALS (by DCP)	GAMMA SPEC	TPH	VOCs (8240)	TPH (8015)	SVOCs (8270)	PCBs (8080)	TAL INORGANICS (n)	ISOTOPIC URANIUM	ISOTOPIC PLUTONIUM	ISOTOPIC THORIUM	TRITIUM (LIQUID SCINT.)	TCLP INORGANICS (1311) (n)	TCLP INORGANICS (1311/8270/8240)	HEX CHROMIUM
					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	BH-079-	HAND AUGER	SOIL	LINE	X				X			X		X		X	X	X	X	X				X	
	BH-080-	HAND AUGER	SOIL	LINE	X				X			X		X		X	X	X	X	X				X	
	BH-081-	HAND AUGER	SOIL	LINE	X				X			X		X		X	X	X	X	X				X	
	BH-082-	HAND AUGER	SOIL	LINE	X				X			X		X		X	X	X	X	X				X	
	BH-083-	HAND AUGER	SOIL	LINE	X				X			X		X		X	X	X	X	X				X	
	BH-084-	HAND AUGER	SOIL	LINE	X				X			X		X		X	X	X	X	X				X	
	BH-085-	HAND AUGER	SOIL	LINE	X				X			X		X		X	X	X	X	X				X	
	BH-086-	HAND AUGER	SOIL	LINE	X				X			X		X		X	X	X	X	X				X	
	BH-087-	HAND AUGER	SOIL	LINE	X				X			X		X		X	X	X	X	X				X	
	BH-088-	HAND AUGER	SOIL	LINE	X				X			X		X		X	X	X	X	X				X	
	BH-089-	HAND AUGER	SOIL	LINE	X				X			X		X		X	X	X	X	X				X	
	BH-090-	HAND AUGER	SOIL	LINE	X				X			X		X		X	X	X	X	X				X	
	BH-091-	HAND AUGER	SOIL	LINE	X				X			X		X		X	X	X	X	X				X	
	BH-092-	HAND AUGER	SOIL	LINE	X				X			X		X		X	X	X	X	X				X	
	BH-093-	HAND AUGER	FIELD DUPLICATE/SOIL	LINE	X				X			X		X		X	X	X	X	X				X	
	BH-094-	HAND AUGER	FIELD DUPLICATE/SOIL	LINE	X				X			X		X		X	X	X	X	X				X	
	BH-095-	HAND AUGER	FIELD DUPLICATE/SOIL	LINE	X				X			X		X		X	X	X	X	X				X	
	BH-096-	HAND AUGER	FIELD DUPLICATE/SOIL	LINE	X				X			X		X		X	X	X	X	X				X	
	BH-097-	HAND AUGER	FIELD DUPLICATE/SOIL	LINE	X				X			X		X		X	X	X	X	X				X	
	EB-002-	GRAB	EQUIP. BLANK	NA										X		X	X	X	X	X				X	
	EB-003-	GRAB	EQUIP. BLANK	NA										X		X	X	X	X	X				X	
	EB-004-	GRAB	EQUIP. BLANK	NA										X		X	X	X	X	X				X	
	EB-005-	GRAB	EQUIP. BLANK	NA										X		X	X	X	X	X				X	
	EB-006-	GRAB	EQUIP. BLANK	NA										X		X	X	X	X	X				X	
	FB-002-	GRAB	FIELD BLANK	NA										X		X	X	X	X	X				X	
	FB-003-	GRAB	FIELD BLANK	NA										X		X	X	X	X	X				X	

Table 5-26. (page 4 of 5)

ER SITE 096 : (Storm Drain System)				FIELD SCREENING (a)					ON-SITE LAB ANALYSES (b) (c) (d)				OFF-SITE LAB ANALYSES (e) (f) (g)																					
FIELD NUMBER	SAMPLE ID (a) See Plates S-1 to S-6 for Locations T1096	SAMPLE METHOD (e.g. Geoprobe, Soil Boring, Hand Auger, etc.)	SAMPLE TYPE (e.g. Surface Soil, Sediment, Rinseate Blank, Trip Blank, Duplicate, etc.)	SAMPLE DEPTH (ft)	VOCs	TPH	SOIL pH	PCBs	RADIATION (alpha, beta, gamma)	VOCs (by GC)	METALS (by DCF)	GAMMA SPEC	TPH	VOCs (8240)	TPH (8015)	SVOCs (8270)	PCBs (8080)	TAL INORGANICS (f)	ISOTOPIC URANIUM	ISOTOPIC PLUTONIUM	ISOTOPIC THORIUM	TRITIUM (LIQUID SCINT.)	TCLP INORGANICS (1311) (g)	TCLP ORGANICS (1311/8270/8240)	HEX CHROMIUM									
	FB-004-	GRAB	FIELD BLANK	NA										X																				
	FB-005-	GRAB	FIELD BLANK	NA										X																				
	FB-006-	GRAB	FIELD BLANK	NA										X																				
	TB-002-	NA	TRIP BLANK	NA										X																				
	TB-003-	NA	TRIP BLANK	NA										X																				
	TB-004-	NA	TRIP BLANK	NA										X																				
	TB-005-	NA	TRIP BLANK	NA										X																				
	TB-006-	NA	TRIP BLANK	NA										X																				
	TB-007-	NA	TRIP BLANK	NA										X																				
The actual number of waste management samples will be based on soil analytical results, and types and containers used.																																		
	DRM-002-	GRAB	SOLID WASTE	NA	X																			X	X									
TOTAL SAMPLES					98									97									97	113	107	107	97	108	108	1	108	1	1	30

Total Samples: Field Screening = 98; On-site Lab = 97; Off-site Lab = 114

Notes:
 (a) Analytical Level I Data: Field screening methods and rationale are discussed in the text.
 (b) Analytical Level II Data: On-site Lab sample container volume/type requirements will be determined by the on-site laboratory during mobilization.
 (c) On-site lab analytical methods will be determined at a later date.
 (d) All geochemical laboratory samples will be preserved on ice unless otherwise noted.
 (e) Analytical Level III Data: Consists of duplicates of 20% of the on-site laboratory analytical samples.
 (f) Off-site Lab sample container volume/type requirements for soil and water will be determined by the Sample Management Office during mobilization.
 (g) The Sample ID contains information regarding location, matrix, depth, etc.; this sample identification scheme is described in Section 4.4.
 (h) Inorganics analytical methods include 6010 and 7000 series analysis.

Table 5-26. (page 5 of 5)

Table 5-27. (page 2 of 2)

ER SITE 096 : (Storm Drain System)				FIELD SCREENING (a)				ON-SITE LAB ANALYSES (b) (c) (d)				OFF-SITE LAB ANALYSES (e) (f) (g)													
FIELD NUMBER	SAMPLE ID (g)	SAMPLE METHOD (e.g. Geoprobe, Soil Boring, Hand Auger, etc.)	SAMPLE TYPE (e.g. Surface Soil, Sediment, Rinse Blank, Trip Blank, Duplicate, etc.)	SAMPLE DEPTH (ft)	VOCs	TPH	SOIL pH	PCBs	RADIATION (alpha, beta, gamma)	VOCs (by GC)	METALS (by DCP)	GAMMA SPEC	TPH	VOCs (8240)	TPH (8015)	SVOCs (8270)	PCBs (8080)	TAL INORGANICS (f)	ISOTOPIC URANIUM	ISOTOPIC PLUTONIUM	ISOTOPIC THORIUM	TRITIUM (LIQUID SCINT.)	TCLP INORGANICS (1311) (c)	TCLP ORGANICS (1311/8270/8240)	HEX CHROMIUM
Assign Bar-Coded Sample Number in Field	T1096-																								

Notes:

- (a) Analytical Level I Data: Field screening methods and rationale are discussed in the text.
- (b) Analytical Level II Data: On-site Lab sample container volume/type requirements will be determined by the on-site laboratory during mobilization.
- (c) On-site lab analytical methods will be determined at a later date.
- (d) All geochemical laboratory samples will be preserved on ice unless otherwise noted.
- (e) Analytical Level III Data: Consists of duplicates of 20% of the on-site laboratory analytical samples.
- (f) Off-site Lab sample container volume/type requirements for soil and water will be determined by the Sample Management Office during mobilization.
- (g) The Sample ID contains information regarding location, matrix, depth, etc.: This sample identification scheme is described in Section 4.4.
- (h) Inorganics analytical methods include 6010 and 7000 series analysis.

Appendix C

ER Site 96 Tables

Table 1

ER Site 96: Listing of Samples Collected and Analysis Performed

ER SITE 96				FIELD SCREENING					ON-SITE LAB ANALYSES				OFF-SITE LAB ANALYSES												
FIELD NUMBER	DATE/TIME Date and Time the sample was collected	SAMPLE ID See Figure 1 for Locations T1096-	REMARKS	VOCs	TPH	SOIL pH	PCBs	RADIATION (alpha, beta, gamma)	VOCs (by GC)	METALS (by DCPI)	GAMMA SPEC	TPH	VOCs (8240)	SVOCs (8270)	TAL INORGANICS	PCB	HEX CHROMIUM	TOTAL CYANIDE	MERCURY	ISOTOPIC URANIUM	ISOTOPIC PLUTONIUM	ISOTOPIC THORIUM	TRITIUM (LIQUID SCINT.)	TCLP INORGANICS (1311)	TCLP ORGANICS (1311/8270/8240)
022858-01	6/13/95-8:30	GP-001-009-S						X					X												
022858-02	6/13/95-8:30	GP-001-009-S		X				X						X	X	X					X	X			
022858-03	6/13/95-8:30	GP-001-009-S		X				X																	
022858-04	6/13/95-8:30	GP-001-009-S		X				X																X	
022858-05	6/13/95-8:30	GP-001-009-S		X				X			X														
022859-01	6/13/95-9:45	GP-002-004-S											X												
022859-02	6/13/95-9:45	GP-002-004-S		X				X						X	X	X									
022859-03	6/13/95-9:45	GP-002-004-S		X				X													X	X			
022859-04	6/13/95-9:45	GP-002-004-S		X				X																X	
022859-05	6/13/95-9:45	GP-002-004-S		X				X			X														
022860-01	6/13/95-10:50	GP-003-006-S											X												
022860-02	6/13/95-10:50	GP-003-006-S		X				X						X	X	X	X								
022860-03	6/13/95-10:50	GP-003-006-S		X				X													X	X			
022860-04	6/13/95-10:50	GP-003-006-S		X				X																X	
022860-05	6/13/95-10:50	GP-003-006-S		X				X			X														
022861-01	6/13/95-13:00	GP-004-005-S											X												
022861-02	6/13/95-13:00	GP-004-005-S		X				X						X	X	X									
022861-03	6/13/95-13:00	GP-004-005-S		X				X													X	X			
022861-04	6/13/95-13:00	GP-004-005-S		X				X																X	
022861-05	6/13/95-13:00	GP-004-005-S		X				X			X														
022862-01	6/13/95-14:50	GP-005-006-S											X												
022862-02	6/13/95-14:50	GP-005-006-S		X				X						X	X	X									
022862-03	6/13/95-14:50	GP-005-006-S		X				X													X	X			
022862-04	6/13/95-14:50	GP-005-006-S		X				X																X	
022862-05	6/13/95-14:50	GP-005-006-S		X				X			X														
022864-01	6/14/95-8:20	GP-006-008-S											X												
022864-02	6/14/95-8:20	GP-006-008-S		X				X						X	X	X	X								
022864-03	6/14/95-8:20	GP-006-008-S		X				X													X	X			
022864-04	6/14/95-8:20	GP-006-008-S		X				X																X	
022864-05	6/14/95-8:20	GP-006-008-S		X				X			X														
022865-01	6/14/95-9:45	GP-007-008-S											X												

ER Site 96: Listing of Samples Collected and Analysis Performed

ER SITE 96				FIELD SCREENING					ON-SITE LAB ANALYSES				OFF-SITE LAB ANALYSES												
FIELD NUMBER Assign Bar-Coded Sample Number in Field	DATE/TIME Date and Time the sample was collected	SAMPLE ID See Figure 1 for Locations T1096-	REMARKS	VOCs	TPH	SOIL pH	PCBs	RADIATION (alpha, beta, gamma)	VOCs (by GC)	METALS (by DCP)	GAMMA SPEC	TPH	VOCs (8240)	SVOCs (8270)	TOTAL INORGANICS	PCB	HEX CHROMIUM	TOTAL CYANIDE	MERCURY	ISOTOPIC URANIUM	ISOTOPIC PLUTONIUM	ISOTOPIC THORIUM	TRITIUM (LIQUID SCINT.)	TCLP INORGANICS (1311)	TCLP ORGANICS (1311/8270/8240)
022865-02	6/14/95-9:45	GP-007-008-S		X				X																	
022865-03	6/14/95-9:45	GP-007-008-S		X				X													X	X			
022865-04	6/14/95-9:45	GP-007-008-S		X				X																X	
022865-05	6/14/95-9:45	GP-007-008-S		X				X			X														
022866-01	6/14/95-11:35	GP-008-008-S											X												
022866-02	6/14/95-11:35	GP-008-008-S		X				X						X	X	X									
022866-03	6/14/95-11:35	GP-008-008-S		X				X													X	X			
022866-04	6/14/95-11:35	GP-008-008-S		X				X																X	
022866-05	6/14/95-11:35	GP-008-008-S		X				X			X														
022867-01	6/14/95-13:00	GP-009-010-S											X												
022867-02	6/14/95-13:00	GP-009-010-S		X				X						X	X	X	X								
022867-03	6/14/95-13:00	GP-009-010-S		X				X													X	X			
022867-04	6/14/95-13:00	GP-009-010-S		X				X																X	
022867-05	6/14/95-13:00	GP-009-010-S		X				X			X														
022868-01	6/14/95-14:15	GP-010-009-S											X												
022868-02	6/14/95-14:15	GP-010-009-S		X				X						X	X	X									
022868-03	6/14/95-14:15	GP-010-009-S		X				X													X	X			
022868-04	6/14/95-14:15	GP-010-009-S		X				X																X	
022869-01	6/15/95-8:48	GP-011-006-S											X												
022869-02	6/15/95-8:48	GP-011-006-S		X				X						X	X	X									
022869-03	6/15/95-8:48	GP-011-006-S		X				X													X	X			
022869-04	6/15/95-8:48	GP-011-006-S		X				X																X	
022869-05	6/15/95-8:48	GP-011-006-S		X				X			X														
022872-01	6/15/95-10:20	GP-013-005-S											X												
022872-02	6/15/95-10:20	GP-013-005-S		X				X						X	X	X	X								
022872-03	6/15/95-10:20	GP-013-005-S		X				X													X	X			
022872-04	6/15/95-10:20	GP-013-005-S		X				X																X	
022872-05	6/15/95-10:20	GP-013-005-S		X				X			X														
022873-01	6/15/95-10:55	GP-014-003-S											X												
022873-02	6/15/95-10:55	GP-014-003-S		X				X						X	X	X									
022873-03	6/15/95-10:55	GP-014-003-S		X				X													X	X			

ER Site 96: Listing of Samples Collected and Analysis Performed

ER SITE 96				FIELD SCREENING					ON-SITE LAB ANALYSES				OFF-SITE LAB ANALYSES												
FIELD NUMBER	DATE/TIME Date and Time the sample was collected	SAMPLE ID See Figure 1 for Locations T1096-	REMARKS	VOCs	TPH	SOIL pH	PCBs	RADIATION (alpha, beta, gamma)	VOCs (by GC)	METALS (by DCPI)	GAMMA SPEC	TPH	VOCs (8240)	SVOCs (8270)	TAL INORGANICS	PCB	HEX CHROMIUM	TOTAL CYANIDE	MERCURY	ISOTOPIC URANIUM	ISOTOPIC PLUTONIUM	ISOTOPIC THORIUM	TRITIUM (LIQUID SCINT.)	TCLP INORGANICS (1311)	TCLP ORGANICS (1311/8270/8240)
022873-04	6/15/95-10:55	GP-014-003-S		X				X																	
022873-05	6/15/95-10:55	GP-014-003-S		X				X			X														
022874-01	6/15/95-12:43	GP-015-005-S									X		X		X	X									
022874-02	6/15/95-12:43	GP-015-005-S		X				X						X	X	X									
022874-03	6/15/95-12:43	GP-015-005-S		X				X												X	X				
022874-04	6/15/95-12:43	GP-015-005-S		X				X															X		
022874-05	6/15/95-12:43	GP-015-005-S		X				X			X														
022875-01	6/15/95-13:30	GP-016-005-S											X												
022875-02	6/15/95-13:30	GP-016-005-S		X				X						X	X	X	X								
022875-03	6/15/95-13:30	GP-016-005-S		X				X												X	X				
022875-04	6/15/95-13:30	GP-016-005-S		X				X															X		
022875-05	6/15/95-13:30	GP-016-005-S		X				X			X														
022876-01	6/15/95-14:05	GP-017-005-S	MS/MSD										X												
022876-02	6/15/95-14:05	GP-017-005-S	MS/MSD	X				X						X	X	X									
022876-03	6/15/95-14:05	GP-017-005-S		X				X												X	X				
022876-04	6/15/95-14:05	GP-017-005-S		X				X															X		
022876-05	6/15/95-14:05	GP-017-005-S		X				X			X														
022877-01	6/15/95-14:50	GP-018-005-S											X												
022877-02	6/15/95-14:50	GP-018-005-S		X				X						X	X	X									
022877-03	6/15/95-14:50	GP-018-005-S		X				X												X	X				
022877-04	6/15/95-14:50	GP-018-005-S		X				X																X	
022877-05	6/15/95-14:50	GP-018-005-S		X				X			X														
022880-01	6/16/95-8:38	GP-019-005-S											X												
022880-02	6/16/95-8:38	GP-019-005-S		X				X						X	X	X	X								
022880-03	6/16/95-8:38	GP-019-005-S		X				X												X	X				
022880-04	6/16/95-8:38	GP-019-005-S		X				X															X		
022880-05	6/16/95-8:38	GP-019-005-S		X				X			X														
022881-01	6/16/95-9:18	GP-020-005-S											X												
022881-02	6/16/95-9:18	GP-020-005-S		X				X						X	X	X									
022881-03	6/16/95-9:18	GP-020-005-S		X				X												X	X				
022881-04	6/16/95-9:18	GP-020-005-S		X				X															X		

ER Site 96: Listing of Samples Collected and Analysis Performed

ER SITE 96				FIELD SCREENING					ON-SITE LAB ANALYSES				OFF-SITE LAB ANALYSES												
FIELD NUMBER	DATE/TIME Date and Time the sample was collected	SAMPLE ID See Figure 1 for Locations T1096-	REMARKS	VOCs	TPH	SOIL pH	PCBs	RADIATION (alpha, beta, gamma)	VOCs (by GC)	METALS (by DCPI)	GAMMA SPEC	TPH	VOCs (8240)	SVOCs (8270)	TAL INORGANICS	PCB	HEX CHROMIUM	TOTAL CYANIDE	MERCURY	ISOTOPIC URANIUM	ISOTOPIC PLUTONIUM	ISOTOPIC THORIUM	TRITIUM (LIQUID SCINT.)	TCLP INORGANICS (1311)	TCLP ORGANICS (1311/8270/8240)
022881-05	6/16/95-9:18	GP-020-005-S		X				X			X														
022882-01	6/16/95-10:10	GP-021-004-S											X												
022882-02	6/16/95-10:10	GP-021-004-S		X				X						X	X	X									
022882-03	6/16/95-10:10	GP-021-004-S		X				X													X	X			
022882-04	6/16/95-10:10	GP-021-004-S		X				X															X		
022882-05	6/16/95-10:10	GP-021-004-S		X				X			X														
022886-01	6/19/95-8:20	GP-022-004-S											X												
022886-02	6/19/95-8:20	GP-022-004-S		X				X						X	X	X	X								
022886-03	6/19/95-8:20	GP-022-004-S		X				X													X	X			
022886-04	6/19/95-8:20	GP-022-004-S		X				X															X		
022886-05	6/19/95-8:20	GP-022-004-S		X				X			X														
022887-01	6/19/95-9:05	GP-023-005-S											X												
022887-02	6/19/95-9:05	GP-023-005-S		X				X						X	X	X									
022887-03	6/19/95-9:05	GP-023-005-S		X				X													X	X			
022887-04	6/19/95-9:05	GP-023-005-S		X				X															X		
022887-05	6/19/95-9:05	GP-023-005-S		X				X			X														
022888-01	6/19/95-10:45	GP-024-005-S											X												
022888-02	6/19/95-10:45	GP-024-005-S		X				X						X	X	X									
022888-03	6/19/95-10:45	GP-024-005-S		X				X													X	X			
022888-04	6/19/95-10:45	GP-024-005-S		X				X															X		
022888-05	6/19/95-10:45	GP-024-005-S		X				X			X														
022889-01	6/19/95-12:55	GP-025-003-S											X												
022889-02	6/19/95-12:55	GP-025-003-S		X				X						X	X	X	X								
022889-03	6/19/95-12:55	GP-025-003-S		X				X													X	X			
022889-04	6/19/95-12:55	GP-025-003-S		X				X															X		
022889-05	6/19/95-12:55	GP-025-003-S		X				X			X														
022890-01	6/19/95-14:20	GP-026-005-S											X												
022890-02	6/19/95-14:20	GP-026-005-S		X				X						X	X	X									
022890-03	6/19/95-14:20	GP-026-005-S		X				X													X	X			
022890-04	6/19/95-14:20	GP-026-005-S		X				X															X		
022890-05	6/19/95-14:20	GP-026-005-S		X				X			X														

ER Site 96: Listing of Samples Collected and Analysis Performed

ER SITE 96				FIELD SCREENING					ON-SITE LAB ANALYSES				OFF-SITE LAB ANALYSES												
FIELD NUMBER	DATE/TIME Date and Time the sample was collected	SAMPLE ID See Figure 1 for Locations T1096-	REMARKS	VOCs	TPH	SOIL pH	PCBS	RADIATION (alpha, beta, gamma)	VOCs (by GC)	METALS (by DCP)	GAMMA SPEC	TPH	VOCs (B240)	SVOCs (B270)	TAL INORGANICS	PCB	HEX CHROMIUM	TOTAL CYANIDE	MERCURY	ISOTOPIC URANIUM	ISOTOPIC PLUTONIUM	ISOTOPIC THORIUM	TRITIUM (LIQUID SCINT.)	TCLP INORGANICS (1311)	TCLP ORGANICS (1311/B240)
022891-01	6/19/95-15:40	GP-027-007-S											X												
022891-02	6/19/95-15:40	GP-027-007-S		X				X						X	X	X					X	X			
022891-03	6/19/95-15:40	GP-027-007-S		X				X																	
022891-04	6/19/95-15:40	GP-027-007-S		X				X																X	
022891-05	6/19/95-15:40	GP-027-007-S		X				X			X														
022892-01	6/20/95-8:45	GP-028-007-S	MS/MSD										X												
022892-02	6/20/95-8:45	GP-028-007-S	MS/MSD	X				X						X	X	X	X								
022892-03	6/20/95-8:45	GP-028-007-S		X				X													X	X			
022892-04	6/20/95-8:45	GP-028-007-S		X				X																X	
022892-05	6/20/95-8:45	GP-028-007-S		X				X			X														
022894-01	6/20/95-9:50	GP-029-009-S											X												
022894-02	6/20/95-9:50	GP-029-009-S		X				X						X	X	X									
022894-03	6/20/95-8:50	GP-029-009-S		X				X													X	X			
022894-04	6/20/95-9:50	GP-029-009-S		X				X																X	
022894-05	6/20/95-9:50	GP-029-009-S		X				X			X														
022895-01	6/20/95-10:55	GP-030-009-S											X												
022895-02	6/20/95-10:55	GP-030-009-S		X				X						X	X	X					X	X			
022895-03	6/20/95-10:55	GP-030-009-S		X				X																	
022895-04	6/20/95-10:55	GP-030-009-S		X				X																X	
022895-05	6/20/95-10:55	GP-030-009-S		X				X			X														
022896-01	6/20/95-12:50	GP-031-005-S											X												
022896-02	6/20/95-12:50	GP-031-005-S		X				X						X	X	X	X								
022896-03	6/20/95-12:50	GP-031-005-S		X				X													X	X			
022896-04	6/20/95-12:50	GP-031-005-S		X				X																X	
022896-05	6/20/95-12:50	GP-031-005-S		X				X			X														
022898-01	6/20/95-14:10	GP-033-003-S											X												
022898-02	6/20/95-14:10	GP-033-003-S		X				X						X	X	X									
022898-03	6/20/95-14:10	GP-033-003-S		X				X													X	X			
022898-04	6/20/95-14:10	GP-033-003-S		X				X																X	
022898-05	6/20/95-14:10	GP-033-003-S		X				X																	
022899-01	6/21/95-8:44	GP-034-004-S									X		X												

TABLE 1
ER Site 96: Listing of Samples Collected and Analysis Performed

ER SITE 96				FIELD SCREENING					ON-SITE LAB ANALYSES				OFF-SITE LAB ANALYSES												
FIELD NUMBER	DATE/TIME Date and Time the sample was collected	SAMPLE ID See Figure 1 for Locations T1096-	REMARKS	VOCs	TPH	SOIL pH	PCBs	RADIATION (alpha, beta, gamma)	VOCs (by GC)	METALS (by DCF)	GAMMA SPEC	TPH	VOCs (8240)	SVOCs (8270)	TAL INORGANICS	PCB	HEX CHROMIUM	TOTAL CYANIDE	MERCURY	ISOTOPIC URANIUM	ISOTOPIC PLUTONIUM	ISOTOPIC THORIUM	TRITIUM (LIQUID SCINT.)	TCLP INORGANICS (1311)	TCLP ORGANICS (1311/8270/8240)
022899-02	6/21/95-8:44	GP-034-004-S		X				X																	
022899-03	6/21/95-8:44	GP-034-004-S		X				X													X	X			
022899-04	6/21/95-8:44	GP-034-004-S		X				X																X	
022901-01	6/21/95-10:00	GP-035-007-S											X												
022901-02	6/21/95-10:00	GP-035-007-S		X				X					X	X	X	X									
022901-03	6/21/95-10:00	GP-035-007-S		X				X													X	X			
022901-04	6/21/95-10:00	GP-035-007-S		X				X																X	
022901-05	6/21/95-10:00	GP-035-007-S		X				X		X															
022902-01	6/21/95-11:05	GP-036-005-S									X		X												
022902-02	6/21/95-11:05	GP-036-005-S		X				X						X	X	X									
022902-03	6/21/95-11:05	GP-036-005-S		X				X													X	X			
022902-04	6/21/95-11:05	GP-036-005-S		X				X																X	
022902-05	6/21/95-11:05	GP-036-005-S		X				X		X															
022903-01	6/21/95-12:48	GP-037-005-S									X		X												
022903-02	6/21/95-12:48	GP-037-005-S		X				X						X	X	X									
022903-03	6/21/95-12:48	GP-037-005-S		X				X													X	X			
022903-04	6/21/95-12:48	GP-037-005-S		X				X																X	
022903-05	6/21/95-12:48	GP-037-005-S		X				X		X															
022904-01	6/21/95-14:15	GP-038-010-S											X												
022904-02	6/21/95-14:15	GP-038-010-S		X				X						X	X	X	X								
022904-03	6/21/95-14:15	GP-038-010-S		X				X													X	X			
022904-04	6/21/95-14:15	GP-038-010-S		X				X																X	
022904-05	6/21/95-14:15	GP-038-010-S		X				X		X															
022905-01	6/22/95-8:30	GP-039-008-S											X												
022905-02	6/22/95-8:30	GP-039-008-S		X				X						X	X	X									
022905-03	6/22/95-8:30	GP-039-008-S		X				X													X	X			
022905-04	6/22/95-8:30	GP-039-008-S		X				X																X	
022905-05	6/22/95-8:30	GP-039-008-S		X				X		X															
022908-01	6/22/95-9:35	GP-040-004-S											X												
022908-02	6/22/95-9:35	GP-040-004-S		X				X						X	X	X									
022908-03	6/22/95-9:35	GP-040-004-S		X				X													X	X			

ER Site 96: Listing of Samples Collected and Analysis Performed

ER SITE 96				FIELD SCREENING					ON-SITE LAB ANALYSES				OFF-SITE LAB ANALYSES												
FIELD NUMBER	DATE/TIME Date and Time the sample was collected	SAMPLE ID See Figure 1 for Locations T1096-	REMARKS	VOCs	TPH	SOIL pH	PCBs	RADIATION (alpha, beta, gamma)	VOCs (by GC)	METALS (by DCP)	GAMMA SPEC	TPH	VOCs (8240)	SVOCs (8270)	TOTAL INORGANICS	PCB	HEX CHROMIUM	TOTAL CYANIDE	MERCURY	ISOTOPIC URANIUM	ISOTOPIC PLUTONIUM	ISOTOPIC THORIUM	TRITIUM (LIQUID SCINT.)	TCLP INORGANICS (1311)	TCLP ORGANICS (1311/8270/8240)
022908-04	6/22/95-9:35	GP-040-004-S		X				X																X	
022908-05	6/22/95-9:35	GP-040-004-S		X				X			X														
022910-01	6/22/95-10:40	GP-041-004-S											X												
022910-02	6/22/95-10:40	GP-041-004-S		X				X					X	X	X	X	X								
022910-03	6/22/95-10:40	GP-041-004-S		X				X												X	X				
022910-04	6/22/95-10:40	GP-041-004-S		X				X															X		
022910-05	6/22/95-10:40	GP-041-004-S		X				X		X															
022911-01	6/22/95-11:20	GP-042-005-S											X												
022911-02	6/22/95-11:20	GP-042-005-S		X				X						X	X	X									
022911-03	6/22/95-11:20	GP-042-005-S		X				X												X	X				
022911-04	6/22/95-11:20	GP-042-005-S		X				X															X		
022911-05	6/22/95-11:20	GP-042-005-S		X				X		X															
022912-01	6/22/95-13:10	GP-043-005-S									X		X												
022912-02	6/22/95-13:10	GP-043-005-S		X				X						X	X	X									
022912-03	6/22/95-13:10	GP-043-005-S		X				X												X	X				
022912-04	6/22/95-13:10	GP-043-005-S		X				X															X		
022912-05	6/22/95-13:10	GP-043-005-S		X				X		X															
022952-01	6/28/95-9:30	GP-044-003-S											X												
022952-02	6/28/95-9:30	GP-044-003-S		X				X						X	X	X	X								
022952-03	6/28/95-9:30	GP-044-003-S		X				X												X	X				
022952-04	6/28/95-9:30	GP-044-003-S		X				X															X		
022953-01	6/28/95-10:50	GP-045-004-S											X												
022953-02	6/28/95-10:50	GP-045-004-S		X				X						X	X	X									
022953-03	6/28/95-10:50	GP-045-004-S		X				X												X	X				
022953-04	6/28/95-10:50	GP-045-004-S		X				X															X		
022953-05	6/28/95-10:50	GP-045-004-S		X				X		X														X	
022956-01	7/10/95-10:00	GP-046-004-S											X												
022956-02	7/10/95-10:00	GP-046-004-S		X				X						X	X	X									
022956-03	7/10/95-10:00	GP-046-004-S		X				X												X	X				
022956-04	7/10/95-10:00	GP-046-004-S		X				X															X		
022956-05	7/10/95-10:00	GP-046-004-S		X				X		X															

TABLE 1
ER Site 96: Listing of Samples Collected and Analysis Performed

ER SITE 96				FIELD SCREENING					ON-SITE LAB ANALYSES				OFF-SITE LAB ANALYSES												
FIELD NUMBER	DATE/TIME Date and Time the sample was collected	SAMPLE ID See Figure 1 for Locations T1096-	REMARKS	VOCs	TPH	SOIL pH	PCBs	RADIATION (alpha, beta, gamma)	VOCs (by GC)	METALS (by DCP)	GAMMA SPEC	TPH	VOCs (8240)	SVOCs (8270)	TAL INORGANICS	PCB	HEX CHROMIUM	TOTAL CYANIDE	MERCURY	ISOTOPIC URANIUM	ISOTOPIC PLUTONIUM	ISOTOPIC THORIUM	TRITIUM (LIQUID SCINT.)	TCLP INORGANICS (1311)	TCLP ORGANICS (1311/8270/8240)
022957-01	7/10/95-11:15	GP-047-006-S											X												
022957-02	7/10/95-11:15	GP-047-006-S		X				X																	
022957-03	7/10/95-11:15	GP-047-006-S		X				X						X	X	X	X				X	X			
022957-04	7/10/95-11:15	GP-047-006-S		X				X																X	
022957-05	7/10/95-11:15	GP-047-006-S		X				X			X														
022958-01	7/10/95-13:15	GP-048-007-S											X												
022958-02	7/10/95-13:15	GP-048-007-S		X				X						X	X	X									
022958-03	7/10/95-13:15	GP-048-007-S		X				X													X	X			
022958-04	7/10/95-13:15	GP-048-007-S		X				X																X	
022958-05	7/10/95-13:15	GP-048-007-S		X				X			X														
022961-01	7/11/95-8:20	GP-050-005-S	MS/MSD										X												
022961-02	7/11/95-8:20	GP-050-005-S	MS/MSD	X				X						X	X	X	X								
022981-03	7/11/95-8:20	GP-050-005-S		X				X													X	X			
022981-04	7/11/95-8:20	GP-050-005-S		X				X																X	
022961-05	7/11/95-8:20	GP-050-005-S		X				X			X														
022962-01	7/11/95-10:15	GP-051-004-S											X												
022962-02	7/11/95-10:15	GP-051-004-S		X				X						X	X	X					X	X			
022962-03	7/11/95-10:15	GP-051-004-S		X				X																X	
022962-04	7/11/95-10:15	GP-051-004-S		X				X																	
022962-05	7/11/95-10:15	GP-051-004-S		X				X			X														
022963-01	7/11/95-11:00	GP-052-004-S											X												
022963-02	7/11/95-11:00	GP-052-004-S		X				X						X	X	X									
022963-03	7/11/95-11:00	GP-052-004-S		X				X													X	X			
022963-04	7/11/95-11:00	GP-052-004-S		X				X																X	
022963-05	7/11/95-11:00	GP-052-004-S		X				X			X														
022965-01	7/11/95-12:40	GP-053-006-S											X												
022965-02	7/11/95-12:40	GP-053-006-S		X				X						X	X	X	X								
022965-03	7/11/95-12:40	GP-053-006-S		X				X													X	X			
022965-04	7/11/95-12:40	GP-053-006-S		X				X																X	
022965-05	7/11/95-12:40	GP-053-006-S		X				X			X														
022966-01	7/11/95-14:05	GP-054-007-S									X		X												

ER Site 96: Listing of Samples Collected and Analysis Performed

ER SITE 96				FIELD SCREENING					ON-SITE LAB ANALYSES				OFF-SITE LAB ANALYSES												
FIELD NUMBER	DATE/TIME Date and Time the sample was collected	SAMPLE ID See Figure 1 for Locations T1096-	REMARKS	VOCs	TPH	SOIL pH	PCBs	RADIATION (alpha, beta, gamma)	VOCs (by GC)	METALS (by DCP)	GAMMA SPEC	TPH	VOCs (B240)	SVOCs (B270)	TOTAL INORGANICS	PCB	HEX CHROMIUM	TOTAL CYANIDE	MERCURY	ISOTOPIC URANIUM	ISOTOPIC PLUTONIUM	ISOTOPIC THORIUM	TRITIUM (LIQUID SCINT.)	TCLP INORGANICS (1311)	TCLP ORGANICS (1311/8270/8240)
022943-04	6/27/95-11:15	SD-025-001-SS		X				X																	
022943-05	6/27/95-11:15	SD-025-001-SS		X				X			X														
022944-01	6/27/95-11:30	SD-026-001-SS		X				X					X												
022944-02	6/27/95-11:30	SD-026-001-SS		X				X						X	X	X									
022944-03	6/27/95-11:30	SD-026-001-SS		X				X													X	X			
022944-04	6/27/95-11:30	SD-026-001-SS		X				X															X		
022944-05	6/27/95-11:30	SD-026-001-SS		X				X			X														
022945-01	6/27/95-11:45	SD-027-001-SS		X				X					X												
022945-02	6/27/95-11:45	SD-027-001-SS		X				X						X	X	X									
022945-03	6/27/95-11:45	SD-027-001-SS		X				X													X	X			
022945-04	6/27/95-11:45	SD-027-001-SS		X				X															X		
022945-05	6/27/95-11:45	SD-027-001-SS		X				X			X														
022946-01	6/27/95-14:20	SD-028-001-SS		X				X					X												
022946-02	6/27/95-14:20	SD-028-001-SS		X				X						X	X	X	X								
022946-03	6/27/95-14:20	SD-028-001-SS		X				X													X	X			
022946-04	6/27/95-14:20	SD-028-001-SS		X				X															X		
022946-05	6/27/95-14:20	SD-028-001-SS		X				X			X														
022947-01	6/27/95-15:10	SD-029-001-SS		X				X					X												
022947-02	6/27/95-15:10	SD-029-001-SS		X				X						X	X	X									
022947-03	6/27/95-15:10	SD-029-001-SS		X				X													X	X			
022947-04	6/27/95-15:10	SD-029-001-SS		X				X															X		
022947-05	6/27/95-15:10	SD-029-001-SS		X				X			X														
022871-01	6/15/95-9:20	GP-012-006-S	DUP OF 022869-01										X												
022871-02	6/15/95-9:20	GP-012-006-S	DUP OF 022869-02	X				X						X	X	X									
022871-03	6/15/95-9:20	GP-012-006-S	DUP OF 022869-03	X				X													X	X			
022871-04	6/15/95-9:20	GP-012-006-S	DUP OF 022869-04	X				X															X		
022871-05	6/15/95-9:20	GP-012-006-S	DUP OF 022869-05	X				X			X														
022897-01	6/20/95-13:20	GP-032-005-S	DUP OF 022896-01										X												
022897-02	6/20/95-13:20	GP-032-005-S	DUP OF 022896-02	X				X						X	X	X	X								

ER Site 96: Listing of Samples Collected and Analysis Performed

ER SITE 96				FIELD SCREENING					ON-SITE LAB ANALYSES				OFF-SITE LAB ANALYSES												
FIELD NUMBER	DATE/TIME Date and Time the sample was collected	SAMPLE ID See Figure 1 for Locations T1096-	REMARKS	VOCs	TPH	SOIL pH	PCBs	RADIATION (alpha, beta, gamma)	VOCs (by GC)	METALS (by DCPI)	GAMMA SPEC	TPH	VOCs (8240)	SVOCs (8270)	TAL INORGANICS	PCB	HEX CHROMIUM	TOTAL CYANIDE	MERCURY	ISOTOPIC URANIUM	ISOTOPIC PLUTONIUM	ISOTOPIC THORIUM	TRITIUM (LIQUID SCINT.)	TCLP INORGANICS (1311)	TCLP ORGANICS (1311/8270/8240)
022897-01	6/20/95-13:20	GP-032-005-S	DUP OF 022896-03	X				X													X	X			
022897-04	6/20/95-13:20	GP-032-005-S	DUP OF 022896-04	X				X																X	
022897-05	6/20/95-13:20	GP-032-005-S	DUP OF 022896-05	X				X			X														
022959-01	7/10/95-13:55	GP-049-007-S	DUP OF 022958-01										X												
022959-02	7/10/95-13:55	GP-049-007-S	DUP OF 022958-02	X				X						X	X	X									
022959-03	7/10/95-13:55	GP-049-007-S	DUP OF 022958-03	X				X													X	X			
022959-04	7/10/95-13:55	GP-049-007-S	DUP OF 022958-04	X				X															X		
022959-05	7/10/95-13:55	GP-049-007-S	DUP OF 022958-05	X				X			X														
022922-01	6/26/95-13:15	SD-008-001-SS	DUP OF 022921-01	X				X					X												
022922-02	6/26/95-13:15	SD-008-001-SS	DUP OF 022921-02	X				X						X	X	X									
022922-03	6/26/95-13:15	SD-008-001-SS	DUP OF 022921-03	X				X													X	X			
022922-04	6/26/95-13:15	SD-008-001-SS	DUP OF 022921-04	X				X																X	
022922-05	6/26/95-13:15	SD-008-001-SS	DUP OF 022921-05	X				X			X														
022942-01	6/27/95-10:55	SD-024-001-SS	DUP OF 022941-01	X				X					X												
022942-02	6/27/95-10:55	SD-024-001-SS	DUP OF 022941-02	X				X						X	X	X									
022942-03	6/27/95-10:55	SD-024-001-SS	DUP OF 022941-03	X				X													X	X			
022942-04	6/27/95-10:55	SD-024-001-SS	DUP OF 022941-04	X				X																X	
022942-05	6/27/95-10:55	SD-024-001-SS	DUP OF 022941-05	X				X			X														
024716-01	7/14/95-10:40	DRM-001-000-W	DECON WATER										X												
024716-02	7/14/95-10:40	DRM-001-000-W	DECON WATER											X											
024716-03	7/14/95-10:40	DRM-001-000-W	DECON WATER												X										
024716-04	7/14/95-10:40	DRM-001-000-W	DECON WATER															X							
024716-05	7/14/95-10:40	DRM-001-000-W	DECON WATER														X								
024716-06	7/14/95-10:40	DRM-001-000-W	DECON WATER																					X	
024716-07	7/14/95-10:40	DRM-001-000-W	DECON WATER																		X	X	X		
024716-08	7/14/95-10:40	DRM-001-000-W	DECON WATER														X								

ER Site 96: Listing of Samples Collected and Analysis Performed

ER SITE 96				FIELD SCREENING					ON-SITE LAB ANALYSES				OFF-SITE LAB ANALYSES												
FIELD NUMBER	DATE/TIME Date and Time the sample was collected	SAMPLE ID See Figure 1 for Locations T1096-	REMARKS	VOCs	TPH	SOIL pH	PCBs	RADIATION (alpha, beta, gamma)	VOCs (by GC)	METALS (by DCP)	GAMMA SPEC	TPH	VOCs (8240)	SVOCs (8270)	TAL INORGANICS	PCB	HEX CHROMIUM	TOTAL CYANIDE	MERCURY	ISOTOPIC URANIUM	ISOTOPIC PLUTONIUM	ISOTOPIC THORIUM	TRITIUM (LIQUID SCINT.)	TCLP INORGANICS (1311)	TCLP ORGANICS (1311/8270/8240)
022936-03	6/27/95-8:55	SD-018-001-SS		X				X												X	X				
022936-04	6/27/95-8:55	SD-018-001-SS		X				X															X		
022936-05	6/27/95-8:55	SD-018-001-SS		X				X		X															
022937-01	6/27/95-9:15	SD-019-001-SS		X				X					X												
022937-02	6/27/95-9:15	SD-019-001-SS		X				X						X	X	X									
022937-03	6/27/95-9:15	SD-019-001-SS		X				X												X	X				
022937-04	6/27/95-9:15	SD-019-001-SS		X				X															X		
022937-05	6/27/95-9:15	SD-019-001-SS		X				X		X															
022938-01	6/27/95-9:30	SD-020-001-SS		X				X					X												
022938-02	6/27/95-9:30	SD-020-001-SS		X				X						X	X	X									
022938-03	6/27/95-9:30	SD-020-001-SS		X				X												X	X				
022938-04	6/27/95-9:30	SD-020-001-SS		X				X															X		
022938-05	6/27/95-9:30	SD-020-001-SS		X				X		X															
022939-01	6/27/95-9:50	SD-021-001-SS		X				X					X												
022939-02	6/27/95-9:50	SD-021-001-SS		X				X						X	X	X	X								
022939-03	6/27/95-9:50	SD-021-001-SS		X				X												X	X				
022939-04	6/27/95-9:50	SD-021-001-SS		X				X															X		
022939-05	6/27/95-9:50	SD-021-001-SS		X				X		X															
022940-01	6/27/95-10:40	SD-022-001-SS		X				X					X												
022940-02	6/27/95-10:40	SD-022-001-SS		X				X						X	X	X									
022940-03	6/27/95-10:40	SD-022-001-SS		X				X												X	X				
022940-04	6/27/95-10:40	SD-022-001-SS		X				X															X		
022940-05	6/27/95-10:40	SD-022-001-SS		X				X		X															
022941-01	6/27/95-10:55	SD-023-001-SS		X				X					X												
022941-02	6/27/95-10:55	SD-023-001-SS		X				X						X	X	X									
022941-03	6/27/95-10:55	SD-023-001-SS		X				X												X	X				
022941-04	6/27/95-10:55	SD-023-001-SS		X				X															X		
022941-05	6/27/95-10:55	SD-023-001-SS		X				X		X															
022943-01	6/27/95-11:15	SD-025-001-SS		X				X					X												
022943-02	6/27/95-11:15	SD-025-001-SS		X				X						X	X	X	X								
022943-03	6/27/95-11:15	SD-025-001-SS		X				X												X	X				

ER Site 96: Listing of Samples Collected and Analysis Performed

ER SITE 96				FIELD SCREENING					ON-SITE LAB ANALYSES				OFF-SITE LAB ANALYSES												
FIELD NUMBER	DATE/TIME Date and Time the sample was collected	SAMPLE ID See Figure 1 for Locations T1096-	REMARKS	VOCs	TPH	SOIL pH	PCBs	RADIATION (alpha, beta, gamma)	VOCs (by GC)	METALS (by DCP)	GAMMA SPEC	TPH	VOCs (8240)	SVOCs (8270)	TAL INORGANICS	PCB	HEX CHROMIUM	TOTAL CYANIDE	MERCURY	ISOTOPIC URANIUM	ISOTOPIC PLUTONIUM	ISOTOPIC THORIUM	TRITIUM (LIQUID SCINT.)	TCLP INORGANICS (1311)	TCLP ORGANICS (1311/8270/8240)
022926-02	6/26/95-14:35	SD-012-001-SS		X				X						X	X	X	X								
022926-03	6/26/95-14:35	SD-012-001-SS		X				X												X	X				
022926-04	6/26/95-14:35	SD-012-001-SS		X				X															X		
022926-05	6/26/95-14:35	SD-012-001-SS		X				X		X															
022927-01	6/26/95-14:50	SD-013-001-SS		X				X					X												
022927-02	6/26/95-14:50	SD-013-001-SS		X				X						X	X	X									
022927-03	6/26/95-14:50	SD-013-001-SS		X				X												X	X				
022927-04	6/26/95-14:50	SD-013-001-SS		X				X															X		
022927-05	6/26/95-14:50	SD-013-001-SS		X				X		X															
022928-01	6/26/95-15:00	SD-014-001-SS		X				X			X		X												
022928-02	6/26/95-15:00	SD-014-001-SS		X				X					X	X	X										
022928-03	6/26/95-15:00	SD-014-001-SS		X				X												X	X				
022928-04	6/26/95-15:00	SD-014-001-SS		X				X															X		
022928-05	6/26/95-15:00	SD-014-001-SS		X				X		X															
022929-01	6/26/95-15:10	SD-015-001-SS		X				X					X												
022929-02	6/26/95-15:10	SD-015-001-SS		X				X						X	X	X	X								
022929-03	6/26/95-15:10	SD-015-001-SS		X				X												X	X				
022929-04	6/26/95-15:10	SD-015-001-SS		X				X															X		
022929-05	6/26/95-15:10	SD-015-001-SS		X				X		X															
022930-01	6/26/95-15:20	SD-016-001-SS		X				X					X												
022930-02	6/26/95-15:20	SD-016-001-SS		X				X						X	X	X									
022930-03	6/26/95-15:20	SD-016-001-SS		X				X												X	X				
022930-04	6/26/95-15:20	SD-016-001-SS		X				X															X		
022930-05	6/26/95-15:20	SD-016-001-SS		X				X		X															
022935-01	6/27/95-8:35	SD-017-001-SS	MS/MSD	X				X					X												
022935-02	6/27/95-8:35	SD-017-001-SS	MS/MSD	X				X						X	X	X									
022935-03	6/27/95-8:35	SD-017-001-SS		X				X												X	X				
022935-04	6/27/95-8:35	SD-017-001-SS		X				X															X		
022935-05	6/27/95-8:35	SD-017-001-SS		X				X		X															
022936-01	6/27/95-8:55	SD-018-001-SS		X				X					X												
022936-02	6/27/95-8:55	SD-018-001-SS		X				X						X	X	X	X								

TABLE 1

ER Site 96: Listing of Samples Collected and Analysis Performed

ER SITE 96				FIELD SCREENING					ON-SITE LAB ANALYSES				OFF-SITE LAB ANALYSES												
FIELD NUMBER Assign Bar-Coded Sample Number in Field	DATE/TIME Date and Time the sample was collected	SAMPLE ID See Figure 1 for Locations T1096-	REMARKS	VOCs	TPH	SOIL pH	PCBs	RADIATION (alpha, beta, gamma)	VOCs (by GC)	METALS (by DCP)	GAMMA SPEC	TPH	VOCs (8240)	SVOCs (8270)	TAL INORGANICS	PCB	HEX CHROMIUM	TOTAL CYANIDE	MERCURY	ISOTOPIC URANIUM	ISOTOPIC PLUTONIUM	ISOTOPIC THORIUM	TRITIUM (LIQUID SCINT.)	TCLP INORGANICS (1311)	TCLP ORGANICS (1311/8270/8240)
022883-01	6/16/95-10:40	EB-001-000-W											X												
022883-02	6/16/95-10:40	EB-001-000-W												X											
022883-03	6/16/95-10:40	EB-001-000-W													X										
022883-04	6/16/95-10:40	EB-001-000-W																X							
022883-05	6/16/95-10:40	EB-001-000-W														X									
022883-06	6/16/95-10:40	EB-001-000-W																							
022883-07	6/16/95-10:40	EB-001-000-W																		X	X			X	
022909-01	6/22/95-13:30	EB-002-000-W											X												
022909-02	6/22/95-13:30	EB-002-000-W												X											
022909-03	6/22/95-13:30	EB-002-000-W													X										
022909-04	6/22/95-13:30	EB-002-000-W																X							
022909-05	6/22/95-13:30	EB-002-000-W														X									
022909-06	6/22/95-13:30	EB-002-000-W																						X	
022909-07	6/22/95-13:30	EB-002-000-W																		X	X				
022909-08	6/22/95-13:30	EB-002-000-W															X								
022931-01	6/26/95-15:40	EB-003-000-W											X												
022931-02	6/26/95-15:40	EB-003-000-W												X											
022931-03	6/26/95-15:40	EB-003-000-W													X										
022931-04	6/26/95-15:40	EB-003-000-W																X							
022931-05	6/26/95-15:40	EB-003-000-W															X								
022931-06	6/26/95-15:40	EB-003-000-W																		X	X				
022931-07	6/26/95-15:40	EB-003-000-W																		X	X				
022931-08	6/26/95-15:40	EB-003-000-W															X								
022949-01	6/27/95-15:20	EB-004-000-W											X												
022949-02	6/27/95-15:20	EB-004-000-W												X											
022949-03	6/27/95-15:20	EB-004-000-W													X										
022949-04	6/27/95-15:20	EB-004-000-W																X							
022949-05	6/27/95-15:20	EB-004-000-W															X								
022949-06	6/27/95-15:20	EB-004-000-W																						X	
022949-07	6/27/95-15:20	EB-004-000-W																		X	X				

TABLE 1

ER Site 96: Listing of Samples Collected and Analysis Performed

ER SITE 96				FIELD SCREENING					ON-SITE LAB ANALYSES				OFF-SITE LAB ANALYSES												
FIELD NUMBER	DATE/TIME Date and Time the sample was collected	SAMPLE ID See Figure 1 for Locations T1096-	REMARKS	VOCs	TPH	SOIL pH	PCBs	RADIATION (alpha, beta, gamma)	VOCs (by GC)	METALS (by DCP)	GAMMA SPEC	TPH	VOCs (8240)	SVOCs (8270)	TAL INORGANICS	PCB	HEX CHROMIUM	TOTAL CYANIDE	MERCURY	ISOTOPIC URANIUM	ISOTOPIC PLUTONIUM	ISOTOPIC THORIUM	TRITIUM (LIQUID SCINT.)	TCLP INORGANICS (1311)	TCLP ORGANICS (1311/8270/8240)
022954-01	7/11/95-13:00	EB-005-000-W											X												
022954-02	7/11/95-13:00	EB-005-000-W												X											
022954-03	7/11/95-13:00	EB-005-000-W													X										
022954-04	7/11/95-13:00	EB-005-000-W																X							
022954-05	7/11/95-13:00	EB-005-000-W														X									
022954-06	7/11/95-13:00	EB-005-000-W																					X		
022954-07	7/11/95-13:00	EB-005-000-W																		X	X				
022879-01	6/15/95-14:15	FB-001-000-S											X												
022906-01	6/21/95-11:10	FB-002-000-S											X												
022933-01	6/26/95-14:25	FB-003-000-S											X												
022948-01	6/27/95-14:00	FB-004-000-S											X												
022964-01	7/11/95-10:25	FB-005-000-S											X												
022863-01	6/13/95-7:20	TB-001-000-S											X												
022870-01	6/14/95-7:38	TB-002-000-S											X												
022878-01	6/15/95-7:30	TB-003-000-S											X												
022884-01	6/16/95-7:55	TB-004-000-S											X												
022885-01	6/16/95-10:30	TB-005-000-W											X												
022893-01	6/19/95-7:45	TB-006-000-S											X												
022900-01	6/20/95-7:40	TB-007-000-S											X												
022907-01	6/21/95-7:30	TB-008-000-S											X												
022913-01	6/22/95-7:40	TB-009-000-S											X												
022914-01	6/22/95-13:30	TB-010-000-W											X												
022932-01	6/26/95-9:51	TB-011-000-S											X												
022934-01	6/26/95-15:30	TB-012-000-W											X												
022950-01	6/27/95-8:00	TB-013-000-S											X												
022951-01	6/27/95-15:15	TB-014-000-W											X												
022955-01	6/28/95-7:40	TB-015-000-S											X												

ER Site 96: Listing of Samples Collected and Analysis Performed

ER SITE 96				FIELD SCREENING					ON-SITE LAB ANALYSES				OFF-SITE LAB ANALYSES												
FIELD NUMBER	DATE/TIME Date and Time the sample was collected	SAMPLE ID See Figure 1 for Locations T1096-	REMARKS	VOCs	TPH	SOIL pH	PCBs	RADIATION (alpha, beta, gamma)	VOCs (by GC)	METALS (by DCP)	GAMMA SPEC	TPH	VOCs (B240)	SVOCs (B270)	TAL INORGANICS	PCB	HEX CHROMIUM	TOTAL CYANIDE	MERCURY	ISOTOPIC URANIUM	ISOTOPIC PLUTONIUM	ISOTOPIC THORIUM	TRITIUM (LIQUID SCINT.)	TCLP INORGANICS (1311)	TCLP ORGANICS (1311/8270/8240)
022960-01	7/10/95-7:30	TB-016-000-S											X												
022967-01	7/11/95-13:00	TB-018-000-W											X												
022968-01	7/11/95-7:40	TB-017-000-S											X												
022994-01	7/17/95-7:52	TB-020-000-S											X												
024717-01	7/14/95-10:40	TB-019-000-W											X												

ER Site 96: Detected VOC Analytical Results for Subsurface Soil and Sediment Samples

SAMPLE NUMBER	SAMPLE DATE	COMMON NAME	AMOUNT DETECTED	NOTATION	REPORTING LIMIT	UNIT OF MEASURE
Subsurface Soil						
T1096-GP-001-009-S	13-JUN-95	METHYLENE CHLORIDE	45.2	J	200	ug/kg
T1096-GP-003-006-S	13-JUN-95	ACETONE	16	J	20	ug/kg
T1096-GP-004-005-S	13-JUN-95	METHYLENE CHLORIDE	55	J	200	ug/kg
T1096-GP-005-006-S	13-JUN-95	METHYLENE CHLORIDE	50.8	J	200	ug/kg
T1096-GP-007-008-S	14-JUN-95	METHYLENE CHLORIDE	42.8	J	200	ug/kg
T1096-GP-011-006-S	15-JUN-95	METHYLENE CHLORIDE	101	J	200	ug/kg
T1096-GP-014-003-S	15-JUN-95	METHYLENE CHLORIDE	2.04	J	10	ug/kg
T1096-GP-016-005-S	15-JUN-95	CHLOROMETHANE	3.39	J	10	ug/kg
T1096-GP-016-005-S	15-JUN-95	ACETONE	13.5	J	20	ug/kg
T1096-GP-019-005-S	16-JUN-95	ACETONE	14.6	J	20	ug/kg
T1096-GP-020-005-S	16-JUN-95	METHYLENE CHLORIDE	3.77	J	10	ug/kg
T1096-GP-021-004-S	16-JUN-95	METHYLENE CHLORIDE	3.96	J	10	ug/kg
T1096-GP-021-004-S	16-JUN-95	ACETONE	12.6	J	20	ug/kg
T1096-GP-022-004-S	19-JUN-95	METHYLENE CHLORIDE	4.38	J	10	ug/kg
T1096-GP-022-004-S	19-JUN-95	ACETONE	14.2	J	20	ug/kg
T1096-GP-023-005-S	19-JUN-95	METHYLENE CHLORIDE	4.99	J	10	ug/kg
T1096-GP-023-005-S	19-JUN-95	ACETONE	13.5	J	20	ug/kg
T1096-GP-024-005-S	19-JUN-95	METHYLENE CHLORIDE	3.98	J	10	ug/kg
T1096-GP-025-003-S	19-JUN-95	ACETONE	47.6		20	ug/kg
T1096-GP-025-003-S	19-JUN-95	METHYLENE CHLORIDE	3.11	J	10	ug/kg
T1096-GP-026-005-S	19-JUN-95	ACETONE	10.8	J	20	ug/kg
T1096-GP-026-005-S	19-JUN-95	METHYLENE CHLORIDE	4.5	J	10	ug/kg
T1096-GP-027-007-S	19-JUN-95	ACETONE	12.2	J	20	ug/kg
T1096-GP-031-005-S	20-JUN-95	ACETONE	15.3	J	20	ug/kg
T1096-GP-033-003-S	20-JUN-95	METHYLENE CHLORIDE	2.62	J	10	ug/kg
T1096-GP-033-003-S	20-JUN-95	ACETONE	15.1	J	20	ug/kg
T1096-GP-034-004-S	21-JUN-95	ACETONE	13.5	J	20	ug/kg
T1096-GP-035-007-S	21-JUN-95	METHYLENE CHLORIDE	2.03	J	10	ug/kg
T1096-GP-038-010-S	21-JUN-95	METHYLENE CHLORIDE	2.04	J	10	ug/kg
T1096-GP-039-008-S	22-JUN-95	METHYLENE CHLORIDE	2.27	J	10	ug/kg
T1096-GP-040-004-S	22-JUN-95	ACETONE	10.1	J	20	ug/kg
T1096-GP-040-004-S	22-JUN-95	METHYLENE CHLORIDE	2.2	J	10	ug/kg
T1096-GP-041-004-S	22-JUN-95	ACETONE	10.3	J	20	ug/kg
T1096-GP-042-005-S	22-JUN-95	ACETONE	10.3	J	20	ug/kg
T1096-GP-048-007-S	10-JUL-95	METHYLENE CHLORIDE	2.01	J	10	ug/kg
T1096-GP-050-005-S	11-JUL-95	METHYLENE CHLORIDE	2.47	J	10	ug/kg

TABLE 2

ER Site 96: Detected VOC Analytical Results for Subsurface Soil and Sediment Samples

SAMPLE NUMBER	SAMPLE DATE	COMMON NAME	AMOUNT DETECTED	NOTATION	REPORTING LIMIT	UNIT OF MEASURE
T1096-GP-051-004-S	11-JUL-95	ACETONE	10.9	J	20	ug/kg
T1096-GP-051-004-S	11-JUL-95	METHYLENE CHLORIDE	2.39	J	10	ug/kg
T1096-GP-052-004-S	11-JUL-95	METHYLENE CHLORIDE	2.42	J	10	ug/kg
T1096-GP-053-006-S	11-JUL-95	METHYLENE CHLORIDE	2.46	J	10	ug/kg
T1096-GP-053-006-S	11-JUL-95	ACETONE	26.4		20	ug/kg
T1096-GP-054-007-S	11-JUL-95	METHYLENE CHLORIDE	2.27	J	10	ug/kg
Duplicate						
T1096-GP-032-005-S	20-JUN-95	ACETONE	10.3	J	20	ug/kg
T1096-GP-049-007-S	10-JUL-95	METHYLENE CHLORIDE	2.23	J	10	ug/kg
Sediment						
T1096-SD-001-001-SS	26-JUN-95	ACETONE	35.8		20	ug/kg
T1096-SD-002-001-SS	26-JUN-95	ACETONE	43.7		20	ug/kg
T1096-SD-003-001-SS	26-JUN-95	ACETONE	25.3		20	ug/kg
T1096-SD-004-001-SS	26-JUN-95	ACETONE	27		20	ug/kg
T1096-SD-005-001-SS	26-JUN-95	ACETONE	28		20	ug/kg
T1096-SD-006-001-SS	26-JUN-95	ACETONE	18.4	J	20	ug/kg
T1096-SD-007-001-SS	26-JUN-95	TOLUENE	13.6		10	ug/kg
T1096-SD-007-001-SS	26-JUN-95	XYLENE	6.91	J	40	ug/kg
T1096-SD-007-001-SS	26-JUN-95	ACETONE	27.3		20	ug/kg
T1096-SD-009-001-SS	26-JUN-95	ACETONE	30.2		20	ug/kg
T1096-SD-010-001-SS	26-JUN-95	ACETONE	27.5		20	ug/kg
T1096-SD-011-001-SS	26-JUN-95	TOLUENE	8.82	J	10	ug/kg
T1096-SD-011-001-SS	26-JUN-95	XYLENE	6.46	J	40	ug/kg
T1096-SD-011-001-SS	26-JUN-95	ACETONE	32.9		20	ug/kg
T1096-SD-012-001-SS	26-JUN-95	ACETONE	36.3		20	ug/kg
T1096-SD-013-001-SS	26-JUN-95	ACETONE	25.3		20	ug/kg
T1096-SD-014-001-SS	26-JUN-95	ACETONE	14.9	J	20	ug/kg
T1096-SD-015-001-SS	26-JUN-95	ACETONE	36.4		20	ug/kg
T1096-SD-021-001-SS	27-JUN-95	METHYLENE CHLORIDE	11.9	B	10	ug/kg
T1096-SD-022-001-SS	27-JUN-95	METHYLENE CHLORIDE	2.29	J	10	ug/kg
T1096-SD-025-001-SS	27-JUN-95	METHYLENE CHLORIDE	2.78	J	10	ug/kg
T1096-SD-027-001-SS	27-JUN-95	ACETONE	22.4		20	ug/kg
T1096-SD-028-001-SS	27-JUN-95	ACETONE	16.5	J	20	ug/kg
T1096-SD-029-001-SS	27-JUN-95	TOLUENE	39.3		10	ug/kg
T1096-SD-029-001-SS	27-JUN-95	ACETONE	38		20	ug/kg

TABLE 2

ER Site 96: Detected VOC Analytical Results for Subsurface Soil and Sediment Samples

SAMPLE NUMBER	SAMPLE DATE	COMMON NAME	AMOUNT DETECTED	NOTATION	REPORTING LIMIT	UNIT OF MEASURE
T1096-SD-029-001-SS	27-JUN-95	XYLENE	13.9	J	40	ug/kg
Duplicate						
T1096-SD-008-001-SS	26-JUN-95	ACETONE	23.2		20	ug/kg
T1096-SD-008-001-SS	26-JUN-95	XYLENE	6.65	J	40	ug/kg
T1096-SD-008-001-SS	26-JUN-95	TOLUENE	12.4		10	ug/kg
T1096-SD-024-001-SS	27-JUN-95	METHYLENE CHLORIDE	2.51	J	10	ug/kg
Field Blank						
T1096-FB-001-000-S	15-JUN-95	ACETONE	37.4		20	ug/kg
T1096-FB-001-000-S	15-JUN-95	METHYLENE CHLORIDE	4.75	J	10	ug/kg
T1096-FB-002-000-S	21-JUN-95	METHYLENE CHLORIDE	3.26	J	10	ug/kg
T1096-FB-002-000-S	21-JUN-95	2-BUTANONE	28.2		20	ug/kg
T1096-FB-002-000-S	21-JUN-95	ACETONE	116		20	ug/kg
T1096-FB-004-000-S	27-JUN-95	ACETONE	28.4		20	ug/kg
T1096-FB-005-000-S	11-JUL-95	METHYLENE CHLORIDE	2.49	J	10	ug/kg
T1096-FB-005-000-S	11-JUL-95	ACETONE	24.1		20	ug/kg
Trip Blank						
T1096-TB-003-000-S		ACETONE	39.2		20	ug/kg
T1096-TB-003-000-S		METHYLENE CHLORIDE	5	JB	10	ug/kg
T1096-TB-004-000-S		ACETONE	53.5		20	ug/kg
T1096-TB-004-000-S		METHYLENE CHLORIDE	4.87	J	10	ug/kg
T1096-TB-006-000-S		ACETONE	41.2		20	ug/kg
T1096-TB-006-000-S		METHYLENE CHLORIDE	5.81	JB	10	ug/kg
T1096-TB-007-000-S		ACETONE	177		20	ug/kg
T1096-TB-007-000-S		METHYLENE CHLORIDE	4.67	JB	10	ug/kg
T1096-TB-007-000-S		2-BUTANONE	22.4		20	ug/kg
T1096-TB-008-000-S		ACETONE	78.3		20	ug/kg
T1096-TB-008-000-S		METHYLENE CHLORIDE	4.91	J	10	ug/kg
T1096-TB-008-000-S		2-BUTANONE	20.5		20	ug/kg
T1096-TB-009-000-S		ACETONE	89.5		20	ug/kg
T1096-TB-009-000-S		METHYLENE CHLORIDE	5.07	JB	10	ug/kg
T1096-TB-009-000-S		2-BUTANONE	14.9	J	20	ug/kg
T1096-TB-009-000-S		2-HEXANONE	10.8	J	20	ug/kg
T1096-TB-010-000-W		METHYLENE CHLORIDE	2.02	JB	4	ug/l
T1096-TB-011-000-S		ACETONE	21		20	ug/kg

ER Site 96: Listing of Samples Collected and Analysis Performed

ER SITE 96				FIELD SCREENING				ON-SITE LAB ANALYSES				OFF-SITE LAB ANALYSES														
FIELD NUMBER	DATE/TIME Date and Time the sample was collected	SAMPLE ID See Figure 1 for Locations T1096-	REMARKS	VOCs	TPH	SOIL PH	PCBs	RADIATION (alpha, beta, gamma)	VOCs (by GC)	METALS (by DCP)	GAMMA SPEC	TPH	VOCs (B240)	SVOCs (B270)	TAL INORGANICS	PCB	HEX CHROMIUM	TOTAL CYANIDE	MERCURY	ISOTOPIC URANIUM	ISOTOPIC PLUTONIUM	ISOTOPIC THORIUM	TRITIUM (LIQUID SCINT.)	TCLP INORGANICS (1311)	TCLP ORGANICS (1311/8270/8240)	
022919-01	6/26/95-11:20	SD-005-001-SS		X				X					X													
022919-02	6/26/95-11:20	SD-005-001-SS		X				X						X	X	X										
022919-03	6/26/95-11:20	SD-005-001-SS		X				X												X	X					
022919-04	6/26/95-11:20	SD-005-001-SS		X				X																X		
022919-05	6/26/95-11:20	SD-005-001-SS		X				X			X															
022920-01	6/26/95-13:00	SD-006-001-SS	MS/MSD	X				X					X													
022920-02	6/26/95-13:00	SD-006-001-SS	MS/MSD	X				X						X	X	X	X									
022920-03	6/26/95-13:00	SD-006-001-SS		X				X												X	X					
022920-04	6/26/95-13:00	SD-006-001-SS		X				X																X		
022920-05	6/26/95-13:00	SD-006-001-SS		X				X			X															
022921-01	6/26/95-13:10	SD-007-001-SS		X				X					X													
022921-02	6/26/95-13:10	SD-007-001-SS		X				X						X	X	X										
022921-03	6/26/95-13:10	SD-007-001-SS		X				X												X	X					
022921-04	6/26/95-13:10	SD-007-001-SS		X				X																X		
022921-05	6/26/95-13:10	SD-007-001-SS		X				X			X															
022923-01	6/26/95-13:40	SD-009-001-SS		X				X					X													
022923-02	6/26/95-13:40	SD-009-001-SS		X				X						X	X	X	X									
022923-03	6/26/95-13:40	SD-009-001-SS		X				X												X	X					
022923-04	6/26/95-13:40	SD-009-001-SS		X				X																X		
022923-05	6/26/95-13:40	SD-009-001-SS		X				X			X															
022924-01	6/26/95-14:00	SD-010-001-SS		X				X					X													
022924-02	6/26/95-14:00	SD-010-001-SS		X				X						X	X	X										
022924-03	6/26/95-14:00	SD-010-001-SS		X				X												X	X					
022924-04	6/26/95-14:00	SD-010-001-SS		X				X																X		
022924-05	6/26/95-14:00	SD-010-001-SS		X				X			X															
022925-01	6/26/95-14:10	SD-011-001-SS		X				X					X													
022925-02	6/26/95-14:10	SD-011-001-SS		X				X						X	X	X										
022925-03	6/26/95-14:10	SD-011-001-SS		X				X												X	X					
022925-04	6/26/95-14:10	SD-011-001-SS		X				X																X		
022925-05	6/26/95-14:10	SD-011-001-SS		X				X			X															
022926-01	6/26/95-14:35	SD-012-001-SS		X				X					X													

TABLE 1
ER Site 96: Listing of Samples Collected and Analysis Performed

ER SITE 96				FIELD SCREENING					ON-SITE LAB ANALYSES				OFF-SITE LAB ANALYSES												
FIELD NUMBER	DATE/TIME Date and Time the sample was collected	SAMPLE ID See Figure 1 for Locations T1096-	REMARKS	VOCs	TPH	SOIL pH	PCBs	RADIATION (alpha, beta, gamma)	VOCs (by GC)	METALS (by DCPI)	GAMMA SPEC	TPH	VOCs (B240)	SVOCs (B270)	TAL INORGANICS	PCB	HEX CHROMIUM	TOTAL CYANIDE	MERCURY	ISOTOPIC URANIUM	ISOTOPIC PLUTONIUM	ISOTOPIC THORIUM	TRITIUM (LIQUID SCINT.)	TCLP INORGANICS (1311)	TCLP ORGANICS (1311/8270/8240)
022966-02	7/11/95-14:05	GP-054-007-S		X				X						X	X	X									
022966-03	7/11/95-14:05	GP-054-007-S		X				X												X	X				
022966-04	7/11/95-14:05	GP-054-007-S		X				X															X		
022966-05	7/11/95-14:05	GP-054-007-S		X				X			X														
022993-01	7/17/95-8:30	GP-055-005-S											X												
022993-02	7/17/95-8:30	GP-055-005-S		X				X						X	X	X									
022993-03	7/17/95-8:30	GP-055-005-S		X				X												X	X				
022993-04	7/17/95-8:30	GP-055-005-S		X				X															X		
022993-05	7/17/95-8:30	GP-055-005-S		X				X			X														
022915-01	6/26/95-10:05	SD-001-001-SS		X				X					X												
022915-02	6/26/95-10:05	SD-001-001-SS		X				X						X	X	X									
022915-03	6/26/95-10:05	SD-001-001-SS		X				X												X	X				
022915-04	6/26/95-10:05	SD-001-001-SS		X				X															X		
022915-05	6/26/95-10:05	SD-001-001-SS		X				X			X														
022916-01	6/26/95-10:30	SD-002-001-SS		X				X					X												
022916-02	6/26/95-10:30	SD-002-001-SS		X				X						X	X	X									
022916-03	6/26/95-10:30	SD-002-001-SS		X				X												X	X				
022916-04	6/26/95-10:30	SD-002-001-SS		X				X																X	
022916-05	6/26/95-10:30	SD-002-001-SS		X				X			X														
022917-01	6/26/95-10:50	SD-003-001-SS		X				X					X												
022917-02	6/26/95-10:50	SD-003-001-SS		X				X						X	X	X	X								
022917-03	6/26/95-10:50	SD-003-001-SS		X				X												X	X				
022917-04	6/26/95-10:50	SD-003-001-SS		X				X															X		
022917-05	6/26/95-10:50	SD-003-001-SS		X				X			X														
022918-01	6/26/95-11:05	SD-004-001-SS		X				X					X												
022918-02	6/26/95-11:05	SD-004-001-SS		X				X						X	X	X									
022918-03	6/26/95-11:05	SD-004-001-SS		X				X												X	X				
022918-04	6/26/95-11:05	SD-004-001-SS		X				X															X		
022918-05	6/26/95-11:05	SD-004-001-SS		X				X			X														

ER Site 96: Detected VOC Analytical Results for Subsurface Soil and Sediment Samples

SAMPLE NUMBER	SAMPLE DATE	COMMON NAME	AMOUNT DETECTED	NOTATION	REPORTING LIMIT	UNIT OF MEASURE
T1096-TB-012-000-W		METHYLENE CHLORIDE	7.58		2	ug/l
T1096-TB-013-000-S		ACETONE	19.7	J	20	ug/kg
T1096-TB-014-000-W		METHYLENE CHLORIDE	7.1		2	ug/l
T1096-TB-015-000-S		ACETONE	13.7	JB	50	ug/kg
T1096-TB-016-000-S		ACETONE	17.5	JB	20	ug/kg
T1096-TB-017-000-S		ACETONE	23		20	ug/kg
T1096-TB-017-000-S		METHYLENE CHLORIDE	2.48	J	10	ug/kg
T1096-TB-018-000-W		METHYLENE CHLORIDE	6.55		2	ug/l
T1096-TB-020-000-S		ACETONE	11.7	J	20	ug/kg
T1096-TB-020-000-S		METHYLENE CHLORIDE	9.66	JB	10	ug/kg

J = estimated value

B = detected in the blank

ER Site 96: Detected SVOC Analytical Results for Subsurface Soil and Sediment Samples

SAMPLE NUMBER	SAMPLE DATE	COMMON NAME	AMOUNT DETECTED	NOTATION	REPORTING LIMIT	UNIT OF MEASURE
Subsurface Soil						
T1096-GP-011-006-S	15-JUN-95	PHENANTHRENE	1720		328	ug/kg
T1096-GP-011-006-S	15-JUN-95	FLUORENE	339		328	ug/kg
T1096-GP-011-006-S	15-JUN-95	FLUORANTHENE	1850		328	ug/kg
T1096-GP-011-006-S	15-JUN-95	BENZO(A)PYRENE	1010		328	ug/kg
T1096-GP-011-006-S	15-JUN-95	CHRYSENE	916		328	ug/kg
T1096-GP-011-006-S	15-JUN-95	BENZO(K)FLUORANTHENE	584		328	ug/kg
T1096-GP-011-006-S	15-JUN-95	BENZO(A)ANTHRACENE	922		328	ug/kg
T1096-GP-011-006-S	15-JUN-95	ANTHRACENE	598		328	ug/kg
T1096-GP-011-006-S	15-JUN-95	DIBENZOFURAN	196	J	328	ug/kg
T1096-GP-011-006-S	15-JUN-95	PYRENE	1680		328	ug/kg
T1096-GP-011-006-S	15-JUN-95	NAPHTHALENE	292	J	328	ug/kg
T1096-GP-011-006-S	15-JUN-95	INDENO(1,2,3-CD)PYRENE	490		328	ug/kg
T1096-GP-011-006-S	15-JUN-95	BENZO(B)FLUORANTHENE	1120		328	ug/kg
T1096-GP-011-006-S	15-JUN-95	BENZO(GHI)PERYLENE	423		328	ug/kg
T1096-GP-011-006-S	15-JUN-95	ACENAPHTHENE	303	J	328	ug/kg
T1096-GP-015-005-S	15-JUN-95	PYRENE	208	J	333	ug/kg
T1096-GP-015-005-S	15-JUN-95	FLUORANTHENE	254	J	333	ug/kg
T1096-GP-021-004-S	16-JUN-95	BIS(2-ETHYLHEXYL)PHTHALATE	338		328	ug/kg
T1096-GP-031-005-S	20-JUN-95	PYRENE	188	J	333	ug/kg
T1096-GP-031-005-S	20-JUN-95	FLUORANTHENE	190	J	333	ug/kg
T1096-GP-034-004-S	21-JUN-95	PHENANTHRENE	446		333	ug/kg
T1096-GP-034-004-S	21-JUN-95	BENZO(B)FLUORANTHENE	269	J	333	ug/kg
T1096-GP-034-004-S	21-JUN-95	PYRENE	393		333	ug/kg
T1096-GP-034-004-S	21-JUN-95	FLUORANTHENE	493		333	ug/kg
T1096-GP-034-004-S	21-JUN-95	CHRYSENE	183	J	333	ug/kg
Duplicate						
T1096-GP-012-006-S	15-JUN-95	PHENANTHRENE	526		326	ug/kg
T1096-GP-012-006-S	15-JUN-95	PYRENE	543		326	ug/kg
T1096-GP-012-006-S	15-JUN-95	BENZO(B)FLUORANTHENE	266	J	326	ug/kg
T1096-GP-012-006-S	15-JUN-95	BENZO(A)PYRENE	244	J	326	ug/kg
T1096-GP-012-006-S	15-JUN-95	BENZO(A)ANTHRACENE	229	J	326	ug/kg
T1096-GP-012-006-S	15-JUN-95	CHRYSENE	263	J	326	ug/kg
T1096-GP-012-006-S	15-JUN-95	FLUORANTHENE	647		326	ug/kg
T1096-GP-032-005-S	20-JUN-95	PHENANTHRENE	303	J	326	ug/kg
T1096-GP-032-005-S	20-JUN-95	BENZO(B)FLUORANTHENE	267	J	326	ug/kg
T1096-GP-032-005-S	20-JUN-95	BENZO(A)PYRENE	231	J	326	ug/kg

ER Site 96: Detected SVOC Analytical Results for Subsurface Soil and Sediment Samples

SAMPLE NUMBER	SAMPLE DATE	COMMON NAME	AMOUNT DETECTED	NOTATION	REPORTING LIMIT	UNIT OF MEASURE
T1096-GP-032-005-S	20-JUN-95	FLUORANTHENE	577		326	ug/kg
T1096-GP-032-005-S	20-JUN-95	BENZO(A)ANTHRACENE	228	J	326	ug/kg
T1096-GP-032-005-S	20-JUN-95	BENZO(GH)PERYLENE	199	J	326	ug/kg
T1096-GP-032-005-S	20-JUN-95	INDENO(1,2,3-CD)PYRENE	186	J	326	ug/kg
T1096-GP-032-005-S	20-JUN-95	PYRENE	505		326	ug/kg
Sediment						
T1096-SD-001-001-SS	26-JUN-95	BENZO(A)PYRENE	2730	J	3260	ug/kg
T1096-SD-001-001-SS	26-JUN-95	PHENANTHRENE	2370	J	3260	ug/kg
T1096-SD-001-001-SS	26-JUN-95	BENZO(B)FLUORANTHENE	3650		3260	ug/kg
T1096-SD-001-001-SS	26-JUN-95	BENZO(A)ANTHRACENE	2240	J	3260	ug/kg
T1096-SD-001-001-SS	26-JUN-95	FLUORANTHENE	4970		3260	ug/kg
T1096-SD-001-001-SS	26-JUN-95	PYRENE	5560		3260	ug/kg
T1096-SD-001-001-SS	26-JUN-95	CHRYSENE	3190	J	3260	ug/kg
T1096-SD-002-001-SS	26-JUN-95	PHENANTHRENE	3270	J	3310	ug/kg
T1096-SD-002-001-SS	26-JUN-95	FLUORANTHENE	5840		3310	ug/kg
T1096-SD-002-001-SS	26-JUN-95	BENZO(A)ANTHRACENE	2620	J	3310	ug/kg
T1096-SD-002-001-SS	26-JUN-95	PYRENE	7170		3310	ug/kg
T1096-SD-002-001-SS	26-JUN-95	CHRYSENE	3780		3310	ug/kg
T1096-SD-002-001-SS	26-JUN-95	BENZO(B)FLUORANTHENE	4610		3310	ug/kg
T1096-SD-002-001-SS	26-JUN-95	BIS(2-ETHYLHEXYL)PHTHALATE	2140	J	3310	ug/kg
T1096-SD-003-001-SS	26-JUN-95	PHENANTHRENE	7610		3230	ug/kg
T1096-SD-003-001-SS	26-JUN-95	PYRENE	18800		3230	ug/kg
T1096-SD-003-001-SS	26-JUN-95	BENZO(GH)PERYLENE	4240		3230	ug/kg
T1096-SD-003-001-SS	26-JUN-95	FLUORANTHENE	14500		3230	ug/kg
T1096-SD-003-001-SS	26-JUN-95	BIS(2-ETHYLHEXYL)PHTHALATE	12800		3230	ug/kg
T1096-SD-003-001-SS	26-JUN-95	CHRYSENE	11500		3230	ug/kg
T1096-SD-003-001-SS	26-JUN-95	INDENO(1,2,3-CD)PYRENE	3970		3230	ug/kg
T1096-SD-003-001-SS	26-JUN-95	BENZO(A)ANTHRACENE	7070		3230	ug/kg
T1096-SD-003-001-SS	26-JUN-95	BENZO(K)FLUORANTHENE	3880		3230	ug/kg
T1096-SD-003-001-SS	26-JUN-95	BENZO(B)FLUORANTHENE	12400		3230	ug/kg
T1096-SD-004-001-SS	26-JUN-95	BENZO(A)ANTHRACENE	7900		3240	ug/kg
T1096-SD-004-001-SS	26-JUN-95	PHENANTHRENE	8010		3240	ug/kg
T1096-SD-004-001-SS	26-JUN-95	ANTHRACENE	1710	J	3240	ug/kg
T1096-SD-004-001-SS	26-JUN-95	BENZO(GH)PERYLENE	3450		3240	ug/kg
T1096-SD-004-001-SS	26-JUN-95	CHRYSENE	9260		3240	ug/kg
T1096-SD-004-001-SS	26-JUN-95	FLUORANTHENE	13700		3240	ug/kg
T1096-SD-004-001-SS	26-JUN-95	BENZO(B)FLUORANTHENE	11900		3240	ug/kg
T1096-SD-004-001-SS	26-JUN-95	PYRENE	17600		3240	ug/kg

ER Site 96: Detected SVOC Analytical Results for Subsurface Soil and Sediment Samples

SAMPLE NUMBER	SAMPLE DATE	COMMON NAME	AMOUNT DETECTED	NOTATION	REPORTING LIMIT	UNIT OF MEASURE
T1096-SD-004-001-SS	26-JUN-95	INDENO(1,2,3-CD)PYRENE	3380		3240	ug/kg
T1096-SD-004-001-SS	26-JUN-95	BENZO(K)FLUORANTHENE	3660		3240	ug/kg
T1096-SD-005-001-SS	26-JUN-95	PHENANTHRENE	5140		3330	ug/kg
T1096-SD-005-001-SS	26-JUN-95	BENZO(GHI)PERYLENE	2720	J	3330	ug/kg
T1096-SD-005-001-SS	26-JUN-95	INDENO(1,2,3-CD)PYRENE	2650	J	3330	ug/kg
T1096-SD-005-001-SS	26-JUN-95	BENZO(K)FLUORANTHENE	2500	J	3330	ug/kg
T1096-SD-005-001-SS	26-JUN-95	PYRENE	13500		3330	ug/kg
T1096-SD-005-001-SS	26-JUN-95	BENZO(A)ANTHRACENE	5280		3330	ug/kg
T1096-SD-005-001-SS	26-JUN-95	CHRYSENE	8520		3330	ug/kg
T1096-SD-005-001-SS	26-JUN-95	FLUORANTHENE	10600		3330	ug/kg
T1096-SD-005-001-SS	26-JUN-95	BENZO(B)FLUORANTHENE	9730		3330	ug/kg
T1096-SD-010-001-SS	26-JUN-95	BIS(2-ETHYLHEXYL)PHTHALATE	3300		332	ug/kg
T1096-SD-015-001-SS	26-JUN-95	PYRENE	198	J	329	ug/kg
T1096-SD-015-001-SS	26-JUN-95	BIS(2-ETHYLHEXYL)PHTHALATE	5280		1320	ug/kg
T1096-SD-016-001-SS	26-JUN-95	PHENANTHRENE	423		328	ug/kg
T1096-SD-016-001-SS	26-JUN-95	PYRENE	665		328	ug/kg
T1096-SD-016-001-SS	26-JUN-95	FLUORANTHENE	439		328	ug/kg
T1096-SD-016-001-SS	26-JUN-95	CHRYSENE	196	J	328	ug/kg
T1096-SD-021-001-SS	27-JUN-95	PYRENE	409		325	ug/kg
T1096-SD-021-001-SS	27-JUN-95	BENZO(B)FLUORANTHENE	335		325	ug/kg
T1096-SD-021-001-SS	27-JUN-95	FLUORANTHENE	395		325	ug/kg
T1096-SD-021-001-SS	27-JUN-95	BENZO(A)PYRENE	174	J	325	ug/kg
T1096-SD-021-001-SS	27-JUN-95	PHENANTHRENE	188	J	325	ug/kg
T1096-SD-029-001-SS	27-JUN-95	PYRENE	288	J	327	ug/kg
T1096-SD-029-001-SS	27-JUN-95	BENZO(B)FLUORANTHENE	206	J	327	ug/kg
T1096-SD-029-001-SS	27-JUN-95	BENZO(K)FLUORANTHENE	240	J	327	ug/kg
T1096-SD-029-001-SS	27-JUN-95	PHENANTHRENE	228	J	327	ug/kg
T1096-SD-029-001-SS	27-JUN-95	FLUORANTHENE	317	J	327	ug/kg
Duplicate						
T1096-SD-008-001-SS	26-JUN-95	PYRENE	207	J	328	ug/kg
Equipment Blanks						
T1096-EB-001-000-W		BIS(2-ETHYLHEXYL)PHTHALATE	44.5		10	

J = estimated value

ER Site 96: Detected PCB Analytical Results for Subsurface Soil and Sediment Samples

SAMPLE NUMBER	SAMPLE DATE	COMMON NAME	AMOUNT DETECTED	NOTATION	REPORTING LIMIT	UNIT OF MEASURE
Subsurface Soil						
T1096-GP-055-005-SS	17-Jul-95	AROCLOR 1260	33.9	J	41.6	ug/kg
Sediment						
T1096-SD-001-001-SS	26-JUN-95	AROCLOR 1260	94.1		41	ug/kg
T1096-SD-002-001-SS	26-JUN-95	AROCLOR 1254	164		41.1	ug/kg
T1096-SD-002-001-SS	26-JUN-95	AROCLOR 1260	196		41.1	ug/kg
T1096-SD-003-001-SS	26-JUN-95	POLYCHLORINATED BIPHENYLS 1262	91.7		40.9	ug/kg
T1096-SD-004-001-SS	26-JUN-95	POLYCHLORINATED BIPHENYLS 1262	97.6		41.4	ug/kg
T1096-SD-005-001-SS	26-JUN-95	POLYCHLORINATED BIPHENYLS 1262	36.3	J	40.6	ug/kg
T1096-SD-006-001-SS	26-JUN-95	POLYCHLORINATED BIPHENYLS 1262	95.5		41.6	ug/kg
T1096-SD-007-001-SS	26-JUN-95	POLYCHLORINATED BIPHENYLS 1262	75.7		41.6	ug/kg
T1096-SD-009-001-SS	26-JUN-95	POLYCHLORINATED BIPHENYLS 1262	64.7		41	ug/kg
T1096-SD-010-001-SS	26-JUN-95	POLYCHLORINATED BIPHENYLS 1262	122		41.5	ug/kg
T1096-SD-011-001-SS	26-JUN-95	AROCLOR 1254	36.3	J	41.4	ug/kg
T1096-SD-011-001-SS	26-JUN-95	POLYCHLORINATED BIPHENYLS 1262	197		41.4	ug/kg
T1096-SD-013-001-SS	26-JUN-95	POLYCHLORINATED BIPHENYLS 1262	70		41.6	ug/kg
T1096-SD-014-001-SS	26-JUN-95	POLYCHLORINATED BIPHENYLS 1262	62.8		40.6	ug/kg
T1096-SD-016-001-SS	26-JUN-95	AROCLOR 1260	66.3		41.1	ug/kg
T1096-SD-017-001-SS	27-JUN-95	AROCLOR 1260	58.4		40.5	ug/kg
T1096-SD-018-001-SS	27-JUN-95	AROCLOR 1260	55.2		40.8	ug/kg
T1096-SD-019-001-SS	27-JUN-95	AROCLOR 1260	49.5		40.5	ug/kg
T1096-SD-019-001-SS	27-JUN-95	AROCLOR 1254	45.8		40.5	ug/kg
T1096-SD-020-001-SS	27-JUN-95	AROCLOR 1260	47.4		41.1	ug/kg
T1096-SD-021-001-SS	27-JUN-95	AROCLOR 1260	163		40.4	ug/kg
Duplicate						
T1096-SD-008-001-SS	26-JUN-95	POLYCHLORINATED BIPHENYLS 1262	146		41.3	ug/kg

J = estimated value

TABLE 5

ER Site 96: Metal Analytical Results for Subsurface Soil Samples

SAMPLE NUMBER	SAMPLE DATE	COMMON NAME	AMOUNT DETECTED	NOTATION	DETECTION LIMIT	UNIT OF MEASURE
T1096-GP-001-009-S	13-JUN-95	ALUMINUM	9030	B	1.17	mg/kg
T1096-GP-001-009-S	13-JUN-95	ANTIMONY	0.219	J	0.0939	mg/kg
T1096-GP-001-009-S	13-JUN-95	ARSENIC	2.94		0.182	mg/kg
T1096-GP-001-009-S	13-JUN-95	BARIUM	95.7	B	0.0065	mg/kg
T1096-GP-001-009-S	13-JUN-95	BERYLLIUM	0.496		0.00112	mg/kg
T1096-GP-001-009-S	13-JUN-95	CADMIUM	0.0048	U	0.00951	mg/kg
T1096-GP-001-009-S	13-JUN-95	CALCIUM	58800	B	9.8	mg/kg
T1096-GP-001-009-S	13-JUN-95	CHROMIUM	10.7	B	0.0584	mg/kg
T1096-GP-001-009-S	13-JUN-95	COBALT	11.4		0.0172	mg/kg
T1096-GP-001-009-S	13-JUN-95	COPPER	8.39		0.0528	mg/kg
T1096-GP-001-009-S	13-JUN-95	IRON	14400		0.99	mg/kg
T1096-GP-001-009-S	13-JUN-95	LEAD	5.67		0.111	mg/kg
T1096-GP-001-009-S	13-JUN-95	MAGNESIUM	4990	B	1.15	mg/kg
T1096-GP-001-009-S	13-JUN-95	MANGANESE	256	B	0.00943	mg/kg
T1096-GP-001-009-S	13-JUN-95	MERCURY	0.0322	B	0.00203	mg/kg
T1096-GP-001-009-S	13-JUN-95	NICKEL	23.4		0.0791	mg/kg
T1096-GP-001-009-S	13-JUN-95	POTASSIUM	1370		0.63	mg/kg
T1096-GP-001-009-S	13-JUN-95	SELENIUM	0.758		0.14	mg/kg
T1096-GP-001-009-S	13-JUN-95	SILVER	0.122	U	0.244	mg/kg
T1096-GP-001-009-S	13-JUN-95	SODIUM	152	B	1.53	mg/kg
T1096-GP-001-009-S	13-JUN-95	THALLIUM	2.03		0.203	mg/kg
T1096-GP-001-009-S	13-JUN-95	VANADIUM	26.5	B	0.0229	mg/kg
T1096-GP-001-009-S	13-JUN-95	ZINC	28.2	B	0.265	mg/kg
T1096-GP-002-004-S	13-JUN-95	ALUMINUM	9420	B	1.17	mg/kg
T1096-GP-002-004-S	13-JUN-95	ANTIMONY	0.158	J	0.0939	mg/kg
T1096-GP-002-004-S	13-JUN-95	ARSENIC	2.94		0.182	mg/kg
T1096-GP-002-004-S	13-JUN-95	BARIUM	125	B	0.0065	mg/kg
T1096-GP-002-004-S	13-JUN-95	BERYLLIUM	0.479	J	0.00112	mg/kg
T1096-GP-002-004-S	13-JUN-95	CADMIUM	0.0048	U	0.00951	mg/kg
T1096-GP-002-004-S	13-JUN-95	CALCIUM	24100	B	9.8	mg/kg
T1096-GP-002-004-S	13-JUN-95	CHROMIUM	10.6	B	0.0584	mg/kg
T1096-GP-002-004-S	13-JUN-95	COBALT	5.7		0.0172	mg/kg
T1096-GP-002-004-S	13-JUN-95	COPPER	8.43		0.0528	mg/kg
T1096-GP-002-004-S	13-JUN-95	IRON	14900		0.99	mg/kg
T1096-GP-002-004-S	13-JUN-95	LEAD	6.77		0.111	mg/kg

TABLE 5
 ER Site 96: Metal Analytical Results for Subsurface Soil Samples

SAMPLE NUMBER	SAMPLE DATE	COMMON NAME	AMOUNT DETECTED	NOTATION	DETECTION LIMIT	UNIT OF MEASURE
T1096-GP-002-004-S	13-JUN-95	MAGNESIUM	5100	B	1.15	mg/kg
T1096-GP-002-004-S	13-JUN-95	MANGANESE	277	B	0.00943	mg/kg
T1096-GP-002-004-S	13-JUN-95	MERCURY	0.0243	JB	0.00231	mg/kg
T1096-GP-002-004-S	13-JUN-95	NICKEL	13.2		0.0791	mg/kg
T1096-GP-002-004-S	13-JUN-95	POTASSIUM	1770		0.63	mg/kg
T1096-GP-002-004-S	13-JUN-95	SELENIUM	0.755		0.14	mg/kg
T1096-GP-002-004-S	13-JUN-95	SILVER	0.122	U	0.244	mg/kg
T1096-GP-002-004-S	13-JUN-95	SODIUM	86.6	B	1.53	mg/kg
T1096-GP-002-004-S	13-JUN-95	THALLIUM	1.89		0.203	mg/kg
T1096-GP-002-004-S	13-JUN-95	VANADIUM	26.9	B	0.0229	mg/kg
T1096-GP-002-004-S	13-JUN-95	ZINC	33.9	B	0.265	mg/kg
T1096-GP-003-006-S	13-JUN-95	ALUMINUM	9490	B	1.17	mg/kg
T1096-GP-003-006-S	13-JUN-95	ANTIMONY	0.105	J	0.0939	mg/kg
T1096-GP-003-006-S	13-JUN-95	ARSENIC	3.24		0.182	mg/kg
T1096-GP-003-006-S	13-JUN-95	BARIUM	191	B	0.0065	mg/kg
T1096-GP-003-006-S	13-JUN-95	BERYLLIUM	0.504		0.00112	mg/kg
T1096-GP-003-006-S	13-JUN-95	CADMIUM	0.0048	U	0.00951	mg/kg
T1096-GP-003-006-S	13-JUN-95	CALCIUM	32700	B	9.8	mg/kg
T1096-GP-003-006-S	13-JUN-95	CHROMIUM	10.2	B	0.0584	mg/kg
T1096-GP-003-006-S	13-JUN-95	CHROMIUM (VI)	0.44		0.1	mg/kg
T1096-GP-003-006-S	13-JUN-95	COBALT	11.7		0.0172	mg/kg
T1096-GP-003-006-S	13-JUN-95	COPPER	8.84		0.0528	mg/kg
T1096-GP-003-006-S	13-JUN-95	IRON	13000		0.99	mg/kg
T1096-GP-003-006-S	13-JUN-95	LEAD	6.7		0.111	mg/kg
T1096-GP-003-006-S	13-JUN-95	MAGNESIUM	5380	B	1.15	mg/kg
T1096-GP-003-006-S	13-JUN-95	MANGANESE	262	B	0.00943	mg/kg
T1096-GP-003-006-S	13-JUN-95	MERCURY	0.0223	JB	0.00225	mg/kg
T1096-GP-003-006-S	13-JUN-95	NICKEL	27.9		0.0791	mg/kg
T1096-GP-003-006-S	13-JUN-95	POTASSIUM	1670		0.63	mg/kg
T1096-GP-003-006-S	13-JUN-95	SELENIUM	0.547		0.14	mg/kg
T1096-GP-003-006-S	13-JUN-95	SILVER	0.122	U	0.244	mg/kg
T1096-GP-003-006-S	13-JUN-95	SODIUM	100	B	1.53	mg/kg
T1096-GP-003-006-S	13-JUN-95	THALLIUM	1.63		0.203	mg/kg
T1096-GP-003-006-S	13-JUN-95	VANADIUM	25.3	B	0.0229	mg/kg
T1096-GP-003-006-S	13-JUN-95	ZINC	34.2	B	0.265	mg/kg

TABLE 5
ER Site 96: Metal Analytical Results for Subsurface Soil Samples

SAMPLE NUMBER	SAMPLE DATE	COMMON NAME	AMOUNT DETECTED	NOTATION	DETECTION LIMIT	UNIT OF MEASURE
T1096-GP-004-005-S	13-JUN-95	ALUMINUM	6080	B	1.17	mg/kg
T1096-GP-004-005-S	13-JUN-95	ANTIMONY	0.322	J	0.0939	mg/kg
T1096-GP-004-005-S	13-JUN-95	ARSENIC	3.04		0.182	mg/kg
T1096-GP-004-005-S	13-JUN-95	BARIUM	145	B	0.0065	mg/kg
T1096-GP-004-005-S	13-JUN-95	BERYLLIUM	0.309	J	0.00112	mg/kg
T1096-GP-004-005-S	13-JUN-95	CADMIUM	0.0048	U	0.00951	mg/kg
T1096-GP-004-005-S	13-JUN-95	CALCIUM	41400	B	9.8	mg/kg
T1096-GP-004-005-S	13-JUN-95	CHROMIUM	5.93	B	0.0584	mg/kg
T1096-GP-004-005-S	13-JUN-95	COBALT	2.98		0.0172	mg/kg
T1096-GP-004-005-S	13-JUN-95	COPPER	4.9		0.0528	mg/kg
T1096-GP-004-005-S	13-JUN-95	IRON	7230		0.99	mg/kg
T1096-GP-004-005-S	13-JUN-95	LEAD	3.84		0.111	mg/kg
T1096-GP-004-005-S	13-JUN-95	MAGNESIUM	2710	B	1.15	mg/kg
T1096-GP-004-005-S	13-JUN-95	MANGANESE	90.1	B	0.00943	mg/kg
T1096-GP-004-005-S	13-JUN-95	MERCURY	0.0237	JB	0.00216	mg/kg
T1096-GP-004-005-S	13-JUN-95	NICKEL	11		0.0791	mg/kg
T1096-GP-004-005-S	13-JUN-95	POTASSIUM	916		0.63	mg/kg
T1096-GP-004-005-S	13-JUN-95	SELENIUM	0.394	J	0.14	mg/kg
T1096-GP-004-005-S	13-JUN-95	SILVER	0.122	U	0.244	mg/kg
T1096-GP-004-005-S	13-JUN-95	SODIUM	70.8	B	1.53	mg/kg
T1096-GP-004-005-S	13-JUN-95	THALLIUM	0.751	J	0.203	mg/kg
T1096-GP-004-005-S	13-JUN-95	VANADIUM	16.3	B	0.0229	mg/kg
T1096-GP-004-005-S	13-JUN-95	ZINC	16.8	B	0.265	mg/kg
T1096-GP-005-006-S	13-JUN-95	ALUMINUM	4520	B	1.19	mg/kg
T1096-GP-005-006-S	13-JUN-95	ANTIMONY	0.204	J	0.0958	mg/kg
T1096-GP-005-006-S	13-JUN-95	ARSENIC	1.02		0.186	mg/kg
T1096-GP-005-006-S	13-JUN-95	BARIUM	49.7	B	0.00663	mg/kg
T1096-GP-005-006-S	13-JUN-95	BERYLLIUM	0.256	J	0.00114	mg/kg
T1096-GP-005-006-S	13-JUN-95	CADMIUM	0.0049	UB	0.0097	mg/kg
T1096-GP-005-006-S	13-JUN-95	CALCIUM	19700	B	2	mg/kg
T1096-GP-005-006-S	13-JUN-95	CHROMIUM	4.25	B	0.0596	mg/kg
T1096-GP-005-006-S	13-JUN-95	COBALT	4.19	B	0.0176	mg/kg
T1096-GP-005-006-S	13-JUN-95	COPPER	5.91		0.0539	mg/kg
T1096-GP-005-006-S	13-JUN-95	IRON	8990	B	1.01	mg/kg
T1096-GP-005-006-S	13-JUN-95	LEAD	3.91		0.113	mg/kg

TABLE 5
ER Site 96: Metal Analytical Results for Subsurface Soil Samples

SAMPLE NUMBER	SAMPLE DATE	COMMON NAME	AMOUNT DETECTED	NOTATION	DETECTION LIMIT	UNIT OF MEASURE
T1096-GP-005-006-S	13-JUN-95	MAGNESIUM	2590	B	0.235	mg/kg
T1096-GP-005-006-S	13-JUN-95	MANGANESE	168	B	0.00962	mg/kg
T1096-GP-005-006-S	13-JUN-95	MERCURY	0.0207	JB	0.00222	mg/kg
T1096-GP-005-006-S	13-JUN-95	NICKEL	13.1		0.0807	mg/kg
T1096-GP-005-006-S	13-JUN-95	POTASSIUM	1140		0.643	mg/kg
T1096-GP-005-006-S	13-JUN-95	SELENIUM	0.404	JB	0.143	mg/kg
T1096-GP-005-006-S	13-JUN-95	SILVER	0.125	U	0.249	mg/kg
T1096-GP-005-006-S	13-JUN-95	SODIUM	76.8	B	1.56	mg/kg
T1096-GP-005-006-S	13-JUN-95	THALLIUM	1.05		0.207	mg/kg
T1096-GP-005-006-S	13-JUN-95	VANADIUM	17.7	B	0.0234	mg/kg
T1096-GP-005-006-S	13-JUN-95	ZINC	20.8	B	0.27	mg/kg
T1096-GP-006-008-S	14-JUN-95	ALUMINUM	4670	B	1.19	mg/kg
T1096-GP-006-008-S	14-JUN-95	ANTIMONY	0.229	J	0.0958	mg/kg
T1096-GP-006-008-S	14-JUN-95	ARSENIC	1.44		0.186	mg/kg
T1096-GP-006-008-S	14-JUN-95	BARIUM	62.2	B	0.00663	mg/kg
T1096-GP-006-008-S	14-JUN-95	BERYLLIUM	0.246	J	0.00114	mg/kg
T1096-GP-006-008-S	14-JUN-95	CADMIUM	0.0049	UB	0.0097	mg/kg
T1096-GP-006-008-S	14-JUN-95	CALCIUM	20800	B	2	mg/kg
T1096-GP-006-008-S	14-JUN-95	CHROMIUM	4.93	B	0.0596	mg/kg
T1096-GP-006-008-S	14-JUN-95	CHROMIUM (VI)	0.32	J	0.1	mg/kg
T1096-GP-006-008-S	14-JUN-95	COBALT	4.48		0.0176	mg/kg
T1096-GP-006-008-S	14-JUN-95	COPPER	7.18		0.0539	mg/kg
T1096-GP-006-008-S	14-JUN-95	IRON	11500		1.01	mg/kg
T1096-GP-006-008-S	14-JUN-95	LEAD	6.43	B	0.113	mg/kg
T1096-GP-006-008-S	14-JUN-95	MAGNESIUM	3390	B	0.235	mg/kg
T1096-GP-006-008-S	14-JUN-95	MANGANESE	209	B	0.00962	mg/kg
T1096-GP-006-008-S	14-JUN-95	MERCURY	0.0242	JB	0.00197	mg/kg
T1096-GP-006-008-S	14-JUN-95	NICKEL	6.49		0.0807	mg/kg
T1096-GP-006-008-S	14-JUN-95	POTASSIUM	1440	B	0.643	mg/kg
T1096-GP-006-008-S	14-JUN-95	SELENIUM	0.07	U	0.143	mg/kg
T1096-GP-006-008-S	14-JUN-95	SILVER	0.125	U	0.249	mg/kg
T1096-GP-006-008-S	14-JUN-95	SODIUM	57.4	B	1.56	mg/kg
T1096-GP-006-008-S	14-JUN-95	THALLIUM	0.842	J	0.207	mg/kg
T1096-GP-006-008-S	14-JUN-95	VANADIUM	19.4	B	0.0234	mg/kg
T1096-GP-006-008-S	14-JUN-95	ZINC	26.5	B	0.27	mg/kg

TABLE 5

ER Site 96: Metal Analytical Results for Subsurface Soil Samples

SAMPLE NUMBER	SAMPLE DATE	COMMON NAME	AMOUNT DETECTED	NOTATION	DETECTION LIMIT	UNIT OF MEASURE
T1096-GP-007-008-S	14-JUN-95	ALUMINUM	8630		1.19	mg/kg
T1096-GP-007-008-S	14-JUN-95	ANTIMONY	0.647	JB	0.0958	mg/kg
T1096-GP-007-008-S	14-JUN-95	ARSENIC	3.54	B	0.186	mg/kg
T1096-GP-007-008-S	14-JUN-95	BARIUM	136	B	0.00663	mg/kg
T1096-GP-007-008-S	14-JUN-95	BERYLLIUM	0.422	J	0.00114	mg/kg
T1096-GP-007-008-S	14-JUN-95	CADMIUM	0.0049	UB	0.0097	mg/kg
T1096-GP-007-008-S	14-JUN-95	CALCIUM	44300	B	2	mg/kg
T1096-GP-007-008-S	14-JUN-95	CHROMIUM	7.69	B	0.0596	mg/kg
T1096-GP-007-008-S	14-JUN-95	COBALT	4.13		0.0176	mg/kg
T1096-GP-007-008-S	14-JUN-95	COPPER	6.89	B	0.0539	mg/kg
T1096-GP-007-008-S	14-JUN-95	IRON	11000	B	1.01	mg/kg
T1096-GP-007-008-S	14-JUN-95	LEAD	6.09		0.106	mg/kg
T1096-GP-007-008-S	14-JUN-95	MAGNESIUM	3610		0.235	mg/kg
T1096-GP-007-008-S	14-JUN-95	MANGANESE	162	B	0.00962	mg/kg
T1096-GP-007-008-S	14-JUN-95	MERCURY	0.0325	B	0.00215	mg/kg
T1096-GP-007-008-S	14-JUN-95	NICKEL	6.33	B	0.0807	mg/kg
T1096-GP-007-008-S	14-JUN-95	POTASSIUM	1570	B	0.643	mg/kg
T1096-GP-007-008-S	14-JUN-95	SELENIUM	0.632	B	0.143	mg/kg
T1096-GP-007-008-S	14-JUN-95	SILVER	0.125	U	0.249	mg/kg
T1096-GP-007-008-S	14-JUN-95	SODIUM	121	B	1.56	mg/kg
T1096-GP-007-008-S	14-JUN-95	THALLIUM	1.63		0.207	mg/kg
T1096-GP-007-008-S	14-JUN-95	VANADIUM	25		0.0234	mg/kg
T1096-GP-007-008-S	14-JUN-95	ZINC	23.4		0.27	mg/kg
T1096-GP-008-008-S	14-JUN-95	ALUMINUM	4820		1.19	mg/kg
T1096-GP-008-008-S	14-JUN-95	ANTIMONY	0.227	JB	0.0958	mg/kg
T1096-GP-008-008-S	14-JUN-95	ARSENIC	3.25	B	0.186	mg/kg
T1096-GP-008-008-S	14-JUN-95	BARIUM	113	B	0.00663	mg/kg
T1096-GP-008-008-S	14-JUN-95	BERYLLIUM	0.325	J	0.00114	mg/kg
T1096-GP-008-008-S	14-JUN-95	CADMIUM	0.434	JB	0.0097	mg/kg
T1096-GP-008-008-S	14-JUN-95	CALCIUM	32400	B	2	mg/kg
T1096-GP-008-008-S	14-JUN-95	CHROMIUM	5.7	B	0.0596	mg/kg
T1096-GP-008-008-S	14-JUN-95	COBALT	3.05		0.0176	mg/kg
T1096-GP-008-008-S	14-JUN-95	COPPER	4.52	B	0.0539	mg/kg
T1096-GP-008-008-S	14-JUN-95	IRON	6690	B	1.01	mg/kg
T1096-GP-008-008-S	14-JUN-95	LEAD	4.61		0.113	mg/kg

TABLE 5

ER Site 96: Metal Analytical Results for Subsurface Soil Samples

SAMPLE NUMBER	SAMPLE DATE	COMMON NAME	AMOUNT DETECTED	NOTATION	DETECTION LIMIT	UNIT OF MEASURE
T1096-GP-008-008-S	14-JUN-95	MAGNESIUM	2530		0.235	mg/kg
T1096-GP-008-008-S	14-JUN-95	MANGANESE	121	B	0.00962	mg/kg
T1096-GP-008-008-S	14-JUN-95	MERCURY	0.0121	JB	0.00226	mg/kg
T1096-GP-008-008-S	14-JUN-95	NICKEL	27.9	B	0.0807	mg/kg
T1096-GP-008-008-S	14-JUN-95	POTASSIUM	760	B	0.643	mg/kg
T1096-GP-008-008-S	14-JUN-95	SELENIUM	0.368	JB	0.143	mg/kg
T1096-GP-008-008-S	14-JUN-95	SILVER	0.125	U	0.249	mg/kg
T1096-GP-008-008-S	14-JUN-95	SODIUM	49.5	B	1.56	mg/kg
T1096-GP-008-008-S	14-JUN-95	THALLIUM	0.967	J	0.207	mg/kg
T1096-GP-008-008-S	14-JUN-95	VANADIUM	15.8		0.0234	mg/kg
T1096-GP-008-008-S	14-JUN-95	ZINC	16.7		0.27	mg/kg
T1096-GP-009-010-S	14-JUN-95	ALUMINUM	5530	B	1.19	mg/kg
T1096-GP-009-010-S	14-JUN-95	ANTIMONY	0.281	J	0.0958	mg/kg
T1096-GP-009-010-S	14-JUN-95	ARSENIC	2.2		0.186	mg/kg
T1096-GP-009-010-S	14-JUN-95	BARIUM	80.5	B	0.00663	mg/kg
T1096-GP-009-010-S	14-JUN-95	BERYLLIUM	0.274	J	0.00114	mg/kg
T1096-GP-009-010-S	14-JUN-95	CADMIUM	0.0049	UB	0.0097	mg/kg
T1096-GP-009-010-S	14-JUN-95	CALCIUM	24900	B	2	mg/kg
T1096-GP-009-010-S	14-JUN-95	CHROMIUM	6.29	B	0.0596	mg/kg
T1096-GP-009-010-S	14-JUN-95	CHROMIUM (VI)	0.54		0.1	mg/kg
T1096-GP-009-010-S	14-JUN-95	COBALT	3.41		0.0176	mg/kg
T1096-GP-009-010-S	14-JUN-95	COPPER	5.1		0.0539	mg/kg
T1096-GP-009-010-S	14-JUN-95	IRON	9860		1.01	mg/kg
T1096-GP-009-010-S	14-JUN-95	LEAD	4.16	B	0.113	mg/kg
T1096-GP-009-010-S	14-JUN-95	MAGNESIUM	2740	B	0.235	mg/kg
T1096-GP-009-010-S	14-JUN-95	MANGANESE	151	B	0.00962	mg/kg
T1096-GP-009-010-S	14-JUN-95	MERCURY	0.0143	JB	0.00228	mg/kg
T1096-GP-009-010-S	14-JUN-95	NICKEL	21.9		0.0807	mg/kg
T1096-GP-009-010-S	14-JUN-95	POTASSIUM	915	B	0.643	mg/kg
T1096-GP-009-010-S	14-JUN-95	SELENIUM	0.07	U	0.143	mg/kg
T1096-GP-009-010-S	14-JUN-95	SILVER	0.125	U	0.249	mg/kg
T1096-GP-009-010-S	14-JUN-95	SODIUM	183	B	1.56	mg/kg
T1096-GP-009-010-S	14-JUN-95	THALLIUM	0.535	J	0.207	mg/kg
T1096-GP-009-010-S	14-JUN-95	VANADIUM	19.8	B	0.0234	mg/kg
T1096-GP-009-010-S	14-JUN-95	ZINC	19.1	B	0.27	mg/kg

TABLE 5
ER Site 96: Metal Analytical Results for Subsurface Soil Samples

SAMPLE NUMBER	SAMPLE DATE	COMMON NAME	AMOUNT DETECTED	NOTATION	DETECTION LIMIT	UNIT OF MEASURE
T1096-GP-010-009-S	14-JUN-95	ALUMINUM	4740		1.15	mg/kg
T1096-GP-010-009-S	14-JUN-95	ANTIMONY	0.329	JB	0.0929	mg/kg
T1096-GP-010-009-S	14-JUN-95	ARSENIC	2.14	B	0.18	mg/kg
T1096-GP-010-009-S	14-JUN-95	BARIUM	64	B	0.00643	mg/kg
T1096-GP-010-009-S	14-JUN-95	BERYLLIUM	0.287	J	0.00111	mg/kg
T1096-GP-010-009-S	14-JUN-95	CADMIUM	0.0047	UB	0.00941	mg/kg
T1096-GP-010-009-S	14-JUN-95	CALCIUM	17900	B	1.94	mg/kg
T1096-GP-010-009-S	14-JUN-95	CHROMIUM	6.48	B	0.0578	mg/kg
T1096-GP-010-009-S	14-JUN-95	COBALT	9.88		0.0171	mg/kg
T1096-GP-010-009-S	14-JUN-95	COPPER	5.75	B	0.0523	mg/kg
T1096-GP-010-009-S	14-JUN-95	IRON	10100	B	0.98	mg/kg
T1096-GP-010-009-S	14-JUN-95	LEAD	4.76		0.113	mg/kg
T1096-GP-010-009-S	14-JUN-95	MAGNESIUM	2360		0.228	mg/kg
T1096-GP-010-009-S	14-JUN-95	MANGANESE	174	B	0.00933	mg/kg
T1096-GP-010-009-S	14-JUN-95	MERCURY	0.0101	JB	0.00216	mg/kg
T1096-GP-010-009-S	14-JUN-95	NICKEL	94.2	B	0.0783	mg/kg
T1096-GP-010-009-S	14-JUN-95	POTASSIUM	978	B	0.624	mg/kg
T1096-GP-010-009-S	14-JUN-95	SELENIUM	0.276	JB	0.139	mg/kg
T1096-GP-010-009-S	14-JUN-95	SILVER	0.295	J	0.242	mg/kg
T1096-GP-010-009-S	14-JUN-95	SODIUM	124	B	1.51	mg/kg
T1096-GP-010-009-S	14-JUN-95	THALLIUM	1.33		0.201	mg/kg
T1096-GP-010-009-S	14-JUN-95	VANADIUM	17.2		0.0227	mg/kg
T1096-GP-010-009-S	14-JUN-95	ZINC	20.1		0.262	mg/kg
T1096-GP-011-006-S	15-JUN-95	ALUMINUM	7950		1.17	mg/kg
T1096-GP-011-006-S	15-JUN-95	ANTIMONY	0.461	JB	0.0939	mg/kg
T1096-GP-011-006-S	15-JUN-95	ARSENIC	3.27	B	0.182	mg/kg
T1096-GP-011-006-S	15-JUN-95	BARIUM	190	B	0.0065	mg/kg
T1096-GP-011-006-S	15-JUN-95	BERYLLIUM	0.422	J	0.00112	mg/kg
T1096-GP-011-006-S	15-JUN-95	CADMIUM	0.136	JB	0.00951	mg/kg
T1096-GP-011-006-S	15-JUN-95	CALCIUM	28400	B	1.96	mg/kg
T1096-GP-011-006-S	15-JUN-95	CHROMIUM	7.51	B	0.0584	mg/kg
T1096-GP-011-006-S	15-JUN-95	COBALT	4.33		0.0172	mg/kg
T1096-GP-011-006-S	15-JUN-95	COPPER	6.76	B	0.0528	mg/kg
T1096-GP-011-006-S	15-JUN-95	IRON	11600	B	0.99	mg/kg
T1096-GP-011-006-S	15-JUN-95	LEAD	5.69		0.105	mg/kg

TABLE 5
ER Site 96: Metal Analytical Results for Subsurface Soil Samples

SAMPLE NUMBER	SAMPLE DATE	COMMON NAME	AMOUNT DETECTED	NOTATION	DETECTION LIMIT	UNIT OF MEASURE
T1096-GP-011-006-S	15-JUN-95	MAGNESIUM	4030		0.23	mg/kg
T1096-GP-011-006-S	15-JUN-95	MANGANESE	212	B	0.00943	mg/kg
T1096-GP-011-006-S	15-JUN-95	MERCURY	0.00832	JB	0.00228	mg/kg
T1096-GP-011-006-S	15-JUN-95	NICKEL	7.53	B	0.0791	mg/kg
T1096-GP-011-006-S	15-JUN-95	POTASSIUM	1370	B	0.63	mg/kg
T1096-GP-011-006-S	15-JUN-95	SELENIUM	0.514	B	0.14	mg/kg
T1096-GP-011-006-S	15-JUN-95	SILVER	7.53		0.244	mg/kg
T1096-GP-011-006-S	15-JUN-95	SODIUM	72	B	1.53	mg/kg
T1096-GP-011-006-S	15-JUN-95	THALLIUM	1.47		0.203	mg/kg
T1096-GP-011-006-S	15-JUN-95	VANADIUM	24.5		0.0229	mg/kg
T1096-GP-011-006-S	15-JUN-95	ZINC	26.3		0.265	mg/kg
T1096-GP-013-005-S	15-JUN-95	ALUMINUM	10900		1.18	mg/kg
T1096-GP-013-005-S	15-JUN-95	ANTIMONY	0.196	J	0.0948	mg/kg
T1096-GP-013-005-S	15-JUN-95	ARSENIC	4		0.184	mg/kg
T1096-GP-013-005-S	15-JUN-95	BARIUM	204	B	0.00656	mg/kg
T1096-GP-013-005-S	15-JUN-95	BERYLLIUM	0.576		0.00113	mg/kg
T1096-GP-013-005-S	15-JUN-95	CADMIUM	0.215	JB	0.0096	mg/kg
T1096-GP-013-005-S	15-JUN-95	CALCIUM	34200	B	1.98	mg/kg
T1096-GP-013-005-S	15-JUN-95	CHROMIUM	10.2	B	0.059	mg/kg
T1096-GP-013-005-S	15-JUN-95	CHROMIUM (VI)	0.58		0.1	mg/kg
T1096-GP-013-005-S	15-JUN-95	COBALT	5.91		0.0174	mg/kg
T1096-GP-013-005-S	15-JUN-95	COPPER	10.8		0.0534	mg/kg
T1096-GP-013-005-S	15-JUN-95	IRON	14000		1	mg/kg
T1096-GP-013-005-S	15-JUN-95	LEAD	7.86		0.112	mg/kg
T1096-GP-013-005-S	15-JUN-95	MAGNESIUM	5400	B	0.233	mg/kg
T1096-GP-013-005-S	15-JUN-95	MANGANESE	286	B	0.00952	mg/kg
T1096-GP-013-005-S	15-JUN-95	MERCURY	0.00927	JB	0.00225	mg/kg
T1096-GP-013-005-S	15-JUN-95	NICKEL	14.9		0.0799	mg/kg
T1096-GP-013-005-S	15-JUN-95	POTASSIUM	1840		0.637	mg/kg
T1096-GP-013-005-S	15-JUN-95	SELENIUM	0.07	U	0.142	mg/kg
T1096-GP-013-005-S	15-JUN-95	SILVER	0.124	U	0.247	mg/kg
T1096-GP-013-005-S	15-JUN-95	SODIUM	75.1	B	1.54	mg/kg
T1096-GP-013-005-S	15-JUN-95	THALLIUM	0.969	J	0.205	mg/kg
T1096-GP-013-005-S	15-JUN-95	VANADIUM	29.5		0.0232	mg/kg
T1096-GP-013-005-S	15-JUN-95	ZINC	35.3		0.267	mg/kg

ER Site 96: Metal Analytical Results for Subsurface Soil Samples

SAMPLE NUMBER	SAMPLE DATE	COMMON NAME	AMOUNT DETECTED	NOTATION	DETECTION LIMIT	UNIT OF MEASURE
T1096-GP-014-003-S	15-JUN-95	ALUMINUM	11900		1.18	mg/kg
T1096-GP-014-003-S	15-JUN-95	ANTIMONY	0.272	J	0.0948	mg/kg
T1096-GP-014-003-S	15-JUN-95	ARSENIC	3.57		0.184	mg/kg
T1096-GP-014-003-S	15-JUN-95	BARIUM	169	B	0.00656	mg/kg
T1096-GP-014-003-S	15-JUN-95	BERYLLIUM	0.58		0.00113	mg/kg
T1096-GP-014-003-S	15-JUN-95	CADMIUM	0.21	JB	0.0096	mg/kg
T1096-GP-014-003-S	15-JUN-95	CALCIUM	36300	B	1.98	mg/kg
T1096-GP-014-003-S	15-JUN-95	CHROMIUM	11.7	B	0.059	mg/kg
T1096-GP-014-003-S	15-JUN-95	COBALT	6.4		0.0174	mg/kg
T1096-GP-014-003-S	15-JUN-95	COPPER	10.9		0.0534	mg/kg
T1096-GP-014-003-S	15-JUN-95	IRON	15800		1	mg/kg
T1096-GP-014-003-S	15-JUN-95	LEAD	7.71		0.112	mg/kg
T1096-GP-014-003-S	15-JUN-95	MAGNESIUM	5990	B	0.233	mg/kg
T1096-GP-014-003-S	15-JUN-95	MANGANESE	264	B	0.00952	mg/kg
T1096-GP-014-003-S	15-JUN-95	MERCURY	0.0129	JB	0.00179	mg/kg
T1096-GP-014-003-S	15-JUN-95	NICKEL	11.6		0.0799	mg/kg
T1096-GP-014-003-S	15-JUN-95	POTASSIUM	1580		0.637	mg/kg
T1096-GP-014-003-S	15-JUN-95	SELENIUM	0.07	U	0.142	mg/kg
T1096-GP-014-003-S	15-JUN-95	SILVER	0.124	U	0.247	mg/kg
T1096-GP-014-003-S	15-JUN-95	SODIUM	187	B	1.54	mg/kg
T1096-GP-014-003-S	15-JUN-95	THALLIUM	0.981	J	0.205	mg/kg
T1096-GP-014-003-S	15-JUN-95	VANADIUM	28.9		0.0232	mg/kg
T1096-GP-014-003-S	15-JUN-95	ZINC	33.3		0.267	mg/kg
T1096-GP-015-005-S	15-JUN-95	ALUMINUM	6620		1.18	mg/kg
T1096-GP-015-005-S	15-JUN-95	ANTIMONY	0.15	J	0.0948	mg/kg
T1096-GP-015-005-S	15-JUN-95	ARSENIC	3.27		0.184	mg/kg
T1096-GP-015-005-S	15-JUN-95	BARIUM	127	B	0.00656	mg/kg
T1096-GP-015-005-S	15-JUN-95	BERYLLIUM	0.323	J	0.00113	mg/kg
T1096-GP-015-005-S	15-JUN-95	CADMIUM	0.125	JB	0.0096	mg/kg
T1096-GP-015-005-S	15-JUN-95	CALCIUM	78400	B	4.95	mg/kg
T1096-GP-015-005-S	15-JUN-95	CHROMIUM	5.55	B	0.059	mg/kg
T1096-GP-015-005-S	15-JUN-95	COBALT	3.12		0.0174	mg/kg
T1096-GP-015-005-S	15-JUN-95	COPPER	4.1		0.0534	mg/kg
T1096-GP-015-005-S	15-JUN-95	IRON	7020		1	mg/kg
T1096-GP-015-005-S	15-JUN-95	LEAD	4.02		0.112	mg/kg

ER Site 96: Metal Analytical Results for Subsurface Soil Samples

SAMPLE NUMBER	SAMPLE DATE	COMMON NAME	AMOUNT DETECTED	NOTATION	DETECTION LIMIT	UNIT OF MEASURE
T1096-GP-015-005-S	15-JUN-95	MAGNESIUM	3690	B	0.233	mg/kg
T1096-GP-015-005-S	15-JUN-95	MANGANESE	91.9	B	0.00952	mg/kg
T1096-GP-015-005-S	15-JUN-95	MERCURY	0.0104	JB	0.00195	mg/kg
T1096-GP-015-005-S	15-JUN-95	NICKEL	5.78		0.0799	mg/kg
T1096-GP-015-005-S	15-JUN-95	POTASSIUM	881		0.637	mg/kg
T1096-GP-015-005-S	15-JUN-95	SELENIUM	0.07	U	0.142	mg/kg
T1096-GP-015-005-S	15-JUN-95	SILVER	0.124	U	0.247	mg/kg
T1096-GP-015-005-S	15-JUN-95	SODIUM	182	B	1.54	mg/kg
T1096-GP-015-005-S	15-JUN-95	THALLIUM	0.104	U	0.205	mg/kg
T1096-GP-015-005-S	15-JUN-95	VANADIUM	18.1		0.0232	mg/kg
T1096-GP-015-005-S	15-JUN-95	ZINC	14		0.267	mg/kg
T1096-GP-016-005-S	15-JUN-95	ALUMINUM	6090		1.18	mg/kg
T1096-GP-016-005-S	15-JUN-95	ANTIMONY	0.237	J	0.0948	mg/kg
T1096-GP-016-005-S	15-JUN-95	ARSENIC	3.04		0.184	mg/kg
T1096-GP-016-005-S	15-JUN-95	BARIUM	182	B	0.00856	mg/kg
T1096-GP-016-005-S	15-JUN-95	BERYLLIUM	0.356	J	0.00113	mg/kg
T1096-GP-016-005-S	15-JUN-95	CADMIUM	0.124	JB	0.0096	mg/kg
T1096-GP-016-005-S	15-JUN-95	CALCIUM	34400	B	1.98	mg/kg
T1096-GP-016-005-S	15-JUN-95	CHROMIUM	5.26	B	0.059	mg/kg
T1096-GP-016-005-S	15-JUN-95	CHROMIUM (VI)	0.54		0.1	mg/kg
T1096-GP-016-005-S	15-JUN-95	COBALT	3.77		0.0174	mg/kg
T1096-GP-016-005-S	15-JUN-95	COPPER	7.05		0.0534	mg/kg
T1096-GP-016-005-S	15-JUN-95	IRON	8470		1	mg/kg
T1096-GP-016-005-S	15-JUN-95	LEAD	4.92		0.112	mg/kg
T1096-GP-016-005-S	15-JUN-95	MAGNESIUM	3640	B	0.233	mg/kg
T1096-GP-016-005-S	15-JUN-95	MANGANESE	165	B	0.00952	mg/kg
T1096-GP-016-005-S	15-JUN-95	MERCURY	0.00869	JB	0.00238	mg/kg
T1096-GP-016-005-S	15-JUN-95	NICKEL	7.5		0.0799	mg/kg
T1096-GP-016-005-S	15-JUN-95	POTASSIUM	1040		0.637	mg/kg
T1096-GP-016-005-S	15-JUN-95	SELENIUM	0.07	U	0.142	mg/kg
T1096-GP-016-005-S	15-JUN-95	SILVER	0.124	U	0.247	mg/kg
T1096-GP-016-005-S	15-JUN-95	SODIUM	102	B	1.54	mg/kg
T1096-GP-016-005-S	15-JUN-95	THALLIUM	0.366	J	0.205	mg/kg
T1096-GP-016-005-S	15-JUN-95	VANADIUM	22.6		0.0232	mg/kg
T1096-GP-016-005-S	15-JUN-95	ZINC	21.8		0.267	mg/kg

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ER Site 96: Metal Analytical Results for Subsurface Soil Samples

SAMPLE NUMBER	SAMPLE DATE	COMMON NAME	AMOUNT DETECTED	NOTATION	DETECTION LIMIT	UNIT OF MEASURE
T1096-GP-017-005-S	15-JUN-95	ALUMINUM	5920		1.18	mg/kg
T1096-GP-017-005-S	15-JUN-95	ANTIMONY	0.187	J	0.0948	mg/kg
T1096-GP-017-005-S	15-JUN-95	ARSENIC	3.88		0.184	mg/kg
T1096-GP-017-005-S	15-JUN-95	BARIUM	171	B	0.00656	mg/kg
T1096-GP-017-005-S	15-JUN-95	BERYLLIUM	0.331	J	0.00113	mg/kg
T1096-GP-017-005-S	15-JUN-95	CADMIUM	0.129	JB	0.0096	mg/kg
T1096-GP-017-005-S	15-JUN-95	CALCIUM	70100	B	4.95	mg/kg
T1096-GP-017-005-S	15-JUN-95	CHROMIUM	5.17	B	0.059	mg/kg
T1096-GP-017-005-S	15-JUN-95	COBALT	3.45		0.0174	mg/kg
T1096-GP-017-005-S	15-JUN-95	COPPER	4.96		0.0534	mg/kg
T1096-GP-017-005-S	15-JUN-95	IRON	6900		1	mg/kg
T1096-GP-017-005-S	15-JUN-95	LEAD	5.47		0.112	mg/kg
T1096-GP-017-005-S	15-JUN-95	MAGNESIUM	3600	B	0.233	mg/kg
T1096-GP-017-005-S	15-JUN-95	MANGANESE	104	B	0.00952	mg/kg
T1096-GP-017-005-S	15-JUN-95	MERCURY	0.00844	JB	0.00212	mg/kg
T1096-GP-017-005-S	15-JUN-95	NICKEL	6.48		0.0799	mg/kg
T1096-GP-017-005-S	15-JUN-95	POTASSIUM	764		0.637	mg/kg
T1096-GP-017-005-S	15-JUN-95	SELENIUM	0.07	U	0.142	mg/kg
T1096-GP-017-005-S	15-JUN-95	SILVER	0.124	U	0.247	mg/kg
T1096-GP-017-005-S	15-JUN-95	SODIUM	103	B	1.54	mg/kg
T1096-GP-017-005-S	15-JUN-95	THALLIUM	0.104	U	0.205	mg/kg
T1096-GP-017-005-S	15-JUN-95	VANADIUM	18.2		0.0232	mg/kg
T1096-GP-017-005-S	15-JUN-95	ZINC	15.7		0.267	mg/kg
T1096-GP-018-005-S	15-JUN-95	ALUMINUM	7810		1.18	mg/kg
T1096-GP-018-005-S	15-JUN-95	ANTIMONY	0.189	J	0.0948	mg/kg
T1096-GP-018-005-S	15-JUN-95	ARSENIC	3.06		0.184	mg/kg
T1096-GP-018-005-S	15-JUN-95	BARIUM	200	B	0.00656	mg/kg
T1096-GP-018-005-S	15-JUN-95	BERYLLIUM	0.399	J	0.00113	mg/kg
T1096-GP-018-005-S	15-JUN-95	CADMIUM	0.132	JB	0.0096	mg/kg
T1096-GP-018-005-S	15-JUN-95	CALCIUM	48600	B	1.98	mg/kg
T1096-GP-018-005-S	15-JUN-95	CHROMIUM	7.62	B	0.059	mg/kg
T1096-GP-018-005-S	15-JUN-95	COBALT	4.07		0.0174	mg/kg
T1096-GP-018-005-S	15-JUN-95	COPPER	8.32		0.0534	mg/kg
T1096-GP-018-005-S	15-JUN-95	IRON	9960		1	mg/kg
T1096-GP-018-005-S	15-JUN-95	LEAD	7.18		0.112	mg/kg

ER Site 96: Metal Analytical Results for Subsurface Soil Samples

SAMPLE NUMBER	SAMPLE DATE	COMMON NAME	AMOUNT DETECTED	NOTATION	DETECTION LIMIT	UNIT OF MEASURE
T1096-GP-018-005-S	15-JUN-95	MAGNESIUM	3860	B	0.233	mg/kg
T1096-GP-018-005-S	15-JUN-95	MANGANESE	147	B	0.00952	mg/kg
T1096-GP-018-005-S	15-JUN-95	MERCURY	0.014	JB	0.00203	mg/kg
T1096-GP-018-005-S	15-JUN-95	NICKEL	8.75		0.0799	mg/kg
T1096-GP-018-005-S	15-JUN-95	POTASSIUM	1100		0.637	mg/kg
T1096-GP-018-005-S	15-JUN-95	SELENIUM	0.07	U	0.142	mg/kg
T1096-GP-018-005-S	15-JUN-95	SILVER	0.124	U	0.247	mg/kg
T1096-GP-018-005-S	15-JUN-95	SODIUM	416	B	1.54	mg/kg
T1096-GP-018-005-S	15-JUN-95	THALLIUM	0.538	J	0.205	mg/kg
T1096-GP-018-005-S	15-JUN-95	VANADIUM	20.3		0.0232	mg/kg
T1096-GP-018-005-S	15-JUN-95	ZINC	20.8		0.267	mg/kg
T1096-GP-019-005-S	16-JUN-95	ALUMINUM	11000		1.18	mg/kg
T1096-GP-019-005-S	16-JUN-95	ANTIMONY	0.264	J	0.0948	mg/kg
T1096-GP-019-005-S	16-JUN-95	ARSENIC	3.75		0.184	mg/kg
T1096-GP-019-005-S	16-JUN-95	BARIUM	146	B	0.00656	mg/kg
T1096-GP-019-005-S	16-JUN-95	BERYLLIUM	0.537		0.00113	mg/kg
T1096-GP-019-005-S	16-JUN-95	CADMIUM	0.191	JB	0.0096	mg/kg
T1096-GP-019-005-S	16-JUN-95	CALCIUM	45700	B	1.98	mg/kg
T1096-GP-019-005-S	16-JUN-95	CHROMIUM	10.9	B	0.059	mg/kg
T1096-GP-019-005-S	16-JUN-95	CHROMIUM (VI)	0.28	J	0.1	mg/kg
T1096-GP-019-005-S	16-JUN-95	COBALT	5.44		0.0174	mg/kg
T1096-GP-019-005-S	16-JUN-95	COPPER	10.3		0.0534	mg/kg
T1096-GP-019-005-S	16-JUN-95	IRON	14000		1	mg/kg
T1096-GP-019-005-S	16-JUN-95	LEAD	6.92		0.112	mg/kg
T1096-GP-019-005-S	16-JUN-95	MAGNESIUM	4740	B	0.233	mg/kg
T1096-GP-019-005-S	16-JUN-95	MANGANESE	208	B	0.00952	mg/kg
T1096-GP-019-005-S	16-JUN-95	MERCURY	0.0115	JB	0.00207	mg/kg
T1096-GP-019-005-S	16-JUN-95	NICKEL	11.3		0.0799	mg/kg
T1096-GP-019-005-S	16-JUN-95	POTASSIUM	1630		0.637	mg/kg
T1096-GP-019-005-S	16-JUN-95	SELENIUM	0.07	U	0.142	mg/kg
T1096-GP-019-005-S	16-JUN-95	SILVER	0.124	U	0.247	mg/kg
T1096-GP-019-005-S	16-JUN-95	SODIUM	101	B	1.54	mg/kg
T1096-GP-019-005-S	16-JUN-95	THALLIUM	0.745	J	0.205	mg/kg
T1096-GP-019-005-S	16-JUN-95	VANADIUM	26.1		0.0232	mg/kg
T1096-GP-019-005-S	16-JUN-95	ZINC	34.9		0.267	mg/kg

ER Site 96: Metal Analytical Results for Subsurface Soil Samples

SAMPLE NUMBER	SAMPLE DATE	COMMON NAME	AMOUNT DETECTED	NOTATION	DETECTION LIMIT	UNIT OF MEASURE
T1096-GP-020-005-S	16-JUN-95	ALUMINUM	6800		1.18	mg/kg
T1096-GP-020-005-S	16-JUN-95	ANTIMONY	0.154	J	0.0948	mg/kg
T1096-GP-020-005-S	16-JUN-95	ARSENIC	2.91		0.184	mg/kg
T1096-GP-020-005-S	16-JUN-95	BARIIUM	183	B	0.00656	mg/kg
T1096-GP-020-005-S	16-JUN-95	BERYLLIUM	0.357	J	0.00113	mg/kg
T1096-GP-020-005-S	16-JUN-95	CADMIUM	0.143	JB	0.0096	mg/kg
T1096-GP-020-005-S	16-JUN-95	CALCIUM	44000	B	1.98	mg/kg
T1096-GP-020-005-S	16-JUN-95	CHROMIUM	7.22	B	0.059	mg/kg
T1096-GP-020-005-S	16-JUN-95	COBALT	4.78		0.0174	mg/kg
T1096-GP-020-005-S	16-JUN-95	COPPER	6.95		0.0534	mg/kg
T1096-GP-020-005-S	16-JUN-95	IRON	12200		1	mg/kg
T1096-GP-020-005-S	16-JUN-95	LEAD	5.03		0.112	mg/kg
T1096-GP-020-005-S	16-JUN-95	MAGNESIUM	4150	B	0.233	mg/kg
T1096-GP-020-005-S	16-JUN-95	MANGANESE	217	B	0.00952	mg/kg
T1096-GP-020-005-S	16-JUN-95	MERCURY	0.00806	JB	0.00213	mg/kg
T1096-GP-020-005-S	16-JUN-95	NICKEL	8.16		0.0799	mg/kg
T1096-GP-020-005-S	16-JUN-95	POTASSIUM	1150		0.637	mg/kg
T1096-GP-020-005-S	16-JUN-95	SELENIUM	0.07	U	0.142	mg/kg
T1096-GP-020-005-S	16-JUN-95	SILVER	0.124	U	0.247	mg/kg
T1096-GP-020-005-S	16-JUN-95	SODIUM	369	B	1.54	mg/kg
T1096-GP-020-005-S	16-JUN-95	THALLIUM	0.559	J	0.205	mg/kg
T1096-GP-020-005-S	16-JUN-95	VANADIUM	25.7		0.0232	mg/kg
T1096-GP-020-005-S	16-JUN-95	ZINC	23.8		0.267	mg/kg
T1096-GP-021-004-S	16-JUN-95	ALUMINUM	8980		1.18	mg/kg
T1096-GP-021-004-S	16-JUN-95	ANTIMONY	0.301	J	0.0948	mg/kg
T1096-GP-021-004-S	16-JUN-95	ARSENIC	3.28		0.184	mg/kg
T1096-GP-021-004-S	16-JUN-95	BARIIUM	148	B	0.00656	mg/kg
T1096-GP-021-004-S	16-JUN-95	BERYLLIUM	0.535		0.00113	mg/kg
T1096-GP-021-004-S	16-JUN-95	CADMIUM	0.184	JB	0.0096	mg/kg
T1096-GP-021-004-S	16-JUN-95	CALCIUM	32600	B	1.98	mg/kg
T1096-GP-021-004-S	16-JUN-95	CHROMIUM	9.92	B	0.059	mg/kg
T1096-GP-021-004-S	16-JUN-95	COBALT	5.54		0.0174	mg/kg
T1096-GP-021-004-S	16-JUN-95	COPPER	9.22		0.0534	mg/kg
T1096-GP-021-004-S	16-JUN-95	IRON	13000		1	mg/kg
T1096-GP-021-004-S	16-JUN-95	LEAD	6.85		0.112	mg/kg

ER Site 96: Metal Analytical Results for Subsurface Soil Samples

SAMPLE NUMBER	SAMPLE DATE	COMMON NAME	AMOUNT DETECTED	NOTATION	DETECTION LIMIT	UNIT OF MEASURE
T1096-GP-021-004-S	16-JUN-95	MAGNESIUM	5180	B	0.233	mg/kg
T1096-GP-021-004-S	16-JUN-95	MANGANESE	230	B	0.00952	mg/kg
T1096-GP-021-004-S	16-JUN-95	MERCURY	0.0362	B	0.00246	mg/kg
T1096-GP-021-004-S	16-JUN-95	NICKEL	15.5		0.0799	mg/kg
T1096-GP-021-004-S	16-JUN-95	POTASSIUM	1370		0.637	mg/kg
T1096-GP-021-004-S	16-JUN-95	SELENIUM	0.07	U	0.142	mg/kg
T1096-GP-021-004-S	16-JUN-95	SILVER	0.124	U	0.247	mg/kg
T1096-GP-021-004-S	16-JUN-95	SODIUM	158	B	1.54	mg/kg
T1096-GP-021-004-S	16-JUN-95	THALLIUM	0.611	J	0.205	mg/kg
T1096-GP-021-004-S	16-JUN-95	VANADIUM	21.3		0.0232	mg/kg
T1096-GP-021-004-S	16-JUN-95	ZINC	30.2		0.267	mg/kg
T1096-GP-022-004-S	19-JUN-95	ALUMINUM	8580		1.18	mg/kg
T1096-GP-022-004-S	19-JUN-95	ANTIMONY	0.209	J	0.0948	mg/kg
T1096-GP-022-004-S	19-JUN-95	ARSENIC	4.59		0.184	mg/kg
T1096-GP-022-004-S	19-JUN-95	BARIUM	154	B	0.00656	mg/kg
T1096-GP-022-004-S	19-JUN-95	BERYLLIUM	0.423	J	0.00113	mg/kg
T1096-GP-022-004-S	19-JUN-95	CADMIUM	0.173	JB	0.0096	mg/kg
T1096-GP-022-004-S	19-JUN-95	CALCIUM	77100	B	4.95	mg/kg
T1096-GP-022-004-S	19-JUN-95	CHROMIUM	8.02	B	0.059	mg/kg
T1096-GP-022-004-S	19-JUN-95	CHROMIUM (VI)	0.014	J	0.01	mg/kg
T1096-GP-022-004-S	19-JUN-95	COBALT	5.14		0.0174	mg/kg
T1096-GP-022-004-S	19-JUN-95	COPPER	7.52		0.0534	mg/kg
T1096-GP-022-004-S	19-JUN-95	IRON	10600		1	mg/kg
T1096-GP-022-004-S	19-JUN-95	LEAD	5.97		0.112	mg/kg
T1096-GP-022-004-S	19-JUN-95	MAGNESIUM	5050	B	0.233	mg/kg
T1096-GP-022-004-S	19-JUN-95	MANGANESE	196	B	0.00952	mg/kg
T1096-GP-022-004-S	19-JUN-95	MERCURY	0.0113	JB	0.00221	mg/kg
T1096-GP-022-004-S	19-JUN-95	NICKEL	14.8		0.0799	mg/kg
T1096-GP-022-004-S	19-JUN-95	POTASSIUM	1400		0.637	mg/kg
T1096-GP-022-004-S	19-JUN-95	SELENIUM	0.07	U	0.142	mg/kg
T1096-GP-022-004-S	19-JUN-95	SILVER	0.124	U	0.247	mg/kg
T1096-GP-022-004-S	19-JUN-95	SODIUM	154	B	1.54	mg/kg
T1096-GP-022-004-S	19-JUN-95	THALLIUM	0.48	J	0.205	mg/kg
T1096-GP-022-004-S	19-JUN-95	VANADIUM	28.8		0.0232	mg/kg
T1096-GP-022-004-S	19-JUN-95	ZINC	23.4		0.267	mg/kg

ER Site 96: Metal Analytical Results for Subsurface Soil Samples

SAMPLE NUMBER	SAMPLE DATE	COMMON NAME	AMOUNT DETECTED	NOTATION	DETECTION LIMIT	UNIT OF MEASURE
T1096-GP-023-005-S	19-JUN-95	ALUMINUM	9630		1.18	mg/kg
T1096-GP-023-005-S	19-JUN-95	ANTIMONY	0.0987	J	0.0948	mg/kg
T1096-GP-023-005-S	19-JUN-95	ARSENIC	2.91		0.184	mg/kg
T1096-GP-023-005-S	19-JUN-95	BARIUM	120	B	0.00656	mg/kg
T1096-GP-023-005-S	19-JUN-95	BERYLLIUM	0.454	J	0.00113	mg/kg
T1096-GP-023-005-S	19-JUN-95	CADMIUM	0.155	JB	0.0096	mg/kg
T1096-GP-023-005-S	19-JUN-95	CALCIUM	28200	B	1.98	mg/kg
T1096-GP-023-005-S	19-JUN-95	CHROMIUM	10	B	0.059	mg/kg
T1096-GP-023-005-S	19-JUN-95	COBALT	5.25		0.0174	mg/kg
T1096-GP-023-005-S	19-JUN-95	COPPER	9.52		0.0534	mg/kg
T1096-GP-023-005-S	19-JUN-95	IRON	13700		1	mg/kg
T1096-GP-023-005-S	19-JUN-95	LEAD	6.72		0.112	mg/kg
T1096-GP-023-005-S	19-JUN-95	MAGNESIUM	5070	B	0.233	mg/kg
T1096-GP-023-005-S	19-JUN-95	MANGANESE	275	B	0.00952	mg/kg
T1096-GP-023-005-S	19-JUN-95	MERCURY	0.0103	JB	0.00241	mg/kg
T1096-GP-023-005-S	19-JUN-95	NICKEL	9.22		0.0799	mg/kg
T1096-GP-023-005-S	19-JUN-95	POTASSIUM	2080		0.637	mg/kg
T1096-GP-023-005-S	19-JUN-95	SELENIUM	0.07	U	0.142	mg/kg
T1096-GP-023-005-S	19-JUN-95	SILVER	0.124	U	0.247	mg/kg
T1096-GP-023-005-S	19-JUN-95	SODIUM	562	B	1.54	mg/kg
T1096-GP-023-005-S	19-JUN-95	THALLIUM	0.633	J	0.205	mg/kg
T1096-GP-023-005-S	19-JUN-95	VANADIUM	24.6		0.0232	mg/kg
T1096-GP-023-005-S	19-JUN-95	ZINC	34		0.267	mg/kg
T1096-GP-024-005-S	19-JUN-95	ALUMINUM	9350		1.18	mg/kg
T1096-GP-024-005-S	19-JUN-95	ANTIMONY	0.131	J	0.0948	mg/kg
T1096-GP-024-005-S	19-JUN-95	ARSENIC	3.06		0.184	mg/kg
T1096-GP-024-005-S	19-JUN-95	BARIUM	118	B	0.00656	mg/kg
T1096-GP-024-005-S	19-JUN-95	BERYLLIUM	0.455	J	0.00113	mg/kg
T1096-GP-024-005-S	19-JUN-95	CADMIUM	0.146	JB	0.0096	mg/kg
T1096-GP-024-005-S	19-JUN-95	CALCIUM	27300	B	1.98	mg/kg
T1096-GP-024-005-S	19-JUN-95	CHROMIUM	9.09	B	0.059	mg/kg
T1096-GP-024-005-S	19-JUN-95	COBALT	5		0.0174	mg/kg
T1096-GP-024-005-S	19-JUN-95	COPPER	8.46		0.0534	mg/kg
T1096-GP-024-005-S	19-JUN-95	IRON	13200		1	mg/kg
T1096-GP-024-005-S	19-JUN-95	LEAD	6.29		0.112	mg/kg

ER Site 96: Metal Analytical Results for Subsurface Soil Samples

SAMPLE NUMBER	SAMPLE DATE	COMMON NAME	AMOUNT DETECTED	NOTATION	DETECTION LIMIT	UNIT OF MEASURE
T1096-GP-024-005-S	19-JUN-95	MAGNESIUM	4870	B	0.233	mg/kg
T1096-GP-024-005-S	19-JUN-95	MANGANESE	254	B	0.00952	mg/kg
T1096-GP-024-005-S	19-JUN-95	MERCURY	0.0181	JB	0.00232	mg/kg
T1096-GP-024-005-S	19-JUN-95	NICKEL	8.44		0.0799	mg/kg
T1096-GP-024-005-S	19-JUN-95	POTASSIUM	1970		0.637	mg/kg
T1096-GP-024-005-S	19-JUN-95	SELENIUM	0.07	U	0.142	mg/kg
T1096-GP-024-005-S	19-JUN-95	SILVER	0.124	U	0.247	mg/kg
T1096-GP-024-005-S	19-JUN-95	SODIUM	376	B	1.54	mg/kg
T1096-GP-024-005-S	19-JUN-95	THALLIUM	0.494	J	0.205	mg/kg
T1096-GP-024-005-S	19-JUN-95	VANADIUM	30.3		0.0232	mg/kg
T1096-GP-024-005-S	19-JUN-95	ZINC	32.2		0.267	mg/kg
T1096-GP-025-003-S	19-JUN-95	ALUMINUM	5980		1.18	mg/kg
T1096-GP-025-003-S	19-JUN-95	ANTIMONY	0.048	U	0.0948	mg/kg
T1096-GP-025-003-S	19-JUN-95	ARSENIC	3.07		0.184	mg/kg
T1096-GP-025-003-S	19-JUN-95	BARIUM	137	B	0.00656	mg/kg
T1096-GP-025-003-S	19-JUN-95	BERYLLIUM	0.327	J	0.00113	mg/kg
T1096-GP-025-003-S	19-JUN-95	CADMIUM	0.104	JB	0.0096	mg/kg
T1096-GP-025-003-S	19-JUN-95	CALCIUM	41800	B	1.98	mg/kg
T1096-GP-025-003-S	19-JUN-95	CHROMIUM	5.33	B	0.059	mg/kg
T1096-GP-025-003-S	19-JUN-95	CHROMIUM (VI)	0.005	U	0.01	mg/kg
T1096-GP-025-003-S	19-JUN-95	COBALT	3.49		0.0174	mg/kg
T1096-GP-025-003-S	19-JUN-95	COPPER	6.57		0.0534	mg/kg
T1096-GP-025-003-S	19-JUN-95	IRON	7440		1	mg/kg
T1096-GP-025-003-S	19-JUN-95	LEAD	4.17		0.112	mg/kg
T1096-GP-025-003-S	19-JUN-95	MAGNESIUM	2890	B	0.233	mg/kg
T1096-GP-025-003-S	19-JUN-95	MANGANESE	131	B	0.00952	mg/kg
T1096-GP-025-003-S	19-JUN-95	MERCURY	0.00926	JB	0.00218	mg/kg
T1096-GP-025-003-S	19-JUN-95	NICKEL	6.8		0.0799	mg/kg
T1096-GP-025-003-S	19-JUN-95	POTASSIUM	858		0.637	mg/kg
T1096-GP-025-003-S	19-JUN-95	SELENIUM	0.07	U	0.142	mg/kg
T1096-GP-025-003-S	19-JUN-95	SILVER	0.124	U	0.247	mg/kg
T1096-GP-025-003-S	19-JUN-95	SODIUM	123	B	1.54	mg/kg
T1096-GP-025-003-S	19-JUN-95	THALLIUM	0.243	J	0.205	mg/kg
T1096-GP-025-003-S	19-JUN-95	VANADIUM	15.3		0.0232	mg/kg
T1096-GP-025-003-S	19-JUN-95	ZINC	16.2		0.267	mg/kg

ER Site 96: Metal Analytical Results for Subsurface Soil Samples

SAMPLE NUMBER	SAMPLE DATE	COMMON NAME	AMOUNT DETECTED	NOTATION	DETECTION LIMIT	UNIT OF MEASURE
T1096-GP-026-005-S	19-JUN-95	ALUMINUM	5120		1.18	mg/kg
T1096-GP-026-005-S	19-JUN-95	ANTIMONY	0.047	U	0.0948	mg/kg
T1096-GP-026-005-S	19-JUN-95	ARSENIC	1.46		0.184	mg/kg
T1096-GP-026-005-S	19-JUN-95	BARIIUM	46.6	B	0.00656	mg/kg
T1096-GP-026-005-S	19-JUN-95	BERYLLIUM	0.297	J	0.00113	mg/kg
T1096-GP-026-005-S	19-JUN-95	CADMIUM	0.0852	JB	0.0096	mg/kg
T1096-GP-026-005-S	19-JUN-95	CALCIUM	16700	B	1.98	mg/kg
T1096-GP-026-005-S	19-JUN-95	CHROMIUM	4.8	B	0.059	mg/kg
T1096-GP-026-005-S	19-JUN-95	COBALT	4.19		0.0174	mg/kg
T1096-GP-026-005-S	19-JUN-95	COPPER	6.08		0.0534	mg/kg
T1096-GP-026-005-S	19-JUN-95	IRON	9700		1	mg/kg
T1096-GP-026-005-S	19-JUN-95	LEAD	4.06		0.112	mg/kg
T1096-GP-026-005-S	19-JUN-95	MAGNESIUM	3030	B	0.233	mg/kg
T1096-GP-026-005-S	19-JUN-95	MANGANESE	189	B	0.00952	mg/kg
T1096-GP-026-005-S	19-JUN-95	MERCURY	0.0012	UB	0.00231	mg/kg
T1096-GP-026-005-S	19-JUN-95	NICKEL	6.07		0.0799	mg/kg
T1096-GP-026-005-S	19-JUN-95	POTASSIUM	1300		0.637	mg/kg
T1096-GP-026-005-S	19-JUN-95	SELENIUM	0.07	U	0.142	mg/kg
T1096-GP-026-005-S	19-JUN-95	SILVER	0.124	U	0.247	mg/kg
T1096-GP-026-005-S	19-JUN-95	SODIUM	108	B	1.54	mg/kg
T1096-GP-026-005-S	19-JUN-95	THALLIUM	0.303	J	0.205	mg/kg
T1096-GP-026-005-S	19-JUN-95	VANADIUM	16.1		0.0232	mg/kg
T1096-GP-026-005-S	19-JUN-95	ZINC	23.9		0.267	mg/kg
T1096-GP-027-007-S	19-JUN-95	ALUMINUM	9770		1.18	mg/kg
T1096-GP-027-007-S	19-JUN-95	ANTIMONY	0.207	J	0.0948	mg/kg
T1096-GP-027-007-S	19-JUN-95	ARSENIC	3.41		0.184	mg/kg
T1096-GP-027-007-S	19-JUN-95	BARIIUM	182	B	0.00656	mg/kg
T1096-GP-027-007-S	19-JUN-95	BERYLLIUM	0.518		0.00113	mg/kg
T1096-GP-027-007-S	19-JUN-95	CADMIUM	0.2	JB	0.0096	mg/kg
T1096-GP-027-007-S	19-JUN-95	CALCIUM	28000	B	1.98	mg/kg
T1096-GP-027-007-S	19-JUN-95	CHROMIUM	9.55	B	0.059	mg/kg
T1096-GP-027-007-S	19-JUN-95	COBALT	5.45		0.0174	mg/kg
T1096-GP-027-007-S	19-JUN-95	COPPER	8.52		0.0534	mg/kg
T1096-GP-027-007-S	19-JUN-95	IRON	13400		1	mg/kg
T1096-GP-027-007-S	19-JUN-95	LEAD	7.14		0.112	mg/kg

ER Site 96: Metal Analytical Results for Subsurface Soil Samples

SAMPLE NUMBER	SAMPLE DATE	COMMON NAME	AMOUNT DETECTED	NOTATION	DETECTION LIMIT	UNIT OF MEASURE
T1096-GP-027-007-S	19-JUN-95	MAGNESIUM	5290	B	0.233	mg/kg
T1096-GP-027-007-S	19-JUN-95	MANGANESE	268	B	0.00952	mg/kg
T1096-GP-027-007-S	19-JUN-95	MERCURY	0.0011	UB	0.00213	mg/kg
T1096-GP-027-007-S	19-JUN-95	NICKEL	9.94		0.0799	mg/kg
T1096-GP-027-007-S	19-JUN-95	POTASSIUM	1720		0.637	mg/kg
T1096-GP-027-007-S	19-JUN-95	SELENIUM	0.07	U	0.142	mg/kg
T1096-GP-027-007-S	19-JUN-95	SILVER	0.124	U	0.247	mg/kg
T1096-GP-027-007-S	19-JUN-95	SODIUM	149	B	1.54	mg/kg
T1096-GP-027-007-S	19-JUN-95	THALLIUM	0.697	J	0.205	mg/kg
T1096-GP-027-007-S	19-JUN-95	VANADIUM	28.4		0.0232	mg/kg
T1096-GP-027-007-S	19-JUN-95	ZINC	32.6		0.267	mg/kg
T1096-GP-028-007-S	20-JUN-95	ALUMINUM	4130	B	1.19	mg/kg
T1096-GP-028-007-S	20-JUN-95	ANTIMONY	0.361	JB	0.0958	mg/kg
T1096-GP-028-007-S	20-JUN-95	ARSENIC	1.14		0.186	mg/kg
T1096-GP-028-007-S	20-JUN-95	BARIUM	48.9	B	0.00663	mg/kg
T1096-GP-028-007-S	20-JUN-95	BERYLLIUM	0.192	J	0.00114	mg/kg
T1096-GP-028-007-S	20-JUN-95	CADMIUM	0.0049	U	0.0097	mg/kg
T1096-GP-028-007-S	20-JUN-95	CALCIUM	24500	B	2	mg/kg
T1096-GP-028-007-S	20-JUN-95	CHROMIUM	6.39		0.0596	mg/kg
T1096-GP-028-007-S	20-JUN-95	CHROMIUM (VI)	0.64		0.1	mg/kg
T1096-GP-028-007-S	20-JUN-95	COBALT	3.58		0.0176	mg/kg
T1096-GP-028-007-S	20-JUN-95	COPPER	11.1		0.0539	mg/kg
T1096-GP-028-007-S	20-JUN-95	IRON	9350		1.01	mg/kg
T1096-GP-028-007-S	20-JUN-95	LEAD	3.61	B	0.113	mg/kg
T1096-GP-028-007-S	20-JUN-95	MAGNESIUM	3140	B	0.235	mg/kg
T1096-GP-028-007-S	20-JUN-95	MANGANESE	180	B	0.00962	mg/kg
T1096-GP-028-007-S	20-JUN-95	MERCURY	0.00277	J	0.00216	mg/kg
T1096-GP-028-007-S	20-JUN-95	NICKEL	6.71	B	0.0807	mg/kg
T1096-GP-028-007-S	20-JUN-95	POTASSIUM	1030		0.643	mg/kg
T1096-GP-028-007-S	20-JUN-95	SELENIUM	0.47	J	0.143	mg/kg
T1096-GP-028-007-S	20-JUN-95	SILVER	0.125	U	0.249	mg/kg
T1096-GP-028-007-S	20-JUN-95	SODIUM	106		1.56	mg/kg
T1096-GP-028-007-S	20-JUN-95	THALLIUM	0.631	J	0.207	mg/kg
T1096-GP-028-007-S	20-JUN-95	VANADIUM	17.9		0.0234	mg/kg
T1096-GP-028-007-S	20-JUN-95	ZINC	19.8		0.27	mg/kg

ER Site 96: Metal Analytical Results for Subsurface Soil Samples

SAMPLE NUMBER	SAMPLE DATE	COMMON NAME	AMOUNT DETECTED	NOTATION	DETECTION LIMIT	UNIT OF MEASURE
T1096-GP-029-009-S	20-JUN-95	ALUMINUM	7000	B	1.19	mg/kg
T1096-GP-029-009-S	20-JUN-95	ANTIMONY	0.428	JB	0.0958	mg/kg
T1096-GP-029-009-S	20-JUN-95	ARSENIC	2.26		0.186	mg/kg
T1096-GP-029-009-S	20-JUN-95	BARIUM	75.2	B	0.00663	mg/kg
T1096-GP-029-009-S	20-JUN-95	BERYLLIUM	0.337	J	0.00114	mg/kg
T1096-GP-029-009-S	20-JUN-95	CADMIUM	0.0049	U	0.0097	mg/kg
T1096-GP-029-009-S	20-JUN-95	CALCIUM	30900	B	2	mg/kg
T1096-GP-029-009-S	20-JUN-95	CHROMIUM	8.53		0.0596	mg/kg
T1096-GP-029-009-S	20-JUN-95	COBALT	4.74		0.0176	mg/kg
T1096-GP-029-009-S	20-JUN-95	COPPER	6.17		0.0539	mg/kg
T1096-GP-029-009-S	20-JUN-95	IRON	14200		1.01	mg/kg
T1096-GP-029-009-S	20-JUN-95	LEAD	6.58	B	0.113	mg/kg
T1096-GP-029-009-S	20-JUN-95	MAGNESIUM	3830	B	0.235	mg/kg
T1096-GP-029-009-S	20-JUN-95	MANGANESE	240	B	0.00962	mg/kg
T1096-GP-029-009-S	20-JUN-95	MERCURY	0.0659	B	0.00212	mg/kg
T1096-GP-029-009-S	20-JUN-95	NICKEL	37.1	B	0.0807	mg/kg
T1096-GP-029-009-S	20-JUN-95	POTASSIUM	1890		0.643	mg/kg
T1096-GP-029-009-S	20-JUN-95	SELENIUM	0.811		0.143	mg/kg
T1096-GP-029-009-S	20-JUN-95	SILVER	0.125	U	0.249	mg/kg
T1096-GP-029-009-S	20-JUN-95	SODIUM	94.1		1.56	mg/kg
T1096-GP-029-009-S	20-JUN-95	THALLIUM	1.35		0.207	mg/kg
T1096-GP-029-009-S	20-JUN-95	VANADIUM	26.3		0.0234	mg/kg
T1096-GP-029-009-S	20-JUN-95	ZINC	27.4		0.27	mg/kg
T1096-GP-030-009-S	20-JUN-95	ALUMINUM	6250	B	1.19	mg/kg
T1096-GP-030-009-S	20-JUN-95	ANTIMONY	0.628	JB	0.0958	mg/kg
T1096-GP-030-009-S	20-JUN-95	ARSENIC	2.2		0.186	mg/kg
T1096-GP-030-009-S	20-JUN-95	BARIUM	61.3	B	0.00663	mg/kg
T1096-GP-030-009-S	20-JUN-95	BERYLLIUM	0.336	J	0.00114	mg/kg
T1096-GP-030-009-S	20-JUN-95	CADMIUM	0.0049	U	0.0097	mg/kg
T1096-GP-030-009-S	20-JUN-95	CALCIUM	28000	B	2	mg/kg
T1096-GP-030-009-S	20-JUN-95	CHROMIUM	7.26		0.0596	mg/kg
T1096-GP-030-009-S	20-JUN-95	COBALT	8.16		0.0176	mg/kg
T1096-GP-030-009-S	20-JUN-95	COPPER	7.43		0.0539	mg/kg
T1096-GP-030-009-S	20-JUN-95	IRON	19400		1.01	mg/kg
T1096-GP-030-009-S	20-JUN-95	LEAD	4.32	B	0.113	mg/kg

ER Site 96: Metal Analytical Results for Subsurface Soil Samples

SAMPLE NUMBER	SAMPLE DATE	COMMON NAME	AMOUNT DETECTED	NOTATION	DETECTION LIMIT	UNIT OF MEASURE
T1096-GP-030-009-S	20-JUN-95	MAGNESIUM	3860	B	0.235	mg/kg
T1096-GP-030-009-S	20-JUN-95	MANGANESE	237	B	0.00962	mg/kg
T1096-GP-030-009-S	20-JUN-95	MERCURY	0.0062	JB	0.00235	mg/kg
T1096-GP-030-009-S	20-JUN-95	NICKEL	7.71	B	0.0807	mg/kg
T1096-GP-030-009-S	20-JUN-95	POTASSIUM	1950		0.643	mg/kg
T1096-GP-030-009-S	20-JUN-95	SELENIUM	0.573		0.143	mg/kg
T1096-GP-030-009-S	20-JUN-95	SILVER	0.125	U	0.249	mg/kg
T1096-GP-030-009-S	20-JUN-95	SODIUM	80.6		1.56	mg/kg
T1096-GP-030-009-S	20-JUN-95	THALLIUM	2.02		0.207	mg/kg
T1096-GP-030-009-S	20-JUN-95	VANADIUM	35.1		0.0234	mg/kg
T1096-GP-030-009-S	20-JUN-95	ZINC	31.6		0.27	mg/kg
T1096-GP-031-005-S	20-JUN-95	ALUMINUM	8230	B	1.19	mg/kg
T1096-GP-031-005-S	20-JUN-95	ANTIMONY	0.457	JB	0.0958	mg/kg
T1096-GP-031-005-S	20-JUN-95	ARSENIC	4.64		0.186	mg/kg
T1096-GP-031-005-S	20-JUN-95	BARIUM	224	B	0.00663	mg/kg
T1096-GP-031-005-S	20-JUN-95	BERYLLIUM	0.388	J	0.00114	mg/kg
T1096-GP-031-005-S	20-JUN-95	CADMIUM	0.0049	U	0.0097	mg/kg
T1096-GP-031-005-S	20-JUN-95	CALCIUM	74600	B	5	mg/kg
T1096-GP-031-005-S	20-JUN-95	CHROMIUM	7.77		0.0596	mg/kg
T1096-GP-031-005-S	20-JUN-95	CHROMIUM (VI)	0.68		0.1	mg/kg
T1096-GP-031-005-S	20-JUN-95	COBALT	4.62		0.0176	mg/kg
T1096-GP-031-005-S	20-JUN-95	COPPER	4.07		0.0539	mg/kg
T1096-GP-031-005-S	20-JUN-95	IRON	10600		1.01	mg/kg
T1096-GP-031-005-S	20-JUN-95	LEAD	5.3	B	0.113	mg/kg
T1096-GP-031-005-S	20-JUN-95	MAGNESIUM	4650	B	0.235	mg/kg
T1096-GP-031-005-S	20-JUN-95	MANGANESE	134	B	0.00962	mg/kg
T1096-GP-031-005-S	20-JUN-95	MERCURY	0.0011	UB	0.00226	mg/kg
T1096-GP-031-005-S	20-JUN-95	NICKEL	6.96	B	0.0807	mg/kg
T1096-GP-031-005-S	20-JUN-95	POTASSIUM	1350		0.643	mg/kg
T1096-GP-031-005-S	20-JUN-95	SELENIUM	0.539		0.143	mg/kg
T1096-GP-031-005-S	20-JUN-95	SILVER	0.125	U	0.249	mg/kg
T1096-GP-031-005-S	20-JUN-95	SODIUM	78.6		1.56	mg/kg
T1096-GP-031-005-S	20-JUN-95	THALLIUM	0.93	J	0.207	mg/kg
T1096-GP-031-005-S	20-JUN-95	VANADIUM	42.6		0.0234	mg/kg
T1096-GP-031-005-S	20-JUN-95	ZINC	19.1		0.27	mg/kg

ER Site 96: Metal Analytical Results for Subsurface Soil Samples

SAMPLE NUMBER	SAMPLE DATE	COMMON NAME	AMOUNT DETECTED	NOTATION	DETECTION LIMIT	UNIT OF MEASURE
T1096-GP-033-003-S	20-JUN-95	ALUMINUM	8310	B	1.19	mg/kg
T1096-GP-033-003-S	20-JUN-95	ANTIMONY	0.593	JB	0.0958	mg/kg
T1096-GP-033-003-S	20-JUN-95	ARSENIC	7.51		0.186	mg/kg
T1096-GP-033-003-S	20-JUN-95	BARIUM	193	B	0.00663	mg/kg
T1096-GP-033-003-S	20-JUN-95	BERYLLIUM	0.408	J	0.00114	mg/kg
T1096-GP-033-003-S	20-JUN-95	CADMIUM	0.0049	U	0.0097	mg/kg
T1096-GP-033-003-S	20-JUN-95	CALCIUM	53300	B	5	mg/kg
T1096-GP-033-003-S	20-JUN-95	CHROMIUM	7.95		0.0596	mg/kg
T1096-GP-033-003-S	20-JUN-95	COBALT	4.75		0.0176	mg/kg
T1096-GP-033-003-S	20-JUN-95	COPPER	5.45		0.0539	mg/kg
T1096-GP-033-003-S	20-JUN-95	IRON	13100		1.01	mg/kg
T1096-GP-033-003-S	20-JUN-95	LEAD	6.81	B	0.113	mg/kg
T1096-GP-033-003-S	20-JUN-95	MAGNESIUM	5550	B	0.235	mg/kg
T1096-GP-033-003-S	20-JUN-95	MANGANESE	172	B	0.00962	mg/kg
T1096-GP-033-003-S	20-JUN-95	MERCURY	0.0364	B	0.00246	mg/kg
T1096-GP-033-003-S	20-JUN-95	NICKEL	12	B	0.0807	mg/kg
T1096-GP-033-003-S	20-JUN-95	POTASSIUM	1570		0.643	mg/kg
T1096-GP-033-003-S	20-JUN-95	SELENIUM	0.624		0.143	mg/kg
T1096-GP-033-003-S	20-JUN-95	SILVER	0.125	U	0.249	mg/kg
T1096-GP-033-003-S	20-JUN-95	SODIUM	131		1.56	mg/kg
T1096-GP-033-003-S	20-JUN-95	THALLIUM	1.27		0.207	mg/kg
T1096-GP-033-003-S	20-JUN-95	VANADIUM	44.1		0.0234	mg/kg
T1096-GP-033-003-S	20-JUN-95	ZINC	36.3		0.27	mg/kg
T1096-GP-034-004-S	21-JUN-95	ALUMINUM	6590	B	1.19	mg/kg
T1096-GP-034-004-S	21-JUN-95	ANTIMONY	0.429	JB	0.0958	mg/kg
T1096-GP-034-004-S	21-JUN-95	ARSENIC	4.47		0.186	mg/kg
T1096-GP-034-004-S	21-JUN-95	BARIUM	312	B	0.00663	mg/kg
T1096-GP-034-004-S	21-JUN-95	BERYLLIUM	0.323	J	0.00114	mg/kg
T1096-GP-034-004-S	21-JUN-95	CADMIUM	0.0049	U	0.0097	mg/kg
T1096-GP-034-004-S	21-JUN-95	CALCIUM	106000	B	10	mg/kg
T1096-GP-034-004-S	21-JUN-95	CHROMIUM	7.96		0.0596	mg/kg
T1096-GP-034-004-S	21-JUN-95	COBALT	3.71		0.0176	mg/kg
T1096-GP-034-004-S	21-JUN-95	COPPER	5.03		0.0539	mg/kg
T1096-GP-034-004-S	21-JUN-95	IRON	9660		1.01	mg/kg
T1096-GP-034-004-S	21-JUN-95	LEAD	3.76	B	0.113	mg/kg

TABLE 5

ER Site 96: Metal Analytical Results for Subsurface Soil Samples

SAMPLE NUMBER	SAMPLE DATE	COMMON NAME	AMOUNT DETECTED	NOTATION	DETECTION LIMIT	UNIT OF MEASURE
T1096-GP-034-004-S	21-JUN-95	MAGNESIUM	5420	B	0.235	mg/kg
T1096-GP-034-004-S	21-JUN-95	MANGANESE	156	B	0.00962	mg/kg
T1096-GP-034-004-S	21-JUN-95	MERCURY	0.0117	JB	0.00244	mg/kg
T1096-GP-034-004-S	21-JUN-95	NICKEL	26.1	B	0.0807	mg/kg
T1096-GP-034-004-S	21-JUN-95	POTASSIUM	1220		0.643	mg/kg
T1096-GP-034-004-S	21-JUN-95	SELENIUM	0.351	J	0.143	mg/kg
T1096-GP-034-004-S	21-JUN-95	SILVER	0.125	U	0.249	mg/kg
T1096-GP-034-004-S	21-JUN-95	SODIUM	266		1.56	mg/kg
T1096-GP-034-004-S	21-JUN-95	THALLIUM	0.936	J	0.207	mg/kg
T1096-GP-034-004-S	21-JUN-95	VANADIUM	31.4		0.0234	mg/kg
T1096-GP-034-004-S	21-JUN-95	ZINC	16.5		0.27	mg/kg
T1096-GP-035-007-S	21-JUN-95	ALUMINUM	6450	B	1.19	mg/kg
T1096-GP-035-007-S	21-JUN-95	ANTIMONY	0.409	JB	0.0958	mg/kg
T1096-GP-035-007-S	21-JUN-95	ARSENIC	1.68		0.186	mg/kg
T1096-GP-035-007-S	21-JUN-95	BARIUM	58	B	0.00663	mg/kg
T1096-GP-035-007-S	21-JUN-95	BERYLLIUM	0.366	J	0.00114	mg/kg
T1096-GP-035-007-S	21-JUN-95	CADMIUM	0.0049	U	0.0097	mg/kg
T1096-GP-035-007-S	21-JUN-95	CALCIUM	20700	B	2	mg/kg
T1096-GP-035-007-S	21-JUN-95	CHROMIUM	7.53		0.0596	mg/kg
T1096-GP-035-007-S	21-JUN-95	CHROMIUM (VI)	0.7		0.1	mg/kg
T1096-GP-035-007-S	21-JUN-95	COBALT	4.22		0.0176	mg/kg
T1096-GP-035-007-S	21-JUN-95	COPPER	6.28		0.0539	mg/kg
T1096-GP-035-007-S	21-JUN-95	IRON	14100		1.01	mg/kg
T1096-GP-035-007-S	21-JUN-95	LEAD	3.77	B	0.113	mg/kg
T1096-GP-035-007-S	21-JUN-95	MAGNESIUM	3260	B	0.235	mg/kg
T1096-GP-035-007-S	21-JUN-95	MANGANESE	185	B	0.00962	mg/kg
T1096-GP-035-007-S	21-JUN-95	MERCURY	0.027	J	0.00232	mg/kg
T1096-GP-035-007-S	21-JUN-95	NICKEL	13	B	0.0807	mg/kg
T1096-GP-035-007-S	21-JUN-95	POTASSIUM	1470		0.643	mg/kg
T1096-GP-035-007-S	21-JUN-95	SELENIUM	0.637		0.143	mg/kg
T1096-GP-035-007-S	21-JUN-95	SILVER	0.125	U	0.249	mg/kg
T1096-GP-035-007-S	21-JUN-95	SODIUM	130		1.56	mg/kg
T1096-GP-035-007-S	21-JUN-95	THALLIUM	1.22		0.207	mg/kg
T1096-GP-035-007-S	21-JUN-95	VANADIUM	27.5		0.0234	mg/kg
T1096-GP-035-007-S	21-JUN-95	ZINC	23.2		0.27	mg/kg

TABLE 5
ER Site 96: Metal Analytical Results for Subsurface Soil Samples

SAMPLE NUMBER	SAMPLE DATE	COMMON NAME	AMOUNT DETECTED	NOTATION	DETECTION LIMIT	UNIT OF MEASURE
T1096-GP-036-005-S	21-JUN-95	ALUMINUM	9680	B	1.19	mg/kg
T1096-GP-036-005-S	21-JUN-95	ANTIMONY	0.578	JB	0.0958	mg/kg
T1096-GP-036-005-S	21-JUN-95	ARSENIC	3.5		0.186	mg/kg
T1096-GP-036-005-S	21-JUN-95	BARIUM	213	B	0.00663	mg/kg
T1096-GP-036-005-S	21-JUN-95	BERYLLIUM	0.464	J	0.00114	mg/kg
T1096-GP-036-005-S	21-JUN-95	CADMIUM	0.0049	U	0.0097	mg/kg
T1096-GP-036-005-S	21-JUN-95	CALCIUM	45100	B	2	mg/kg
T1096-GP-036-005-S	21-JUN-95	CHROMIUM	9.54		0.0596	mg/kg
T1096-GP-036-005-S	21-JUN-95	COBALT	5		0.0176	mg/kg
T1096-GP-036-005-S	21-JUN-95	COPPER	6.1		0.0539	mg/kg
T1096-GP-036-005-S	21-JUN-95	IRON	15100		1.01	mg/kg
T1096-GP-036-005-S	21-JUN-95	LEAD	5.32	B	0.113	mg/kg
T1096-GP-036-005-S	21-JUN-95	MAGNESIUM	5330	B	0.235	mg/kg
T1096-GP-036-005-S	21-JUN-95	MANGANESE	221	B	0.00962	mg/kg
T1096-GP-036-005-S	21-JUN-95	MERCURY	0.0469		0.00237	mg/kg
T1096-GP-036-005-S	21-JUN-95	NICKEL	7.61	B	0.0807	mg/kg
T1096-GP-036-005-S	21-JUN-95	POTASSIUM	2150		0.643	mg/kg
T1096-GP-036-005-S	21-JUN-95	SELENIUM	0.747		0.143	mg/kg
T1096-GP-036-005-S	21-JUN-95	SILVER	0.125	U	0.249	mg/kg
T1096-GP-036-005-S	21-JUN-95	SODIUM	309		1.56	mg/kg
T1096-GP-036-005-S	21-JUN-95	THALLIUM	1.64		0.207	mg/kg
T1096-GP-036-005-S	21-JUN-95	VANADIUM	37.8		0.0234	mg/kg
T1096-GP-036-005-S	21-JUN-95	ZINC	29.7		0.27	mg/kg
T1096-GP-037-005-S	21-JUN-95	ALUMINUM	7440	B	1.19	mg/kg
T1096-GP-037-005-S	21-JUN-95	ANTIMONY	0.477	JB	0.0958	mg/kg
T1096-GP-037-005-S	21-JUN-95	ARSENIC	2.63		0.186	mg/kg
T1096-GP-037-005-S	21-JUN-95	BARIUM	85.8	B	0.00663	mg/kg
T1096-GP-037-005-S	21-JUN-95	BERYLLIUM	0.364	J	0.00114	mg/kg
T1096-GP-037-005-S	21-JUN-95	CADMIUM	0.0049	U	0.0097	mg/kg
T1096-GP-037-005-S	21-JUN-95	CALCIUM	28500	B	2	mg/kg
T1096-GP-037-005-S	21-JUN-95	CHROMIUM	7.74		0.0596	mg/kg
T1096-GP-037-005-S	21-JUN-95	COBALT	4.24		0.0176	mg/kg
T1096-GP-037-005-S	21-JUN-95	COPPER	4.56		0.0539	mg/kg
T1096-GP-037-005-S	21-JUN-95	IRON	12600		1.01	mg/kg
T1096-GP-037-005-S	21-JUN-95	LEAD	4.41	B	0.113	mg/kg

ER Site 96: Metal Analytical Results for Subsurface Soil Samples

SAMPLE NUMBER	SAMPLE DATE	COMMON NAME	AMOUNT DETECTED	NOTATION	DETECTION LIMIT	UNIT OF MEASURE
T1096-GP-037-005-S	21-JUN-95	MAGNESIUM	4030	B	0.235	mg/kg
T1096-GP-037-005-S	21-JUN-95	MANGANESE	166	B	0.00962	mg/kg
T1096-GP-037-005-S	21-JUN-95	MERCURY	0.0359		0.00234	mg/kg
T1096-GP-037-005-S	21-JUN-95	NICKEL	6.13	B	0.0807	mg/kg
T1096-GP-037-005-S	21-JUN-95	POTASSIUM	1340		0.643	mg/kg
T1096-GP-037-005-S	21-JUN-95	SELENIUM	0.755		0.143	mg/kg
T1096-GP-037-005-S	21-JUN-95	SILVER	0.125	U	0.249	mg/kg
T1096-GP-037-005-S	21-JUN-95	SODIUM	87.7		1.56	mg/kg
T1096-GP-037-005-S	21-JUN-95	THALLIUM	1.01		0.207	mg/kg
T1096-GP-037-005-S	21-JUN-95	VANADIUM	28.2		0.0234	mg/kg
T1096-GP-037-005-S	21-JUN-95	ZINC	26.7		0.27	mg/kg
T1096-GP-038-010-S	21-JUN-95	ALUMINUM	4150	B	1.19	mg/kg
T1096-GP-038-010-S	21-JUN-95	ANTIMONY	0.048	UB	0.0958	mg/kg
T1096-GP-038-010-S	21-JUN-95	ARSENIC	1.15		0.186	mg/kg
T1096-GP-038-010-S	21-JUN-95	BARIUM	97.1	B	0.00663	mg/kg
T1096-GP-038-010-S	21-JUN-95	BERYLLIUM	0.236	J	0.00114	mg/kg
T1096-GP-038-010-S	21-JUN-95	CADMIUM	0.0049	U	0.0097	mg/kg
T1096-GP-038-010-S	21-JUN-95	CALCIUM	17000	B	2	mg/kg
T1096-GP-038-010-S	21-JUN-95	CHROMIUM	4.73		0.0596	mg/kg
T1096-GP-038-010-S	21-JUN-95	CHROMIUM (VI)	0.62		0.1	mg/kg
T1096-GP-038-010-S	21-JUN-95	COBALT	7.09		0.0176	mg/kg
T1096-GP-038-010-S	21-JUN-95	COPPER	3.62		0.0539	mg/kg
T1096-GP-038-010-S	21-JUN-95	IRON	10300		1.01	mg/kg
T1096-GP-038-010-S	21-JUN-95	LEAD	3.47	B	0.113	mg/kg
T1096-GP-038-010-S	21-JUN-95	MAGNESIUM	2420	B	0.235	mg/kg
T1096-GP-038-010-S	21-JUN-95	MANGANESE	173	B	0.00962	mg/kg
T1096-GP-038-010-S	21-JUN-95	MERCURY	0.0237	J	0.00223	mg/kg
T1096-GP-038-010-S	21-JUN-95	NICKEL	10.4	B	0.0807	mg/kg
T1096-GP-038-010-S	21-JUN-95	POTASSIUM	1180		0.643	mg/kg
T1096-GP-038-010-S	21-JUN-95	SELENIUM	0.429	J	0.143	mg/kg
T1096-GP-038-010-S	21-JUN-95	SILVER	0.125	U	0.249	mg/kg
T1096-GP-038-010-S	21-JUN-95	SODIUM	61.9		1.56	mg/kg
T1096-GP-038-010-S	21-JUN-95	THALLIUM	0.801	J	0.207	mg/kg
T1096-GP-038-010-S	21-JUN-95	VANADIUM	18.2		0.0234	mg/kg
T1096-GP-038-010-S	21-JUN-95	ZINC	19.2		0.27	mg/kg

TABLE 5
ER Site 96: Metal Analytical Results for Subsurface Soil Samples

SAMPLE NUMBER	SAMPLE DATE	COMMON NAME	AMOUNT DETECTED	NOTATION	DETECTION LIMIT	UNIT OF MEASURE
T1096-GP-039-008-S	22-JUN-95	ALUMINUM	5540	B	1.19	mg/kg
T1096-GP-039-008-S	22-JUN-95	ANTIMONY	0.645	JB	0.0958	mg/kg
T1096-GP-039-008-S	22-JUN-95	ARSENIC	1.56		0.186	mg/kg
T1096-GP-039-008-S	22-JUN-95	BARIUM	64	B	0.00663	mg/kg
T1096-GP-039-008-S	22-JUN-95	BERYLLIUM	0.299	J	0.00114	mg/kg
T1096-GP-039-008-S	22-JUN-95	CADMIUM	0.0049	U	0.0097	mg/kg
T1096-GP-039-008-S	22-JUN-95	CALCIUM	76200	B	5	mg/kg
T1096-GP-039-008-S	22-JUN-95	CHROMIUM	7.53		0.0596	mg/kg
T1096-GP-039-008-S	22-JUN-95	COBALT	6.03		0.0176	mg/kg
T1096-GP-039-008-S	22-JUN-95	COPPER	7.31		0.0539	mg/kg
T1096-GP-039-008-S	22-JUN-95	IRON	20200		1.01	mg/kg
T1096-GP-039-008-S	22-JUN-95	LEAD	4.34	B	0.113	mg/kg
T1096-GP-039-008-S	22-JUN-95	MAGNESIUM	4360	B	0.295	mg/kg
T1096-GP-039-008-S	22-JUN-95	MANGANESE	346	B	0.00962	mg/kg
T1096-GP-039-008-S	22-JUN-95	MERCURY	0.0012	U	0.0024	mg/kg
T1096-GP-039-008-S	22-JUN-95	NICKEL	6.46	B	0.0807	mg/kg
T1096-GP-039-008-S	22-JUN-95	POTASSIUM	2310		0.643	mg/kg
T1096-GP-039-008-S	22-JUN-95	SELENIUM	0.501		0.143	mg/kg
T1096-GP-039-008-S	22-JUN-95	SILVER	0.125	U	0.249	mg/kg
T1096-GP-039-008-S	22-JUN-95	SODIUM	166		1.56	mg/kg
T1096-GP-039-008-S	22-JUN-95	THALLIUM	1.71		0.207	mg/kg
T1096-GP-039-008-S	22-JUN-95	VANADIUM	36.4		0.0234	mg/kg
T1096-GP-039-008-S	22-JUN-95	ZINC	34.4		0.27	mg/kg
T1096-GP-040-004-S	22-JUN-95	ALUMINUM	7260	B	1.19	mg/kg
T1096-GP-040-004-S	22-JUN-95	ANTIMONY	0.749	JB	0.0958	mg/kg
T1096-GP-040-004-S	22-JUN-95	ARSENIC	2.23		0.186	mg/kg
T1096-GP-040-004-S	22-JUN-95	BARIUM	117	B	0.00663	mg/kg
T1096-GP-040-004-S	22-JUN-95	BERYLLIUM	0.352	J	0.00114	mg/kg
T1096-GP-040-004-S	22-JUN-95	CADMIUM	0.0049	U	0.0097	mg/kg
T1096-GP-040-004-S	22-JUN-95	CALCIUM	23700	B	2	mg/kg
T1096-GP-040-004-S	22-JUN-95	CHROMIUM	8.72		0.0596	mg/kg
T1096-GP-040-004-S	22-JUN-95	COBALT	5.59		0.0176	mg/kg
T1096-GP-040-004-S	22-JUN-95	COPPER	6.15		0.0539	mg/kg
T1096-GP-040-004-S	22-JUN-95	IRON	17000		1.01	mg/kg
T1096-GP-040-004-S	22-JUN-95	LEAD	7.4	B	0.113	mg/kg

ER Site 96: Metal Analytical Results for Subsurface Soil Samples

SAMPLE NUMBER	SAMPLE DATE	COMMON NAME	AMOUNT DETECTED	NOTATION	DETECTION LIMIT	UNIT OF MEASURE
T1096-GP-040-004-S	22-JUN-95	MAGNESIUM	4700	B	0.235	mg/kg
T1096-GP-040-004-S	22-JUN-95	MANGANESE	233	B	0.00962	mg/kg
T1096-GP-040-004-S	22-JUN-95	MERCURY	0.0011	U	0.00229	mg/kg
T1096-GP-040-004-S	22-JUN-95	NICKEL	7.14	B	0.0807	mg/kg
T1096-GP-040-004-S	22-JUN-95	POTASSIUM	1690		0.643	mg/kg
T1096-GP-040-004-S	22-JUN-95	SELENIUM	0.818		0.143	mg/kg
T1096-GP-040-004-S	22-JUN-95	SILVER	0.125	U	0.249	mg/kg
T1096-GP-040-004-S	22-JUN-95	SODIUM	176		1.56	mg/kg
T1096-GP-040-004-S	22-JUN-95	THALLIUM	1.5		0.207	mg/kg
T1096-GP-040-004-S	22-JUN-95	VANADIUM	34.4		0.0234	mg/kg
T1096-GP-040-004-S	22-JUN-95	ZINC	32.9		0.27	mg/kg
T1096-GP-041-004-S	22-JUN-95	ALUMINUM	8390	B	1.19	mg/kg
T1096-GP-041-004-S	22-JUN-95	ANTIMONY	0.726	JB	0.0958	mg/kg
T1096-GP-041-004-S	22-JUN-95	ARSENIC	5.06		0.186	mg/kg
T1096-GP-041-004-S	22-JUN-95	BARIUM	185	B	0.00663	mg/kg
T1096-GP-041-004-S	22-JUN-95	BERYLLIUM	0.419	J	0.00114	mg/kg
T1096-GP-041-004-S	22-JUN-95	CADMIUM	0.0049	U	0.0097	mg/kg
T1096-GP-041-004-S	22-JUN-95	CALCIUM	66200	B	5	mg/kg
T1096-GP-041-004-S	22-JUN-95	CHROMIUM	8.36		0.0596	mg/kg
T1096-GP-041-004-S	22-JUN-95	CHROMIUM (VI)	0.24	J	0.1	mg/kg
T1096-GP-041-004-S	22-JUN-95	COBALT	4.54		0.0176	mg/kg
T1096-GP-041-004-S	22-JUN-95	COPPER	5.01		0.0539	mg/kg
T1096-GP-041-004-S	22-JUN-95	IRON	12500		1.01	mg/kg
T1096-GP-041-004-S	22-JUN-95	LEAD	4.47	B	0.113	mg/kg
T1096-GP-041-004-S	22-JUN-95	MAGNESIUM	5550	B	0.235	mg/kg
T1096-GP-041-004-S	22-JUN-95	MANGANESE	162	B	0.00962	mg/kg
T1096-GP-041-004-S	22-JUN-95	MERCURY	0.0318		0.00215	mg/kg
T1096-GP-041-004-S	22-JUN-95	NICKEL	9.31	B	0.0807	mg/kg
T1096-GP-041-004-S	22-JUN-95	POTASSIUM	1510		0.643	mg/kg
T1096-GP-041-004-S	22-JUN-95	SELENIUM	0.248	J	0.143	mg/kg
T1096-GP-041-004-S	22-JUN-95	SILVER	0.125	U	0.249	mg/kg
T1096-GP-041-004-S	22-JUN-95	SODIUM	155		1.56	mg/kg
T1096-GP-041-004-S	22-JUN-95	THALLIUM	1.22		0.207	mg/kg
T1096-GP-041-004-S	22-JUN-95	VANADIUM	40.6		0.0234	mg/kg
T1096-GP-041-004-S	22-JUN-95	ZINC	22.4		0.27	mg/kg

ER Site 96: Metal Analytical Results for Subsurface Soil Samples

SAMPLE NUMBER	SAMPLE DATE	COMMON NAME	AMOUNT DETECTED	NOTATION	DETECTION LIMIT	UNIT OF MEASURE
T1096-GP-042-005-S	22-JUN-95	ALUMINUM	8460	B	1.19	mg/kg
T1096-GP-042-005-S	22-JUN-95	ANTIMONY	0.509	JB	0.0958	mg/kg
T1096-GP-042-005-S	22-JUN-95	ARSENIC	4.25		0.186	mg/kg
T1096-GP-042-005-S	22-JUN-95	BARIUM	117	B	0.00663	mg/kg
T1096-GP-042-005-S	22-JUN-95	BERYLLIUM	0.404	J	0.00114	mg/kg
T1096-GP-042-005-S	22-JUN-95	CADMIUM	0.0049	U	0.0097	mg/kg
T1096-GP-042-005-S	22-JUN-95	CALCIUM	73100	B	5	mg/kg
T1096-GP-042-005-S	22-JUN-95	CHROMIUM	8.69		0.0596	mg/kg
T1096-GP-042-005-S	22-JUN-95	COBALT	4.75		0.0176	mg/kg
T1096-GP-042-005-S	22-JUN-95	COPPER	5.71		0.0539	mg/kg
T1096-GP-042-005-S	22-JUN-95	IRON	12400		1.01	mg/kg
T1096-GP-042-005-S	22-JUN-95	LEAD	4.9	B	0.113	mg/kg
T1096-GP-042-005-S	22-JUN-95	MAGNESIUM	6430	B	0.235	mg/kg
T1096-GP-042-005-S	22-JUN-95	MANGANESE	210	B	0.00962	mg/kg
T1096-GP-042-005-S	22-JUN-95	MERCURY	0.0012	U	0.00237	mg/kg
T1096-GP-042-005-S	22-JUN-95	NICKEL	7.29	B	0.0807	mg/kg
T1096-GP-042-005-S	22-JUN-95	POTASSIUM	1710		0.643	mg/kg
T1096-GP-042-005-S	22-JUN-95	SELENIUM	0.38	J	0.143	mg/kg
T1096-GP-042-005-S	22-JUN-95	SILVER	0.125	U	0.249	mg/kg
T1096-GP-042-005-S	22-JUN-95	SODIUM	147		1.56	mg/kg
T1096-GP-042-005-S	22-JUN-95	THALLIUM	1.04		0.207	mg/kg
T1096-GP-042-005-S	22-JUN-95	VANADIUM	42.9		0.0234	mg/kg
T1096-GP-042-005-S	22-JUN-95	ZINC	24		0.27	mg/kg
T1096-GP-043-005-S	22-JUN-95	ALUMINUM	9500	B	1.19	mg/kg
T1096-GP-043-005-S	22-JUN-95	ANTIMONY	0.529	JB	0.0958	mg/kg
T1096-GP-043-005-S	22-JUN-95	ARSENIC	5.09		0.186	mg/kg
T1096-GP-043-005-S	22-JUN-95	BARIUM	179	B	0.00663	mg/kg
T1096-GP-043-005-S	22-JUN-95	BERYLLIUM	0.45	J	0.00114	mg/kg
T1096-GP-043-005-S	22-JUN-95	CADMIUM	0.0049	U	0.0097	mg/kg
T1096-GP-043-005-S	22-JUN-95	CALCIUM	57300	B	5	mg/kg
T1096-GP-043-005-S	22-JUN-95	CHROMIUM	9.81		0.0596	mg/kg
T1096-GP-043-005-S	22-JUN-95	COBALT	6.76		0.0176	mg/kg
T1096-GP-043-005-S	22-JUN-95	COPPER	6.94		0.0539	mg/kg
T1096-GP-043-005-S	22-JUN-95	IRON	13900		1.01	mg/kg
T1096-GP-043-005-S	22-JUN-95	LEAD	6.53	B	0.113	mg/kg

TABLE 5

ER Site 96: Metal Analytical Results for Subsurface Soil Samples

SAMPLE NUMBER.	SAMPLE DATE	COMMON NAME	AMOUNT DETECTED	NOTATION	DETECTION LIMIT	UNIT OF MEASURE
T1096-GP-043-005-S	22-JUN-95	MAGNESIUM	6690	B	0.235	mg/kg
T1096-GP-043-005-S	22-JUN-95	MANGANESE	234	B	0.00962	mg/kg
T1096-GP-043-005-S	22-JUN-95	MERCURY	0.00279	J	0.00243	mg/kg
T1096-GP-043-005-S	22-JUN-95	NICKEL	10.3	B	0.0807	mg/kg
T1096-GP-043-005-S	22-JUN-95	POTASSIUM	1850		0.643	mg/kg
T1096-GP-043-005-S	22-JUN-95	SELENIUM	0.456	J	0.143	mg/kg
T1096-GP-043-005-S	22-JUN-95	SILVER	0.125	U	0.249	mg/kg
T1096-GP-043-005-S	22-JUN-95	SODIUM	441		1.56	mg/kg
T1096-GP-043-005-S	22-JUN-95	THALLIUM	1.19		0.207	mg/kg
T1096-GP-043-005-S	22-JUN-95	VANADIUM	40.9		0.0234	mg/kg
T1096-GP-043-005-S	22-JUN-95	ZINC	30		0.27	mg/kg
T1096-GP-044-003-S	28-JUN-95	ALUMINUM	6720	B	1.14	mg/kg
T1096-GP-044-003-S	28-JUN-95	ANTIMONY	0.3	JB	0.0922	mg/kg
T1096-GP-044-003-S	28-JUN-95	ARSENIC	4.88		0.179	mg/kg
T1096-GP-044-003-S	28-JUN-95	BARIUM	151	B	0.00638	mg/kg
T1096-GP-044-003-S	28-JUN-95	BERYLLIUM	0.319	JB	0.0011	mg/kg
T1096-GP-044-003-S	28-JUN-95	CADMIUM	0.031	JB	0.00933	mg/kg
T1096-GP-044-003-S	28-JUN-95	CALCIUM	44400	B	1.92	mg/kg
T1096-GP-044-003-S	28-JUN-95	CHROMIUM	5.39	B	0.0573	mg/kg
T1096-GP-044-003-S	28-JUN-95	CHROMIUM (VI)	0.05	JB	0.025	mg/kg
T1096-GP-044-003-S	28-JUN-95	COBALT	4.32		0.0169	mg/kg
T1096-GP-044-003-S	28-JUN-95	COPPER	5.73		0.0519	mg/kg
T1096-GP-044-003-S	28-JUN-95	IRON	9150		0.972	mg/kg
T1096-GP-044-003-S	28-JUN-95	LEAD	4.53	B	0.109	mg/kg
T1096-GP-044-003-S	28-JUN-95	MAGNESIUM	6080	B	0.226	mg/kg
T1096-GP-044-003-S	28-JUN-95	MANGANESE	163	B	0.00925	mg/kg
T1096-GP-044-003-S	28-JUN-95	MERCURY	0.00619	J	0.00241	mg/kg
T1096-GP-044-003-S	28-JUN-95	NICKEL	6.18	B	0.0776	mg/kg
T1096-GP-044-003-S	28-JUN-95	POTASSIUM	1160	B	0.619	mg/kg
T1096-GP-044-003-S	28-JUN-95	SELENIUM	0.165	JB	0.138	mg/kg
T1096-GP-044-003-S	28-JUN-95	SILVER	0.12	U	0.24	mg/kg
T1096-GP-044-003-S	28-JUN-95	SODIUM	169	B	1.5	mg/kg
T1096-GP-044-003-S	28-JUN-95	THALLIUM	0.1	U	0.199	mg/kg
T1096-GP-044-003-S	28-JUN-95	VANADIUM	43.1		0.0225	mg/kg
T1096-GP-044-003-S	28-JUN-95	ZINC	24	B	0.26	mg/kg

ER Site 96: Metal Analytical Results for Subsurface Soil Samples

SAMPLE NUMBER	SAMPLE DATE	COMMON NAME	AMOUNT DETECTED	NOTATION	DETECTION LIMIT	UNIT OF MEASURE
T1096-GP-045-004-S	28-JUN-95	ALUMINUM	7180	B	1.11	mg/kg
T1096-GP-045-004-S	28-JUN-95	ANTIMONY	0.231	JB	0.0895	mg/kg
T1096-GP-045-004-S	28-JUN-95	ARSENIC	2.88		0.174	mg/kg
T1096-GP-045-004-S	28-JUN-95	BARIUM	94.4	B	0.00619	mg/kg
T1096-GP-045-004-S	28-JUN-95	BERYLLIUM	0.378	JB	0.00106	mg/kg
T1096-GP-045-004-S	28-JUN-95	CADMIUM	0.0694	JB	0.00906	mg/kg
T1096-GP-045-004-S	28-JUN-95	CALCIUM	40100	B	1.87	mg/kg
T1096-GP-045-004-S	28-JUN-95	CHROMIUM	7.03	B	0.0557	mg/kg
T1096-GP-045-004-S	28-JUN-95	COBALT	4.43		0.0164	mg/kg
T1096-GP-045-004-S	28-JUN-95	COPPER	7.45		0.0503	mg/kg
T1096-GP-045-004-S	28-JUN-95	IRON	10900		0.943	mg/kg
T1096-GP-045-004-S	28-JUN-95	LEAD	5.58	B	0.106	mg/kg
T1096-GP-045-004-S	28-JUN-95	MAGNESIUM	5200	B	0.219	mg/kg
T1096-GP-045-004-S	28-JUN-95	MANGANESE	223	B	0.00899	mg/kg
T1096-GP-045-004-S	28-JUN-95	MERCURY	0.0155	J	0.00215	mg/kg
T1096-GP-045-004-S	28-JUN-95	NICKEL	7.31	B	0.0754	mg/kg
T1096-GP-045-004-S	28-JUN-95	POTASSIUM	1490	B	0.601	mg/kg
T1096-GP-045-004-S	28-JUN-95	SELENIUM	0.068	UB	0.134	mg/kg
T1096-GP-045-004-S	28-JUN-95	SILVER	0.118	U	0.233	mg/kg
T1096-GP-045-004-S	28-JUN-95	SODIUM	97.4	B	1.46	mg/kg
T1096-GP-045-004-S	28-JUN-95	THALLIUM	0.321	J	0.193	mg/kg
T1096-GP-045-004-S	28-JUN-95	VANADIUM	34.8		0.0219	mg/kg
T1096-GP-045-004-S	28-JUN-95	ZINC	29	B	0.252	mg/kg
T1096-GP-046-004-S	10-JUL-95	ALUMINUM	8790	B	1.17	mg/kg
T1096-GP-046-004-S	10-JUL-95	ANTIMONY	0.166	JB	0.0939	mg/kg
T1096-GP-046-004-S	10-JUL-95	ARSENIC	4.74		0.182	mg/kg
T1096-GP-046-004-S	10-JUL-95	BARIUM	230	B	0.0065	mg/kg
T1096-GP-046-004-S	10-JUL-95	BERYLLIUM	0.397	JB	0.00112	mg/kg
T1096-GP-046-004-S	10-JUL-95	CADMIUM	0.235	JB	0.00951	mg/kg
T1096-GP-046-004-S	10-JUL-95	CALCIUM	57700	B	2.94	mg/kg
T1096-GP-046-004-S	10-JUL-95	CHROMIUM	7.21		0.0584	mg/kg
T1096-GP-046-004-S	10-JUL-95	COBALT	3.98		0.0172	mg/kg
T1096-GP-046-004-S	10-JUL-95	COPPER	6.28		0.0528	mg/kg
T1096-GP-046-004-S	10-JUL-95	IRON	10100	B	0.99	mg/kg
T1096-GP-046-004-S	10-JUL-95	LEAD	5.13		0.111	mg/kg

ER Site 96: Metal Analytical Results for Subsurface Soil Samples

SAMPLE NUMBER	SAMPLE DATE	COMMON NAME	AMOUNT DETECTED	NOTATION	DETECTION LIMIT	UNIT OF MEASURE
T1096-GP-046-004-S	10-JUL-95	MAGNESIUM	6290	B	0.23	mg/kg
T1096-GP-046-004-S	10-JUL-95	MANGANESE	176	B	0.00943	mg/kg
T1096-GP-046-004-S	10-JUL-95	MERCURY	0.034	B	0.00223	mg/kg
T1096-GP-046-004-S	10-JUL-95	NICKEL	8.1	B	0.0791	mg/kg
T1096-GP-046-004-S	10-JUL-95	POTASSIUM	1470	B	0.63	mg/kg
T1096-GP-046-004-S	10-JUL-95	SELENIUM	0.07	U	0.14	mg/kg
T1096-GP-046-004-S	10-JUL-95	SILVER	0.122	U	0.244	mg/kg
T1096-GP-046-004-S	10-JUL-95	SODIUM	116	B	1.53	mg/kg
T1096-GP-046-004-S	10-JUL-95	THALLIUM	0.102	U	0.203	mg/kg
T1096-GP-046-004-S	10-JUL-95	VANADIUM	40.5		0.0229	mg/kg
T1096-GP-046-004-S	10-JUL-95	ZINC	25	B	0.265	mg/kg
T1096-GP-047-006-S	10-JUL-95	ALUMINUM	7980	B	1.17	mg/kg
T1096-GP-047-006-S	10-JUL-95	ANTIMONY	0.319	JB	0.0939	mg/kg
T1096-GP-047-006-S	10-JUL-95	ARSENIC	3.45		0.182	mg/kg
T1096-GP-047-006-S	10-JUL-95	BARIIUM	164	B	0.0065	mg/kg
T1096-GP-047-006-S	10-JUL-95	BERYLLIUM	0.419	JB	0.00112	mg/kg
T1096-GP-047-006-S	10-JUL-95	CADMIUM	0.25	JB	0.00951	mg/kg
T1096-GP-047-006-S	10-JUL-95	CALCIUM	33100	B	1.96	mg/kg
T1096-GP-047-006-S	10-JUL-95	CHROMIUM	6.94		0.0584	mg/kg
T1096-GP-047-006-S	10-JUL-95	CHROMIUM (VI)	0.38	J	0.1	mg/kg
T1096-GP-047-006-S	10-JUL-95	COBALT	5.13		0.0172	mg/kg
T1096-GP-047-006-S	10-JUL-95	COPPER	8.01		0.0528	mg/kg
T1096-GP-047-006-S	10-JUL-95	IRON	11700	B	0.99	mg/kg
T1096-GP-047-006-S	10-JUL-95	LEAD	6.36		0.111	mg/kg
T1096-GP-047-006-S	10-JUL-95	MAGNESIUM	5140	B	0.23	mg/kg
T1096-GP-047-006-S	10-JUL-95	MANGANESE	223	B	0.00943	mg/kg
T1096-GP-047-006-S	10-JUL-95	MERCURY	0.0313	JB	0.00241	mg/kg
T1096-GP-047-006-S	10-JUL-95	NICKEL	9.85	B	0.0791	mg/kg
T1096-GP-047-006-S	10-JUL-95	POTASSIUM	1580	B	0.63	mg/kg
T1096-GP-047-006-S	10-JUL-95	SELENIUM	0.07	U	0.14	mg/kg
T1096-GP-047-006-S	10-JUL-95	SILVER	0.122	U	0.244	mg/kg
T1096-GP-047-006-S	10-JUL-95	SODIUM	119	B	1.53	mg/kg
T1096-GP-047-006-S	10-JUL-95	THALLIUM	0.102	U	0.203	mg/kg
T1096-GP-047-006-S	10-JUL-95	VANADIUM	33.4		0.0229	mg/kg
T1096-GP-047-006-S	10-JUL-95	ZINC	31.4	B	0.265	mg/kg

BLE 5

ER Site 96: Metal Analytical Results for Subsurface Soil Samples

SAMPLE NUMBER	SAMPLE DATE	COMMON NAME	AMOUNT DETECTED	NOTATION	DETECTION LIMIT	UNIT OF MEASURE
T1096-GP-048-007-S	10-JUL-95	ALUMINUM	8190	B	1.17	mg/kg
T1096-GP-048-007-S	10-JUL-95	ANTIMONY	0.263	JB	0.0939	mg/kg
T1096-GP-048-007-S	10-JUL-95	ARSENIC	3.17		0.182	mg/kg
T1096-GP-048-007-S	10-JUL-95	BARIUM	125	B	0.0065	mg/kg
T1096-GP-048-007-S	10-JUL-95	BERYLLIUM	0.429	JB	0.00112	mg/kg
T1096-GP-048-007-S	10-JUL-95	CADMIUM	0.237	JB	0.00951	mg/kg
T1096-GP-048-007-S	10-JUL-95	CALCIUM	26600	B	1.96	mg/kg
T1096-GP-048-007-S	10-JUL-95	CHROMIUM	8.08		0.0584	mg/kg
T1096-GP-048-007-S	10-JUL-95	COBALT	4.72		0.0172	mg/kg
T1096-GP-048-007-S	10-JUL-95	COPPER	7.99		0.0528	mg/kg
T1096-GP-048-007-S	10-JUL-95	IRON	11800	B	0.99	mg/kg
T1096-GP-048-007-S	10-JUL-95	LEAD	6.13		0.111	mg/kg
T1096-GP-048-007-S	10-JUL-95	MAGNESIUM	4760	B	0.23	mg/kg
T1096-GP-048-007-S	10-JUL-95	MANGANESE	233	B	0.00943	mg/kg
T1096-GP-048-007-S	10-JUL-95	MERCURY	0.0232	JB	0.00206	mg/kg
T1096-GP-048-007-S	10-JUL-95	NICKEL	8.45	B	0.0791	mg/kg
T1096-GP-048-007-S	10-JUL-95	POTASSIUM	1640	B	0.63	mg/kg
T1096-GP-048-007-S	10-JUL-95	SELENIUM	0.07	U	0.14	mg/kg
T1096-GP-048-007-S	10-JUL-95	SILVER	0.122	U	0.244	mg/kg
T1096-GP-048-007-S	10-JUL-95	SODIUM	608	B	1.53	mg/kg
T1096-GP-048-007-S	10-JUL-95	THALLIUM	0.102	U	0.203	mg/kg
T1096-GP-048-007-S	10-JUL-95	VANADIUM	23.3		0.0229	mg/kg
T1096-GP-048-007-S	10-JUL-95	ZINC	28.7	B	0.265	mg/kg
T1096-GP-050-005-S	11-JUL-95	ALUMINUM	7760	B	1.1	mg/kg
T1096-GP-050-005-S	11-JUL-95	ANTIMONY	0.241	J	0.0887	mg/kg
T1096-GP-050-005-S	11-JUL-95	ARSENIC	4.3		0.172	mg/kg
T1096-GP-050-005-S	11-JUL-95	BARIUM	258	B	0.00614	mg/kg
T1096-GP-050-005-S	11-JUL-95	BERYLLIUM	0.413	JB	0.00106	mg/kg
T1096-GP-050-005-S	11-JUL-95	CADMIUM	0.452	J	0.00898	mg/kg
T1096-GP-050-005-S	11-JUL-95	CALCIUM	37700	B	1.85	mg/kg
T1096-GP-050-005-S	11-JUL-95	CHROMIUM	6.74		0.0552	mg/kg
T1096-GP-050-005-S	11-JUL-95	CHROMIUM (VI)	0.05	U	0.1	mg/kg
T1096-GP-050-005-S	11-JUL-95	COBALT	4.49	B	0.0163	mg/kg
T1096-GP-050-005-S	11-JUL-95	COPPER	7.59	B	0.0499	mg/kg
T1096-GP-050-005-S	11-JUL-95	IRON	17000		0.935	mg/kg

ER Site 96: Metal Analytical Results for Subsurface Soil Samples

SAMPLE NUMBER	SAMPLE DATE	COMMON NAME	AMOUNT DETECTED	NOTATION	DETECTION LIMIT	UNIT OF MEASURE
T1096-GP-050-005-S	11-JUL-95	LEAD	5.43		0.105	mg/kg
T1096-GP-050-005-S	11-JUL-95	MAGNESIUM	4960	B	0.218	mg/kg
T1096-GP-050-005-S	11-JUL-95	MANGANESE	298	B	0.00891	mg/kg
T1096-GP-050-005-S	11-JUL-95	MERCURY	0.0252	JB	0.00222	mg/kg
T1096-GP-050-005-S	11-JUL-95	NICKEL	8.14		0.0747	mg/kg
T1096-GP-050-005-S	11-JUL-95	POTASSIUM	1660		0.595	mg/kg
T1096-GP-050-005-S	11-JUL-95	SELENIUM	0.066	U	0.132	mg/kg
T1096-GP-050-005-S	11-JUL-95	SILVER	0.116	U	0.231	mg/kg
T1096-GP-050-005-S	11-JUL-95	SODIUM	150	B	1.44	mg/kg
T1096-GP-050-005-S	11-JUL-95	THALLIUM	0.096	U	0.192	mg/kg
T1096-GP-050-005-S	11-JUL-95	VANADIUM	50.2	B	0.0217	mg/kg
T1096-GP-050-005-S	11-JUL-95	ZINC	34.7	B	0.25	mg/kg
T1096-GP-051-004-S	11-JUL-95	ALUMINUM	7080	B	1.1	mg/kg
T1096-GP-051-004-S	11-JUL-95	ANTIMONY	0.044	U	0.0887	mg/kg
T1096-GP-051-004-S	11-JUL-95	ARSENIC	3.38		0.172	mg/kg
T1096-GP-051-004-S	11-JUL-95	BARIUM	161	B	0.00614	mg/kg
T1096-GP-051-004-S	11-JUL-95	BERYLLIUM	0.338	JB	0.00106	mg/kg
T1096-GP-051-004-S	11-JUL-95	CADMIUM	0.325	J	0.00898	mg/kg
T1096-GP-051-004-S	11-JUL-95	CALCIUM	40900	B	1.85	mg/kg
T1096-GP-051-004-S	11-JUL-95	CHROMIUM	7.04		0.0552	mg/kg
T1096-GP-051-004-S	11-JUL-95	COBALT	3.83	B	0.0163	mg/kg
T1096-GP-051-004-S	11-JUL-95	COPPER	6.15	B	0.0499	mg/kg
T1096-GP-051-004-S	11-JUL-95	IRON	10200		0.935	mg/kg
T1096-GP-051-004-S	11-JUL-95	LEAD	4.96		0.105	mg/kg
T1096-GP-051-004-S	11-JUL-95	MAGNESIUM	4310	B	0.218	mg/kg
T1096-GP-051-004-S	11-JUL-95	MANGANESE	167	B	0.00891	mg/kg
T1096-GP-051-004-S	11-JUL-95	MERCURY	0.0286	JB	0.00225	mg/kg
T1096-GP-051-004-S	11-JUL-95	NICKEL	6.76		0.0747	mg/kg
T1096-GP-051-004-S	11-JUL-95	POTASSIUM	1450		0.595	mg/kg
T1096-GP-051-004-S	11-JUL-95	SELENIUM	0.066	U	0.132	mg/kg
T1096-GP-051-004-S	11-JUL-95	SILVER	0.116	U	0.231	mg/kg
T1096-GP-051-004-S	11-JUL-95	SODIUM	123	B	1.44	mg/kg
T1096-GP-051-004-S	11-JUL-95	THALLIUM	0.096	U	0.192	mg/kg
T1096-GP-051-004-S	11-JUL-95	VANADIUM	25	B	0.0217	mg/kg
T1096-GP-051-004-S	11-JUL-95	ZINC	24.3	B	0.25	mg/kg

TABLE 5
ER Site 96: Metal Analytical Results for Subsurface Soil Samples

SAMPLE NUMBER	SAMPLE DATE	COMMON NAME	AMOUNT DETECTED	NOTATION	DETECTION LIMIT	UNIT OF MEASURE
T1096-GP-052-004-S	11-JUL-95	ALUMINUM	6850	B	1.12	mg/kg
T1096-GP-052-004-S	11-JUL-95	ANTIMONY	0.045	U	0.0904	mg/kg
T1096-GP-052-004-S	11-JUL-95	ARSENIC	2.77		0.176	mg/kg
T1096-GP-052-004-S	11-JUL-95	BARIUM	113	B	0.00626	mg/kg
T1096-GP-052-004-S	11-JUL-95	BERYLLIUM	0.345	JB	0.00108	mg/kg
T1096-GP-052-004-S	11-JUL-95	CADMIUM	0.323	J	0.00916	mg/kg
T1096-GP-052-004-S	11-JUL-95	CALCIUM	29400	B	1.89	mg/kg
T1096-GP-052-004-S	11-JUL-95	CHROMIUM	6.96		0.0563	mg/kg
T1096-GP-052-004-S	11-JUL-95	COBALT	4.51	B	0.0166	mg/kg
T1096-GP-052-004-S	11-JUL-95	COPPER	7.47	B	0.0509	mg/kg
T1096-GP-052-004-S	11-JUL-95	IRON	11700		0.953	mg/kg
T1096-GP-052-004-S	11-JUL-95	LEAD	4.95		0.107	mg/kg
T1096-GP-052-004-S	11-JUL-95	MAGNESIUM	4590	B	0.222	mg/kg
T1096-GP-052-004-S	11-JUL-95	MANGANESE	194	B	0.00908	mg/kg
T1096-GP-052-004-S	11-JUL-95	MERCURY	0.0262	JB	0.00228	mg/kg
T1096-GP-052-004-S	11-JUL-95	NICKEL	7.16		0.0762	mg/kg
T1096-GP-052-004-S	11-JUL-95	POTASSIUM	1630		0.607	mg/kg
T1096-GP-052-004-S	11-JUL-95	SELENIUM	0.068	U	0.135	mg/kg
T1096-GP-052-004-S	11-JUL-95	SILVER	0.118	U	0.235	mg/kg
T1096-GP-052-004-S	11-JUL-95	SODIUM	124	B	1.47	mg/kg
T1096-GP-052-004-S	11-JUL-95	THALLIUM	0.098	U	0.195	mg/kg
T1096-GP-052-004-S	11-JUL-95	VANADIUM	24.5	B	0.0221	mg/kg
T1096-GP-052-004-S	11-JUL-95	ZINC	28.4	B	0.255	mg/kg
T1096-GP-053-006-S	11-JUL-95	ALUMINUM	7430	B	1.1	mg/kg
T1096-GP-053-006-S	11-JUL-95	ANTIMONY	0.116	J	0.0887	mg/kg
T1096-GP-053-006-S	11-JUL-95	ARSENIC	3.46		0.172	mg/kg
T1096-GP-053-006-S	11-JUL-95	BARIUM	182	B	0.00614	mg/kg
T1096-GP-053-006-S	11-JUL-95	BERYLLIUM	0.384	JB	0.00106	mg/kg
T1096-GP-053-006-S	11-JUL-95	CADMIUM	0.321	J	0.00898	mg/kg
T1096-GP-053-006-S	11-JUL-95	CALCIUM	32900	B	1.85	mg/kg
T1096-GP-053-006-S	11-JUL-95	CHROMIUM	8.51		0.0552	mg/kg
T1096-GP-053-006-S	11-JUL-95	CHROMIUM (VI)	0.05	U	0.1	mg/kg
T1096-GP-053-006-S	11-JUL-95	COBALT	4.74	B	0.0163	mg/kg
T1096-GP-053-006-S	11-JUL-95	COPPER	7.46	B	0.0499	mg/kg
T1096-GP-053-006-S	11-JUL-95	IRON	11000		0.935	mg/kg

ER Site 96: Metal Analytical Results for Subsurface Soil Samples

SAMPLE NUMBER	SAMPLE DATE	COMMON NAME	AMOUNT DETECTED	NOTATION	DETECTION LIMIT	UNIT OF MEASURE
T1096-GP-053-006-S	11-JUL-95	LEAD	5.44		0.105	mg/kg
T1096-GP-053-006-S	11-JUL-95	MAGNESIUM	4510	B	0.218	mg/kg
T1096-GP-053-006-S	11-JUL-95	MANGANESE	218	B	0.00891	mg/kg
T1096-GP-053-006-S	11-JUL-95	MERCURY	0.021	JB	0.00247	mg/kg
T1096-GP-053-006-S	11-JUL-95	NICKEL	8.68		0.0747	mg/kg
T1096-GP-053-006-S	11-JUL-95	POTASSIUM	1810		0.595	mg/kg
T1096-GP-053-006-S	11-JUL-95	SELENIUM	0.066	U	0.132	mg/kg
T1096-GP-053-006-S	11-JUL-95	SILVER	0.116	U	0.231	mg/kg
T1096-GP-053-006-S	11-JUL-95	SODIUM	181	B	1.44	mg/kg
T1096-GP-053-006-S	11-JUL-95	THALLIUM	0.096	U	0.192	mg/kg
T1096-GP-053-006-S	11-JUL-95	VANADIUM	26.2	B	0.0217	mg/kg
T1096-GP-053-006-S	11-JUL-95	ZINC	29.1	B	0.25	mg/kg
T1096-GP-054-007-S	11-JUL-95	ALUMINUM	4840	B	1.11	mg/kg
T1096-GP-054-007-S	11-JUL-95	ANTIMONY	0.045	U	0.0895	mg/kg
T1096-GP-054-007-S	11-JUL-95	ARSENIC	1.33		0.174	mg/kg
T1096-GP-054-007-S	11-JUL-95	BARIUM	59.9	B	0.00619	mg/kg
T1096-GP-054-007-S	11-JUL-95	BERYLLIUM	0.251	JB	0.00106	mg/kg
T1096-GP-054-007-S	11-JUL-95	CADMIUM	0.298	J	0.00906	mg/kg
T1096-GP-054-007-S	11-JUL-95	CALCIUM	13800	B	1.87	mg/kg
T1096-GP-054-007-S	11-JUL-95	CHROMIUM	5.57		0.0557	mg/kg
T1096-GP-054-007-S	11-JUL-95	COBALT	4.24	B	0.0164	mg/kg
T1096-GP-054-007-S	11-JUL-95	COPPER	7.31	B	0.0503	mg/kg
T1096-GP-054-007-S	11-JUL-95	IRON	11900		0.943	mg/kg
T1096-GP-054-007-S	11-JUL-95	LEAD	3.4		0.106	mg/kg
T1096-GP-054-007-S	11-JUL-95	MAGNESIUM	2960	B	0.219	mg/kg
T1096-GP-054-007-S	11-JUL-95	MANGANESE	183	B	0.00899	mg/kg
T1096-GP-054-007-S	11-JUL-95	MERCURY	0.04	B	0.00204	mg/kg
T1096-GP-054-007-S	11-JUL-95	NICKEL	5.3		0.0754	mg/kg
T1096-GP-054-007-S	11-JUL-95	POTASSIUM	1410		0.601	mg/kg
T1096-GP-054-007-S	11-JUL-95	SELENIUM	0.068	U	0.134	mg/kg
T1096-GP-054-007-S	11-JUL-95	SILVER	0.118	U	0.233	mg/kg
T1096-GP-054-007-S	11-JUL-95	SODIUM	120	B	1.46	mg/kg
T1096-GP-054-007-S	11-JUL-95	THALLIUM	0.097	U	0.193	mg/kg
T1096-GP-054-007-S	11-JUL-95	VANADIUM	19.7	B	0.0219	mg/kg
T1096-GP-054-007-S	11-JUL-95	ZINC	25.3	B	0.252	mg/kg

ER Site 96: Metal Analytical Results for Subsurface Soil Samples

SAMPLE NUMBER	SAMPLE DATE	COMMON NAME	AMOUNT DETECTED	NOTATION	DETECTION LIMIT	UNIT OF MEASURE
T1096-GP-055-005-S	17-JUL-95	ALUMINUM	7520	B	1.19	mg/kg
T1096-GP-055-005-S	17-JUL-95	ANTIMONY	0.312	JB	0.0958	mg/kg
T1096-GP-055-005-S	17-JUL-95	ARSENIC	2.75		0.186	mg/kg
T1096-GP-055-005-S	17-JUL-95	BARIUM	100	B	0.00663	mg/kg
T1096-GP-055-005-S	17-JUL-95	BERYLLIUM	0.352	JB	0.00114	mg/kg
T1096-GP-055-005-S	17-JUL-95	CADMIUM	0.169	J	0.0097	mg/kg
T1096-GP-055-005-S	17-JUL-95	CALCIUM	31800	B	2	mg/kg
T1096-GP-055-005-S	17-JUL-95	CHROMIUM	8.35	B	0.0596	mg/kg
T1096-GP-055-005-S	17-JUL-95	COBALT	5.01		0.0176	mg/kg
T1096-GP-055-005-S	17-JUL-95	COPPER	6.75		0.0539	mg/kg
T1096-GP-055-005-S	17-JUL-95	IRON	12400		1.01	mg/kg
T1096-GP-055-005-S	17-JUL-95	LEAD	5.28		0.113	mg/kg
T1096-GP-055-005-S	17-JUL-95	MAGNESIUM	4460	B	0.235	mg/kg
T1096-GP-055-005-S	17-JUL-95	MANGANESE	198	B	0.00962	mg/kg
T1096-GP-055-005-S	17-JUL-95	MERCURY	0.0137	JB	0.00212	mg/kg
T1096-GP-055-005-S	17-JUL-95	NICKEL	10.2		0.0807	mg/kg
T1096-GP-055-005-S	17-JUL-95	POTASSIUM	1400	B	0.643	mg/kg
T1096-GP-055-005-S	17-JUL-95	SELENIUM	0.07	U	0.143	mg/kg
T1096-GP-055-005-S	17-JUL-95	SILVER	0.125	U	0.249	mg/kg
T1096-GP-055-005-S	17-JUL-95	SODIUM	103	B	1.56	mg/kg
T1096-GP-055-005-S	17-JUL-95	THALLIUM	0.104	U	0.207	mg/kg
T1096-GP-055-005-S	17-JUL-95	VANADIUM	25.6		0.0234	mg/kg
T1096-GP-055-005-S	17-JUL-95	ZINC	26.9	B	0.27	mg/kg

U = non-detect

J = estimated value

B = detected in the blank

ER Site 96: Detected Radionuclide Analytic... Results for Subsurface Soil and Sediment Samples

SAMPLE NUMBER	SAMPLE DATE	COMMON NAME	AMOUNT DETECTED	ERROR (+/-)	REPORTING LIMIT	UNIT OF MEASURE
Subsurface Soils						
T1096-GP-001-009-S	13-JUN-95	URANIUM-238	0.948	0.142	0.09	pCi/g
T1096-GP-001-009-S	13-JUN-95	URANIUM-233/234	1.12	0.16	0.09	pCi/g
T1096-GP-002-004-S	13-JUN-95	URANIUM-238	1.09	0.161	0.09	pCi/g
T1096-GP-002-004-S	13-JUN-95	URANIUM-233/234	1.07	0.159	0.09	pCi/g
T1096-GP-003-006-S	13-JUN-95	URANIUM-238	1.23	0.174	0.09	pCi/g
T1096-GP-003-006-S	13-JUN-95	URANIUM-233/234	1.34	0.185	0.09	pCi/g
T1096-GP-005-006-S	13-JUN-95	URANIUM-238	1.19	0.16	0.09	pCi/g
T1096-GP-005-006-S	13-JUN-96	URANIUM-233/234	1.27	0.167	0.09	pCi/g
T1096-GP-006-008-S	14-JUN-95	PLUTONIUM-238	0.136	0.0321	0.03	pCi/g
T1096-GP-006-008-S	14-JUN-95	TRITIUM	16200	1000	258	pCi/L
T1096-GP-006-008-S	14-JUN-95	URANIUM-238	1.19	0.124	0.09	pCi/g
T1096-GP-006-008-S	14-JUN-95	URANIUM-233/234	1.27	0.131	0.09	pCi/g
T1096-GP-007-008-S	14-JUN-95	TRITIUM	7240	840	251	pCi/L
T1096-GP-008-008-S	14-JUN-95	TRITIUM	11700	1500	815	pCi/L
T1096-GP-009-010-S	14-JUN-95	TRITIUM	6040	590	253	pCi/L
T1096-GP-010-009-S	14-JUN-95	TRITIUM	1390	320	260	pCi/L
T1096-GP-013-005-S	15-JUN-95	URANIUM-238	1.02	0.146	0.09	pCi/g
T1096-GP-013-005-S	15-JUN-95	URANIUM-233/234	0.962	0.14	0.09	pCi/g
T1096-GP-014-003-S	15-JUN-95	URANIUM-233/234	0.921	0.129	0.09	pCi/g
T1096-GP-015-005-S	15-JUN-95	PLUTONIUM-238	0.0331	0.0198	0.03	pCi/g
T1096-GP-015-005-S	15-JUN-95	URANIUM-238	1	0.136	0.09	pCi/g
T1096-GP-015-005-S	15-JUN-95	URANIUM-233/234	0.89	0.125	0.09	pCi/g
T1096-GP-016-005-S	15-JUN-95	URANIUM-233/234	1	0.131	0.09	pCi/g
T1096-GP-017-005-S	15-JUN-95	URANIUM-233/234	0.932	0.121	0.09	pCi/g
T1096-GP-018-005-S	15-JUN-95	TRITIUM	270	230	248	pCi/L
T1096-GP-018-005-S	15-JUN-95	URANIUM-238	0.905	0.151	0.09	pCi/g
T1096-GP-019-005-S	16-JUN-95	PLUTONIUM-238	0.0337	0.022	0.03	pCi/g
T1096-GP-019-005-S	16-JUN-95	URANIUM-238	0.915	0.121	0.09	pCi/g
T1096-GP-023-005-S	19-JUN-95	URANIUM-238	1.2	0.127	0.09	pCi/g
T1096-GP-023-005-S	19-JUN-95	URANIUM-233/234	1.39	0.143	0.09	pCi/g
T1096-GP-024-005-S	19-JUN-95	URANIUM-233/234	1.03	0.112	0.09	pCi/g
T1096-GP-025-003-S	19-JUN-95	URANIUM-238	1.15	0.127	0.09	pCi/g

TABLE 6
ER Site 96: Detected Radionuclide Analytical Results for Subsurface Soil and Sediment Samples

SAMPLE NUMBER	SAMPLE DATE	COMMON NAME	AMOUNT DETECTED	ERROR (+/-)	REPORTING LIMIT	UNIT OF MEASURE
T1096-GP-025-003-S	19-JUN-95	URANIUM-233/234	1.15	0.127	0.09	pCi/g
T1096-GP-027-007-S	19-JUN-95	URANIUM-238	1.11	0.13	0.09	pCi/g
T1096-GP-027-007-S	19-JUN-95	URANIUM-233/234	1.16	0.133	0.09	pCi/g
T1096-GP-028-007-S	20-JUN-95	URANIUM-238	0.977	0.106	0.09	pCi/g
T1096-GP-028-007-S	20-JUN-95	URANIUM-233/234	0.986	0.107	0.09	pCi/g
T1096-GP-029-009-S	20-JUN-95	URANIUM-238	1.32	0.136	0.09	pCi/g
T1096-GP-029-009-S	20-JUN-95	URANIUM-233/234	1.34	0.138	0.09	pCi/g
T1096-GP-030-009-S	20-JUN-95	URANIUM-238	1.41	0.139	0.09	pCi/g
T1096-GP-030-009-S	20-JUN-95	URANIUM-233/234	1.4	0.138	0.09	pCi/g
T1096-GP-033-003-S	20-JUN-95	URANIUM-238	1.05	0.115	0.09	pCi/g
T1096-GP-033-003-S	20-JUN-95	URANIUM-233/234	1.17	0.124	0.09	pCi/g
T1096-GP-035-007-S	21-JUN-95	URANIUM-238	1.19	0.124	0.09	pCi/g
T1096-GP-035-007-S	21-JUN-95	URANIUM-233/234	1.22	0.126	0.09	pCi/g
T1096-GP-036-005-S	21-JUN-95	URANIUM-238	0.928	0.105	0.09	pCi/g
T1096-GP-036-005-S	21-JUN-95	URANIUM-233/234	1.12	0.121	0.09	pCi/g
T1096-GP-037-005-S	21-JUN-95	URANIUM-233/234	0.99	0.11	0.09	pCi/g
T1096-GP-038-010-S	21-JUN-95	URANIUM-238	0.912	0.103	0.09	pCi/g
T1096-GP-038-010-S	21-JUN-95	URANIUM-233/234	0.983	0.109	0.09	pCi/g
T1096-GP-039-008-S	22-JUN-95	URANIUM-238	1.21	0.132	0.09	pCi/g
T1096-GP-039-008-S	22-JUN-95	URANIUM-233/234	1.33	0.142	0.09	pCi/g
T1096-GP-040-004-S	22-JUN-95	URANIUM-238	1.38	0.169	0.09	pCi/g
T1096-GP-040-004-S	22-JUN-95	URANIUM-233/234	1.53	0.184	0.09	pCi/g
T1096-GP-042-005-S	22-JUN-95	URANIUM-238	1.11	0.119	0.09	pCi/g
T1096-GP-042-005-S	22-JUN-95	URANIUM-233/234	1.22	0.128	0.09	pCi/g
T1096-GP-043-005-S	22-JUN-95	URANIUM-238	1	0.109	0.09	pCi/g
T1096-GP-043-005-S	22-JUN-95	URANIUM-233/234	1.15	0.122	0.09	pCi/g
T1096-GP-044-003-S	28-JUN-95	TRITIUM	350	230	0.09	pCi/L
T1096-GP-044-003-S	28-JUN-95	URANIUM-238	1.24	0.166	0.09	pCi/g
T1096-GP-044-003-S	28-JUN-95	URANIUM-233/234	1.39	0.18	0.09	pCi/g
T1096-GP-045-004-S	28-JUN-95	URANIUM-238	1.08	0.146	0.09	pCi/g
T1096-GP-045-004-S	28-JUN-95	URANIUM-233/234	1.11	0.149	0.09	pCi/g
T1096-GP-046-004-S	10-JUL-95	URANIUM-238	0.987	0.105	0.09	pCi/g
T1096-GP-046-004-S	10-JUL-95	URANIUM-233/234	1.29	0.129	0.09	pCi/g

ER Site 96: Detected Radionuclide Analytical Results for Subsurface Soil and Sediment Samples

SAMPLE NUMBER	SAMPLE DATE	COMMON NAME	AMOUNT DETECTED	ERROR (+/-)	REPORTING LIMIT	UNIT OF MEASURE
T1096-GP-047-006-S	10-JUL-95	URANIUM-238	0.969	0.137	0.09	pCi/g
T1096-GP-047-006-S	10-JUL-95	URANIUM-233/234	1.12	0.153	0.09	pCi/g
T1096-GP-048-007-S	10-JUL-95	URANIUM-238	0.909	0.105	0.09	pCi/g
T1096-GP-048-007-S	10-JUL-95	URANIUM-233/234	1.03	0.115	0.09	pCi/g
T1096-GP-050-005-S	11-JUL-95	URANIUM-238	0.916	0.14	0.09	pCi/g
T1096-GP-050-005-S	11-JUL-95	URANIUM-233/234	1.08	0.158	0.09	pCi/g
T1096-GP-051-004-S	11-JUL-95	URANIUM-233/234	1.03	0.144	0.09	pCi/g
T1096-GP-052-004-S	11-JUL-95	PLUTONIUM-238	0.934	0.121	0.03	pCi/g
T1096-GP-052-004-S	11-JUL-95	PU-239/240	0.0434	0.0191	0.03	pCi/g
T1096-GP-052-004-S	11-JUL-95	URANIUM-238	0.984	0.157	0.09	pCi/g
T1096-GP-053-006-S	11-JUL-95	URANIUM-238	1.22	0.169	0.09	pCi/g
T1096-GP-053-006-S	11-JUL-95	URANIUM-233/234	1.35	0.182	0.09	pCi/g
T1096-GP-054-007-S	11-JUL-95	URANIUM-238	1.24	0.176	0.09	pCi/g
T1096-GP-054-007-S	11-JUL-95	URANIUM-233/234	1.15	0.167	0.09	pCi/g
T1096-GP-055-005-S	17-JUL-95	URANIUM-238	0.991	0.117	0.09	pCi/g
T1096-GP-055-005-S	17-JUL-95	URANIUM-233/234	1.07	0.124	0.09	pCi/g
Sediments						
T1096-SD-017-001-SS	27-JUN-95	PLUTONIUM-238	0.439	0.235	0.03	pCi/g
T1096-SD-028-001-SS	27-JUN-95	URANIUM-238	0.905	0.128	0.09	pCi/g
T1096-SD-028-001-SS	27-JUN-95	URANIUM-233/234	0.903	0.128	0.09	pCi/g

TABLE 7
ER Site 96: Metal Analytical Results for Sediment Samples

SAMPLE NUMBER	SAMPLE DATE	COMMON NAME	AMOUNT DETECTED	NOTATION	DETECTION LIMIT	UNIT OF MEASURE
T1096-SD-001-001-SS	26-JUN-95	ALUMINUM	5080	B	1.19	mg/kg
T1096-SD-001-001-SS	26-JUN-95	ANTIMONY	0.313	J	0.0958	mg/kg
T1096-SD-001-001-SS	26-JUN-95	ARSENIC	2.05		0.186	mg/kg
T1096-SD-001-001-SS	26-JUN-95	BARIIUM	99	B	0.00663	mg/kg
T1096-SD-001-001-SS	26-JUN-95	BERYLLIUM	0.261	BJ	0.00114	mg/kg
T1096-SD-001-001-SS	26-JUN-95	CADMIUM	1.15	B	0.0097	mg/kg
T1096-SD-001-001-SS	26-JUN-95	CALCIUM	26700	B	2	mg/kg
T1096-SD-001-001-SS	26-JUN-95	CHROMIUM	14.9	B	0.0596	mg/kg
T1096-SD-001-001-SS	26-JUN-95	COBALT	3		0.0176	mg/kg
T1096-SD-001-001-SS	26-JUN-95	COPPER	26.1		0.0539	mg/kg
T1096-SD-001-001-SS	26-JUN-95	IRON	8040	B	1.01	mg/kg
T1096-SD-001-001-SS	26-JUN-95	LEAD	31.4	B	0.113	mg/kg
T1096-SD-001-001-SS	26-JUN-95	MAGNESIUM	2430	B	0.235	mg/kg
T1096-SD-001-001-SS	26-JUN-95	MANGANESE	101	B	0.00962	mg/kg
T1096-SD-001-001-SS	26-JUN-95	MERCURY	0.0546	B	0.00222	mg/kg
T1096-SD-001-001-SS	26-JUN-95	NICKEL	6.03	B	0.0807	mg/kg
T1096-SD-001-001-SS	26-JUN-95	POTASSIUM	977	B	0.643	mg/kg
T1096-SD-001-001-SS	26-JUN-95	SELENIUM	0.197	J	0.143	mg/kg
T1096-SD-001-001-SS	26-JUN-95	SILVER	18.5		0.249	mg/kg
T1096-SD-001-001-SS	26-JUN-95	SODIUM	96.6	B	1.56	mg/kg
T1096-SD-001-001-SS	26-JUN-95	THALLIUM	0.207	U	0.207	mg/kg
T1096-SD-001-001-SS	26-JUN-95	VANADIUM	21.5		0.0234	mg/kg
T1096-SD-001-001-SS	26-JUN-95	ZINC	104	B	0.27	mg/kg
T1096-SD-002-001-SS	26-JUN-95	ALUMINUM	5220	B	1.18	mg/kg
T1096-SD-002-001-SS	26-JUN-95	ANTIMONY	0.26	J	0.0948	mg/kg
T1096-SD-002-001-SS	26-JUN-95	ARSENIC	2.49		0.184	mg/kg
T1096-SD-002-001-SS	26-JUN-95	BARIIUM	223	B	0.00656	mg/kg
T1096-SD-002-001-SS	26-JUN-95	BERYLLIUM	0.283	BJ	0.00113	mg/kg
T1096-SD-002-001-SS	26-JUN-95	CADMIUM	1.78	B	0.0096	mg/kg
T1096-SD-002-001-SS	26-JUN-95	CALCIUM	36900	B	1.98	mg/kg
T1096-SD-002-001-SS	26-JUN-95	CHROMIUM	80.8	B	0.059	mg/kg
T1096-SD-002-001-SS	26-JUN-95	COBALT	3.8		0.0174	mg/kg
T1096-SD-002-001-SS	26-JUN-95	COPPER	41.7		0.0534	mg/kg
T1096-SD-002-001-SS	26-JUN-95	IRON	7710	B	1	mg/kg
T1096-SD-002-001-SS	26-JUN-95	LEAD	63	B	0.112	mg/kg

TABLE 7
ER Site 96: Metal Analytical Results for Sediment Samples

SAMPLE NUMBER	SAMPLE DATE	COMMON NAME	AMOUNT DETECTED	NOTATION	DETECTION LIMIT	UNIT OF MEASURE
T1096-SD-002-001-SS	26-JUN-95	MAGNESIUM	3100	B	0.233	mg/kg
T1096-SD-002-001-SS	26-JUN-95	MANGANESE	131	B	0.00952	mg/kg
T1096-SD-002-001-SS	26-JUN-95	MERCURY	0.0348	B	0.00225	mg/kg
T1096-SD-002-001-SS	26-JUN-95	NICKEL	6.87	B	0.0799	mg/kg
T1096-SD-002-001-SS	26-JUN-95	POTASSIUM	1200	B	0.637	mg/kg
T1096-SD-002-001-SS	26-JUN-95	SELENIUM	0.142	U	0.142	mg/kg
T1096-SD-002-001-SS	26-JUN-95	SILVER	76.4		0.247	mg/kg
T1096-SD-002-001-SS	26-JUN-95	SODIUM	118	B	1.54	mg/kg
T1096-SD-002-001-SS	26-JUN-95	THALLIUM	0.205	U	0.205	mg/kg
T1096-SD-002-001-SS	26-JUN-95	VANADIUM	18.9		0.0232	mg/kg
T1096-SD-002-001-SS	26-JUN-95	ZINC	168	B	0.267	mg/kg
T1096-SD-003-001-SS	26-JUN-95	ALUMINUM	5340	B	1.19	mg/kg
T1096-SD-003-001-SS	26-JUN-95	ANTIMONY	0.0958	U	0.0958	mg/kg
T1096-SD-003-001-SS	26-JUN-95	ARSENIC	2.45		0.186	mg/kg
T1096-SD-003-001-SS	26-JUN-95	BARIUM	246	B	0.00663	mg/kg
T1096-SD-003-001-SS	26-JUN-95	BERYLLIUM	0.276	BJ	0.00114	mg/kg
T1096-SD-003-001-SS	26-JUN-95	CADMIUM	1.28	B	0.0097	mg/kg
T1096-SD-003-001-SS	26-JUN-95	CALCIUM	56700	B	5	mg/kg
T1096-SD-003-001-SS	26-JUN-95	CHROMIUM	17.4	B	0.0596	mg/kg
T1096-SD-003-001-SS	26-JUN-95	CHROMIUM (VI)	0.39	B	0.025	mg/kg
T1096-SD-003-001-SS	26-JUN-95	COBALT	3.69		0.0176	mg/kg
T1096-SD-003-001-SS	26-JUN-95	COPPER	33.5		0.0539	mg/kg
T1096-SD-003-001-SS	26-JUN-95	IRON	8150	B	1.01	mg/kg
T1096-SD-003-001-SS	26-JUN-95	LEAD	41.7	B	0.113	mg/kg
T1096-SD-003-001-SS	26-JUN-95	MAGNESIUM	3050	B	0.235	mg/kg
T1096-SD-003-001-SS	26-JUN-95	MANGANESE	133	B	0.00962	mg/kg
T1096-SD-003-001-SS	26-JUN-95	MERCURY	0.0468	B	0.00219	mg/kg
T1096-SD-003-001-SS	26-JUN-95	NICKEL	6.14	B	0.0807	mg/kg
T1096-SD-003-001-SS	26-JUN-95	POTASSIUM	1190	B	0.643	mg/kg
T1096-SD-003-001-SS	26-JUN-95	SELENIUM	0.143	U	0.143	mg/kg
T1096-SD-003-001-SS	26-JUN-95	SILVER	33		0.249	mg/kg
T1096-SD-003-001-SS	26-JUN-95	SODIUM	125	B	1.56	mg/kg
T1096-SD-003-001-SS	26-JUN-95	THALLIUM	0.207	U	0.207	mg/kg
T1096-SD-003-001-SS	26-JUN-95	VANADIUM	19.1		0.0234	mg/kg
T1096-SD-003-001-SS	26-JUN-95	ZINC	144	B	0.27	mg/kg

TABLE 7
ER Site 96: Metal Analytical Results for Sediment Samples

SAMPLE NUMBER	SAMPLE DATE	COMMON NAME	AMOUNT DETECTED	NOTATION	DETECTION LIMIT	UNIT OF MEASURE
T1096-SD-004-001-SS	26-JUN-95	ALUMINUM	3850	B	1.09	mg/kg
T1096-SD-004-001-SS	26-JUN-95	ANTIMONY	0.268	J	0.0879	mg/kg
T1096-SD-004-001-SS	26-JUN-95	ARSENIC	2.32		0.171	mg/kg
T1096-SD-004-001-SS	26-JUN-95	BARIUM	131	B	0.00609	mg/kg
T1096-SD-004-001-SS	26-JUN-95	BERYLLIUM	0.219	BJ	0.00105	mg/kg
T1096-SD-004-001-SS	26-JUN-95	CADMIUM	1.26	B	0.0089	mg/kg
T1096-SD-004-001-SS	26-JUN-95	CALCIUM	29700	B	1.84	mg/kg
T1096-SD-004-001-SS	26-JUN-95	CHROMIUM	14.9	B	0.0547	mg/kg
T1096-SD-004-001-SS	26-JUN-95	COBALT	2.63		0.0162	mg/kg
T1096-SD-004-001-SS	26-JUN-95	COPPER	27.7		0.0495	mg/kg
T1096-SD-004-001-SS	26-JUN-95	IRON	6960	B	0.927	mg/kg
T1096-SD-004-001-SS	26-JUN-95	LEAD	30.8	B	0.104	mg/kg
T1096-SD-004-001-SS	26-JUN-95	MAGNESIUM	2190	B	0.216	mg/kg
T1096-SD-004-001-SS	26-JUN-95	MANGANESE	329	B	0.00883	mg/kg
T1096-SD-004-001-SS	26-JUN-95	MERCURY	0.0497	B	0.00228	mg/kg
T1096-SD-004-001-SS	26-JUN-95	NICKEL	4.63	B	0.0741	mg/kg
T1096-SD-004-001-SS	26-JUN-95	POTASSIUM	788	B	0.59	mg/kg
T1096-SD-004-001-SS	26-JUN-95	SELENIUM	0.131	U	0.131	mg/kg
T1096-SD-004-001-SS	26-JUN-95	SILVER	19.5		0.229	mg/kg
T1096-SD-004-001-SS	26-JUN-95	SODIUM	84.3	B	1.43	mg/kg
T1096-SD-004-001-SS	26-JUN-95	THALLIUM	0.2	J	0.19	mg/kg
T1096-SD-004-001-SS	26-JUN-95	VANADIUM	14.2		0.0215	mg/kg
T1096-SD-004-001-SS	26-JUN-95	ZINC	101	B	0.248	mg/kg
T1096-SD-005-001-SS	26-JUN-95	ALUMINUM	5300	B	1.19	mg/kg
T1096-SD-005-001-SS	26-JUN-95	ANTIMONY	0.498	J	0.0958	mg/kg
T1096-SD-005-001-SS	26-JUN-95	ARSENIC	2.54		0.186	mg/kg
T1096-SD-005-001-SS	26-JUN-95	BARIUM	95.8	B	0.00663	mg/kg
T1096-SD-005-001-SS	26-JUN-95	BERYLLIUM	0.292	BJ	0.00114	mg/kg
T1096-SD-005-001-SS	26-JUN-95	CADMIUM	0.417	BJ	0.0097	mg/kg
T1096-SD-005-001-SS	26-JUN-95	CALCIUM	39100	B	2	mg/kg
T1096-SD-005-001-SS	26-JUN-95	CHROMIUM	8.42	B	0.0596	mg/kg
T1096-SD-005-001-SS	26-JUN-95	COBALT	3.02		0.0176	mg/kg
T1096-SD-005-001-SS	26-JUN-95	COPPER	11.1		0.0539	mg/kg
T1096-SD-005-001-SS	26-JUN-95	IRON	8770	B	1.01	mg/kg
T1096-SD-005-001-SS	26-JUN-95	LEAD	10.3		0.113	mg/kg

TABLE 7
ER Site 96: Metal Analytical Results for Sediment Samples

SAMPLE NUMBER	SAMPLE DATE	COMMON NAME	AMOUNT DETECTED	NOTATION	DETECTION LIMIT	UNIT OF MEASURE
T1096-SD-005-001-SS	26-JUN-95	MAGNESIUM	2630	B	0.235	mg/kg
T1096-SD-005-001-SS	26-JUN-95	MANGANESE	113	B	0.00962	mg/kg
T1096-SD-005-001-SS	26-JUN-95	MERCURY	0.0256	BJ	0.0024	mg/kg
T1096-SD-005-001-SS	26-JUN-95	NICKEL	4.69	B	0.0807	mg/kg
T1096-SD-005-001-SS	26-JUN-95	POTASSIUM	1090	B	0.643	mg/kg
T1096-SD-005-001-SS	26-JUN-95	SELENIUM	0.292	J	0.143	mg/kg
T1096-SD-005-001-SS	26-JUN-95	SILVER	8.81		0.249	mg/kg
T1096-SD-005-001-SS	26-JUN-95	SODIUM	62.6	B	1.56	mg/kg
T1096-SD-005-001-SS	26-JUN-95	THALLIUM	0.293	J	0.207	mg/kg
T1096-SD-005-001-SS	26-JUN-95	VANADIUM	20.7	B	0.0234	mg/kg
T1096-SD-005-001-SS	26-JUN-95	ZINC	48.2	B	0.27	mg/kg
T1096-SD-006-001-SS	26-JUN-95	ALUMINIUM	4920	B	1.12	mg/kg
T1096-SD-006-001-SS	26-JUN-95	ANTIMONY	0.168	J	0.0904	mg/kg
T1096-SD-006-001-SS	26-JUN-95	ARSENIC	2.21		0.176	mg/kg
T1096-SD-006-001-SS	26-JUN-95	BARIUM	134	B	0.00626	mg/kg
T1096-SD-006-001-SS	26-JUN-95	BERYLLIUM	0.312	BJ	0.00108	mg/kg
T1096-SD-006-001-SS	26-JUN-95	CADMIUM	0.181	BJ	0.00916	mg/kg
T1096-SD-006-001-SS	26-JUN-95	CALCIUM	23200	B	1.89	mg/kg
T1096-SD-006-001-SS	26-JUN-95	CHROMIUM	6.38	B	0.0563	mg/kg
T1096-SD-006-001-SS	26-JUN-95	CHROMIUM (VI)	0.22	B	0.025	mg/kg
T1096-SD-006-001-SS	26-JUN-95	COBALT	3.86		0.0166	mg/kg
T1096-SD-006-001-SS	26-JUN-95	COPPER	10.1		0.0509	mg/kg
T1096-SD-006-001-SS	26-JUN-95	IRON	10900	B	0.953	mg/kg
T1096-SD-006-001-SS	26-JUN-95	LEAD	13.8	B	0.107	mg/kg
T1096-SD-006-001-SS	26-JUN-95	MAGNESIUM	2420	B	0.222	mg/kg
T1096-SD-006-001-SS	26-JUN-95	MANGANESE	120	B	0.00908	mg/kg
T1096-SD-006-001-SS	26-JUN-95	MERCURY	0.0176	BJ	0.00219	mg/kg
T1096-SD-006-001-SS	26-JUN-95	NICKEL	5.31	B	0.0762	mg/kg
T1096-SD-006-001-SS	26-JUN-95	POTASSIUM	937	B	0.607	mg/kg
T1096-SD-006-001-SS	26-JUN-95	SELENIUM	0.135	U	0.135	mg/kg
T1096-SD-006-001-SS	26-JUN-95	SILVER	0.235	U	0.235	mg/kg
T1096-SD-006-001-SS	26-JUN-95	SODIUM	88.1	B	1.47	mg/kg
T1096-SD-006-001-SS	26-JUN-95	THALLIUM	0.195	U	0.195	mg/kg
T1096-SD-006-001-SS	26-JUN-95	VANADIUM	24.2		0.0221	mg/kg
T1096-SD-006-001-SS	26-JUN-95	ZINC	42.2	B	0.255	mg/kg

TABLE 7
ER Site 96: Metal Analytical Results for Sediment Samples

SAMPLE NUMBER	SAMPLE DATE	COMMON NAME	AMOUNT DETECTED	NOTATION	DETECTION LIMIT	UNIT OF MEASURE
T1096-SD-007-001-SS	26-JUN-95	ALUMINUM	2880	B	1.19	mg/kg
T1096-SD-007-001-SS	26-JUN-95	ANTIMONY	0.206	J	0.0958	mg/kg
T1096-SD-007-001-SS	26-JUN-95	ARSENIC	1.96		0.186	mg/kg
T1096-SD-007-001-SS	26-JUN-95	BARIUM	120	B	0.00663	mg/kg
T1096-SD-007-001-SS	26-JUN-95	BERYLLIUM	0.204	BJ	0.00114	mg/kg
T1096-SD-007-001-SS	26-JUN-95	CADMIUM	0.213	BJ	0.0097	mg/kg
T1096-SD-007-001-SS	26-JUN-95	CALCIUM	14700	B	2	mg/kg
T1096-SD-007-001-SS	26-JUN-95	CHROMIUM	7.83	B	0.0596	mg/kg
T1096-SD-007-001-SS	26-JUN-95	COBALT	3.04		0.0176	mg/kg
T1096-SD-007-001-SS	26-JUN-95	COPPER	17.5		0.0539	mg/kg
T1096-SD-007-001-SS	26-JUN-95	IRON	10700	B	1.01	mg/kg
T1096-SD-007-001-SS	26-JUN-95	LEAD	97	B	0.113	mg/kg
T1096-SD-007-001-SS	26-JUN-95	MAGNESIUM	1570	B	0.235	mg/kg
T1096-SD-007-001-SS	26-JUN-95	MANGANESE	92.1	B	0.00962	mg/kg
T1096-SD-007-001-SS	26-JUN-95	MERCURY	0.0173	BJ	0.00226	mg/kg
T1096-SD-007-001-SS	26-JUN-95	NICKEL	4.08	B	0.0807	mg/kg
T1096-SD-007-001-SS	26-JUN-95	POTASSIUM	529	B	0.643	mg/kg
T1096-SD-007-001-SS	26-JUN-95	SELENIUM	0.143	U	0.143	mg/kg
T1096-SD-007-001-SS	26-JUN-95	SILVER	0.249	U	0.249	mg/kg
T1096-SD-007-001-SS	26-JUN-95	SODIUM	72.3	B	1.56	mg/kg
T1096-SD-007-001-SS	26-JUN-95	THALLIUM	0.207	U	0.207	mg/kg
T1096-SD-007-001-SS	26-JUN-95	VANADIUM	22.5		0.0234	mg/kg
T1096-SD-007-001-SS	26-JUN-95	ZINC	79.7	B	0.27	mg/kg
T1096-SD-009-001-SS	26-JUN-95	ALUMINUM	4390	B	1.14	mg/kg
T1096-SD-009-001-SS	26-JUN-95	ANTIMONY	0.162	J	0.0922	mg/kg
T1096-SD-009-001-SS	26-JUN-95	ARSENIC	2.4		0.179	mg/kg
T1096-SD-009-001-SS	26-JUN-95	BARIUM	128	B	0.00638	mg/kg
T1096-SD-009-001-SS	26-JUN-95	BERYLLIUM	0.343	BJ	0.0011	mg/kg
T1096-SD-009-001-SS	26-JUN-95	CADMIUM	0.221	BJ	0.00933	mg/kg
T1096-SD-009-001-SS	26-JUN-95	CALCIUM	29700	B	1.92	mg/kg
T1096-SD-009-001-SS	26-JUN-95	CHROMIUM	4.41	B	0.0573	mg/kg
T1096-SD-009-001-SS	26-JUN-95	CHROMIUM (VI)	0.13	B	0.025	mg/kg
T1096-SD-009-001-SS	26-JUN-95	COBALT	2.91		0.0169	mg/kg
T1096-SD-009-001-SS	26-JUN-95	COPPER	12.2		0.0519	mg/kg
T1096-SD-009-001-SS	26-JUN-95	IRON	8040	B	0.972	mg/kg

TABLE 7
ER Site 96: Metal Analytical Results for Sediment Samples

SAMPLE NUMBER	SAMPLE DATE	COMMON NAME	AMOUNT DETECTED	NOTATION	DETECTION LIMIT	UNIT OF MEASURE
T1096-SD-009-001-SS	26-JUN-95	LEAD	9.69	B	0.109	mg/kg
T1096-SD-009-001-SS	26-JUN-95	MAGNESIUM	2500	B	0.226	mg/kg
T1096-SD-009-001-SS	26-JUN-95	MANGANESE	112	B	0.00925	mg/kg
T1096-SD-009-001-SS	26-JUN-95	MERCURY	0.0132	BJ	0.00215	mg/kg
T1096-SD-009-001-SS	26-JUN-95	NICKEL	4.4	B	0.0776	mg/kg
T1096-SD-009-001-SS	26-JUN-95	POTASSIUM	674	B	0.619	mg/kg
T1096-SD-009-001-SS	26-JUN-95	SELENIUM	0.138	U	0.138	mg/kg
T1096-SD-009-001-SS	26-JUN-95	SILVER	0.24	U	0.24	mg/kg
T1096-SD-009-001-SS	26-JUN-95	SODIUM	79.7	B	1.5	mg/kg
T1096-SD-009-001-SS	26-JUN-95	THALLIUM	0.199	U	0.199	mg/kg
T1096-SD-009-001-SS	26-JUN-95	VANADIUM	17.6		0.0225	mg/kg
T1096-SD-009-001-SS	26-JUN-95	ZINC	36.4	B	0.26	mg/kg
T1096-SD-010-001-SS	26-JUN-95	ALUMINUM	4420	B	1.15	mg/kg
T1096-SD-010-001-SS	26-JUN-95	ANTIMONY	0.0929	U	0.0929	mg/kg
T1096-SD-010-001-SS	26-JUN-95	ARSENIC	2.53		0.18	mg/kg
T1096-SD-010-001-SS	26-JUN-95	BARIUM	201	B	0.00643	mg/kg
T1096-SD-010-001-SS	26-JUN-95	BERYLLIUM	0.282	BJ	0.00111	mg/kg
T1096-SD-010-001-SS	26-JUN-95	CADMIUM	0.182	BJ	0.00941	mg/kg
T1096-SD-010-001-SS	26-JUN-95	CALCIUM	32600	B	1.94	mg/kg
T1096-SD-010-001-SS	26-JUN-95	CHROMIUM	7.49	B	0.0578	mg/kg
T1096-SD-010-001-SS	26-JUN-95	COBALT	3.1		0.0171	mg/kg
T1096-SD-010-001-SS	26-JUN-95	COPPER	8.74		0.0523	mg/kg
T1096-SD-010-001-SS	26-JUN-95	IRON	8150	B	0.98	mg/kg
T1096-SD-010-001-SS	26-JUN-95	LEAD	31.7	B	0.11	mg/kg
T1096-SD-010-001-SS	26-JUN-95	MAGNESIUM	2590	B	0.228	mg/kg
T1096-SD-010-001-SS	26-JUN-95	MANGANESE	108	B	0.00933	mg/kg
T1096-SD-010-001-SS	26-JUN-95	MERCURY	0.0181	BJ	0.00231	mg/kg
T1096-SD-010-001-SS	26-JUN-95	NICKEL	4.79	B	0.0783	mg/kg
T1096-SD-010-001-SS	26-JUN-95	POTASSIUM	787	B	0.624	mg/kg
T1096-SD-010-001-SS	26-JUN-95	SELENIUM	0.139	U	0.139	mg/kg
T1096-SD-010-001-SS	26-JUN-95	SILVER	0.242	U	0.242	mg/kg
T1096-SD-010-001-SS	26-JUN-95	SODIUM	73.1	B	1.51	mg/kg
T1096-SD-010-001-SS	26-JUN-95	THALLIUM	0.201	U	0.201	mg/kg
T1096-SD-010-001-SS	26-JUN-95	VANADIUM	19.7		0.0227	mg/kg
T1096-SD-010-001-SS	26-JUN-95	ZINC	31.3	B	0.262	mg/kg

TABLE 7
ER Site 96: Metal Analytical Results for Sediment Samples

SAMPLE NUMBER	SAMPLE DATE	COMMON NAME	AMOUNT DETECTED	NOTATION	DETECTION LIMIT	UNIT OF MEASURE
T1096-SD-011-001-SS	26-JUN-95	ALUMINUM	5080	B	1.18	mg/kg
T1096-SD-011-001-SS	26-JUN-95	ANTIMONY	0.25	J	0.0948	mg/kg
T1096-SD-011-001-SS	26-JUN-95	ARSENIC	3.13		0.184	mg/kg
T1096-SD-011-001-SS	26-JUN-95	BARIUM	143	B	0.00656	mg/kg
T1096-SD-011-001-SS	26-JUN-95	BERYLLIUM	0.294	BJ	0.00113	mg/kg
T1096-SD-011-001-SS	26-JUN-95	CADMIUM	0.554	B	0.0096	mg/kg
T1096-SD-011-001-SS	26-JUN-95	CALCIUM	34900	B	1.98	mg/kg
T1096-SD-011-001-SS	26-JUN-95	CHROMIUM	8.91	B	0.059	mg/kg
T1096-SD-011-001-SS	26-JUN-95	COBALT	3.72		0.0174	mg/kg
T1096-SD-011-001-SS	26-JUN-95	COPPER	22.2		0.0534	mg/kg
T1096-SD-011-001-SS	26-JUN-95	IRON	10600	B	1	mg/kg
T1096-SD-011-001-SS	26-JUN-95	LEAD	23	B	0.112	mg/kg
T1096-SD-011-001-SS	26-JUN-95	MAGNESIUM	3060	B	0.233	mg/kg
T1096-SD-011-001-SS	26-JUN-95	MANGANESE	167	B	0.00952	mg/kg
T1096-SD-011-001-SS	26-JUN-95	MERCURY	0.0435	B	0.00234	mg/kg
T1096-SD-011-001-SS	26-JUN-95	NICKEL	6.02	B	0.0799	mg/kg
T1096-SD-011-001-SS	26-JUN-95	POTASSIUM	998	B	0.637	mg/kg
T1096-SD-011-001-SS	26-JUN-95	SELENIUM	0.142	U	0.142	mg/kg
T1096-SD-011-001-SS	26-JUN-95	SILVER	0.247	U	0.247	mg/kg
T1096-SD-011-001-SS	26-JUN-95	SODIUM	85	B	1.54	mg/kg
T1096-SD-011-001-SS	26-JUN-95	THALLIUM	0.273	J	0.205	mg/kg
T1096-SD-011-001-SS	26-JUN-95	VANADIUM	23.3		0.0232	mg/kg
T1096-SD-011-001-SS	26-JUN-95	ZINC	51.6	B	0.267	mg/kg
T1096-SD-012-001-SS	26-JUN-95	ALUMINUM	5400	B	1.12	mg/kg
T1096-SD-012-001-SS	26-JUN-95	ANTIMONY	0.228	J	0.0904	mg/kg
T1096-SD-012-001-SS	26-JUN-95	ARSENIC	3.49		0.176	mg/kg
T1096-SD-012-001-SS	26-JUN-95	BARIUM	149	B	0.00626	mg/kg
T1096-SD-012-001-SS	26-JUN-95	BERYLLIUM	0.324	BJ	0.00108	mg/kg
T1096-SD-012-001-SS	26-JUN-95	CADMIUM	0.183	BJ	0.00916	mg/kg
T1096-SD-012-001-SS	26-JUN-95	CALCIUM	33000	B	1.89	mg/kg
T1096-SD-012-001-SS	26-JUN-95	CHROMIUM	5.35	B	0.0563	mg/kg
T1096-SD-012-001-SS	26-JUN-95	CHROMIUM (VI)	0.07	BJ	0.025	mg/kg
T1096-SD-012-001-SS	26-JUN-95	COBALT	3.74		0.0166	mg/kg
T1096-SD-012-001-SS	26-JUN-95	COPPER	7.27		0.0509	mg/kg
T1096-SD-012-001-SS	26-JUN-95	IRON	8950	B	0.953	mg/kg

TABLE 7

ER Site 96: Metal Analytical Results for Sediment Samples

SAMPLE NUMBER	SAMPLE DATE	COMMON NAME	AMOUNT DETECTED	NOTATION	DETECTION LIMIT	UNIT OF MEASURE
T1096-SD-012-001-SS	26-JUN-95	LEAD	14.8	B	0.107	mg/kg
T1096-SD-012-001-SS	26-JUN-95	MAGNESIUM	3120	B	0.222	mg/kg
T1096-SD-012-001-SS	26-JUN-95	MANGANESE	141	B	0.00908	mg/kg
T1096-SD-012-001-SS	26-JUN-95	MERCURY	0.0132	BJ	0.00222	mg/kg
T1096-SD-012-001-SS	26-JUN-95	NICKEL	5.97	B	0.0762	mg/kg
T1096-SD-012-001-SS	26-JUN-95	POTASSIUM	1010	B	0.607	mg/kg
T1096-SD-012-001-SS	26-JUN-95	SELENIUM	0.135	U	0.135	mg/kg
T1096-SD-012-001-SS	26-JUN-95	SILVER	0.235	U	0.235	mg/kg
T1096-SD-012-001-SS	26-JUN-95	SODIUM	82.5	B	1.47	mg/kg
T1096-SD-012-001-SS	26-JUN-95	THALLIUM	0.195	U	0.195	mg/kg
T1096-SD-012-001-SS	26-JUN-95	VANADIUM	22.1		0.0221	mg/kg
T1096-SD-012-001-SS	26-JUN-95	ZINC	25.3	B	0.255	mg/kg
T1096-SD-013-001-SS	26-JUN-95	ALUMINUM	7210	B	1.18	mg/kg
T1096-SD-013-001-SS	26-JUN-95	ANTIMONY	0.307	J	0.0948	mg/kg
T1096-SD-013-001-SS	26-JUN-95	ARSENIC	4.04		0.184	mg/kg
T1096-SD-013-001-SS	26-JUN-95	BARIUM	220	B	0.00656	mg/kg
T1096-SD-013-001-SS	26-JUN-95	BERYLLIUM	0.369	BJ	0.00113	mg/kg
T1096-SD-013-001-SS	26-JUN-95	CADMIUM	0.255	BJ	0.0096	mg/kg
T1096-SD-013-001-SS	26-JUN-95	CALCIUM	51200	B	1.98	mg/kg
T1096-SD-013-001-SS	26-JUN-95	CHROMIUM	7.13	B	0.059	mg/kg
T1096-SD-013-001-SS	26-JUN-95	COBALT	4.54		0.0174	mg/kg
T1096-SD-013-001-SS	26-JUN-95	COPPER	12.7		0.0534	mg/kg
T1096-SD-013-001-SS	26-JUN-95	IRON	10400	B	1	mg/kg
T1096-SD-013-001-SS	26-JUN-95	LEAD	16.1	B	0.112	mg/kg
T1096-SD-013-001-SS	26-JUN-95	MAGNESIUM	4270	B	0.233	mg/kg
T1096-SD-013-001-SS	26-JUN-95	MANGANESE	160	B	0.00952	mg/kg
T1096-SD-013-001-SS	26-JUN-95	MERCURY	0.0142	BJ	0.00231	mg/kg
T1096-SD-013-001-SS	26-JUN-95	NICKEL	7.22	B	0.0799	mg/kg
T1096-SD-013-001-SS	26-JUN-95	POTASSIUM	1380	B	0.637	mg/kg
T1096-SD-013-001-SS	26-JUN-95	SELENIUM	0.142	U	0.142	mg/kg
T1096-SD-013-001-SS	26-JUN-95	SILVER	0.247	U	0.247	mg/kg
T1096-SD-013-001-SS	26-JUN-95	SODIUM	128	B	1.54	mg/kg
T1096-SD-013-001-SS	26-JUN-95	THALLIUM	0.205	U	0.205	mg/kg
T1096-SD-013-001-SS	26-JUN-95	VANADIUM	24.8		0.0232	mg/kg
T1096-SD-013-001-SS	26-JUN-95	ZINC	45.4	B	0.267	mg/kg

TABLE 7
ER Site 96: Metal Analytical Results for Sediment Samples

SAMPLE NUMBER	SAMPLE DATE	COMMON NAME	AMOUNT DETECTED	NOTATION	DETECTION LIMIT	UNIT OF MEASURE
T1096-SD-014-001-SS	26-JUN-95	ALUMINUM	7150	B	1.12	mg/kg
T1096-SD-014-001-SS	26-JUN-95	ANTIMONY	0.163	J	0.0904	mg/kg
T1096-SD-014-001-SS	26-JUN-95	ARSENIC	4.08		0.176	mg/kg
T1096-SD-014-001-SS	26-JUN-95	BARIUM	263	B	0.00626	mg/kg
T1096-SD-014-001-SS	26-JUN-95	BERYLLIUM	0.391	BJ	0.00108	mg/kg
T1096-SD-014-001-SS	26-JUN-95	CADMIUM	0.384	BJ	0.00916	mg/kg
T1096-SD-014-001-SS	26-JUN-95	CALCIUM	77600	B	4.72	mg/kg
T1096-SD-014-001-SS	26-JUN-95	CHROMIUM	7.59	B	0.0563	mg/kg
T1096-SD-014-001-SS	26-JUN-95	COBALT	4.15		0.0166	mg/kg
T1096-SD-014-001-SS	26-JUN-95	COPPER	27.8		0.0509	mg/kg
T1096-SD-014-001-SS	26-JUN-95	IRON	9540	B	0.953	mg/kg
T1096-SD-014-001-SS	26-JUN-95	LEAD	27.6	B	0.107	mg/kg
T1096-SD-014-001-SS	26-JUN-95	MAGNESIUM	4560	B	0.222	mg/kg
T1096-SD-014-001-SS	26-JUN-95	MANGANESE	245	B	0.00908	mg/kg
T1096-SD-014-001-SS	26-JUN-95	MERCURY	0.0145	BJ	0.00231	mg/kg
T1096-SD-014-001-SS	26-JUN-95	NICKEL	7.61	B	0.0762	mg/kg
T1096-SD-014-001-SS	26-JUN-95	POTASSIUM	1390	B	0.607	mg/kg
T1096-SD-014-001-SS	26-JUN-95	SELENIUM	0.135	U	0.135	mg/kg
T1096-SD-014-001-SS	26-JUN-95	SILVER	0.235	U	0.235	mg/kg
T1096-SD-014-001-SS	26-JUN-95	SODIUM	107	B	1.47	mg/kg
T1096-SD-014-001-SS	26-JUN-95	THALLIUM	0.195	U	0.195	mg/kg
T1096-SD-014-001-SS	26-JUN-95	VANADIUM	23.1		0.0221	mg/kg
T1096-SD-014-001-SS	26-JUN-95	ZINC	84	B	0.255	mg/kg
T1096-SD-015-001-SS	26-JUN-95	ALUMINUM	8290	B	1.18	mg/kg
T1096-SD-015-001-SS	26-JUN-95	ANTIMONY	0.455	J	0.0948	mg/kg
T1096-SD-015-001-SS	26-JUN-95	ARSENIC	3.94		0.184	mg/kg
T1096-SD-015-001-SS	26-JUN-95	BARIUM	184	B	0.00656	mg/kg
T1096-SD-015-001-SS	26-JUN-95	BERYLLIUM	0.421	BJ	0.00113	mg/kg
T1096-SD-015-001-SS	26-JUN-95	CADMIUM	0.255	BJ	0.0096	mg/kg
T1096-SD-015-001-SS	26-JUN-95	CALCIUM	52400	B	4.95	mg/kg
T1096-SD-015-001-SS	26-JUN-95	CHROMIUM	8.58	B	0.059	mg/kg
T1096-SD-015-001-SS	26-JUN-95	CHROMIUM (VI)	0.145	B	0.025	mg/kg
T1096-SD-015-001-SS	26-JUN-95	COBALT	4.63		0.0174	mg/kg
T1096-SD-015-001-SS	26-JUN-95	COPPER	19.5		0.0534	mg/kg
T1096-SD-015-001-SS	26-JUN-95	IRON	12700	B	1	mg/kg

TABLE 7
ER Site 96: Metal Analytical Results for Sediment Samples

SAMPLE NUMBER	SAMPLE DATE	COMMON NAME	AMOUNT DETECTED	NOTATION	DETECTION LIMIT	UNIT OF MEASURE
T1096-SD-015-001-SS	26-JUN-95	LEAD	17.1	B	0.112	mg/kg
T1096-SD-015-001-SS	26-JUN-95	MAGNESIUM	4870	B	0.233	mg/kg
T1096-SD-015-001-SS	26-JUN-95	MANGANESE	181	B	0.00952	mg/kg
T1096-SD-015-001-SS	26-JUN-95	MERCURY	0.0203	BJ	0.00243	mg/kg
T1096-SD-015-001-SS	26-JUN-95	NICKEL	8.21	B	0.0799	mg/kg
T1096-SD-015-001-SS	26-JUN-95	POTASSIUM	1590	B	0.637	mg/kg
T1096-SD-015-001-SS	26-JUN-95	SELENIUM	0.142	U	0.142	mg/kg
T1096-SD-015-001-SS	26-JUN-95	SILVER	0.247	U	0.247	mg/kg
T1096-SD-015-001-SS	26-JUN-95	SODIUM	102	B	1.54	mg/kg
T1096-SD-015-001-SS	26-JUN-95	THALLIUM	0.21	J	0.205	mg/kg
T1096-SD-015-001-SS	26-JUN-95	VANADIUM	30.6		0.0232	mg/kg
T1096-SD-015-001-SS	26-JUN-95	ZINC	56.4	B	0.267	mg/kg
T1096-SD-016-001-SS	26-JUN-95	ALUMINUM	8570	B	1.11	mg/kg
T1096-SD-016-001-SS	26-JUN-95	ANTIMONY	0.156	J	0.0895	mg/kg
T1096-SD-016-001-SS	26-JUN-95	ARSENIC	3.88		0.174	mg/kg
T1096-SD-016-001-SS	26-JUN-95	BARIIUM	217	B	0.00619	mg/kg
T1096-SD-016-001-SS	26-JUN-95	BERYLLIUM	0.428	BJ	0.00106	mg/kg
T1096-SD-016-001-SS	26-JUN-95	CADMIUM	0.192	BJ	0.00906	mg/kg
T1096-SD-016-001-SS	26-JUN-95	CALCIUM	58500	B	4.67	mg/kg
T1096-SD-016-001-SS	26-JUN-95	CHROMIUM	8.46	B	0.0557	mg/kg
T1096-SD-016-001-SS	26-JUN-95	COBALT	4.4		0.0164	mg/kg
T1096-SD-016-001-SS	26-JUN-95	COPPER	9.5		0.0503	mg/kg
T1096-SD-016-001-SS	26-JUN-95	IRON	11800	B	0.943	mg/kg
T1096-SD-016-001-SS	26-JUN-95	LEAD	16	B	0.106	mg/kg
T1096-SD-016-001-SS	26-JUN-95	MAGNESIUM	4390	B	0.219	mg/kg
T1096-SD-016-001-SS	26-JUN-95	MANGANESE	186	B	0.00899	mg/kg
T1096-SD-016-001-SS	26-JUN-95	MERCURY	0.0203	BJ	0.00212	mg/kg
T1096-SD-016-001-SS	26-JUN-95	NICKEL	7.82	B	0.0754	mg/kg
T1096-SD-016-001-SS	26-JUN-95	POTASSIUM	1570	B	0.601	mg/kg
T1096-SD-016-001-SS	26-JUN-95	SELENIUM	0.134	U	0.134	mg/kg
T1096-SD-016-001-SS	26-JUN-95	SILVER	0.233	U	0.233	mg/kg
T1096-SD-016-001-SS	26-JUN-95	SODIUM	99.4	B	1.46	mg/kg
T1096-SD-016-001-SS	26-JUN-95	THALLIUM	0.193	U	0.193	mg/kg
T1096-SD-016-001-SS	26-JUN-95	VANADIUM	26.9		0.0219	mg/kg
T1096-SD-016-001-SS	26-JUN-95	ZINC	32.4	B	0.252	mg/kg

TABLE 7
ER Site 96: Metal Analytical Results for Sediment Samples

SAMPLE NUMBER	SAMPLE DATE	COMMON NAME	AMOUNT DETECTED	NOTATION	DETECTION LIMIT	UNIT OF MEASURE
T1096-SD-017-001-SS	27-JUN-95	ALUMINUM	5450	B	1.14	mg/kg
T1096-SD-017-001-SS	27-JUN-95	ANTIMONY	0.239	BJ	0.0922	mg/kg
T1096-SD-017-001-SS	27-JUN-95	ARSENIC	3.36		0.179	mg/kg
T1096-SD-017-001-SS	27-JUN-95	BARIUM	143	B	0.00638	mg/kg
T1096-SD-017-001-SS	27-JUN-95	BERYLLIUM	0.301	BJ	0.0011	mg/kg
T1096-SD-017-001-SS	27-JUN-95	CADMIUM	0.0941	BJ	0.00933	mg/kg
T1096-SD-017-001-SS	27-JUN-95	CALCIUM	61900	B	4.81	mg/kg
T1096-SD-017-001-SS	27-JUN-95	CHROMIUM	5.13	B	0.0573	mg/kg
T1096-SD-017-001-SS	27-JUN-95	COBALT	3.48		0.0169	mg/kg
T1096-SD-017-001-SS	27-JUN-95	COPPER	7.62		0.0519	mg/kg
T1096-SD-017-001-SS	27-JUN-95	IRON	7940		0.972	mg/kg
T1096-SD-017-001-SS	27-JUN-95	LEAD	7.57	B	0.109	mg/kg
T1096-SD-017-001-SS	27-JUN-95	MAGNESIUM	3580	B	0.226	mg/kg
T1096-SD-017-001-SS	27-JUN-95	MANGANESE	128	B	0.00925	mg/kg
T1096-SD-017-001-SS	27-JUN-95	MERCURY	0.0167	J	0.00235	mg/kg
T1096-SD-017-001-SS	27-JUN-95	NICKEL	5.2	B	0.0776	mg/kg
T1096-SD-017-001-SS	27-JUN-95	POTASSIUM	1080	B	0.619	mg/kg
T1096-SD-017-001-SS	27-JUN-95	SELENIUM	0.138	BU	0.138	mg/kg
T1096-SD-017-001-SS	27-JUN-95	SILVER	0.24	U	0.24	mg/kg
T1096-SD-017-001-SS	27-JUN-95	SODIUM	69.8	B	1.5	mg/kg
T1096-SD-017-001-SS	27-JUN-95	THALLIUM	0.199	U	0.199	mg/kg
T1096-SD-017-001-SS	27-JUN-95	VANADIUM	19.4		0.0225	mg/kg
T1096-SD-017-001-SS	27-JUN-95	ZINC	24.2	B	0.26	mg/kg
T1096-SD-018-001-SS	27-JUN-95	ALUMINUM	3410	B	1.17	mg/kg
T1096-SD-018-001-SS	27-JUN-95	ANTIMONY	0.0939	BU	0.0939	mg/kg
T1096-SD-018-001-SS	27-JUN-95	ARSENIC	2.53		0.182	mg/kg
T1096-SD-018-001-SS	27-JUN-95	BARIUM	93.9	B	0.0065	mg/kg
T1096-SD-018-001-SS	27-JUN-95	BERYLLIUM	0.219	BJ	0.00112	mg/kg
T1096-SD-018-001-SS	27-JUN-95	CADMIUM	0.0936	BJ	0.00951	mg/kg
T1096-SD-018-001-SS	27-JUN-95	CALCIUM	45700	B	1.96	mg/kg
T1096-SD-018-001-SS	27-JUN-95	CHROMIUM	2.85	B	0.0584	mg/kg
T1096-SD-018-001-SS	27-JUN-95	CHROMIUM (VI)	0.095	BJ	0.025	mg/kg
T1096-SD-018-001-SS	27-JUN-95	COBALT	2.08		0.0172	mg/kg
T1096-SD-018-001-SS	27-JUN-95	COPPER	5.03		0.0528	mg/kg
T1096-SD-018-001-SS	27-JUN-95	IRON	3920		0.99	mg/kg

TABLE 7
ER Site 96: Metal Analytical Results for Sediment Samples

SAMPLE NUMBER	SAMPLE DATE	COMMON NAME	AMOUNT DETECTED	NOTATION	DETECTION LIMIT	UNIT OF MEASURE
T1096-SD-018-001-SS	27-JUN-95	LEAD	5.77	B	0.111	mg/kg
T1096-SD-018-001-SS	27-JUN-95	MAGNESIUM	2780	B	0.23	mg/kg
T1096-SD-018-001-SS	27-JUN-95	MANGANESE	87.2	B	0.00943	mg/kg
T1096-SD-018-001-SS	27-JUN-95	MERCURY	0.0277	J	0.00229	mg/kg
T1096-SD-018-001-SS	27-JUN-95	NICKEL	3.71	B	0.0791	mg/kg
T1096-SD-018-001-SS	27-JUN-95	POTASSIUM	708	B	0.63	mg/kg
T1096-SD-018-001-SS	27-JUN-95	SELENIUM	0.14	BU	0.14	mg/kg
T1096-SD-018-001-SS	27-JUN-95	SILVER	0.244	U	0.244	mg/kg
T1096-SD-018-001-SS	27-JUN-95	SODIUM	53.9	B	1.53	mg/kg
T1096-SD-018-001-SS	27-JUN-95	THALLIUM	0.203	U	0.203	mg/kg
T1096-SD-018-001-SS	27-JUN-95	VANADIUM	10.6		0.0229	mg/kg
T1096-SD-018-001-SS	27-JUN-95	ZINC	14.7	B	0.265	mg/kg
T1096-SD-019-001-SS	27-JUN-95	ALUMINUM	3850	B	1.13	mg/kg
T1096-SD-019-001-SS	27-JUN-95	ANTIMONY	0.191	BJ	0.0912	mg/kg
T1096-SD-019-001-SS	27-JUN-95	ARSENIC	2.77		0.177	mg/kg
T1096-SD-019-001-SS	27-JUN-95	BARIUM	163	B	0.00631	mg/kg
T1096-SD-019-001-SS	27-JUN-95	BERYLLIUM	0.243	BJ	0.00109	mg/kg
T1096-SD-019-001-SS	27-JUN-95	CADMIUM	0.0884	BJ	0.00923	mg/kg
T1096-SD-019-001-SS	27-JUN-95	CALCIUM	39800	B	1.9	mg/kg
T1096-SD-019-001-SS	27-JUN-95	CHROMIUM	4.14	B	0.0567	mg/kg
T1096-SD-019-001-SS	27-JUN-95	COBALT	2.78		0.0168	mg/kg
T1096-SD-019-001-SS	27-JUN-95	COPPER	6.33		0.0513	mg/kg
T1096-SD-019-001-SS	27-JUN-95	IRON	6310		0.962	mg/kg
T1096-SD-019-001-SS	27-JUN-95	LEAD	6.7	B	0.108	mg/kg
T1096-SD-019-001-SS	27-JUN-95	MANGANESE	104	B	0.00916	mg/kg
T1096-SD-019-001-SS	27-JUN-95	MERCURY	0.0113	J	0.00229	mg/kg
T1096-SD-019-001-SS	27-JUN-95	NICKEL	4.42	B	0.0768	mg/kg
T1096-SD-019-001-SS	27-JUN-95	POTASSIUM	685	B	0.612	mg/kg
T1096-SD-019-001-SS	27-JUN-95	SELENIUM	0.136	BU	0.136	mg/kg
T1096-SD-019-001-SS	27-JUN-95	SILVER	0.237	U	0.237	mg/kg
T1096-SD-019-001-SS	27-JUN-95	SODIUM	54.7	B	1.49	mg/kg
T1096-SD-019-001-SS	27-JUN-95	THALLIUM	0.197	U	0.197	mg/kg
T1096-SD-019-001-SS	27-JUN-95	VANADIUM	18.4		0.0223	mg/kg
T1096-SD-019-001-SS	27-JUN-95	ZINC	17.7	B	0.257	mg/kg
T1096-SD-020-001-SS	27-JUN-95	ALUMINUM	3680	B	1.17	mg/kg

TABLE 7
ER Site 96: Metal Analytical Results for Sediment Samples

SAMPLE NUMBER	SAMPLE DATE	COMMON NAME	AMOUNT DETECTED	NOTATION	DETECTION LIMIT	UNIT OF MEASURE
T1096-SD-020-001-SS	27-JUN-95	ANTIMONY	0.0939	BU	0.0939	mg/kg
T1096-SD-020-001-SS	27-JUN-95	ARSENIC	2.81		0.182	mg/kg
T1096-SD-020-001-SS	27-JUN-95	BARIUM	139	B	0.0065	mg/kg
T1096-SD-020-001-SS	27-JUN-95	BERYLLIUM	0.232	BJ	0.00112	mg/kg
T1096-SD-020-001-SS	27-JUN-95	CADMIUM	0.0771	BJ	0.00951	mg/kg
T1096-SD-020-001-SS	27-JUN-95	CALCIUM	36000	B	1.96	mg/kg
T1096-SD-020-001-SS	27-JUN-95	CHROMIUM	3.74	B	0.0584	mg/kg
T1096-SD-020-001-SS	27-JUN-95	COBALT	2.64		0.0172	mg/kg
T1096-SD-020-001-SS	27-JUN-95	COPPER	6.74		0.0528	mg/kg
T1096-SD-020-001-SS	27-JUN-95	IRON	6340		0.99	mg/kg
T1096-SD-020-001-SS	27-JUN-95	LEAD	8.37	B	0.111	mg/kg
T1096-SD-020-001-SS	27-JUN-95	MANGANESE	109	B	0.00943	mg/kg
T1096-SD-020-001-SS	27-JUN-95	MERCURY	0.0141	J	0.00232	mg/kg
T1096-SD-020-001-SS	27-JUN-95	NICKEL	4.13	B	0.0791	mg/kg
T1096-SD-020-001-SS	27-JUN-95	POTASSIUM	804	B	0.63	mg/kg
T1096-SD-020-001-SS	27-JUN-95	SELENIUM	0.14	BU	0.14	mg/kg
T1096-SD-020-001-SS	27-JUN-95	SILVER	0.244	U	0.244	mg/kg
T1096-SD-020-001-SS	27-JUN-95	SODIUM	51.3	B	1.53	mg/kg
T1096-SD-020-001-SS	27-JUN-95	THALLIUM	0.215	J	0.203	mg/kg
T1096-SD-020-001-SS	27-JUN-95	VANADIUM	16.2		0.0229	mg/kg
T1096-SD-020-001-SS	27-JUN-95	ZINC	17.4	B	0.265	mg/kg
T1096-SD-021-001-SS	27-JUN-95	ALUMINUM	7760	B	1.14	mg/kg
T1096-SD-021-001-SS	27-JUN-95	ANTIMONY	0.124	BJ	0.0922	mg/kg
T1096-SD-021-001-SS	27-JUN-95	ARSENIC	3.97		0.179	mg/kg
T1096-SD-021-001-SS	27-JUN-95	BARIUM	224	B	0.00638	mg/kg
T1096-SD-021-001-SS	27-JUN-95	BERYLLIUM	0.421	BJ	0.0011	mg/kg
T1096-SD-021-001-SS	27-JUN-95	CADMIUM	0.205	BJ	0.00933	mg/kg
T1096-SD-021-001-SS	27-JUN-95	CALCIUM	45500	B	1.92	mg/kg
T1096-SD-021-001-SS	27-JUN-95	CHROMIUM	7.11	B	0.0573	mg/kg
T1096-SD-021-001-SS	27-JUN-95	CHROMIUM (VI)	0.275	B	0.025	mg/kg
T1096-SD-021-001-SS	27-JUN-95	COBALT	4.26		0.0169	mg/kg
T1096-SD-021-001-SS	27-JUN-95	COPPER	13		0.0519	mg/kg
T1096-SD-021-001-SS	27-JUN-95	IRON	9310		0.972	mg/kg
T1096-SD-021-001-SS	27-JUN-95	LEAD	13	B	0.109	mg/kg
T1096-SD-021-001-SS	27-JUN-95	MAGNESIUM	4330	B	0.226	mg/kg

TABLE 7
ER Site 96: Metal Analytical Results for Sediment Samples

SAMPLE NUMBER	SAMPLE DATE	COMMON NAME	AMOUNT DETECTED	NOTATION	DETECTION LIMIT	UNIT OF MEASURE
T1096-SD-021-001-SS	27-JUN-95	MANGANESE	193	B	0.00925	mg/kg
T1096-SD-021-001-SS	27-JUN-95	MERCURY	0.0147	J	0.00225	mg/kg
T1096-SD-021-001-SS	27-JUN-95	NICKEL	7.39	B	0.0776	mg/kg
T1096-SD-021-001-SS	27-JUN-95	POTASSIUM	1710	B	0.619	mg/kg
T1096-SD-021-001-SS	27-JUN-95	SELENIUM	0.314	BJ	0.138	mg/kg
T1096-SD-021-001-SS	27-JUN-95	SILVER	0.24	U	0.24	mg/kg
T1096-SD-021-001-SS	27-JUN-95	SODIUM	130	B	1.5	mg/kg
T1096-SD-021-001-SS	27-JUN-95	THALLIUM	0.406	J	0.199	mg/kg
T1096-SD-021-001-SS	27-JUN-95	VANADIUM	21		0.0225	mg/kg
T1096-SD-021-001-SS	27-JUN-95	ZINC	32.8	B	0.26	mg/kg
T1096-SD-022-001-SS	27-JUN-95	ALUMINUM	4060	B	1.09	mg/kg
T1096-SD-022-001-SS	27-JUN-95	ANTIMONY	0.106	BJ	0.0879	mg/kg
T1096-SD-022-001-SS	27-JUN-95	ARSENIC	3.2		0.171	mg/kg
T1096-SD-022-001-SS	27-JUN-95	BARIIUM	117	B	0.00609	mg/kg
T1096-SD-022-001-SS	27-JUN-95	BERYLLIUM	0.269	BJ	0.00105	mg/kg
T1096-SD-022-001-SS	27-JUN-95	CADMIUM	0.059	BJ	0.0089	mg/kg
T1096-SD-022-001-SS	27-JUN-95	CALCIUM	25900	B	1.84	mg/kg
T1096-SD-022-001-SS	27-JUN-95	CHROMIUM	3.43	B	0.0547	mg/kg
T1096-SD-022-001-SS	27-JUN-95	COBALT	2.3		0.0162	mg/kg
T1096-SD-022-001-SS	27-JUN-95	COPPER	3		0.0495	mg/kg
T1096-SD-022-001-SS	27-JUN-95	IRON	5420		0.927	mg/kg
T1096-SD-022-001-SS	27-JUN-95	LEAD	3.47	B	0.104	mg/kg
T1096-SD-022-001-SS	27-JUN-95	MANGANESE	76.2	B	0.00883	mg/kg
T1096-SD-022-001-SS	27-JUN-95	MERCURY	0.00315	J	0.00246	mg/kg
T1096-SD-022-001-SS	27-JUN-95	NICKEL	3.99	B	0.0741	mg/kg
T1096-SD-022-001-SS	27-JUN-95	POTASSIUM	591	B	0.59	mg/kg
T1096-SD-022-001-SS	27-JUN-95	SELENIUM	0.131	BU	0.131	mg/kg
T1096-SD-022-001-SS	27-JUN-95	SILVER	0.229	U	0.229	mg/kg
T1096-SD-022-001-SS	27-JUN-95	SODIUM	231	B	1.43	mg/kg
T1096-SD-022-001-SS	27-JUN-95	THALLIUM	0.266	J	0.19	mg/kg
T1096-SD-022-001-SS	27-JUN-95	VANADIUM	17.2		0.0215	mg/kg
T1096-SD-022-001-SS	27-JUN-95	ZINC	12.2	B	0.248	mg/kg
T1096-SD-023-001-SS	27-JUN-95	ALUMINUM	3440	B	1.13	mg/kg
T1096-SD-023-001-SS	27-JUN-95	ANTIMONY	0.241	BJ	0.0912	mg/kg
T1096-SD-023-001-SS	27-JUN-95	ARSENIC	3.26		0.177	mg/kg

TABLE 7
ER Site 96: Metal Analytical Results for Sediment Samples

SAMPLE NUMBER	SAMPLE DATE	COMMON NAME	AMOUNT DETECTED	NOTATION	DETECTION LIMIT	UNIT OF MEASURE
T1096-SD-023-001-SS	27-JUN-95	BARIUM	70.2	B	0.00631	mg/kg
T1096-SD-023-001-SS	27-JUN-95	BERYLLIUM	0.227	BJ	0.00109	mg/kg
T1096-SD-023-001-SS	27-JUN-95	CADMIUM	0.0263	BJ	0.00923	mg/kg
T1096-SD-023-001-SS	27-JUN-95	CALCIUM	31400	B	1.9	mg/kg
T1096-SD-023-001-SS	27-JUN-95	CHROMIUM	3.62	B	0.0567	mg/kg
T1096-SD-023-001-SS	27-JUN-95	COBALT	2.35		0.0168	mg/kg
T1096-SD-023-001-SS	27-JUN-95	COPPER	3.1		0.0513	mg/kg
T1096-SD-023-001-SS	27-JUN-95	IRON	6500		0.962	mg/kg
T1096-SD-023-001-SS	27-JUN-95	LEAD	3.03	B	0.108	mg/kg
T1096-SD-023-001-SS	27-JUN-95	MANGANESE	75.3	B	0.00916	mg/kg
T1096-SD-023-001-SS	27-JUN-95	MERCURY	0.254		0.00222	mg/kg
T1096-SD-023-001-SS	27-JUN-95	NICKEL	3.65	B	0.0768	mg/kg
T1096-SD-023-001-SS	27-JUN-95	POTASSIUM	548	B	0.612	mg/kg
T1096-SD-023-001-SS	27-JUN-95	SELENIUM	0.136	BU	0.136	mg/kg
T1096-SD-023-001-SS	27-JUN-95	SILVER	0.237	U	0.237	mg/kg
T1096-SD-023-001-SS	27-JUN-95	SODIUM	54.7	B	1.49	mg/kg
T1096-SD-023-001-SS	27-JUN-95	THALLIUM	0.342	J	0.197	mg/kg
T1096-SD-023-001-SS	27-JUN-95	VANADIUM	17.4		0.0223	mg/kg
T1096-SD-023-001-SS	27-JUN-95	ZINC	12.3	B	0.257	mg/kg
T1096-SD-025-001-SS	27-JUN-95	ALUMINIUM	3770	B	1.12	mg/kg
T1096-SD-025-001-SS	27-JUN-95	ANTIMONY	0.217	BJ	0.0904	mg/kg
T1096-SD-025-001-SS	27-JUN-95	ARSENIC	3.87		0.176	mg/kg
T1096-SD-025-001-SS	27-JUN-95	BARIUM	145	B	0.00626	mg/kg
T1096-SD-025-001-SS	27-JUN-95	BERYLLIUM	0.233	BJ	0.00108	mg/kg
T1096-SD-025-001-SS	27-JUN-95	CADMIUM	0.0492	BJ	0.00916	mg/kg
T1096-SD-025-001-SS	27-JUN-95	CALCIUM	56700	B	4.72	mg/kg
T1096-SD-025-001-SS	27-JUN-95	CHROMIUM	3.73	B	0.0563	mg/kg
T1096-SD-025-001-SS	27-JUN-95	CHROMIUM (VI)	0.095	BJ	0.025	mg/kg
T1096-SD-025-001-SS	27-JUN-95	COBALT	2.66		0.0166	mg/kg
T1096-SD-025-001-SS	27-JUN-95	COPPER	3.38		0.0509	mg/kg
T1096-SD-025-001-SS	27-JUN-95	IRON	6960		0.953	mg/kg
T1096-SD-025-001-SS	27-JUN-95	LEAD	3.42	B	0.107	mg/kg
T1096-SD-025-001-SS	27-JUN-95	MAGNESIUM	2780	B	0.222	mg/kg
T1096-SD-025-001-SS	27-JUN-95	MANGANESE	77.2	B	0.00908	mg/kg
T1096-SD-025-001-SS	27-JUN-95	MERCURY	0.00479	J	0.00209	mg/kg

ER Site 96: Metal Analytical Results for Sediment Samples

SAMPLE NUMBER	SAMPLE DATE	COMMON NAME	AMOUNT DETECTED	NOTATION	DETECTION LIMIT	UNIT OF MEASURE
T1096-SD-025-001-SS	27-JUN-95	NICKEL	4.02	B	0.0762	mg/kg
T1096-SD-025-001-SS	27-JUN-95	POTASSIUM	636	B	0.607	mg/kg
T1096-SD-025-001-SS	27-JUN-95	SELENIUM	0.135	BU	0.135	mg/kg
T1096-SD-025-001-SS	27-JUN-95	SILVER	0.235	U	0.235	mg/kg
T1096-SD-025-001-SS	27-JUN-95	SODIUM	66.5	B	1.47	mg/kg
T1096-SD-025-001-SS	27-JUN-95	THALLIUM	0.358	J	0.195	mg/kg
T1096-SD-025-001-SS	27-JUN-95	VANADIUM	21		0.0221	mg/kg
T1096-SD-025-001-SS	27-JUN-95	ZINC	12.7	B	0.255	mg/kg
T1096-SD-026-001-SS	27-JUN-95	ALUMINUM	4270	B	1.17	mg/kg
T1096-SD-026-001-SS	27-JUN-95	ANTIMONY	0.189	BJ	0.0939	mg/kg
T1096-SD-026-001-SS	27-JUN-95	ARSENIC	3.11		0.182	mg/kg
T1096-SD-026-001-SS	27-JUN-95	BARIUM	125	B	0.0065	mg/kg
T1096-SD-026-001-SS	27-JUN-95	BERYLLIUM	0.223	BJ	0.00112	mg/kg
T1096-SD-026-001-SS	27-JUN-95	CADMIUM	0.0874	BJ	0.00951	mg/kg
T1096-SD-026-001-SS	27-JUN-95	CALCIUM	83200	B	4.9	mg/kg
T1096-SD-026-001-SS	27-JUN-95	CHROMIUM	3.82	B	0.0584	mg/kg
T1096-SD-026-001-SS	27-JUN-95	COBALT	2.43		0.0172	mg/kg
T1096-SD-026-001-SS	27-JUN-95	COPPER	3.39		0.0528	mg/kg
T1096-SD-026-001-SS	27-JUN-95	IRON	6030		0.99	mg/kg
T1096-SD-026-001-SS	27-JUN-95	LEAD	3.12	B	0.111	mg/kg
T1096-SD-026-001-SS	27-JUN-95	MANGANESE	72.3	B	0.00943	mg/kg
T1096-SD-026-001-SS	27-JUN-95	MERCURY	0.00228	U	0.00228	mg/kg
T1096-SD-026-001-SS	27-JUN-95	NICKEL	3.96	B	0.0791	mg/kg
T1096-SD-026-001-SS	27-JUN-95	POTASSIUM	675	B	0.63	mg/kg
T1096-SD-026-001-SS	27-JUN-95	SELENIUM	0.14	BU	0.14	mg/kg
T1096-SD-026-001-SS	27-JUN-95	SILVER	0.244	U	0.244	mg/kg
T1096-SD-026-001-SS	27-JUN-95	SODIUM	71.9	B	1.53	mg/kg
T1096-SD-026-001-SS	27-JUN-95	THALLIUM	0.389	J	0.203	mg/kg
T1096-SD-026-001-SS	27-JUN-95	VANADIUM	19.1		0.0229	mg/kg
T1096-SD-026-001-SS	27-JUN-95	ZINC	11.2	B	0.265	mg/kg
T1096-SD-027-001-SS	27-JUN-95	ALUMINUM	4300	B	1.13	mg/kg
T1096-SD-027-001-SS	27-JUN-95	ANTIMONY	0.196	BJ	0.0912	mg/kg
T1096-SD-027-001-SS	27-JUN-95	ARSENIC	3.14		0.177	mg/kg
T1096-SD-027-001-SS	27-JUN-95	BARIUM	219	B	0.00631	mg/kg
T1096-SD-027-001-SS	27-JUN-95	BERYLLIUM	0.205	BJ	0.00109	mg/kg

ER Site 96: Metal Analytical Results for Sediment Samples

SAMPLE NUMBER	SAMPLE DATE	COMMON NAME	AMOUNT DETECTED	NOTATION	DETECTION LIMIT	UNIT OF MEASURE
T1096-SD-027-001-SS	27-JUN-95	CADMIUM	0.0996	BJ	0.00923	mg/kg
T1096-SD-027-001-SS	27-JUN-95	CALCIUM	79500	B	1.9	mg/kg
T1096-SD-027-001-SS	27-JUN-95	CHROMIUM	3.58	B	0.0567	mg/kg
T1096-SD-027-001-SS	27-JUN-95	COBALT	2.52		0.0168	mg/kg
T1096-SD-027-001-SS	27-JUN-95	COPPER	3.5		0.0513	mg/kg
T1096-SD-027-001-SS	27-JUN-95	IRON	5530		0.962	mg/kg
T1096-SD-027-001-SS	27-JUN-95	LEAD	3.17	B	0.108	mg/kg
T1096-SD-027-001-SS	27-JUN-95	MANGANESE	79.1	B	0.00916	mg/kg
T1096-SD-027-001-SS	27-JUN-95	MERCURY	0.0163	J	0.00223	mg/kg
T1096-SD-027-001-SS	27-JUN-95	NICKEL	4.23	B	0.0768	mg/kg
T1096-SD-027-001-SS	27-JUN-95	POTASSIUM	603	B	0.612	mg/kg
T1096-SD-027-001-SS	27-JUN-95	SELENIUM	0.207	BJ	0.136	mg/kg
T1096-SD-027-001-SS	27-JUN-95	SILVER	0.237	U	0.237	mg/kg
T1096-SD-027-001-SS	27-JUN-95	SODIUM	99.6	B	1.49	mg/kg
T1096-SD-027-001-SS	27-JUN-95	THALLIUM	0.224	J	0.197	mg/kg
T1096-SD-027-001-SS	27-JUN-95	VANADIUM	18.7		0.0223	mg/kg
T1096-SD-027-001-SS	27-JUN-95	ZINC	11.1	B	0.257	mg/kg
T1096-SD-028-001-SS	27-JUN-95	ALUMINUM	8500	B	1.11	mg/kg
T1096-SD-028-001-SS	27-JUN-95	ANTIMONY	0.273	BJ	0.0895	mg/kg
T1096-SD-028-001-SS	27-JUN-95	ARSENIC	3.07		0.174	mg/kg
T1096-SD-028-001-SS	27-JUN-95	BARIUM	150	B	0.00619	mg/kg
T1096-SD-028-001-SS	27-JUN-95	BERYLLIUM	0.459	BJ	0.00106	mg/kg
T1096-SD-028-001-SS	27-JUN-95	CADMIUM	0.11	BJ	0.00906	mg/kg
T1096-SD-028-001-SS	27-JUN-95	CALCIUM	33300	B	1.87	mg/kg
T1096-SD-028-001-SS	27-JUN-95	CHROMIUM	7.5	B	0.0557	mg/kg
T1096-SD-028-001-SS	27-JUN-95	CHROMIUM (VI)	0.075	BJ	0.025	mg/kg
T1096-SD-028-001-SS	27-JUN-95	COBALT	5.54		0.0164	mg/kg
T1096-SD-028-001-SS	27-JUN-95	COPPER	9.42		0.0503	mg/kg
T1096-SD-028-001-SS	27-JUN-95	IRON	13000		0.943	mg/kg
T1096-SD-028-001-SS	27-JUN-95	LEAD	6.87	B	0.106	mg/kg
T1096-SD-028-001-SS	27-JUN-95	MAGNESIUM	5290	B	0.219	mg/kg
T1096-SD-028-001-SS	27-JUN-95	MANGANESE	286	B	0.00899	mg/kg
T1096-SD-028-001-SS	27-JUN-95	MERCURY	0.0383		0.00228	mg/kg
T1096-SD-028-001-SS	27-JUN-95	NICKEL	8.88	B	0.0754	mg/kg
T1096-SD-028-001-SS	27-JUN-95	POTASSIUM	1870	B	0.601	mg/kg

TABLE 7

ER Site 96: Metal Analytical Results for Sediment Samples

SAMPLE NUMBER	SAMPLE DATE	COMMON NAME	AMOUNT DETECTED	NOTATION	DETECTION LIMIT	UNIT OF MEASURE
T1096-SD-028-001-SS	27-JUN-95	SELENIUM	0.134	BJ	0.134	mg/kg
T1096-SD-028-001-SS	27-JUN-95	SILVER	0.233	U	0.233	mg/kg
T1096-SD-028-001-SS	27-JUN-95	SODIUM	124	B	1.46	mg/kg
T1096-SD-028-001-SS	27-JUN-95	THALLIUM	0.757	J	0.193	mg/kg
T1096-SD-028-001-SS	27-JUN-95	VANADIUM	22.9		0.0219	mg/kg
T1096-SD-028-001-SS	27-JUN-95	ZINC	37.2	B	0.252	mg/kg
T1096-SD-029-001-SS	27-JUN-95	ALUMINUM	6650	B	1.14	mg/kg
T1096-SD-029-001-SS	27-JUN-95	ANTIMONY	0.207	BJ	0.0922	mg/kg
T1096-SD-029-001-SS	27-JUN-95	ARSENIC	2.84		0.179	mg/kg
T1096-SD-029-001-SS	27-JUN-95	BARIIUM	142	B	0.00638	mg/kg
T1096-SD-029-001-SS	27-JUN-95	BERYLLIUM	0.431	BJ	0.0011	mg/kg
T1096-SD-029-001-SS	27-JUN-95	CADMIUM	0.179	BJ	0.00933	mg/kg
T1096-SD-029-001-SS	27-JUN-95	CALCIUM	32700	B	1.92	mg/kg
T1096-SD-029-001-SS	27-JUN-95	CHROMIUM	6.21	B	0.0573	mg/kg
T1096-SD-029-001-SS	27-JUN-95	COBALT	3.96		0.0169	mg/kg
T1096-SD-029-001-SS	27-JUN-95	COPPER	9.56		0.0519	mg/kg
T1096-SD-029-001-SS	27-JUN-95	IRON	9280		0.972	mg/kg
T1096-SD-029-001-SS	27-JUN-95	LEAD	11.9	B	0.109	mg/kg
T1096-SD-029-001-SS	27-JUN-95	MANGANESE	186	B	0.00925	mg/kg
T1096-SD-029-001-SS	27-JUN-95	MERCURY	0.0135	J	0.00219	mg/kg
T1096-SD-029-001-SS	27-JUN-95	NICKEL	6.77	B	0.0776	mg/kg
T1096-SD-029-001-SS	27-JUN-95	POTASSIUM	1520	B	0.619	mg/kg
T1096-SD-029-001-SS	27-JUN-95	SELENIUM	0.181	BJ	0.138	mg/kg
T1096-SD-029-001-SS	27-JUN-95	SILVER	0.24	U	0.24	mg/kg
T1096-SD-029-001-SS	27-JUN-95	SODIUM	48.3	B	1.5	mg/kg
T1096-SD-029-001-SS	27-JUN-95	THALLIUM	0.457	J	0.199	mg/kg
T1096-SD-029-001-SS	27-JUN-95	VANADIUM	17.7		0.0225	mg/kg
T1096-SD-029-001-SS	27-JUN-95	ZINC	43.7	B	0.26	mg/kg

U = non-detect

J = estimated value

B = detected in the blank

TABLE 8
Site 96: SVOC Data Comparison with RCRA Subpart S

SVOC Compounds	Site 96 Highest Values (ppb)	RCRA Subpart S Action Levels (ppb)	Exceeds RCRA Action Levels
Subsurface Soils			
ANTHRACENE	598	20,000,000	NO
BENZO(A)ANTHRACENE	922	NA	NA
BENZO(A)PYRENE	1010	100	YES
BENZO(B)FLUORANTHENE	1120	NA	NA
BENZO(K)FLUORANTHENE	584	NA	NA
BENZO(GH)PERYLENE	423	NA	NA
BIS(2-ETHYLHEXYL)PHTHALATE	338	50,000	NO
CHRYSENE	916	NA	NA
FLUORANTHENE	1850	3,000,000	NO
FLUORENE	339	3,000,000	NO
INDENO(1,2,3-CD)PYRENE	490	NA	NA
PHENANTHRENE	1720	NA	NA
PYRENE	1680	2,000,000	NO
Sediment			
BENZO(A)ANTHRACENE	7900	NA	NA
BENZO(B)FLUORANTHENE	12,400	NA	NA
BENZO(K)FLUORANTHENE	3880	NA	NA
BENZO(GH)PERYLENE	4240	NA	NA
BIS(2-ETHYLHEXYL)PHTHALATE	12,800	50,000	NO
CHRYSENE	11,500	NA	NA
FLUORANTHENE	14,500	3,000,000	NO
INDENO(1,2,3-CD)PYRENE	3970	NA	NA
PHENANTHRENE	8010	NA	NA
PYRENE	18,800	2,000,000	NO

NA = not available

? = unknown at this time

TABLE 9
ER Site 96: Metal Data Comparison for Subsurface Soil Samples with SNL/NM Background Levels and Subpart S Action Levels

Compound	Number of Samples	Site 96 Range of Values (mg/kg)	TA-I Background UTL/95th Percentile (mg/kg)	Site-Wide Background UTL/95th Percentile (mg/kg)	Subpart S Action Level (mg/kg)
Aluminum	52	11900-4130	12055	NA	NA
Antimony	52	0.749-ND	0.49	3.9	30
Arsenic	52	7.51-1.02	7.64	5.6	80
Barium	52	312-46.6	653.89	200	4000
Beryllium	52	0.58-0.192	0.57	0.8	0.2
Cadmium	52	0.452-ND	0.84	1.6	40
Calcium	52	106000-13800	87221.64	NA	NA
Chromium, total	52	11.7-4.25	11.73	17.3	NA
Chromium VI	52	0.7-ND	54	<2.5	400
Cobalt	52	11.7-2.98	6.25	7.1	NA
Copper	52	11.1-3.62	9.98	25.5	NA
Iron	52	20200-6690	15428.88	NA	NA
Lead	52	7.89-3.4	17.3	68	400 ^a
Magnesium	52	6690-2360	6080	NA	NA
Manganese	52	346-90.1	243	NA	10000 ^b
Mercury	52	0.0659-ND	0.14	0.31	20
Nickel	52	94.2-5.3	10.63	25.4	2000
Potassium	52	2310-760	2173	NA	NA
Selenium	52	0.818-ND	0.24	<1	400 ^b
Silver	52	7.53-ND	NA	2	200
Sodium	52	608-49.5	648.33	NA	NA
Thallium	52	2.03-ND	1.16	<1.1	NA
Vanadium	52	50.2-15.3	34.9	47.2	600 ^b
Zinc	52	36.3-14	50.76	82.4	20000 ^b

^a The action level for lead is provided from U.S. Environmental Protection Agency, 1994. "Revise Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities," PB94-963282, Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C.

^b The action levels are provided from "Report of Generic Action Level Assistance for the Sandia National Laboratory/New Mexico Environmental Restoration Program", (IT Corp, 1994).

ND=not detected
NA=not available

TABLE 10

ER Site 96: Isotopic Uranium Data Comparison for Subsurface Soils and Sediment Samples with SNL/NM Background Levels

Compound	Site 96 Highest Values (pCi/g)	TA-I Background UTL/95th Percentile (pCi/g)	Site-Wide Background UTL/95th Percentile (pCi/g)
Subsurface Soil			
U-238	1.41+/-0.139	1.09	1.3
U-233/234	1.53+/- 0.184	1.15	1.6
Sediment			
U-238	0.905+/-0.128	0.84	1.3
U-233/234	0.903+/-0.128	1.03	1.6

TABLE 11

ER Site 96: Metal Data Comparison for Sediment Samples with SNL/NM Background Levels and Subpart S Action Levels

Compound	Number of Samples	Site 96 Range of Values (mg/kg)	TA-I Background UTL/95th Percentile (mg/kg)	Site-Wide Background UTL/95th Percentile (mg/kg)	Subpart S Action Level (mg/kg)
Aluminum	27	8570-2880	12055	NA	NA
Antimony	27	0.498-ND	0.49	3.9	30
Arsenic	27	4.08-1.96	7.64	5.6	80
Barium	27	263-70.2	653.89	200	4000
Beryllium	27	0.459-0.204	0.57	0.8	0.2
Cadmium	27	1.78-0.0263	0.84	1.6	40
Calcium	27	83200-14700	87221.64	NA	NA
Chromium, total	27	80.8-2.85	11.73	17.3	NA
Chromium VI	27	0.39-0.07	54	<2.5	400
Cobalt	27	5.54-2.08	6.25	7.1	NA
Copper	27	41.7-3.0	9.98	25.5	NA
Iron	27	13000-3920	15428.88	NA	NA
Lead	27	97-3.03	17.3	68	400 ^a
Magnesium	27	5290-1570	6080	NA	NA
Manganese	27	329-72.3	243	NA	10000 ^b
Mercury	27	0.254-ND	0.14	0.31	20
Nickel	27	8.88-3.65	10.63	25.4	2000
Potassium	27	1870-529	2173	NA	NA
Selenium	27	0.314-ND	0.24	<1	400 ^b
Silver	27	76.4-ND	NA	2	200
Sodium	27	231-48.3	648.33	NA	NA
Thallium	27	0.757-ND	1.16	<1.1	NA
Vanadium	27	30.6-10.6	34.9	47.2	600 ^b
Zinc	27	168-11.1	50.76	82.4	20000 ^b

^a The action level for lead is provided from U.S. Environmental Protection Agency, 1994. "Revise Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities," PB94-963282, Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C.

^b The action levels are provided from "Report of Generic Action Level Assistance for the Sandia National Laboratory/New Mexico Environmental Restoration Program", (IT Corp, 1994).

ND=not detected

NA=not available

Appendix D

ER Site 96: Risk Assessment Analysis Report

ER SITE 96: RISK ASSESSMENT ANALYSIS

I. Site Description and History

The Technical Area I (TA-I) Storm Drain System, Environmental Restoration (ER) Site 96, serves all of TA-I. The original storm drain system was constructed between 1948 and 1950. The water is conveyed through a series of open channels and underground lines from north to south from TA-I to the Tijeras Arroyo. The storm drain system was listed as ER Site 96 based on reports that the system had received constituents of concern (COCs) from various activities. System discharges were reported to include nonpoint source surface runoff from TA-I, blowdown from an incinerator scrubbing system, and cooling tower blowdown water (possibly containing chromates and other antifoulants). In addition, there were several releases of various COCs to the storm drains from spills throughout TA-I.

The ER Site 96 boundaries are assumed to be the limits of areas where potential COCs have been detected near breaks in the lines. During the 40-year period of storm drain system operation, chemical and radiological constituents may have been released to the system via the cross-connections to the sanitary sewer, discharges associated with TA-I operations, and releases associated with unusual occurrences. These materials may have been released to the soil through pipe deficiencies and/or at system outfalls. Potential COCs included hydrochloric acid (HCl) and sodium hydroxide (NaOH) from spills; petroleum hydrocarbons from tank overflows; and chromium, chlorinated solvents, alcohols, metals, polychlorinated biphenyls (PCBs), and radionuclides. The recorded releases to the system were diluted by the water carried in the system. Thus, only dilute COCs have potentially been released to soil.

II. Risk Assessment Analysis

Risk assessment of this site includes a number of steps which culminate in a quantitative evaluation of the potential adverse human health effects caused by constituents located at the site. The steps to be discussed include:

Step 1. Site data are described which provide information on the potential COCs, as well as the relevant physical characteristics and properties of the site.

Step 2. Potential pathways by which a representative population might be exposed to the COCs are identified.
--

Step 3. The potential intake of these COCs by the representative population is calculated using a tiered approach. The tiered approach includes screening steps, followed by potential intake calculations and a discussion or evaluation of the uncertainty in those calculations. Potential intake calculations are also applied to background screening data.
Step 4. Data are described on the potential toxicity and cancer effects from exposure to the COCs and associated background constituents and subsequent intake.
Step 5. Potential toxicity effects (specified as a Hazard Index) and cancer risks are calculated for nonradiological COCs and background. For radiological COCs, the incremental total effective dose equivalent (TEDE) and incremental estimated cancer risk are calculated by subtracting applicable background concentrations directly from maximum on-site contaminant values. This background subtraction only occurs when a radiological COC occurs as contamination and exists as a natural background radionuclide.
Step 6. These values are compared with standards established by the United States (U.S.) Environmental Protection Agency (USEPA) and U.S. Department of Energy (USDOE) to determine if further evaluation, and potential site clean-up, is required. Nonradiological COC risk values are also compared to background risk so that an incremental risk may be calculated.
Step 7. Discussion of uncertainties in the previous steps.

II.1 Step 1. Site Data

Site history and characterization activities are used to identify potential COCs. The identification of COCs and the sampling to determine the concentration levels of those COCs across the site are described in the ER Site 96 Data Evaluation Report and the No Further Action Proposal. In order to provide conservatism in this risk assessment, the calculation uses only the maximum concentration value of each COC determined for the entire site. Chemicals that are essential nutrients such as iron, magnesium, calcium, potassium, and sodium were not included in this risk assessment (USEPA 1989a). Both radioactive and nonradioactive COCs are evaluated. The nonradioactive COCs evaluated are both metals and organics.

II.2 Step 2. Pathway Identification

ER Site 96 has been designated with a future land-use scenario of industrial (USDOE, 1996)(see Appendix 1 for default exposure pathways and parameters). Because of the location and the characteristics of the potential

<p>Step 3. The potential intake of these COCs by the representative population is calculated using a tiered approach. The tiered approach includes screening steps, followed by potential intake calculations and a discussion or evaluation of the uncertainty in those calculations. Potential intake calculations are also applied to background screening data.</p>
<p>Step 4. Data are described on the potential toxicity and cancer effects from exposure to the COCs and associated background constituents and subsequent intake.</p>
<p>Step 5. Potential toxicity effects (specified as a Hazard Index) and cancer risks are calculated for nonradiological COCs and background. For radiological COCs, the incremental total effective dose equivalent (TEDE) and incremental estimated cancer risk are calculated by subtracting applicable background concentrations directly from maximum on-site contaminant values. This background subtraction only occurs when a radiological COC occurs as contamination and exists as a natural background radionuclide.</p>
<p>Step 6. These values are compared with standards established by the United States (U.S.) Environmental Protection Agency (USEPA) and U.S. Department of Energy (USDOE) to determine if further evaluation, and potential site clean-up, is required. Nonradiological COC risk values are also compared to background risk so that an incremental risk may be calculated.</p>
<p>Step 7. Discussion of uncertainties in the previous steps.</p>

II.1 Step 1. Site Data

Site history and characterization activities are used to identify potential COCs. The identification of COCs and the sampling to determine the concentration levels of those COCs across the site are described in the ER Site 96 Data Evaluation Report and the No Further Action Proposal. In order to provide conservatism in this risk assessment, the calculation uses only the maximum concentration value of each COC determined for the entire site. Chemicals that are essential nutrients such as iron, magnesium, calcium, potassium, and sodium were not included in this risk assessment (USEPA 1989a). Both radioactive and nonradioactive COCs are evaluated. The nonradioactive COCs evaluated are both metals and organics.

II.2 Step 2. Pathway Identification

ER Site 96 has been designated with a future land-use scenario of industrial (USDOE, 1996)(see Appendix 1 for default exposure pathways and parameters). Because of the location and the characteristics of the potential

contaminants, the primary pathway for human exposure is considered to be soil ingestion. The inhalation pathway for both chemicals and radionuclides is included because of the potential to inhale dust and volatiles. Direct gamma exposure is also included in the radioactive contamination risk assessment. No contamination at depth was determined and therefore no water pathways to the groundwater are considered. Depth to groundwater at Site 96 is approximately 550 feet. Because of the lack of surface water or other significant mechanisms for dermal contact, the dermal exposure pathway is considered to not be significant. No intake routes through plant, meat, or milk ingestion are considered appropriate for the industrial land-use scenario. However, plant uptake is considered for the residential land-use scenario.

PATHWAY IDENTIFICATION

Chemical Constituents	Radionuclide Constituents
Soil Ingestion	Soil Ingestion
Inhalation (Dust and volatiles)	Inhalation (Dust and Volatiles)
Plant uptake (Residential only)	Plant uptake (Residential only)
	Direct Gamma

II.3 Steps 3-5. Calculation of Hazard Indices and Cancer Risks

Steps 3 through 5 are discussed in this section. These steps include the discussion of the tiered approach in eliminating potential COCs from further consideration in the risk assessment process and the calculation of intakes from all identified exposure pathways, the discussion of the toxicity information, and the calculation of the hazard indices and cancer risks.

The risks from the COCs at ER Site 96 were evaluated using a tiered approach. First, the maximum concentrations of COCs were compared to TA-I specific background screening levels using 95th upper tolerance limits (UTLs) or percentile values (Sandia National Laboratories/New Mexico [SNL/NM], 1996). If a maximum concentration of a particular COC exceeded the TA-I specific background screening level, then the COC was compared to the SNL/NM background screening level for this area (IT, 1996). If a SNL/NM-specific screening level was not available for a constituent, then a background value was obtained, when possible, from the U.S. Geological Survey (USGS) National Uranium Resource Evaluation (NURE) program (USGS, 1994). For uranium isotopes, if a maximum concentration exceeded the SNL/NM background screening level, the isotopic ratios of U-238/U-234 and U-238/U-235 were compared to the range of TA-I specific background ratios.

The maximum concentration of each COC was used in order to provide a conservative estimate of the associated risk. If any nonradiological COCs were above both the TA-I or SNL/NM background screening levels or the USGS background value, all nonradiological COCs were considered in further risk assessment analyses.

For radiological COCs that exceeded both the TA-I or SNL/NM background screening levels and, as applicable, were above the range of uranium isotopic ratios, background values were subtracted from the individual maximum radionuclide concentrations. Those that did not exceed these background levels were not carried any further in the risk assessment. This approach is consistent with USDOE orders. Radioactive COCs that did not have a background value and were detected above the analytical minimum detectable activity (MDA) were carried through the risk assessment at their maximum levels. This step is performed (rather than carry the below-background radioactive COCs through the risk assessment and then perform a background risk assessment to determine incremental TEDE and estimated cancer risk) to prevent the "masking" of radiological contamination that may occur if on-site background radiological COCs exist in concentrations far enough below the assigned background level. When this "masking" occurs the final incremental TEDE and estimated cancer risk are reduced and, therefore, provide a non-conservative estimate of the potential impact on an on-site receptor. This approach is also consistent with the regulatory approach (40 CFR Part 196, 1994) which sets a TEDE limit to the on-site receptor in excess of background. The resultant radioactive COCs remaining after this step are referred to as background-adjusted radioactive COCs.

Second, if any nonradiological COC failed the initial screening step, the maximum concentration for each nonradiological COC was compared with action levels calculated using methods and equations promulgated in the proposed Resource Conservation and Recovery Act (RCRA) Subpart S (40 CFR Part 264, 1990) and Risk Assessment Guidance for Superfund (RAGS) (USEPA, 1989a) documentation. If there are 10 or fewer COCs and each has a maximum concentration less than one-tenth of the action level, then the site would be judged to pose no significant health hazard to humans. If there are more than 10 COCs, the Subpart S screening procedure was skipped.

Third, hazard indices and risk due to carcinogenic effects were calculated using Reasonable Maximum Exposure (RME) methods and equations promulgated in RAGS (USEPA, 1989a). The combined effects of all nonradiological COCs in the soils were calculated. The combined effects of the nonradiological COCs at their respective background concentrations in the soils were also calculated. The most conservative background

concentration between the TA-I specific and SNL/NM concentration (minimum value of the 95th UTL or percentile concentration value, as applicable) was used in the risk calculation. For toxic compounds, the combined effects were calculated by summing the individual hazard quotients for each compound into a total Hazard Index. This Hazard Index is compared to the recommended standard of 1. For potentially carcinogenic compounds, the individual risks were summed. The total risk was compared to the recommended acceptable risk range of 10^{-4} to 10^{-6} . For the radioactive COCs, the incremental TEDE was calculated and the corresponding incremental cancer risk estimated using USDOE's RESRAD computer code.

II.3.1 Comparison to Background and Action Levels

Nonradioactive ER Site 96 COCs are listed in Table 1, radioactive COCs are listed in Table 2. Both tables show the associated 95th percentile or UTL background levels (SNL/NM, 1996; IT, 1996). Table 3 shows the isotopic uranium ratio comparison to background. Background levels for plutonium and tritium are not applicable because these radionuclides do not occur naturally, or when due to fallout, at levels detectable by common laboratory analytical instrumentation.

The TA-I background levels have not yet been approved by the USEPA or the NMED, but are the result of statistical analyses of samples collected from background areas within TA-I. USEPA guidance (USEPA, 1989b; 1992a; and 1992b) were followed to arrive at the background levels. The SNL/NM background levels have not yet been approved by the USEPA or the NMED but are the result of a comprehensive study of joint SNL/NM and U.S. Air Force data from the Kirtland Air Force Base (KAFB). The report was submitted for regulatory review in early 1996. The values shown in Table 1 supersede the background values described in an interim background study report (IT, 1994).

The background value for manganese was determined by the USGS as part of the NURE program (USGS, 1994). Several compounds have maximum measured values greater than background screening levels. Therefore all nonradiological COCs were retained for further analysis with the exception of lead. The maximum concentration value for lead is 97 (B) mg/kg. The USEPA intentionally does not provide any toxicological data on lead and therefore no risk parameter values can be calculated. However, EPA guidance for the screening value for lead for an industrial land-use scenario is 2000 mg/kg (EPA, 1996a); for a residential land-use scenario, the EPA

Table 1. Nonradioactive COCs at ER Site 96 and Comparison to the Background Screening Values.

COC name	Maximum concentration (mg/kg)	TA-I 95th % or UTL Level (mg/kg)	Is maximum COC concentration less than or equal to the applicable TA-I background screening value?	SNL/NM 95th % or UTL Level (mg/kg)	Is maximum COC concentration less than or equal to the applicable SNL/NM background screening value?
Aluminum	11,900	12,055	Yes		
Antimony	0.749 JB	0.49	No	3.9	Yes
Arsenic	7.51	7.7	Yes		
Barium	12 B	654	Yes		
Beryllium	0.58	0.57	No	0.80	Yes
Cadmium	1.78 B	0.84	No	1.6	No
Chromium, total	80.8 B	11.7	No	17.3	No
Chromium VI	0.7	54	Yes		
Cobalt	11.7	6.3	No	7.10	No
Copper	41.7	10.0	No	25.5	No
Lead	97 B	17.3	No	68.0	No
Manganese	346 B	243	No	831 ⁺	Yes
Mercury	0.254	0.14	No	0.31	Yes
Nickel	94.2 B	10.6	No	25.4	No
Selenium	0.818	0.24	No	<1 [*]	No
Silver	76.4	NC	No	2.0	No
Thallium	2.03	1.2	No	<1.1	No
Vanadium	50.2 B	34.9	No	47.2	No
Zinc	168 B	50.8	No	82.4	No

NC - not calculated

+ - regional background values from the USGS NURE Program (USGS, 1994)

B - parameter detected in method blank

J - estimated value

* - uncertainty due to detection limits

Table 2. Radioactive COCs at ER Site 96 and Comparison to the Background Screening Values.

COC name	Maximum concentration (pCi/g)	TA-I 95 th % or UTL Level (pCi/g)	Is maximum COC concentration less than or equal to the applicable TA-I background screening value?	SNL/NM 95 th % or UTL Level (pCi/g)	Is maximum COC concentration less than or equal to the applicable SNL/NM background screening value?
Pu-239/240	0.0434	NC	No	NC	No
Pu-238	0.934	NC	No	NC	No
H-3	1.62	NC	No	NC	No
U-238	1.41	0.84	No	1.3	No
U-235	0.0698	0.1	Yes	0.18	Yes
U233/234	1.53	1.03	No	1.6	Yes

NC - not calculated

Table 3. Isotopic Uranium Ratio Comparison to Background Range

COC name	U-238 to U-234 Ratio	TA-I Background U-238 to U-234 Ratio Range	U-238 to U-235 Ratio	TA-I Background U-238 to U-235 Ratio Range	Are isotopic ratios within the range of TA-I background ratios
U-238	0.92	0.804 - 1.253	20.2	8,277 - 23,947	Yes

screening guidance value is 400 mg/kg (EPA, 1994a). The maximum concentration value for lead at this site is less than both of those screening values and therefore lead is eliminated from further consideration in this risk assessment. Because organic compounds do not have calculated background values, this screening step was skipped, and all organics are carried into the risk assessment analyses.

Because several nonradiological COCs had concentrations greater than their respective TA-I specific or SNL/NM background 95th percentile or UTL, the site fails the background screening criteria and all nonradiological COCs proceed to the proposed Subpart S action level screening procedure. Because the ER Site 96 sample set had more than 10 COCs that continued past the first screening level, the proposed Subpart S screening process was skipped. All remaining nonradiological COCs must have a Hazard Index value and cancer risk value calculated. Radioactive contamination does not have pre-determined action levels analogous to proposed Subpart S and

therefore this step in the screening process is not performed for radionuclides.

II.3.2 Identification of Toxicological Parameters

Tables 4 and 5 show the COCs that have been retained in the risk assessment and the values for the toxicological information available for those COCs. Dose conversion factors (DCFs) used in determining the incremental TEDE values for the individual pathways were the default values provided in the RESRAD computer code as developed in the following:

- For ingestion and inhalation, DCFs are taken from Federal Guidance Report No. 11, *Limiting Values of Radionuclide Intake and Air Concentration and Dose Conversion Factors for Inhalation, Submersion, and Ingestion* (USEPA, 1988a).
- The DCFs for surface contamination (contamination on the surface of the site) were taken from USDOE/EH-0070, *External Dose-Rate Conversion Factors for Calculation of Dose to the Public* (USDOE, 1988).
- The DCFs for volume contamination (exposure to contamination deeper than the immediate surface of the site) were calculated using the methods discussed in, *Dose-Rate Conversion Factors for External Exposure to Photon Emitters in Soil* (Health Physics 28:193-205) (Kocher, D.C., 1983), and ANL/EAIS-8, *Data Collection Handbook to Support Modeling the Impacts of Radioactive Material in Soil* (Yu, C., et al., 1993a)..

II.3.3 Exposure Assessment and Risk Characterization

Section II.3.3.1 describes the exposure assessment for this risk assessment. Section II.3.3.2 provides the risk characterization including the Hazard Index value and the excess cancer risk for both the potential nonradiological COCs and associated background; industrial and residential land-uses. The incremental TEDE and incremental estimated cancer risk are provided for the background-adjusted radiological COCs; industrial and residential land-uses.

II.3.3.1 Exposure Assessment

Appendix 1 shows the equations and parameter values used in the calculation of intake values and the subsequent Hazard Index and excess cancer risk values for the individual exposure pathways. The appendix shows the parameters for both industrial and residential land-use scenarios. The equations are based on RAGS (USEPA, 1989a). The parameters are based on information from RAGS (USEPA, 1989a) as well as other USEPA

Table 4. Nonradioactive Toxicological Parameter Values for ER Site 96
COCs

COC name	RfD _o (mg/kg/ d)	RfD _{inh} (mg/kg/d)	Confidence	SF _o (kg- d/mg)	SF _{inh} (kg- d/mg)	Cancer Class ^
Aluminum	1	--	Est.	--	--	--
Antimony	0.0004	--	L	--	--	D
Arsenic	0.0003	--	M	1.5	15.1	A
Barium	0.07	0.000143	M	--	--	D
Beryllium	0.005	--	L	4.3	8.4	B2
Cadmium	0.0005	0.0000571	H	--	6.3	B1
Chromium, total *	1	0.00000057 1	L	--	--	D
Chromium VI	0.005	--	L	--	42	A
Cobalt	0.06	--	--	--	--	--
Copper	0.04	--	Est.	--	--	D
Manganese	0.005	0.0000143	--	--	--	D
Mercury	0.0003	0.0000857	--	--	--	D
Nickel	0.02	--	--	--	--	D
Selenium	0.005	--	H	--	--	D
Silver	0.005	--	--	--	--	D
Thallium	--	--	--	--	--	D
Vanadium	0.007	--	Heast	--	--	D
Zinc	0.3	--	M	--	--	D
Acenaphthylene	--	--	--	--	--	--
Anthracene	0.3	--	L	--	--	D
Benzo(a) anthracene	--	--	--	0.73	0.61	--
Benzo(a) pyrene	--	--	--	7.3	6.1	B2
Benzo(b) fluoranthene	--	--	--	0.73	0.61	B2
Benzo(k) fluoranthene	--	--	--	0.073	0.061	B2
Benzo(g,h,i) perylene	--	--	--	--	--	D
bis(2- ethylhexyl) phthalate	0.02	--	--	0.014	--	B2
Chrysene	--	--	--	0.0073	0.0061	B2
Dibenzofuran	0.004	--	--	--	--	--
Fluoranthene	0.04	--	L	--	--	D
Fluorene	0.04	--	L	--	--	D

COC name	RfD _o (mg/kg/ d)	RfD _{inh} (mg/kg/d)	Confidence	SF _o (kg- d/mg)	SF _{inh} (kg- d/mg)	Cancer Class ^
Indeno(1,2,3- c,d) pyrene	--	--	--	0.73	0.61	B2
Naphthalene	0.04	--	--	--	--	D
Phenanthrene	--	--	--	--	--	D
Pyrene	0.03	--	L	--	--	D
Toluene	0.2	0.14	M	--	--	D
Xylene	2	--	M	--	--	D
PCBs (total aroclor)	--	--	--	7.7	--	B2

* total chromium assumed to be chromium III because chromium VI is calculated separately

RfD_o - oral chronic reference dose in mg/kg-day

RfD_{inh} - inhalation chronic reference dose in mg/kg-day

Confidence - L = low, M = medium, H = high, Est. = estimated

Heast - Heast Table from USEPA 1996b

SF_o - oral slope factor in (mg/kg-day)⁻¹

SF_{inh} - inhalation slope factor in (mg/kg-day)⁻¹

^ EPA weight-of-evidence classification system for carcinogenicity:

A - human carcinogen

B1 - probable human carcinogen. Limited human data are available

B2 - probable human carcinogen. Indicates sufficient evidence in animals and inadequate or no evidence in humans.

C - possible human carcinogen

D - not classifiable as to human carcinogenicity

E - evidence of noncarcinogenicity for humans

-- information not available

* total chromium assumed to be chromium III

Table 5: Radiological Toxicological Parameter Values for ER Site 96 COCs

COC name	SF _{ev} (g/pCi-yr)	SF _o (1/pCi)	SF _{inh} (1/pCi)	Cancer Class [^]
Pu-239/240	1.3E-11	3.2E-10	2.8E-08	A
Pu-238	1.9E-11	3.0E-10	2.7E-08	A
H-3	0	7.2E-14	9.6E-14	A

SF_{ev} - external volume exposure slope factor (risk/yr per pCi/g) SF_o - oral (ingestion) slope factor (risk/pCi)

SF_{inh} - inhalation slope factor (risk/pCi)

[^] EPA weight-of-evidence classification system for carcinogenicity:

A - human carcinogen

B1 - probable human carcinogen. Limited human data are available

B2 - probable human carcinogen. Indicates sufficient evidence in animals and inadequate or no evidence in humans.

C - possible human carcinogen

D - not classifiable as to human carcinogenicity

E - evidence of noncarcinogenicity for humans

guidance documents and reflect the RME approach advocated by RAGS (USEPA, 1989a). For radionuclides, the coded equations provided in the RESRAD computer code were used to estimate the excess dose and cancer risk for the individual exposure pathways. Further discussion of this process is provided in Manual for Implementing Residual Radioactive Material Guidelines Using RESRAD, Version 5.0 (Yu, C., et al., 1993).

Although the designated land-use scenario is industrial for this site, the risk and TEDE values for a residential land-use scenario are also presented. These residential risk and TEDE values are presented only to provide perspective on the potential for risk to human health under the more restrictive land-use scenario.

II.3.3.2 Risk Characterization

Table 6 shows that for the ER Site 96 nonradioactive COCs, the Hazard Index value is 0.1 and the excess cancer risk is 2×10^{-5} for the designated industrial land-use scenario. The numbers presented included exposure from soil ingestion and dust inhalation for the nonradioactive COCs. Table 7 shows that for the ER Site 96 associated nonradiological background constituents, the Hazard Index is 0.08 and the excess cancer risk is 5×10^{-6} for the designated industrial land-use scenario.

Table 6. Nonradioactive Risk Assessment Values for ER Site 96 COCs.

COC Name	Maximum concentration (mg/kg)	Industrial Land-Use Scenario		Residential Land-Use Scenario	
		Hazard Index	Cancer Risk	Hazard Index	Cancer Risk
Aluminum	11,900	0.01	--	0.05	--
Antimony	0.749 JB	0.00	--	0.03	--
Arsenic	7.51	0.02	5E-6	0.43	8E-5
Barium	312 B	0.00	--	0.05	--
Beryllium	0.58	0.00	1E-6	0.00	5E-6
Cadmium	1.78 B	0.00	7E-10	1.46	1E-9
Chromium, total*	80.8 B	0.02	--	0.03	--
Chromium VI	0.7	0.00	2E-9	0.00	3E-9
Cobalt	11.7	0.00	--	0.00	--
Copper	41.7	0.00	--	0.19	--
Manganese	346 B	0.07	--	3.06	--
Mercury	0.254	0.00	--	0.44	--
Nickel	94.2 B	0.00	--	0.14	--
Selenium	0.818	0.00	--	0.29	--
Silver	76.4	0.01	--	3.15	--
Thallium	2.03	--	--	--	--
Vanadium	50.2 B	0.01	--	0.04	--
Zinc	168 B	0.00	--	0.30	--
Acenaphthylene	0.303 J	--	--	--	--
Anthracene	1.71 J	0.00	--	0.00	--
Benzo(a) anthracene	7.9	0.00	3E-06	0.00	3E-5
Benzo(a) pyrene	2.73 J	0.00	8E-06	0.00	7E-5
Benzo(b) fluoranthene	12.4	0.00	4E-06	0.00	3E-5
Benzo(k) fluoranthene	3.88	0.00	1E-07	0.00	9E-7
Benzo(g,h,i) perylene	4.24	--	--	--	--
bis(2-Ethylhexyl) phthalate	12.8	0.00	8E-08	0.00	3E-7
Chrysene	11.5	0.00	4E-08	0.00	4E-7
Dibenzofuran	0.196 J	0.00	--	0.00	--
Fluoranthene	14.5	0.00	--	0.01	--

COC Name	Maximum concentration (mg/kg)	Industrial Land-Use Scenario		Residential Land-Use Scenario	
		Hazard Index	Cancer Risk	Hazard Index	Cancer Risk
Fluorene	0.339	0.00	--	0.00	--
Indeno(1,2,3-c,d) pyrene	3.97	0.00	1E-06	0.00	7E-6
Naphthalene	0.292 J	0.00	--	0.00	--
Phenanthrene	8.01	--	--	--	--
Pyrene	18.8	0.00	--	0.01	--
Toluene	0.0393	0.00	--	0.00	--
Xylene	0.0139 J	0.00	--	0.00	--
PCBs (total aroclors)**	0.557 J	0.00	2E-06	0.00	7E-6
TOTAL		0.1	2E-05	10	2E-4

* total chromium assumed to be chromium III because chromium VI is calculated separately

** PCBs are combined maximum concentrations of all aroclors

J - estimated value

B - parameter detected in method blank

-- information not available

Table 7. Nonradioactive Risk Assessment Values for ER Site 96 Background Constituents.

Constituent Name	Background concentration (mg/kg)	Industrial Land-Use Scenario		Residential Land-Use Scenario	
		Hazard Index	Cancer Risk	Hazard Index	Cancer Risk
Aluminum	12,055	0.01	--	0.05	--
Antimony	0.49	0.00	--	0.02	--
Arsenic	5.6	0.02	4E-06	0.32	6E-05
Barium	200	0.00	--	0.03	--
Beryllium	0.57	0.00	1E-06	0.00	5E-06
Cadmium	0.84	0.00	3E-10	0.69	5E-10
Chromium, total*	11.7	0.00	--	0.00	--
Chromium VI**	11.7	0.00	3E-8	0.01	4E-8
Cobalt	6.3	0.00	--	0.00	--
Copper	10.0	0.00	--	0.04	--
Manganese	243	0.05	--	2.15	--
Mercury	0.14	0.00	--	0.24	--
Nickel	10.6	0.00	--	0.00	--
Selenium	0.24	0.00	--	0.08	--
Silver	2.0	0.00	--	0.08	--
Thallium	<1.1	--	--	--	--
Vanadium	34.9	0.00	--	0.03	--
Zinc	50.8	0.00	--	0.09	--
TOTAL		0.08	5E-6	4	7E-5

-- information not available

* total chromium assumed to be chromium III because chromium VI is calculated separately

** chromium background concentration assumed to be chromium III (most conservative - lowest UTL), risk calculated in terms of chromium VI (consistent with Table 6)

For the radioactive COCs, contribution from the direct gamma exposure pathway is included. The TEDE for industrial land-use is 0.06 mrem/yr.

For the residential land-use scenario, the Hazard Index value increases to 10 and the excess cancer risk is 2×10^{-4} . The numbers presented included exposure from soil ingestion, dust and volatile inhalation, and plant uptake. Although USEPA (1991) generally recommends that inhalation not be included in a residential land-use scenario, this pathway is included because of the potential for soil in Albuquerque, NM, to be eroded and, subsequently, for dust to be present even in predominantly residential areas. Because of the nature of the local soil, other exposure pathways are not considered (see Appendix 1). Table 7 shows that for the ER Site 96 associated nonradiological background constituents, the Hazard Index increases to 4 and the excess cancer risk is 7×10^{-5} .

For the radioactive COCs, contribution from the direct gamma exposure pathway is included. The TEDE for residential land-use is 0.3 mrem/yr.

II.4 Step 6. Comparison of Risk Values to Numerical Standards.

The risk assessment analyses considered the evaluation of the potential for adverse health effects for both an industrial land-use scenario, which is the designated land-use scenario for this site, and also a residential land-use scenario.

For the industrial land-use scenario, the Hazard Index calculated for the nonradioactive COCs is 0.1; this is much less than the numerical standard of 1 suggested in RAGS (USEPA, 1989a). The excess cancer risk is estimated at 2×10^{-5} . In RAGS, the USEPA suggests that a range of values (10^{-6} to 10^{-4}) be used as the numerical standard; the value calculated for this site is in the middle of the suggested acceptable risk range. Therefore, for an industrial land-use scenario, the Hazard Index risk assessment values are significantly less than the established numerical standards and the excess cancer risk is in the middle of the suggested acceptable risk range. This risk assessment also determined risks considering background concentrations of the potential nonradiological COCs for both the industrial and residential land-use scenarios. For the industrial land-use scenario, the Hazard Index is 0.08. The excess cancer risk is estimated at 5×10^{-6} . Incremental risk is determined by subtracting risk associated with background from potential nonradiological COC risk. These numbers are not rounded before the difference is determined and therefore may appear to be inconsistent with numbers presented in tables and discussed within the text. The incremental Hazard Index is 0.06 and the incremental cancer risk is 1.8×10^{-5} for the industrial land-use scenario.

For the radioactive components of the industrial land-use scenario, the calculated incremental TEDE is 0.06 mrem/yr. In accordance with proposed USEPA guidance, the standard being utilized is an incremental TEDE of 15 mrem/yr (40 CFR Part 196, 1994) for the probable land-use scenario (industrial in this case); the calculated dose value for ER Site 96 for an industrial land-use is well below this standard. The cancer risk from the nonradioactive COCs and the radioactive COCs is not additive, as noted in RAGS (USEPA, 1989a). The incremental cancer risk estimate is 7×10^{-7} .

For the residential land-use scenario, the calculated Hazard Index for the nonradioactive COCs is 10, which is greater than the numerical guidance. The excess cancer risk is estimated at 2×10^{-4} ; this value is in the upper end of the suggested acceptable risk range. The Hazard Index for associated background for the residential land-use scenario is 4. The excess cancer risk is estimated at 7×10^{-5} . For the residential land-use scenario, the incremental Hazard Index is 5.9 and the incremental cancer risk is 1.6×10^{-4} .

The incremental TEDE from the radioactive components is 0.3 mrem/yr. In accordance with proposed USEPA guidance, the standard being utilized is an excess TEDE of 75 mrem/yr (40 CFR Part 196, 1994) for a complete loss of institutional controls (residential land-use in this case); the calculated dose values for ER Site 96 for the residential land-use is well below this standard. It should also be noted that, consistent with the proposed guidance (40 CFR Part 196, 1994), ER Site 96 should be eligible for unrestricted radiological release as the residential scenario resulted in an incremental TEDE to the on-site receptor of less than 15 mrem/yr. The cancer risk from the nonradioactive COCs and the radioactive COCs is not additive, as noted in RAGS (USEPA, 1989a). The associated incremental cancer risk is 2×10^{-6} .

II.5 Step 7 Uncertainty Discussion

The conclusion from the risk assessment analysis is that the potential effects caused by potential nonradiological COCs on human health are within the acceptable range compared to established numerical standards for the industrial land-use scenario. Calculated incremental risk between potential nonradiological COCs and associated background indicate small contribution of risk from nonradiological COCs when considering the industrial land-use scenario.

The main contributors to the adverse effects on human health are benzo(a)pyrene (2.73 mg/kg), benzo(b)fluoranthene (12.4 mg/kg),

benzo(a)anthracene (7.9 mg/kg), arsenic (7.51 mg/kg) and PCBs (0.557 mg/kg). Benzo(a)pyrene, benzo(a)anthracene and benzo(b)fluoranthene are components of asphalt. Since TA-I is highly industrialized, the benzo(a)pyrene, benzo(a)anthracene and benzo(b)fluoranthene are likely to have been derived from asphalt. The maximum arsenic concentration (7.51 mg/kg) was below its background screening value. PCBs are known to have been used in TA-I. The PCB concentration value is a sum of all maximum concentrations of individual aroclors. Therefore, this risk assessment is considered conservative as benzo (a) pyrene and benzo (b) fluoranthene are probably not indicative of contamination, arsenic is below its background screening value and PCB concentrations per location are significantly less than the total PCB concentration used in the calculation.

For the radiological COCs the conclusion from the risk assessment is that the potential effects on human health, for the industrial land-use scenario, are well within the proposed standard (40 CFR Part 196, 1994) and are a small fraction of the estimated 290 mrem/yr received due to natural background (NCRP, 1989).

The potential effects on human health, for the nonradiological COCs, are greater when considering the residential land-use scenario. Incremental risk between potential nonradiological COCs and associated background also indicates a increased contribution of risk from the nonradiological COCs. The increased effects on human health are primarily the result of including the plant uptake exposure pathway. Constituents that posed little to no risk considering an industrial land-use scenario (some of which are below background screening levels), contribute a significant portion of the risk associated with the residential land-use scenario. These constituents bioaccumulate in plants. Because TA-I is an industrial site and is designated as an industrial land-use area (USDOE, 1996), the likelihood of significant plant uptake in this area is highly unlikely. The uncertainty in this conclusion is considered to be small.

For the radiological COCs the conclusion from the risk assessment is that the potential effects on human health, for the residential land-use scenario, is well within the proposed standard (40 CFR Part 196, 1994) and is a small fraction of the estimated 290 mrem/yr received due to natural background (NCRP, 1989).

Because of the location, history of the site and the future land-use (USDOE, 1996), there is low uncertainty in the land-use scenario and the potentially affected populations that were considered in making the risk assessment analysis. Because the COCs are found in surface and near-surface soils and because of the location and physical characteristics of the site, there is little uncertainty in the exposure pathways relevant to the analysis. This is

particularly applicable in application to the radiological COCs. Although the storm drain system constitutes a small portion of all of TA-I, and it is buried 3 to 10 feet below ground surface, it was assumed that the radiological COCs were present throughout all of TA-I (254 acres) and that they were uniformly distributed from ground surface to 7 feet below ground surface, not accounting for the 3 feet of clean cover.

An RME approach was used to calculate the risk assessment values, which means that the parameter values used in the calculations were conservative and that the calculated intakes are likely overestimates. Maximum measured values of the concentrations of the COCs and minimum value of the 95th UTL or percentile background concentration value, as applicable, of background concentrations associated with the COCs were used to provide conservative results.

Table 4 shows the uncertainties (confidence) in the nonradiological toxicological parameter values. There is a mixture of estimated values and values from the Health Effects Assessment Summary Tables (HEAST) (USEPA, 1996b) and Integrated Risk Information System (IRIS) (USEPA, 1988, 1994b) data bases. Where values are not provided, information is not available from HEAST, IRIS, or USEPA regions. The constituents without toxicological parameters have low concentrations and are judged to be insignificant contributors to the overall risk. Because of the conservative nature of the RME approach, the uncertainties in the toxicological values are not expected to be of high enough concern to change the conclusion from the risk assessment analysis.

The nonradiological risk assessment values are within the acceptable range for the industrial land-use scenario compared to the established numerical standards. Though the residential land-use Hazard Index is above the numerical standard, it has been determined that future land-use at this locality will not be residential (USDOE, 1996). The radiological incremental TEDE is a very small fraction of estimated background TEDE for both the industrial and residential land-use scenarios and both are well within proposed standards (40 CFR Part 196, 1994). The overall uncertainty in all of the steps in the risk assessment process is considered insignificant with respect to the conclusion reached.

III. Summary

The TA-I Storm Drain System, ER Site 96, had relatively minor contamination consisting of some inorganic and organic nonradioactive and radioactive compounds. Because of the location of the site on KAFB, the designated industrial land-use scenario (USDOE, 1996) and the nature of the contamination, the potential exposure pathways identified for this site

included soil ingestion and dust and volatile inhalation for chemical constituents and soil ingestion, dust and volatile inhalation, and direct gamma exposure for radionuclides. Plant uptake was included as an exposure pathway for the residential land-use scenario. This site is designated for industrial land-use (USDOE, 1996); the residential land-use scenario is provided for perspective only.

The main contributors to the industrial land-use scenario risk assessment values are benzo(a)pyrene, benzo(a)anthracene, benzo(b)fluoranthene, arsenic and PCBs. Benzo(a)pyrene, benzo(a)anthracene and benzo(b)fluoranthene are thought to be derived from asphalt which covers most of TA-1. The maximum arsenic concentration was below its background screening value. PCBs are known to have been used at TA-1. The PCB concentration value is a sum of all maximum concentrations of individual aroclors. Therefore, this risk assessment is considered conservative as benzo (a) pyrene and benzo (b) fluoranthene are probably not indicative of contamination, arsenic was below background and PCB concentrations per location are significantly less than the total PCB concentration used in the calculation.

Using conservative assumptions and employing a RME approach to the risk assessment, the calculations for the nonradiological COCs show that for the industrial land-use scenario the Hazard Index (0.1) is significantly less than the accepted numerical guidance from the USEPA. The estimated cancer risk (2×10^{-5}) is in the middle of the suggested acceptable risk range. The incremental Hazard Index is 0.06 and the incremental cancer risk is 1.8×10^{-5} for the industrial land-use scenario. Incremental risk calculations indicate insignificant contribution to risk from the nonradiological COCs considering an industrial land-use scenario.

The incremental TEDE and corresponding estimated cancer risk from the radioactive components are much less than USEPA guidance values; the estimated incremental TEDE is 0.06 mrem/yr for the industrial land-use scenario. This value is much less than the numerical guidance of 15 mrem/yr in draft USEPA guidance. The corresponding incremental estimated cancer risk value is 7×10^{-7} for the industrial land-use scenario.

The calculations for the nonradiological COCs show that for the residential land-use scenario the Hazard Index (10) is greater than the accepted numerical guidance from the USEPA. The estimated cancer risk (2×10^{-4}) is at the upper end of the suggested acceptable risk range. The increased effects on human health are primarily the result of the inclusion of the plant uptake exposure pathway. Nonradiological constituents that posed little to no risk considering an industrial land-use scenario (some of which are below

background screening levels), contribute a significant portion of the risk associated with the residential land-use scenario. These constituents bioaccumulate in plants. Because TA-I is an industrial site (USDOE, 1996), the likelihood of significant plant uptake in this area is highly unlikely. For the residential land-use scenario, the incremental Hazard Index is 5.9 and the incremental cancer risk is 1.6×10^{-4} . Increased risk from the nonradiological COCs was evident considering residential land-use, due to plant uptake, but future use will be restricted to industrial land-use.

The incremental TEDE and corresponding estimated cancer risk from the radioactive components are much less than USEPA guidance values; the estimated incremental TEDE is 0.3 mrem/yr for the residential land-use scenario. This value is much less than the numerical guidance of 75 mrem/yr in draft USEPA guidance. The corresponding incremental estimated cancer risk value is 2×10^{-6} for the residential land-use scenario.

The uncertainties associated with the calculations are considered small relative to the conservativeness of the risk assessment analysis. We therefore conclude that this site does not have significant potential to affect human health under an industrial land-use scenario.

Ecological Risk Assessment

It is unlikely that activities or COCs at ER Site 96 have or will have significant impact to ecological risk. TA-I is an industrial complex and has been heavily disturbed by humans for over 50 years. Given the amount of known and potential human intrusion, a great diversity or abundance of nonhuman species has not occurred and is unlikely. Much of the relevant ecological information for TA-I can be found in the National Environmental Policy Act (NEPA) compliance document (SNL/NM, 1992).

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APPENDIX 1.

Sandia National Laboratories Environmental Restoration Program

EXPOSURE PATHWAY DISCUSSION FOR CHEMICAL AND RADIONUCLIDE CONTAMINATION

BACKGROUND

Sandia National Laboratories (SNL) proposes that a default set of exposure routes and associated default parameter values be developed for each future land-use designation being considered for SNL/NM Environmental Restoration (ER) project sites. This default set of exposure scenarios and parameter values would be invoked for risk assessments unless site-specific information suggested other parameter values. Because many SNL/NM ER sites have similar types of contamination and physical settings, SNL believes that the risk assessment analyses at these sites can be similar. A default set of exposure scenarios and parameter values will facilitate the risk assessments and subsequent review.

The default exposure routes and parameter values suggested are those that SNL views as resulting in a Reasonable Maximum Exposure (RME) value. Subject to comments and recommendations by the USEPA Region VI and NMED, SNL proposes that these default exposure routes and parameter values be used in future risk assessments.

At SNL/NM, all Environmental Restoration sites exist within the boundaries of the Kirtland AFB. Approximately 157 potential waste and release sites have been identified where hazardous, radiological, or mixed materials may have been released to the environment. Evaluation and characterization activities have occurred at all of these sites to varying degrees. Among other documents, the SNL/ER draft Environmental Assessment (DOE, 1996) presents a summary of the hydrogeology of the sites, the biological resources present and proposed land use scenarios for the SNL/NM ER sites. At this time, all SNL/NM ER sites have been tentatively designated for either industrial or recreational future land use. The NMED has also requested that risk calculations be performed based on a residential land use scenario. All three land use scenarios will be addressed in this document.

The SNL/NM ER project has screened the potential exposure routes and identified default parameter values to be used for calculating potential intake and subsequent hazard index, risk and dose values. EPA (EPA, 1989a) provides a summary of exposure routes that could potentially be of significance at a specific waste site. These potential exposure routes consist of:

- Ingestion of contaminated drinking water;
- Ingestion of contaminated soil;

- Ingestion of contaminated fish and shell fish;
- Ingestion of contaminated fruits and vegetables;
- Ingestion of contaminated meat, eggs, and dairy products;
- Ingestion of contaminated surface water while swimming;
- Dermal contact with chemicals in water;
- Dermal contact with chemicals in soil;
- Inhalation of airborne compounds (vapor phase or particulate), and;
- External exposure to penetrating radiation (immersion in contaminated air; immersion in contaminated water and exposure from ground surfaces with photon-emitting radionuclides).

Based on the location of the SNL ER sites and the characteristics of the surface and subsurface at the sites, we have evaluated these potential exposure routes for different land use scenarios to determine which should be considered in risk assessment analyses (the last exposure route is pertinent to radionuclides only). At SNL/NM ER sites, there does not presently occur any consumption of fish, shell fish, fruits, vegetables, meat, eggs, or dairy products that originate on-site. Additionally, no potential for swimming in surface water is present due to the high-desert environmental conditions. As documented in the RESRAD computer code manual (ANL, 1993), risks resulting from immersion in contaminated air or water are not significant compared to risks from other radiation exposure routes.

For the industrial and recreational land use scenarios, SNL/NM ER has therefore excluded the following four potential exposure routes from further risk assessment evaluations at any SNL/NM ER site:

- Ingestion of contaminated fish and shell fish;
- Ingestion of contaminated fruits and vegetables;
- Ingestion of contaminated meat, eggs, and dairy products; and
- Ingestion of contaminated surface water while swimming.

That part of the exposure pathway for radionuclides related to immersion in contaminated air or water is also eliminated.

For the residential land-use scenario, we will include ingestion of contaminated fruits and vegetables because of the potential for residential gardening.

Based on this evaluation, for future risk assessments, the exposure routes that will be considered are shown in Table 1. Dermal contact is included as a potential exposure pathway in all land use scenarios. However, the potential for dermal exposure to inorganics is not considered significant and will not be included. In general, the dermal exposure pathway is generally considered to

not be significant relative to water ingestion and soil ingestion pathways but will be considered for organic components. Because of the lack of toxicological parameter values for this pathway, the inclusion of this exposure pathway into risk assessment calculations may not be possible and may be part of the uncertainty analysis for a site where dermal contact is potentially applicable.

Table 1. Exposure Pathways Considered for Various Land Use Scenarios

Industrial	Recreational	Residential
Ingestion of contaminated drinking water	Ingestion of contaminated drinking water	Ingestion of contaminated drinking water
Ingestion of contaminated soil	Ingestion of contaminated soil	Ingestion of contaminated soil
Inhalation of airborne compounds (vapor phase or particulate)	Inhalation of airborne compounds (vapor phase or particulate)	Inhalation of airborne compounds (vapor phase or particulate)
Dermal contact	Dermal contact	Dermal contact
External exposure to penetrating radiation from ground surfaces	External exposure to penetrating radiation from ground surfaces	Ingestion of fruits and vegetables
		External exposure to penetrating radiation from ground surfaces

EQUATIONS AND DEFAULT PARAMETER VALUES FOR IDENTIFIED EXPOSURE ROUTES

In general, SNL/NM expects that ingestion of compounds in drinking water and soil will be the more significant exposure routes for chemicals; external exposure to radiation may also be significant for radionuclides. All of the above routes will, however, be considered for their appropriate land use scenarios. The general equations for calculating potential intakes via these routes are shown below. The equations are from the Risk Assessment Guidance for Superfund (RAGS): Volume 1 (EPA, 1989a and 1991). These general equations also apply to calculating potential intakes for radionuclides. A more in-depth discussion of the equations used in performing radiological pathway analyses with the RESRAD code may be found in the RESRAD Manual (ANL, 1993). Also shown are the default values SNL/NM ER suggests for use in Reasonable Maximum Exposure (RME) risk assessment calculations for industrial, recreational, and residential scenarios, based on EPA and other governmental agency guidance. The pathways and values for chemical contaminants are discussed first, followed by those for radionuclide contaminants. RESRAD input parameters that are left as the default values provided with the code are not discussed. Further information relating to these parameters may be found in the RESRAD Manual (ANL, 1993).

Generic Equation for Calculation of Risk Parameter Values

The equation used to calculate the risk parameter values (i.e., Hazard Quotient/Index, excess cancer risk, or radiation total effective dose equivalent [dose]) is similar for all exposure pathways and is given by:

Risk (or Dose) = Intake x Toxicity Effect (either carcinogenic, noncarcinogenic, or radiological)

$$= C \times (CR \times EFD/BW/AT) \times \text{Toxicity Effect} \quad (1)$$

where

- C = contaminant concentration (site specific);
- CR = contact rate for the exposure pathway;
- EFD = exposure frequency and duration;
- BW = body weight of average exposure individual;
- AT = time over which exposure is averaged.

The total risk/dose (either cancer risk or hazard index) is the sum of the risks/doses for all of the site-specific exposure pathways and contaminants.

The evaluation of the carcinogenic health hazard produces a quantitative estimate for excess cancer risk resulting from the COCs present at the site. This estimate is evaluated for determination of further action by comparison of the quantitative estimate with the potentially acceptable risk range of 10^{-4} to 10^{-6} . The evaluation of the noncarcinogenic health hazard produces a quantitative estimate (i.e., the Hazard Index) for the toxicity resulting from the COCs present at the site. This estimate is evaluated for determination of further action by comparison of this quantitative estimate with the EPA standard Hazard Index of unity (1). The evaluation of the health hazard due to radioactive compounds produces a quantitative estimate of doses resulting from the COCs present at the site.

The specific equations used for the individual exposure pathways can be found in RAGS (EPA, 1989) and the RESRAD Manual (ANL, 1993). Table 2 shows the default parameter values suggested for used by SNL at ER sites, based on the selected land use scenario. References are given at the end of the table indicating the source for the chosen parameter values. The intention of SNL is to use default values that are consistent with regulatory guidance and consistent with the RME approach. Therefore, the values chosen will, in general, provide a conservative estimate of the actual risk parameter. These parameter values are

Table 2. Default Parameter Values for Various Land Use Scenarios

Parameter	Industrial	Recreational	Residential
General Exposure Parameters			
Exposure frequency (d/y)	***	***	***
Exposure duration (y)	30 ^{ab}	30 ^{ab}	30 ^{ab}
Body weight (kg)	70 ^{ab}	56 ^{ab}	70 adult ^{ab} 15 child
Averaging Time (days) for carcinogenic compounds (=70 y x 365 d/y)	25550 ^a	25550 ^a	25550 ^a
for noncarcinogenic compounds (=ED x 365 d/y)	10950	10950	10950
Soil Ingestion Pathway			
Ingestion rate	100 mg/d ^c	6.24 g/y ^d	114 mg-y/kg-d ^e
Inhalation Pathway			
Inhalation rate (m ³ /yr)	5000 ^{ab}	146 ^d	5475 ^{ab,d}
Volatilization factor (m ³ /kg)	chemical specific	chemical specific	chemical specific
Particulate emission factor (m ³ /kg)	1.32E9 ^a	1.32E9 ^a	1.32E9 ^a
Water Ingestion Pathway			
Ingestion rate (L/d)	2 ^{ab}	2 ^{ab}	2 ^{ab}
Food Ingestion Pathway			
Ingestion rate (kg/yr)	NA	NA	138 ^{b,d}
Fraction ingested	NA	NA	0.25 ^{b,d}
Dermal Pathway			
Surface area in water (m ²)	2 ^{b,e}	2 ^{b,e}	2 ^{b,e}
Surface area in soil (m ²)	0.53 ^{b,e}	0.53 ^{b,e}	0.53 ^{b,e}
Permeability coefficient	chemical specific	chemical specific	chemical specific

*** The exposure frequencies for the land use scenarios are often integrated into the overall contact rate for specific exposure pathways. When not included, the exposure frequency for the industrial land use scenario is 8 h/d for 250 d/y; for the recreational land use, a value of 2 hr/wk for 52 wk/y is used (EPA, 1989b); for a residential land use, all contact rates are given per day for 350 d/y.

^a RAGS, Vol 1, Part B (EPA, 1991).

^b Exposure Factors Handbook (EPA, 1989b)

^c EPA Region VI guidance.

^d For radionuclides, RESRAD (ANL, 1993) is used for human health risk calculations; default parameters are consistent with RESRAD guidance.

^e Dermal Exposure Assessment, 1992.

suggested for use for the various exposure pathways based on the assumption that a particular site has no unusual characteristics that contradict the default assumptions. For sites for which the assumptions are not valid, the parameter values will be modified and documented.

Summary

SNL proposes the described default exposure routes and parameter values for use in risk assessments at sites that have an industrial, recreational or residential future land-use scenario. There are no current residential land-use designations at SNL ER sites, but this scenario has been requested to be considered by the NMED. For sites designated as industrial or recreational land-use, SNL will provide risk parameter values based on a residential land-use scenario to indicate the effects of data uncertainty on risk value calculations or in order to potentially mitigate the need for institutional controls or restrictions on Sandia ER sites. The parameter values are based on EPA guidance and supplemented by information from other government sources. The values are generally consistent with those proposed by Los Alamos National Laboratory, with a few minor variations. If these exposure routes and parameters are acceptable, SNL will use them in risk assessments for all sites where the assumptions are consistent with site-specific conditions. All deviations will be documented.

References

ANL, 1993, Manual for Implementing Residual Radioactive Material Guidelines Using RESRAD, Version 5.0, ANL/EAD/LD-2, Argonne National Laboratory, Argonne, IL.

DOE, Environmental Assessment of the Environmental Restoration Project at Sandia National Laboratories/New Mexico, US Dept. of Energy, Kirtland Area Office, 1995.

EPA, 1989a, Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual, EPA/540-1089/002, US Environmental Protection Agency, Office of Emergency and Remedial Response, Washington, D.C.

EPA, 1989b, Exposure Factors Handbook, EPA/600/8-89/043, US Environmental Protection Agency, Office of Health and Environmental Assessment, Washington, D.C.

EPA, 1991, Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part B), EPA/540/R-92/003, US Environmental Protection Agency, Office of Emergency and Remedial Response, Washington, D.C.

EPA, 1992, Dermal Exposure Assessment: Principles and Applications, EPA/600/8-91/011B, Office of Research and Development, Washington, D.C.

RSI



ER/FIN/1302

U.S. Department of Energy
Albuquerque Operations Office
Kirtland Area Office
P.O. Box 5400
Albuquerque, NM 87185-5400

Original to: Security

JUN 11 1998

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Robert S. (Stu) Dinwiddie, Manager
New Mexico Environment Department
Hazardous and Radioactive Materials Bureau
RCRA Permits Management Program
2044 Galisteo Street
P.O. Box 26110
Santa Fe, NM 87505-2100

Dear Mr. Dinwiddie:

Enclosed is one of two NMED copies of the Department of Energy/Sandia National Laboratories-New Mexico response to your March 17, 1998, Request for Supplemental Information (RSI) concerning three sites included in the seventh submission of No Further Action (NFA) proposals. These three sites were given an expedited review at our request and are listed below:

OU 1302

Site 96 - The Storm Drain System
Site 187 - Sanitary Sewer Lines
Site 226 - Old Acid Waste Line

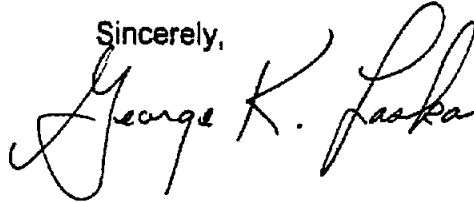
JUN 15 1998

S. Dinwiddie

(2)

If you have any questions, please contact John Gould at (505) 845-6089, or Mark Jackson at (505) 845-6288.

Sincerely,



per Michael J. Zamorski
Area Manager

Enclosure

cc w/enclosure:

D. Bourne, AL, ERD
S. Hoines, NMED-HRMB
J. Parker, NMED-OB
R. Kennett, NMED-OB
D. Neleigh, EPA, Region 6 (2 copies via certified mail)

cc w/o enclosure:

B. Oms, KAO-AIP
W. Cox, SNL, MS 1147
D. Fate, SNL, MS 1148
F. Nimick, SNL, MS 1147
M. Skelly, SNL, MS 1147
B. Garcia, NMED
S. Kruse, NMED

**General
Comments**

**RESPONSES TO NMED COMMENTS
ON NO FURTHER ACTION PROPOSALS
DATED OCTOBER 3, 1996 (7th ROUND)**

GENERAL COMMENTS

- 1. Drafts of maps, supporting documents, appendices, and data tables are unfinished products. For the purpose of a NFA proposal, final versions of these and any other types of information must be submitted.**

Response: To Sandia National Laboratories/Department of Energy's (SNL/DOE's) knowledge, no draft maps or documents were transmitted with the No Further Action (NFA) proposals for Sites 96, 187, and 226. As noted in previous responses to comments on other NFA proposals, some historical reference documents have never been finalized, and only the draft version is available for use (e.g., Comprehensive Environmental Assessment and Response Program [CEARP] Phase I, Preliminary Draft, May 1987).

- 2. It is helpful to include analytical results for field and equipment blanks, and duplicates in data tables. QA/QC data should not be mixed with environmental data in the same tables. If applicable, the QA/QC data tables should also include comparisons of offsite and onsite laboratory results (e.g., RPD's).**

Response: The quality assurance/quality control (QA/QC) data mentioned in this comment (field and equipment blanks) were included in the subject NFA proposals at the end of the relevant data tables. Thus, although they were included in the same tables as the environmental data, they were not intermingled. For these sites, comparisons of on-site and off-site data are not applicable because all data were measured off site.

- 3. Data tables for volatile organic compounds (VOC's), semi-volatile organic compounds (SVOC's), and radionuclides list only the constituents that were detected. While summary tables like these are acceptable (and preferred for review purposes), they provide only part of the information needed to fully evaluate a NFA proposal. To complete the data package, additional tables must be submitted listing all of the various constituents that were analyzed for and their method detection limits/minimum detectable activities.**

Please also note that "J-coded" data must be reported as detected constituents.

Response: The requested tables are included with this package. For the purpose of this set of responses, detailed information is provided later in this package in the responses to Site-Specific Comments.

Please note that, in the subject NFA proposals, J-coded data were reported as detected constituents.

4. **As presented, sample locations and depths must be inferred from the sample identification numbers in the data tables. Notes describing how such information is encoded in the sample identification numbers must be added to the tables.**

Response: SNL/DOE agree that information about encoding of sample location and depth within sample identification numbers must be available to the New Mexico Environment Department (NMED) and any other potential users of resulting data. Notes pertaining to this topic have been added to tables in later NFA proposals. For the purpose of this set of responses, detailed information is provided later in this package in the responses to Site-Specific Comments.

5. **The NFA proposals contain redundant information, making it more time-consuming than necessary to review. Sections of the TA-1 RFI Work Plan are included with the NFA proposals. The NMED is more interested in what was actually done than what was planned. There is generally no need to include sections of the RFI Work Plans with the NFA proposals; relevant information (such as site history) can be summarized or restated in the text of the NFA proposal.**

Response: The comment is noted. SNL/DOE will try to balance omitting redundant information with the need to make NFA proposals stand-alone documents (per General Comment 10).

6. **HRMB will not review the risk assessments for ER Sites 96, 187, and 226 until the sites have been adequately characterized. Risk assessments must be based on the protocols being developed by the DOE/SNL and the NMED.**

Response: SNL/DOE recognize that NMED has the prerogative of deciding when review of risk assessments is appropriate. In this case, the timing clearly hinges on "adequate characterization," which is the subject of many of the specific comments. Please note that, although additional sampling may delineate concentrations between "hits" (results that were found to be above background but below risk-based action levels) and background, there is no reason to anticipate discovery of values higher than those already found during the Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) sampling. Thus, the existing risk assessments are likely to be the most conservative (in terms of showing highest risk), and it may be worth NMED's time to review them at this stage.

7. **QA/QC -- At a meeting held in Santa Fe on December 3, 1996, HRMB staff members expressed concern about SNL's recurring problem regarding the frequent detection of "common laboratory contaminants" (such as acetone and methylene chloride) in various types of blanks. These organic compounds have been and still are widely used at SNL, and in some cases, historically were disposed of onto and into the ground. Thus, the presence of these chemicals in QC samples (such as field and trip blanks) can not be automatically discounted as laboratory contamination.**

Additionally, in this December meeting, HRMB personnel suggested that SNL review its contract laboratory's QA/QC program; and, if it is found deficient, remedy the problem or find other laboratory.

Repeated detections in equipment blanks may indicate improper decontamination practices and/or contaminated wash/rinse water and/or containers or other equipment. SNL should ensure that wash/rinse water, containers, and other equipment is not contaminated prior to their use.

Consistent QC failures are considered by HRMB to be an indication that laboratory data are not reliable. The HRMB will require sampling to be repeated at ER sites where such problems are evident.

Response: The comment is noted by SNL/DOE. SNL's Sample Management Office has an ongoing audit program to evaluate the adequacy of QA/QC problems at the off-site contract laboratories; this program is supplemented by a similar program overseen by DOE's Albuquerque Operations Office. When specific QA/QC concerns arise, the affected laboratory is contacted and corrective actions are defined and implemented. However, laboratory contamination is a sporadic problem at any major commercial laboratory and is a problem that defies universal and permanent correction because several common laboratory contaminants are necessary compounds in sample analytical procedures. This has been recognized by the U.S. Environmental Protection Agency (EPA) and, as NMED is aware, guidance has been available for some time on how to evaluate and use environmental data, despite the presence of laboratory contamination. For completeness, the guidance is included in this package as Attachment A to these general comments.

Because the comment indicates that the Hazardous and Radioactive Materials Bureau (HRMB) may be inclined to require resampling of sites in the event of "consistent QC failures," it is requested that a discussion be held between HRMB and SNL/DOE staff to reach a common understanding on what extent of laboratory contamination is considered to constitute "consistent QC failure."

8. **Breaks/cracks/cross-connections in pipes that are downstream of those determined to have appreciable levels of contamination must be investigated.**

Response: The comment is noted by SNL/DOE. Although there is agreement among the parties on this approach, it is a critical prerequisite to reach consensus on what constitutes "appreciable contamination."

9. **HRMB will not support NFA proposals for active sites. DOE/SNL must investigate active sites within 2 years of decommissioning.**

Response 9: SNL/DOE understand that the HRMB will not support NFA proposals for active sites; however, the comment is only partially germane to the three sites addressed here. Site 187, the sanitary sewer lines, is not an active site because the site is defined as the soils outside the pipe, from the midpoint of the pipe downward. Although water continues to flow within the pipes, modern waste-handling processes prevent the introduction of potential contaminants to that water; therefore, leakage from cracks in the line does not result in active contamination of the site as defined. For the same reasons, Site 226 is not an active site.

Parts of Site 96, the storm-drain system, may need to be considered as active. The enclosed, engineered portions are inactive for the same reasons expressed in the preceding paragraph. However, the unlined surface channels obviously continue to receive flow originating from runoff from streets, parking lots, and miscellaneous exterior surfaces in Technical Area (TA)-I, processes for which environmental controls are less certain than for processes occurring within buildings. It would probably be fruitful to discuss approaches to these portions of Site 96 to ensure a common understanding of future status and timing.

10. **NFA proposals must be self-contained documents. The NFA criteria for a site must be specified in the NFA proposal. It is not adequate to only refer to the list of NFA criteria in the Document of Understanding.**

Response: NFA Criterion 5 was specified in the proposal. See Sections 1.0 and 1.2, page 1-1.

11. **Buildings 810, 814, 824, 838, 839, and 870 are not considered by HRMB to be included in ER Sites 96, 187, or 226. Results of the investigations conducted at and near these buildings by DOE/SNL will be reviewed later by HRMB to determine whether these areas are new solid waste management units. However, DOE/SNL must provide any information from the investigations of these areas that may also be relevant to ER Sites 96, 187, and 226.**

Response: The buildings listed in the NMED comment are not considered by SNL/DOE to be part of the Environmental Restoration (ER) sites. Furthermore, SNL buildings are addressed under a separately funded program (Decontamination and Decommissioning [D&D]) and are not candidates for inclusion as new Solid Waste Management Units. The D&D and ER Projects coordinate activities so that any investigation of soil or piping exterior to a building's slab or basement is conducted with ER goals and requirements in mind. As required by regulation, if contamination is discovered during such an investigation, regulatory authorities are notified. This has been, and will continue to be, SNL/DOE practice.

Results of the above-mentioned investigations will be provided for NMED's review. For the purpose of this set of responses, detailed information is provided later in this package in the responses to Site-Specific Comments. This information is included in this response

because it details the results of work specifically conducted at the storm, sanitary, and acid waste lines that were connected to these buildings and investigated prior to building D&D actions.

Attachment A

Attachment A

**EPA Guidance on
Laboratory Data Validation**



LABORATORY DATA VALIDATION
FUNCTIONAL GUIDELINES FOR EVALUATING ORGANICS ANALYSES

Prepared for the

HAZARDOUS SITE EVALUATION DIVISION
U.S. ENVIRONMENTAL PROTECTION AGENCY

Compiled by

Ruth Bleyler
Sample Management Office

Prepared by

The USEPA Data Review Work Group
Scott Siders - EPA HQ - Co-Chairperson
Jeanne Hankins - EPA Region III - Co-Chairperson
Deborah Szaro - EPA Region I
Leon Lazarus - EPA Region II
Charles Sands - EPA Region III
Charles Hooper - EPA Region IV
Patrick Churilla - EPA Region V
Debra Morey - EPA Region VII
Raleigh Farlow - EPA Region X

February 1, 1988

- 1) Flag positive results for that compound as estimated (J).
 - 2) Flag non-detects for that compound as unusable (R).
- b. If any volatile or semivolatile TCL compound has a % Difference between Initial and Continuing Calibration of greater than 25%:
- 1) Flag all positive results for that compound as estimated (J).
 - 2) Non-detects may be qualified using professional judgment.

IV. BLANKS

A. Objective

The assessment of blank analysis results is to determine the existence and magnitude of contamination problems. The criteria for evaluation of blanks apply to any blank associated with the samples. If problems with any blank exist, all data associated with the Case must be carefully evaluated to determine whether or not there is an inherent variability in the data for the Case, or if the problem is an isolated occurrence not affecting other data.

B. Criteria

No contaminants should be present in the blank(s).

C. Evaluation Procedure

1. Review the results of all associated blank(s), Form I(s) and raw data (chromatograms, reconstructed ion chromatograms, quantization reports or data system printouts).
2. Verify that Method Blank analysis has been reported per matrix, per concentration level, for each GC/MS system used to analyze VOA samples, and for each extraction batch for semivolatiles. The reviewer can use the Method Blank Summary (Form IV) to assist in identifying samples associated with each Method Blank.

D. Action

Action in the case of unsuitable blank results depends on the circumstances and origin of the blank. No positive sample results should be reported unless the concentration of the compound in the sample exceeds 10 times the amount in any blank for the common contaminants listed below, or 5 times the amount for other compounds. In instances where more than one blank is associated with a given sample, qualification should be based upon a comparison with the associated blank having the highest concentration of a contaminant. The results must not be corrected by subtracting any blank value. Specific actions are as follows:

1. If a compound is found in a blank but not found in the sample, no action is taken.
2. Any compound (other than the five listed below) detected in the sample, which was also detected in any associated blank, must be qualified when the sample concentration is less than five times the blank concentration. For the following five compounds, the results are qualified by elevating the limit of detection when the sample concentration is less than 10 times the blank concentration.

Common lab contaminants:

- a. Methylene chloride
- b. Acetone
- c. Toluene
- d. 2-butanone
- e. Common phthalate esters

The reviewer should note that the blank analyses may not involve the same weights, volumes, or dilution factors as the associated samples. These factors must be taken into consideration when applying the 5x and 10x criteria, such that a comparison of the total amount of contamination is actually made.

Additionally, there may be instances where little or no contamination was present in the associated blanks, but qualification of the sample was deemed necessary. Contamination introduced through dilution water is one example. Although it is not always possible to determine, instances of this occurring can be detected when contaminants are found in the diluted sample result, but are absent in the undiluted sample result. Since both results are not routinely reported, it may be impossible to verify this source of contamination. However, if the reviewer determines that the contamination is from a source other than the sample, he/she should qualify the data. In this case, the 5x or 10x rule does not apply; the sample value should be reported as a non-detect.

3. The following are examples of applying the blank qualification guidelines. Certain circumstances may warrant deviations from these guidelines.

Case 1: Sample result is greater than the Contract Required Quantitation Limit (CRQL), but is less than the required amount (5x or 10x) from the blank result.

	Rule	
	10x	5x
Blank Result	7	7
CRQL	5	5
Sample Result	60	30
Qualified Sample Result	60U	30U

In the example for the 10x rule, sample results less than 70 (or 10 x 7) would be qualified as non-detects. In the case of the 5x rule, sample results less than 35 (or 5 x 7) would be qualified as non-detects.

Case 2: Sample result is less than CRQL, and is also less than the required amount (5x or 10x) from the blank result.

	Rule	
	10x	5x
Blank Result	6	6
CRQL	5	5
Sample Result	4J	4J
Qualified Sample Result	5U	5U

Note that data are not reported as 4U, as this would be reported as a detection limit below the CRQL.

Case 3: Sample result is greater than the required amount (5x or 10x) from the blank result.

	Rule	
	10x	5x
Blank Result	10	10
CRQL	5	5
Sample Result	120	60
Qualified Sample Result	120	60

For both the 10x and 5x rules, sample results exceeded the adjusted blank results of 100 (or 10x10) and 50 (or 5x10), respectively.

4. If gross contamination exists (i.e., saturated peaks by GC/MS), all compounds affected should be flagged as unusable (R), due to interference, in all samples affected.
5. If inordinate amounts of other TCL compounds are found at low levels in the blank(s), it may be indicative of a problem at the laboratory and should be noted in the data review comments which are forwarded to the DPO.
6. Similar consideration should be given to TIC compounds which are found in both the sample and associated blank(s). (See Section XI for TIC guidance.)

V. SURROGATE RECOVERY

A. Objective

Laboratory performance on individual samples is established by means of spiking activities. All samples are spiked with surrogate compounds prior to sample preparation. The evaluation of the results of these surrogate spikes is not necessarily straightforward. The sample itself may produce effects due to such factors as interferences and high concentrations of analytes. Since the effects of the sample matrix are frequently outside the control of the laboratory and may present relatively unique problems, the review and validation of data based on specific sample results is

Site Specific

SPECIFIC COMMENTS**OU 1302*****ER Site 96, The Storm Drain System*****1. Appendix A, Plate 1-1, Soil-Boring Location Map --**

- A. The inlets/outlets need to be shown clearly on the map.**
- B. The open ditches need to be shown clearly on the map.**
- C. The various drainage systems (watersheds) should be shown in different colors so that they can be readily distinguished from one another.**
- D. Any surface impoundments need to be shown clearly on the map.**
- E. The direction of flow should be indicated on each main, trunk, and feeder line.**
- F. Connections to the storm system outside the study area should be shown, or indicated in some way on the map.**
- G. See general comment 1.**
- H. The locations of cracks, breaks, and any cross-connections should be shown on the map.**

Response 1A: The inlets/outfalls will be added to Plate 1-1. SNL Facilities plans to upgrade the storm drain system inside TA-I. Based on this latest information, ER/Geographic Information System (GIS) is in the process of upgrading our database. The new plate cannot be upgraded in time for this submittal, but will be provided upon completion of the GIS upgrade.

Response 1B: The open ditches will be added to Plate 1-1. SNL Facilities plans to upgrade the storm drain system inside TA-I. Based on this latest information, ER/GIS is in the process of upgrading our database. The new plate cannot be upgraded in time for this submittal, but will be provided upon completion of the GIS upgrade.

Response 1C: TA-I is part of the overall Tijeras Arroyo Watershed Area. The underground storm drains are shown on Plate 1-1. The open ditches will be added to Plate 1-1 (see Response 1B). SNL/NM ER does not know of any additional drainage systems (watersheds) within the TA-I project area.

Response 1D: SNL/NM ER has no information showing surface impoundments within the TA-I project area.

Response 1E: Flow arrows will be added to Plate 1-1. SNL Facilities plans to upgrade the storm drain system inside TA-I. Based on this latest information, ER/GIS is in the process of upgrading our database. The new plate cannot be upgraded in time for this submittal, but will be provided upon completion of the GIS upgrade.

Response 1F: The outside connections will be added to Plate 1-1. SNL Facilities plans to upgrade the storm drain system inside TA-I. Based on this latest information, ER/GIS is in the process of upgrading our database. The new plate cannot be upgraded in time for this submittal, but will be provided upon completion of the GIS upgrade.

Response 1G: See response to General Comment 1.

Response 1H: The cracks, breaks, and cross-connections have been provided on Plates 5-1 through 5-6 of the "Technical Area I (ADS 1302) RFI Work Plan," Volume 2, Plates 5-1 through 5-11.

2. **According to the RFI Work Plan, ground-water monitor wells were to be installed around the perimeter of Technical Area 1 (TA-1). One purpose of these wells from the HRMB's perspective was to allow for the monitoring of any contamination that may have originated from leaks from the sanitary-sewer and storm-drain systems.**

To HRMB's knowledge, not all of the proposed wells in the RFI Work Plan have been installed. Furthermore, no ground-water data were provided for review. The monitor wells that were proposed in the TA-1 RFI Work Plan must be installed. Analytical results of ground-water samples from wells in the TA-1 area must be submitted for HRMB's review.

Response: The TA-I groundwater monitoring program was incorporated into the Sandia North groundwater program. This project change was approved by HRMB upon approval of the Sandia North Groundwater Investigation Plan (GIP). The HRMB GIP approval letter is provided in Attachment A. To date, four monitor wells have been installed: regional well TAI-W-01 is located at ER Site 190 (southwest corner of TA-I), regional well TA-I-W-03 is located close to the Eubank-1 well (southeast corner of TA-I), and regional well TAI-W-02 and shallow-water bearing well TAI-W-06 are located in the parking lot south of Building 825 (southern boundary of TA-I). The Sandia North groundwater program plans to drill an additional three to five monitor wells at three locations within the TA-I area. The final number of wells installed will depend on whether the shallow-water bearing zone extends into the TA-I area.

Analytical results for fiscal year 1997 have been reported in "Sandia North Groundwater Investigation Annual Report Fiscal Year 1997." Copies of this report have been provided to NMED/HRMB and NMED/DOE Oversight Bureau (OB). The transmittal letter is provided in Attachment A.

3. **Appendix C, Table 2 -- See general comments 2, 3, and 4.**

With regard to the analytical results of samples from locations GP-01, GP-04, GP-05, GP-07, and GP-11, the laboratory reporting limit (LRL) for methylene chloride (200 ug/kg) is too high, and suggests that samples were diluted prior to analysis. New samples must be collected and analyzed for VOC's at these locations.

Additionally, SNL/DOE must return to each location where VOC's were detected and determine the extent of contamination. The source (or sources) of contamination must be determined.

Response: See responses to General Comments 2, 3, and 4. The field blank, equipment blank, duplicate sample, and trip blank data were clearly identified in Appendix C, Table 2. An off-site laboratory analyzed the samples. Therefore, a comparison of off-site and on-site laboratory data could not be conducted at this site.

A table showing the list of volatile organic compounds (VOCs) analyzed for is provided in Attachment B. This list includes the method detection limit (MDL) for each compound.

The sample identification number T1096-GP-001-010-S (example) represents the following: T1 = Technical Area 1, 096 = ER Site 96, GP = geoprobe, 001 = soil boring location one, 010 = depth of sample collected (in feet), and S = soil sample.

The DOE has forwarded a letter to NMED requesting that the response due date be extended an additional 60 days. The letter also stated the following: "... identified several issues in the Request for Supplemental Information (RSI) with potential programmatic implications that may require extensive discussions with the NMED technical staff." The nature and extent of VOC contamination is one of the issues that will impact the program. A response on the nature and extent of contamination will not be addressed at this time. The SNL ER Project requests a meeting with the NMED technical staff to resolve this issue.

4. Appendix C, Table 3 -- See general comments 2, 3, and 4.

With regard to the analytical results of samples from locations SD-001 through SD-005, SD-10, and SD-15, the laboratory reporting limits (LRL's) for the various detected SVOC's are too high, suggesting that samples were diluted prior to analysis. New samples must be collected and analyzed for SVOC's at these locations.

Additionally, SNL/DOE must return to each location where SVOC's were detected and determine the extent of contamination. The source (or sources) of contamination must be determined.

Response: See responses to General Comments 2, 3, and 4. The field blank, equipment blank, and duplicate sample data were clearly identified in Appendix C, Table 3. An off-site laboratory analyzed the samples. Therefore, a comparison of off-site and on-site laboratory data could not be conducted at this site.

A table showing the list of semivolatile organic compounds (SVOCs) analyzed for is provided in Attachment B (see response to Comment 3). The list includes the MDL for each compound.

The sample identification number T1096-GP-001-010-S (example) represents the following: T1 = Technical Area 1, 096 = ER Site 96, GP = geoprobe, 001 = soil boring location one, 010 = depth of sample collected (in feet), and S = soil sample.

The DOE has forwarded a letter to NMED requesting that the response due date be extended an additional 60 days. The letter also stated the following: "... identified several issues in the RSI with potential programmatic implications that may require extensive discussions with the NMED technical staff." The nature and extent of SVOC contamination is one of the issues that will impact the program. A response on the nature and extent of contamination will not be addressed at this time. The SNL ER Project requests a meeting with the NMED technical staff to resolve this issue.

- 5. **Appendix C, Table 4 -- SNL/DOE must return to the locations where the PCB detections occurred and determine the extent of contamination. The source (or sources) of PCB contamination must be determined.**

See general comment 4.

Response: The DOE has forwarded a letter to NMED requesting that the response due date be extended an additional 60 days. The letter also stated the following: "... identified several issues in the RSI with potential programmatic implications that may require extensive discussions with the NMED technical staff." The nature and extent of polychlorinated biphenyl (PCB) contamination is one of the issues that will impact the program. A response on the nature and extent of contamination will not be addressed at this time. The SNL ER Project requests a meeting with the NMED technical staff to resolve this issue.

See response to General Comment 4. The sample identification number T1096-GP-001-010-S (example) represents the following: T1 = Technical Area 1, 096 = ER Site 96, GP = geoprobe, 001 = soil boring location one, 010 = depth of sample collected (in feet), and S = soil sample.

- 6. **Appendix C, Table 5 -- Analytical results for some samples exceed the approved background concentrations for certain metals:**

<u>Metal</u>	<u>Borehole (GP) Location</u>
Ag	011,
As	022, 031, 033, 034, 041, 043, 044, 046,
Ba	013, 031, 034, 036, 046, 050
Co	001, 003, 010,
Ni	003, 008, 010, 029,

T1 001, 002, 003, 007, 010, 011, 029, 030, 033, 034, 035, 036, 039, 040, 041, 043
 V 030, 031, 033, 036, 039, 040, 041, 042, 043, 044, 045, 046, 047, 050

SNL/DOE must return to each location and determine the extent of contamination. The source (or sources) of each contaminant must be determined.

See general comments 2 and 4.

Response: The DOE has forwarded a letter to NMED requesting that the response due date be extended an additional 60 days. The letter also stated the following: "... identified several issues in the RSI with potential programmatic implications that may require extensive discussions with the NMED technical staff." The nature and extent of metal contamination and the approved background values are two of the issues that will impact the program. A response on the nature and extent of contamination and background concentrations will not be addressed at this time. The SNL ER Project requests a meeting with the NMED technical staff to resolve these issues.

See responses to General Comments 2 and 4. The metals equipment blank sample data have been added to Appendix C, Table 5 (Attachment C). An off-site laboratory analyzed the samples. Therefore, a comparison of off-site and on-site laboratory data could not be conducted at this site.

The sample identification number T1096-GP-001-010-S (example) represents the following: T1 = Technical Area 1, 096 = ER Site 96, GP = geoprobe, 001 = soil boring location one, 010 = depth of sample collected (in feet), and S = soil sample.

7. Appendix C, Table 6 -- See general comments 3 and 4.

Analytical results for some samples demonstrate that radioactive contamination is present:

<u>Radionuclide</u>	<u>Borehole (GP) Locations</u>
Plutonium	006, 052
Tritium	006, 007, 008, 009, 010, 018, 044

Plutonium was also detected at 0.439 pCi/g in sediment sample SD-017.

SNL/DOE must return to each of these locations and determine the extent of contamination. The source (or sources) of each contaminant must be determined.

Surface-soil samples must also be collected and analyzed for plutonium throughout the TA-1 area. A sampling and analysis plan must be submitted to HRMB for approval prior to conducting this work.

Response: See responses to General Comments 3 and 4. The field blank, equipment blank, and duplicate sample data were clearly identified in Appendix C, Table 6. An off-site laboratory analyzed the samples. Therefore, a comparison of off-site and on-site laboratory data could not be conducted at this site.

A table showing the list of radionuclides analyzed for is provided in Attachment B (see response to Comment 3). This list includes the MDL for each compound.

The sample identification number T1096-GP-001-010-S (example) represents the following: T1 = Technical Area 1, 096 = ER Site 96, GP = geoprobe, 001 = soil boring location one, 010 = depth of sample collected (in feet), and S = soil sample.

The DOE has forwarded a letter to NMED requesting that the response due date be extended an additional 60 days. The letter also stated the following: "... identified several issues in the RSI with potential programmatic implications that may require extensive discussions with the NMED technical staff." The nature and extent of radionuclide contamination and radiological characterization (i.e., new sample and analysis plan) are two of the issues that will impact the program. A response on these two issues will not be addressed at this time. The SNL ER Project requests a meeting with the NMED technical staff to resolve these issues.

The plutonium result was transcribed incorrectly by SNL ER in Appendix C, Table 6. The correct value should read "0.0439 pCi/g." The value was stated correctly in the NFA text (Section 3.6.2.2).

8. Appendix C, Table 7 -- Analytical results for some samples exceed the approved background concentrations for certain metals:

<u>Metal</u>	<u>Sediment Sample (SD) Locations</u>
Ba	002, 003, 010, 013, 014, 016, 021, 027
Cd	001, 002, 003, 004
Cr	002, 003
Cu	001, 002, 003, 004, 007, 011, 014, 015
Pb	002, 003, 007
Hg	023
Ag	001, 002, 003, 004, 005
Zn	001, 002, 003, 004, 007, 014

SNL/DOE must return to each of these locations and determine the extent of contamination. The source (or sources) of each contaminant must be determined.

See general comments 2 and 4.

Response: The DOE has forwarded a letter to NMED requesting that the response due date be extended an additional 60 days. The letter also stated the following:

“... identified several issues in the RSI with potential programmatic implications that may require extensive discussions with the NMED technical staff.” The nature and extent of metal contamination and the approved background values are two of the issues that will impact the program. A response on the nature and extent of contamination and background concentrations will not be addressed at this time. The SNL ER Project requests a meeting with the NMED technical staff to resolve these issues.

See responses to General Comments 2 and 4. The metals equipment blank sample data have been added to Appendix C, Table 7 (Attachment C) (see response to Comment 6). An off-site laboratory analyzed the samples. Therefore, a comparison of off-site and on-site laboratory data could not be conducted at this site.

The sample identification number T1096-GP-001-010-S (example) represents the following: T1 = Technical Area 1, 096 = ER Site 96, GP = geoprobe, 001 = soil boring location one, 010 = depth of sample collected (in feet), and S = soil sample.

9. **Page 1-1, section 1.3, 2nd sentence -- Why wasn't an investigation done for the drain systems in Technical Areas 2 and 4?**

Response: TAs II and IV are not part of ADS 1302. In addition, these two technical areas are downgradient of the TA-I storm drain system and have no impact on TA-I.

10. **Page 3-1, section 3.4 -- Results relevant to ER Site 96 must be summarized for the earlier investigations:**

- a. the cross-connection study,
- b. sampling done in the discharge channel areas west of TA-2, and
- c. the sampling done during the removal of the local storm-drain system of Building 870.

Data should be summarized in tables for each of the three different investigations. Sample locations should be shown on maps.

Response: These earlier investigations were presented/summarized in the TA-I Work Plan (in Appendix B of the NFA). SNL/DOE believe it would be redundant to further summarize these data.

11. **Page 3-6, section 3.6.1.2, 1st paragraph, last sentence -- the gamma spectroscopy results must be provided.**

Response: The gamma spectroscopy data are provided in Attachment D.

12. **Page 3-7, section 3.6.1.2, bullet 5 -- What was the minimum detectable activity for U-235?**

Response: The detection limit is 0.0112 picocuries per gram (pCi/g) and the reporting limit is 0.0900 pCi/g. A copy of the laboratory report for radiological compounds is provided in Attachment B (see response to Comment 3).

13. Appendix B -- See general comment 5.

Response: See response to General Comment 5.

14. Appendix D -- See general comment 6.

Response: See response to General Comment 6.

15. Appendix C, Table 9 -- The background levels in this table for As, Cd, Cr, Cr⁺⁶, Co, Cu, Pb, Hg, Ag, V, and Zn are not the approved background concentrations for these constituents. The background values reported for the TA-1 study have not been approved by the HRMB.

Response: The DOE has forwarded a letter to NMED requesting that the response due date be extended an additional 60 days. The letter also stated the following: ". . . identified several issues in the RSI with potential programmatic implications that may require extensive discussions with the NMED technical staff." The TA-I background study is one of the issues that will impact the program. A response on the TA-I background study will not be addressed at this time. The SNL ER Project requests a meeting with the NMED technical staff to resolve this issue.

Please note that the TA-I values were evaluated against the approved site-wide background values.

16. Appendix C, Table 11 -- See specific comment 15.

Response: See response to Specific Comment 15.

Attachment A

Attachment A

**Approval Letter for Sandia North GIP
And
Transmittal Letter for Sandia North GIP Annual Report,
Fiscal Year 1997**



GARY E. JOHNSON
GOVERNOR

State of New Mexico
ENVIRONMENT DEPARTMENT
Hazardous & Radioactive Materials Bureau
2044 Galisteo
P.O. Box 26110
Santa Fe, New Mexico 87502
(505) 827-1557
Fax (505) 827-1544



MARK E. WEIDLER
SECRETARY

EDGAR T. THORNTON, III
DEPUTY SECRETARY

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

February 19, 1997

Mr. Michael J. Zamorski
Acting Area Manager
Kirtland Area Office
US Department of Energy
P.O. Box 5400
Albuquerque, New Mexico

RE: Sandia North Groundwater Investigation Plan: Approval

Dear Mr. Zamorski:


The Hazardous and Radioactive Materials Bureau (HRMB) has completed review of the US Department of Energy response to our request of November 27, 1996 for more information on the Sandia North Groundwater Investigation Plan (GIP). These comments were transmitted in your letter to me dated January 8, 1997.

These comments adequately address the concerns of HRMB. Accordingly, the Sandia North GIP is approved.

Some of the activities proposed in the Sandia North GIP to complete this investigation will be accomplished in FY97. It is my understanding that funding is actively being sought beyond FY 97 to conduct the remaining activities.

Please contact Stephanie Kruse of my staff at 827-1561 if you have any comments or questions.

Sincerely,


Benito J. Garcia, Chief
Hazardous and Radioactive Materials Bureau

Mr. Michael J. Zaomrski
February 19, 1997
Page 2

xc: Benito Garcia, NMED/HRMB
Stu Dinwiddie, NMED/HRME
Ron Kern, NMED/DOE OE
Mark Jackson, DOE/KAO
Warren Cox, SNL
David Neleigh, EPA
FILE: HSWA SNL OUI303 97
COMP: SNL, 2/19/97, DOE/KAO, HRMB, 97, RE



Department of Energy
Albuquerque Operations Office
Kirtland Area Office
P.O. Box 5400
Albuquerque, New Mexico 87185-5400

APR 8 1998

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Benito Garcia, Bureau Chief
New Mexico Environment Department
Hazardous and Radioactive Materials Bureau
2044 Galisteo Street
P.O. Box 26110
Santa Fe, NM 87505-2100

Dear Mr. Garcia:

Enclosed is one copy of the Sandia North Groundwater Investigation Annual Report, Fiscal Year 1997 (October 1, 1996 - September 30, 1997) prepared by Sandia National Laboratories/New Mexico (SNL/NM), ID Number NM5890110518-1. As discussed in prior correspondence, one of the copies normally sent to your office for distribution to your technical staff at the District 1 Office, is being sent directly to them.

If you have any questions, please contact John Gould at (505) 845-6089, or Mark Jackson at (505) 845-6288.

Sincerely,

A handwritten signature in cursive script that reads "George K. Jackson".

Michael J. Zamorski
Area Manager

Enclosure

cc w/enclosure:

D Bourne, AL, ERD

J. Parker, NMED-OB

R. Kennett, NMED-OB

S. Hoines, NMED

D. Neleigh, EPA, Region 6 (2 copies via certified mail)

Mr. Benito Garcia

2

cc w/o enclosure:

B. Oms, KAO-OB

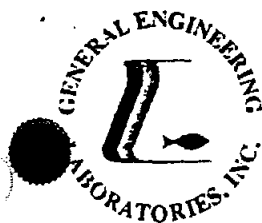
W. Cox, SNL, MS 1147

S. Dinwiddie, NMED

S. Kruse, NMED

Attachment B

**List of VOCs, SVOCs, and Radionuclides Analyzed for
At ER Site 96**



GENERAL ENGINEERING LABORATORIES

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Laboratory Certifications

STATE	GEL	EPI
FL	ES7156/87294	EE7472/87458
NC	233	
SC	10120	10582
TN	02934	
VA	00151	
WI	99985779	

CERTIFICATE OF ANALYSIS

Client: Sandia National Laboratories
 PO Box 5800
 Albuquerque, New Mexico 87185-1331

Contact: Ms. Pamela Puissant

Project Description: RFP #AJ2480

cc: SNLS00295

Report Date: July 22, 1995

Page 1 of 3

Sample ID : 022888-01 T1096-GP-024-005-S
 Lab ID : 9506422-07
 Matrix : SOIL
 Date Collected : 06/19/95
 Date Received : 06/21/95
 Priority : Routine
 Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
<i>Target Compound List Volatiles - 35 items</i>											
1,1,1-Trichloroethane	U	ND	2.00	10.0	ug/kg	1.0	JRU	06/28/95	2314	68254	1
1,1,2,2-Tetrachloroethane	U	ND	2.00	10.0	ug/kg	1.0					
1,1,2-Trichloroethane	U	ND	2.00	10.0	ug/kg	1.0					
1,1-Dichloroethane	U	ND	2.00	10.0	ug/kg	1.0					
1,1-Dichloroethylene	U	ND	2.00	10.0	ug/kg	1.0					
1,2-Dichloroethane	U	ND	2.00	10.0	ug/kg	1.0					
1,2-Dichloropropane	U	ND	2.00	10.0	ug/kg	1.0					
1,2-cis-Dichloroethylene	U	ND	10.0	10.0	ug/kg	1.0					
1,2-trans-Dichloroethylene	U	ND	2.00	10.0	ug/kg	1.0					
2-Butanone	U	ND	10.0	50.0	ug/kg	1.0					
2-Hexanone	U	ND	10.0	20.0	ug/kg	1.0					
4-Methyl-2-pentanone	U	ND	10.0	20.0	ug/kg	1.0					
Acetone	U	ND	10.0	50.0	ug/kg	1.0					
Benzene	U	ND	2.00	10.0	ug/kg	1.0					
Bromoform	U	ND	2.00	10.0	ug/kg	1.0					
Carbon Disulfide	U	ND	2.00	20.0	ug/kg	1.0					
Carbon Tetrachloride	U	ND	2.00	10.0	ug/kg	1.0					
Chlorobenzene	U	ND	2.00	10.0	ug/kg	1.0					
Chlorodibromomethane	U	ND	2.00	10.0	ug/kg	1.0					
Chloroethane	U	ND	2.00	10.0	ug/kg	1.0					
Chloroform	U	ND	2.00	10.0	ug/kg	1.0					
Dichlorobromomethane	U	ND	2.00	10.0	ug/kg	1.0					
Ethylbenzene	U	ND	2.00	10.0	ug/kg	1.0					
Methyl Bromide	U	ND	2.00	10.0	ug/kg	1.0					
Methyl Chloride	U	ND	2.00	10.0	ug/kg	1.0					
Methylene Chloride	J	3.98	2.00	25.0	ug/kg	1.0					
Styrene	U	ND	2.00	10.0	ug/kg	1.0					

3





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Contact: Ms. Pamela Puissant

Project Description: RFP #AJ2480

cc: SNLS00295

Report Date: July 22, 1995

Page 2 of 3

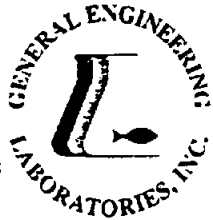
Sample ID : 022888-01 T1096-GP-024-005-S

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Tetrachloroethylene	U	ND	2.00	10.0	ug/kg	1.0					
Toluene	U	ND	2.00	10.0	ug/kg	1.0	JRU	06/28/95	2314	68254	1
Trichloroethylene	U	ND	2.00	10.0	ug/kg	1.0					
Vinyl Acetate	U	ND	10.0	20.0	ug/kg	1.0					
Vinyl chloride	U	ND	2.00	10.0	ug/kg	1.0					
Xylenes (TOTAL)	U	ND	4.00	20.0	ug/kg	1.0					
cis-1,3-Dichloropropylene	U	ND	2.00	10.0	ug/kg	1.0					
trans-1,3-Dichloropropylene	U	ND	2.00	10.0	ug/kg	1.0					
Organic Prep											
Evaporative Loss @ 105 C		4.00	1.00	1.00	wt%	1.0	DDT	07/08/95	1745	68630	2

Surrogate Recovery	Test	Percent%	Acceptable Limits
1,2-Dichloroethane-d4	TCL VOLATILES	95.2	(71.9 - 131.)
Bromofluorobenzene	TCL VOLATILES	90.0	(74.0 - 112.)
Toluene-d8	TCL VOLATILES	106.	(82.3 - 117.)

M = Method	Method-Description
M 1	EPA 8240 extended
M 2	EPA 3550

34



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cc: SNLS00295

Report Date: July 22, 1995


Page 3 of 3

Sample ID : 022888-01 T1096-GP-024-005-S

M = Method Method-Description

Data reported in mass/mass units is reported 'as received'.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Edie Kent at (803) 769-7385.


Analytical Report Specialist



GENERAL ENGINEERING LABORATORIES

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Client: Sandia National Laboratories
 PO Box 5800
 Albuquerque, New Mexico 87185-1331

Contact: Ms. Pamela Puissant

Project Description: RFP #AJ2480

cc: SNLS00295

Report Date: August 01, 1995

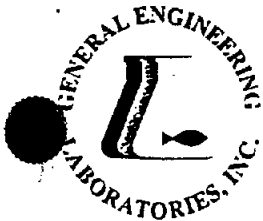
Page 1 of 5

Sample ID : 022888-02 T1096-GP-024-005-S
 Lab ID : 9506422-08
 Matrix : SOIL
 Date Collected : 06/19/95
 Date Received : 06/21/95
 Priority : Routine
 Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Organic Prep											
Evaporative Loss @ 105 C		7.00	1.00	1.00	wt%	1.0	DDT	07/08/95	1745	68630	1
Extractable Organics											
<i>Target Compound List BINIA Compounds - 65 items</i>											
1,2,4-Trichlorobenzene	U	ND	146	331	ug/kg	1.0	JCB	06/29/95	1720	68223	2
1,2-Dichlorobenzene	U	ND	108	331	ug/kg	1.0					
1,3-Dichlorobenzene	U	ND	132	331	ug/kg	1.0					
1,4-Dichlorobenzene	U	ND	127	331	ug/kg	1.0					
2,4,5-Trichlorophenol	U	ND	151	331	ug/kg	1.0					
2,4,6-Trichlorophenol	U	ND	118	331	ug/kg	1.0					
2,4-Dichlorophenol	U	ND	108	331	ug/kg	1.0					
2,4-Dimethylphenol	U	ND	167	331	ug/kg	1.0					
2,4-Dinitrophenol	U	ND	101	1490	ug/kg	1.0					
2,4-Dinitrotoluene	U	ND	128	331	ug/kg	1.0					
2,6-Dinitrotoluene	U	ND	126	331	ug/kg	1.0					
2-Chloronaphthalene	U	ND	110	331	ug/kg	1.0					
2-Chlorophenol	U	ND	115	331	ug/kg	1.0					
2-Methylnaphthalene	U	ND	103	331	ug/kg	1.0					
2-Nitrophenol	U	ND	124	331	ug/kg	1.0					
2-methyl-4,6-dinitrophenol	U	ND	98.0	1650	ug/kg	1.0					
3,3'-Dichlorobenzidine	U	ND	161	1660	ug/kg	1.0					
4-Bromophenyl phenyl ether	U	ND	179	331	ug/kg	1.0					
4-Chloroaniline	U	ND	148	331	ug/kg	1.0					
4-Chlorophenyl phenyl ether	U	ND	147	331	ug/kg	1.0					
4-Nitrophenol	U	ND	71.5	662	ug/kg	1.0					
4-chloro-3-methyl phenol	U	ND	95.0	331	ug/kg	1.0					
Acenaphthene	U	ND	103	331	ug/kg	1.0					
Acenaphthylene	U	ND	117	331	ug/kg	1.0					
Anthracene	U	ND	113	331	ug/kg	1.0					

36





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Laboratory Certifications

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TN	02934	
VA	00151	
WI	99988779	

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 PO Box 5800
 Albuquerque, New Mexico 87185-1331

Contact: Ms. Pamela Puissant

Project Description: RFP #AJ2480

cc: SNLS00295

Report Date: August 01, 1995

Page 2 of 5

Sample ID : 022888-02 T1096-GP-024-005-S

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Benzo(a)anthracene	U	ND	174	331	ug/kg	1.0					
Benzo(a)pyrene	U	ND	166	331	ug/kg	1.0	JCB	06/29/95	1720	68223	2
Benzo(b)fluoranthene	U	ND	196	331	ug/kg	1.0					
Benzo(ghi)perylene	U	ND	277	331	ug/kg	1.0					
Benzo(k)fluoranthene	U	ND	142	331	ug/kg	1.0					
Benzoic Acid	U	ND	110	662	ug/kg	1.0					
Benzyl Alcohol	U	ND	62.2	331	ug/kg	1.0					
Butyl benzyl phthalate	U	ND	154	331	ug/kg	1.0					
Chrysene	U	ND	139	331	ug/kg	1.0					
Di-n-butyl phthalate	U	ND	131	331	ug/kg	1.0					
Di-n-octyl phthalate	U	ND	119	331	ug/kg	1.0					
Dibenzo(a,h)anthracene	U	ND	222	331	ug/kg	1.0					
Dibenzofuran	U	ND	124	331	ug/kg	1.0					
Diethyl phthalate	U	ND	129	331	ug/kg	1.0					
Dimethyl phthalate	U	ND	128	331	ug/kg	1.0					
Fluoranthene	U	ND	151	331	ug/kg	1.0					
Fluorene	U	ND	130	331	ug/kg	1.0					
Hexachlorobenzene	U	ND	188	331	ug/kg	1.0					
Hexachlorobutadiene	U	ND	145	331	ug/kg	1.0					
Hexachlorocyclopentadiene	U	ND	241	331	ug/kg	1.0					
Hexachloroethane	U	ND	117	331	ug/kg	1.0					
Indeno(1,2,3-c,d)pyrene	U	ND	184	331	ug/kg	1.0					
Isophorone	U	ND	87.1	331	ug/kg	1.0					
N-Nitrosodiphenylamine	U	ND	126	331	ug/kg	1.0					
N-Nitrosodipropylamine	U	ND	109	331	ug/kg	1.0					
Naphthalene	U	ND	122	331	ug/kg	1.0					
Nitrobenzene	U	ND	126	331	ug/kg	1.0					
Pentachlorophenol	U	ND	255	331	ug/kg	1.0					
Phenanthrene	U	ND	113	331	ug/kg	1.0					
Phenol	U	ND	110	331	ug/kg	1.0					
Pyrene	U	ND	165	331	ug/kg	1.0					
Bis(2-Chloroethoxy)methane	U	ND	166	331	ug/kg	1.0					
Bis(2-Chloroethyl) ether	U	ND	104	331	ug/kg	1.0					
Bis(2-Chloroisopropyl)ether	U	ND	95.7	331	ug/kg	1.0					
Bis(2-Ethylhexyl)phthalate	U	ND	132	331	ug/kg	1.0					



GENERAL ENGINEERING LABORATORIES

Meeting today's needs with a vision for tomorrow.

Laboratory Certifications

STATE	GEL	EPI
FL	ES7156/87294	ES7472/87458
NC	233	
SC	10120	10582
TN	02934	
VA	00151	
WI	99988779	

CERTIFICATE OF ANALYSIS

Client: Sandia National Laboratories
 PO Box 5800
 Albuquerque, New Mexico 87185-1331

Contact: Ms. Pamela Puissant

Project Description: RFP #AJ2480

cc: SNLS00295

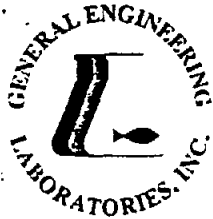
Report Date: August 01, 1995

Page 3 of 5

Sample ID : 022888-02 T1096-GP-024-005-S

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
m,p-Cresol	U	ND	116	331	ug/kg	1.0					
m-Nitroaniline	U	ND	1660	1660	ug/kg	1.0	JCB	06/29/95	1720	68223	2
o-Cresol	U	ND	121	331	ug/kg	1.0					
o-Nitroaniline	U	ND	92.7	331	ug/kg	1.0					
p-Nitroaniline	U	ND	136	331	ug/kg	1.0					
<i>PCB analysis - 7 items</i>											
PCB-1016	U	ND	33.1	41.4	ug/kg	10.	JLS	07/06/95	1741	68302	3
PCB-1221	U	ND	33.1	41.4	ug/kg	10.					
PCB-1232	U	ND	33.1	41.4	ug/kg	10.					
PCB-1242	U	ND	33.1	41.4	ug/kg	10.					
PCB-1248	U	ND	33.1	41.4	ug/kg	10.					
PCB-1254	U	ND	33.1	41.4	ug/kg	10.					
PCB-1260	U	ND	33.1	41.4	ug/kg	10.					
Metals Analysis											
Mercury	J	0.0181	0.00232	0.200	mg/kg	1.0	ADF	07/06/95	1124	68273	4
Silver	U	ND	0.247	0.990	mg/kg	2.0	NRM	06/30/95	0008	68042	5
Aluminum		9350	1.18	4.95	mg/kg	2.0					
Arsenic		3.06	0.184	0.990	mg/kg	2.0					
Barium		118	0.00656	0.990	mg/kg	2.0					
Beryllium	J	0.455	0.00113	0.495	mg/kg	2.0					
Calcium		27300	1.98	9.90	mg/kg	2.0					
Cadmium	J	0.146	0.00960	0.495	mg/kg	2.0					
Cobalt		5.00	0.0174	0.990	mg/kg	2.0					
Chromium		9.09	0.0590	0.990	mg/kg	2.0					
Copper		8.46	0.0534	0.990	mg/kg	2.0					
Iron		13200	1.00	4.95	mg/kg	2.0					
Potassium		1970	0.637	9.90	mg/kg	2.0					
Magnesium		4870	0.233	0.990	mg/kg	2.0					
Manganese		254	0.00952	0.990	mg/kg	2.0					
Sodium		376	1.54	9.90	mg/kg	2.0					
Nickel		8.44	0.0799	0.990	mg/kg	2.0					
Lead		6.29	0.112	0.297	mg/kg	2.0					
Antimony	J	0.131	0.0948	0.990	mg/kg	2.0					
Selenium	U	ND	0.142	0.495	mg/kg	2.0					
Thallium	J	0.494	0.205	0.990	mg/kg	2.0					

33



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WI	99988779	

CERTIFICATE OF ANALYSIS

Client: Sandia National Laboratories
 PO Box 5800
 Albuquerque, New Mexico 87185-1331

Contact: Ms. Pamela Puissant

Project Description: RFP #AJ2480

cc: SNLS00295

Report Date: August 01, 1995

Page 4 of 5

Sample ID : 022888-02 T1096-GP-024-005-S

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Vanadium		30.3	0.0232	0.990	mg/kg	2.0					
Zinc		32.2	0.267	1.98	mg/kg	2.0	NRM	06/30/95	0008	68042	5

The following prep procedures were performed:

GC/MS Extractables

PCB's

Mercury

TRACE

MBB	06/27/95	2345	68223	6
MBB	06/28/95	2300	68302	6
ADF	07/05/95	1500	68273	4
FGD	06/28/95	1300	68042	7

Comments:

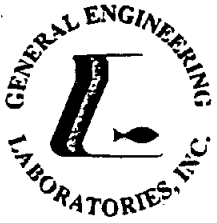
A dilution was required for Metals analysis due to high concentration(s).
 As a result, the detection limits are elevated.

Surrogate Recovery	Test	Percent%	Acceptable Limits
2,4,6-Tribromophenol	TCL SEMIVOA	72.5	(19.0 - 122.)
2-Fluorobiphenyl	TCL SEMIVOA	94.8	(30.0 - 114.)
2-Fluorophenol	TCL SEMIVOA	73.7	(44.0 - 102.)
Nitrobenzene-d5	TCL SEMIVOA	85.2	(23.0 - 120.)
Phenol-d6	TCL SEMIVOA	85.8	(45.0 - 111.)
p-Terphenyl-d14	TCL SEMIVOA	98.8	(52.0 - 135.)
4CMX	PCB	103.	(50.0 - 150.)

M = Method

Method-Description

M 1	EPA 3550
M 2	EPA 8270
M 3	EPA 8080
M 4	EPA 7471
M 5	EPA 6010A



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Report Date: August 01, 1995

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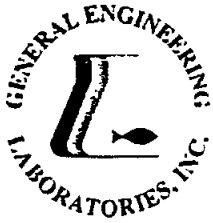
Sample ID : 022888-02 T1096-GP-024-005-S

M = Method	Method-Description
M 6	EPA 3500/3520
M 7	EPA 3050

Data reported in mass/mass units is reported 'as received'.

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Client: Sandia National Laboratories
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Contact: Ms. Pamela Puissant
 Project Description: RFP #AJ2480

cc: SNLS00295

Report Date: July 22, 1995

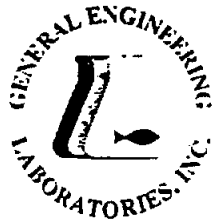
Page 1 of 2

Sample ID : 022888-03 T1096-GP-024-005-S
 Lab ID : 9506422-09
 Matrix : SOIL
 Date Collected : 06/19/95
 Date Received : 06/21/95
 Priority : Routine
 Collector : Client

Parameter	Qualfler	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Radiological											
<i>Alpha Spectroscopy Plutonium - 2 items</i>											
Plutonium-238	U	ND	+/- 0.0109	0.0266	0.0300	pCi/g	1.0	BTM	07/07/95	1733	67828 1
Plutonium-239/240	U	ND	+/- 0	0.00534	0.0300	pCi/g	1.0				
<i>Alpha Spectroscopy Uranium - 3 items</i>											
Uranium-233/234		1.03	+/- 0.112	0.0112	0.0900	pCi/g	1.0	PEM	07/09/95	1501	67830 2
Uranium-235	J	0.0445	+/- 0.0171	0.0112	0.0900	pCi/g	1.0				
Uranium-238		0.894	+/- 0.101	0.0140	0.0900	pCi/g	1.0				

M = Method	Method-Description
M 1	EPI A-012B
M 2	EPI A-011B





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Client: Sandia National Laboratories
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Contact: Ms. Pamela Puissant
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cc: SNLS00295

Report Date: July 22, 1995

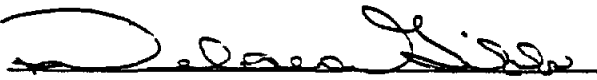
Page 2 of 2

Sample ID : 022888-03 T1096-GP-024-005-S

M = Method

Method-Description

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42

LOCKHEED ANALYTICAL SERVICES

RAD DATA REPORT (ra01)

General Eng. Laboratories, Inc. *Char.SC

Projects indicated for a normal TAT (Project SANDIA '95-30)

Client Sample ID: 022888-04 T1096-GP-024-005-S

LAL Sample ID: L4795-1

Date Collected: 19-JUN-95

Date Received: 22-JUN-95

Matrix: Soil

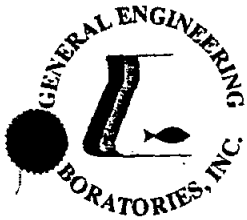
Login Number: L4795

Constituent	Analyzed	Batch	Activity	Error	MDA	DataQual	Units
% Moisture		RAD PERCENT SOLIDS_25076	8.9				%
% Solids		RAD PERCENT SOLIDS_25076	91.				%
Gross Dry Wt.		RAD PERCENT SOLIDS_25076	780				g
Gross Wet Wt.		RAD PERCENT SOLIDS_25076	830				g
Tare Wt.		RAD PERCENT SOLIDS_25076	240				g
H-3	26-JUL-95	TRITIUM(H3) LAL-0067_25074	-10	180	110		pCi/L

INFORMATION ONLY

Attachment C

Equipment Blank Metals Data for ER Site 96



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Client: Sandia National Laboratories
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Contact: Ms. Pamela Puissant

Project Description: RFP #AJ2480A

cc: SNLS00295

Report Date: September 30, 1995

Page 1 of 2

Sample ID : 022883-03 T1096-EB-001-000-W
 Lab ID : 9506378-12
 Matrix : AQUEOUS
 Date Collected : 06/16/95
 Date Received : 06/17/95
 Priority : Routine
 Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Metals Analysis											
Mercury		0.000428	0.0000148	0.000200	mg/l	1.0	ADF	06/30/95	1832	68179	1
Silver	U	ND	0.00249	0.0100	mg/l	1.0	NRM	07/25/95	2248	69688	2
Aluminum	B	0.0549	0.0119	0.0500	mg/l	1.0	WCC	06/30/95	1144	68037	2
Arsenic	U	ND	0.00186	0.0100	mg/l	1.0					
Barium	J	0.000285	0.0000663	0.0100	mg/l	1.0					
Beryllium	J	0.000147	0.0000114	0.00500	mg/l	1.0					
Calcium	J	0.0980	0.0200	0.100	mg/l	1.0					
Cadmium	U	ND	0.0000970	0.00500	mg/l	1.0					
Cobalt	U	ND	0.000176	0.0100	mg/l	1.0					
Chromium	U	ND	0.000596	0.0100	mg/l	1.0					
Copper	U	ND	0.000539	0.0100	mg/l	1.0					
Iron		0.0531	0.0101	0.0500	mg/l	1.0					
Potassium	J	0.0427	0.00643	0.100	mg/l	1.0					
Magnesium	B	0.0111	0.00235	0.0100	mg/l	1.0					
Manganese	JB	0.00117	0.0000962	0.0100	mg/l	1.0					
Sodium		0.152	0.0156	0.100	mg/l	1.0					
Nickel	J	0.00167	0.000807	0.0100	mg/l	1.0					
Lead	U	ND	0.00113	0.00300	mg/l	1.0					
Antimony	U	ND	0.000958	0.0100	mg/l	1.0					
Selenium	U	ND	0.00143	0.00500	mg/l	1.0					
Thallium	U	ND	0.00207	0.0100	mg/l	1.0					
Vanadium	U	ND	0.000234	0.0100	mg/l	1.0					
Zinc		0.0553	0.00270	0.0200	mg/l	1.0					

The following prep procedures were performed:

Mercury
TRACE

ADF 06/29/95 1400 68179 1
 BBJ 06/28/95 1330 68037 3





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Contact: Ms. Pamela Puissant

Project Description: RFP #AJ2480A

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Page 2 of 2

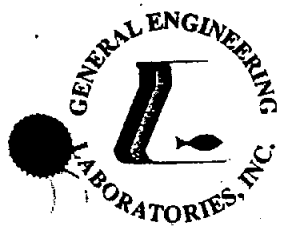
Sample ID : 022883-03 T1096-EB-001-000-W

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
TRACE							FGD	07/25/95	1300	69688	3

M = Method	Method-Description
M 1	EPA 7470
M 2	EPA 6010A
M 3	EPA 3005

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Contact: Ms. Pamela Puissant

Project Description: RFP #AJ2480A

cc: SNLS00295

Report Date: September 30, 1995

Page 1 of 2

Sample ID : 022909-03 T1096-EB-002-000-W
 Lab ID : 9506506-18
 Matrix : AQUEOUS
 Date Collected : 06/22/95
 Date Received : 06/24/95
 Priority : Routine
 Collector : Client

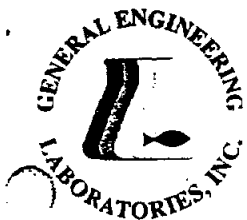
Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Metals Analysis											
Mercury	J	0.0000210	0.0000148	0.000200	mg/l	1.0	ADF	06/30/95	1842	68179	1
Silver	U	ND	0.00249	0.0100	mg/l	1.0	NRM	07/25/95	2306	69688	2
Aluminum	B	0.0979	0.0119	0.0500	mg/l	1.0	WCC	06/30/95	1207	68037	2
Arsenic	U	ND	0.00186	0.0100	mg/l	1.0					
Barium	J	0.000688	0.0000663	0.0100	mg/l	1.0					
Beryllium	J	0.000145	0.0000114	0.00500	mg/l	1.0					
Calcium		0.248	0.0200	0.100	mg/l	1.0					
Cadmium	U	ND	0.0000970	0.00500	mg/l	1.0					
Cobalt	U	ND	0.000176	0.0100	mg/l	1.0					
Chromium	J	0.00139	0.000596	0.0100	mg/l	1.0					
Copper	U	ND	0.000539	0.0100	mg/l	1.0					
Iron		0.160	0.0101	0.0500	mg/l	1.0					
Potassium	J	0.0348	0.00643	0.100	mg/l	1.0					
Magnesium	B	0.0232	0.00235	0.0100	mg/l	1.0					
Manganese	JB	0.00143	0.0000962	0.0100	mg/l	1.0					
Sodium		0.307	0.0156	0.100	mg/l	1.0					
Nickel	J	0.00216	0.000807	0.0100	mg/l	1.0					
Lead	U	ND	0.00113	0.00300	mg/l	1.0					
Antimony	U	ND	0.000958	0.0100	mg/l	1.0					
Selenium	U	ND	0.00143	0.00500	mg/l	1.0					
Thallium	U	ND	0.00207	0.0100	mg/l	1.0					
Vanadium	U	ND	0.000234	0.0100	mg/l	1.0					
Zinc	J	0.00667	0.00270	0.0200	mg/l	1.0					

The following prep procedures were performed:

Mercury
 RACE

ADF 06/29/95 1400 68179 1
 BBJ 06/28/95 1330 68037 3





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VA	00151	
WI	99988779	

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Contact: Ms. Pamela Puissant

Project Description: RFP #AJ2480A

cc: SNLS00295

Report Date: September 30, 1995


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Sample ID : 022909-03 T1096-EB-002-000-W

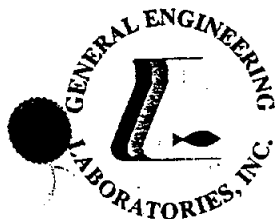
Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
TRACE							FGD	07/25/95	1300	69688	3

M = Method	Method-Description
M 1	EPA 7470
M 2	EPA 6010A
M 3	EPA 3005

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Contact: Ms. Pamela Puissant

Project Description: RFP #AJ2480A

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Page 1 of 2

Sample ID : 022931-03 T1096-EB-003-000-W
 Lab ID : 9506556-51
 Matrix : AQUEOUS
 Date Collected : 06/26/95
 Date Received : 06/28/95
 Priority : Routine
 Collector : Client

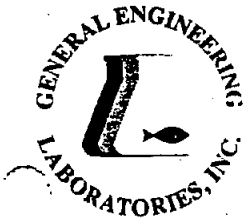
Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Metals Analysis											
Mercury	U	ND	0.0000148	0.000200	mg/l	1.0	ADF	07/07/95	1519	68581	1
Silver	U	ND	0.00249	0.0100	mg/l	1.0	NRM	07/06/95	2055	68474	2
Aluminum	B	0.0513	0.0119	0.0500	mg/l	1.0					
Arsenic	U	ND	0.00186	0.0100	mg/l	1.0					
Barium	JB	0.000861	0.0000663	0.0100	mg/l	1.0					
Beryllium	U	ND	0.0000114	0.00500	mg/l	1.0					
Calcium	B	0.272	0.0200	0.100	mg/l	1.0					
Cadmium	JB	0.00251	0.0000970	0.00500	mg/l	1.0					
Cobalt	U	ND	0.000176	0.0100	mg/l	1.0					
Chromium	J	0.000705	0.000596	0.0100	mg/l	1.0					
Copper	JB	0.00158	0.000539	0.0100	mg/l	1.0					
Iron	J	0.0287	0.0101	0.0500	mg/l	1.0					
Potassium	JB	0.0655	0.00643	0.100	mg/l	1.0					
Magnesium		0.156	0.00235	0.0100	mg/l	1.0					
Manganese	JB	0.000980	0.0000962	0.0100	mg/l	1.0					
Sodium	B	1.73	0.0156	0.100	mg/l	1.0					
Nickel	U	ND	0.000807	0.0100	mg/l	1.0					
Lead	B	0.00461	0.00113	0.00300	mg/l	1.0	NRM	07/14/95	0104	68909	2
Antimony	U	ND	0.000958	0.0100	mg/l	1.0	NRM	07/06/95	2055	68474	2
Selenium	U	ND	0.00143	0.00500	mg/l	1.0					
Thallium	U	ND	0.00207	0.0100	mg/l	1.0					
Vanadium	U	ND	0.000234	0.0100	mg/l	1.0					
Zinc	JB	0.00513	0.00270	0.0200	mg/l	1.0					

The following prep procedures were performed:

Mercury
TRACE

ADF 07/06/95 1530 68581 1
 BBJ 07/03/95 1500 68474 3





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Project Description: RFP #AJ2480A

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Report Date: September 30, 1995


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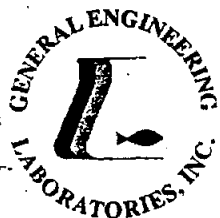
Sample ID : 022931-03 T1096-EB-003-000-W

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
TRACE							FGD	07/12/95	1400	68909	3

M = Method	Method-Description
M 1	EPA 7470
M 2	EPA 6010A
M 3	EPA 3005

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Contact: Ms. Pamela Puissant

Project Description: RFP #AJ2480A

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Report Date: September 30, 1995

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Sample ID : 022931-08 T1096-EB-003-000-W
Lab ID : 9506556-55
Matrix : AQUEOUS
Date Collected : 06/26/95
Date Received : 06/28/95
Priority : Routine
Collector : Client

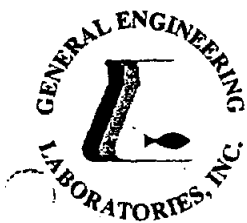
Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
General Chemistry Chromium, Hexavalent	U	ND	0.00500	0.0200	mg/l	1.0	TSM	06/30/95	1145	68387	1

M = Method	Method-Description
M 1	EPA 7196

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Contact: Ms. Pamela Puissant

Project Description: RFP #AJ2480A

cc: SNLS00295

Report Date: September 30, 1995

Page 1 of 2

Sample ID : 022949-03 T1096-EB-004-000-W
 Lab ID : 9506596-43
 Matrix : AQUEOUS
 Date Collected : 06/27/95
 Date Received : 06/29/95
 Priority : Routine
 Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Metals Analysis											
Mercury	U	ND	0.0000148	0.000200	mg/l	1.0	ADF	07/07/95	1524	68581	1
Silver	U	ND	0.00249	0.0100	mg/l	1.0	NRM	07/06/95	2100	68474	2
Aluminum	JB	0.0285	0.0119	0.0500	mg/l	1.0					
Arsenic	U	ND	0.00186	0.0100	mg/l	1.0					
Barium	JB	0.000333	0.0000663	0.0100	mg/l	1.0					
Beryllium	U	ND	0.0000114	0.00500	mg/l	1.0					
Calcium	B	0.103	0.0200	0.100	mg/l	1.0					
Cadmium	JB	0.00244	0.0000970	0.00500	mg/l	1.0					
Cobalt	U	ND	0.000176	0.0100	mg/l	1.0					
Chromium	J	0.000616	0.000596	0.0100	mg/l	1.0					
Copper	UB	ND	0.000539	0.0100	mg/l	1.0					
Iron	J	0.0105	0.0101	0.0500	mg/l	1.0					
Potassium	JB	0.0264	0.00643	0.100	mg/l	1.0					
Magnesium		0.0425	0.00235	0.0100	mg/l	1.0					
Manganese	JB	0.000580	0.0000962	0.0100	mg/l	1.0					
Sodium	B	0.848	0.0156	0.100	mg/l	1.0					
Nickel	U	ND	0.000807	0.0100	mg/l	1.0					
Lead	B	0.00562	0.00113	0.00300	mg/l	1.0	NRM	07/14/95	0109	68909	2
Antimony	U	ND	0.000958	0.0100	mg/l	1.0	NRM	07/06/95	2100	68474	2
Selenium	U	ND	0.00143	0.00500	mg/l	1.0					
Thallium	U	ND	0.00207	0.0100	mg/l	1.0					
Vanadium	U	ND	0.000234	0.0100	mg/l	1.0					
Zinc	JB	0.00356	0.00270	0.0200	mg/l	1.0					

The following prep procedures were performed:

Mercury
TRACE

ADF 07/06/95 1530 68581 1
 BBJ 07/03/95 1500 68474 3





GENERAL ENGINEERING LABORATORIES

Meeting today's needs with a vision for tomorrow.

Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	
VA	00151	
WI	99988779	

CERTIFICATE OF ANALYSIS

Client: Sandia National Laboratories
 PO Box 5800
 Albuquerque, New Mexico 87185-1331

Contact: Ms. Pamela Puissant

Project Description: RFP #AJ2480A

cc: SNLS00295

Report Date: September 30, 1995


Page 2 of 2

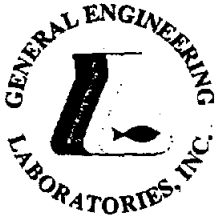
Sample ID : 022949-03 T1096-EB-004-000-W

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
TRACE							FGD	07/12/95	1400	68909	3

M = Method	Method-Description
M 1	EPA 7470
M 2	EPA 6010A
M 3	EPA 3005

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Edie Kent at (803) 769-7385.


 Analytical Report Specialist



GENERAL ENGINEERING LABORATORIES

Meeting today's needs with a vision for tomorrow.

Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	
VA	00151	
WI	99988779	

CERTIFICATE OF ANALYSIS

Client: Sandia National Laboratories
 PO Box 5800
 Albuquerque, New Mexico 87185-1331

Contact: Ms. Pamela Puissant
 Project Description: RFP #AJ2480

cc: SNLS00295

Report Date: July 31, 1995

Page 1 of 2

Sample ID : 022954-03 T1096-EB-005-000-W
 Lab ID : 9507219-18
 Matrix : AQUEOUS
 Date Collected : 07/11/95
 Date Received : 07/13/95
 Priority : Routine
 Collector : Client

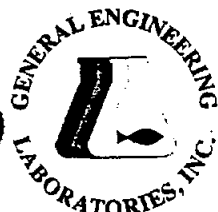
Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Metals Analysis											
Mercury	JB	0.0000810	0.0000148	0.000500	mg/l	1.0	ADF	07/26/95	2139	69543	1
Silver	U	ND	0.00249	0.0100	mg/l	1.0	NRM	07/22/95	0124	69183	2
Aluminum	J	0.0237	0.0119	0.0500	mg/l	1.0					
Arsenic	U	ND	0.00186	0.0100	mg/l	1.0					
Barium	JB	0.000934	0.0000663	0.0100	mg/l	1.0					
Beryllium	U	ND	0.0000114	0.00500	mg/l	1.0					
Calcium		0.229	0.0200	0.100	mg/l	1.0					
Cadmium	U	ND	0.0000970	0.00500	mg/l	1.0					
Cobalt	U	ND	0.000176	0.0100	mg/l	1.0					
Chromium	J	0.00116	0.000596	0.0100	mg/l	1.0					
Copper	J	0.00211	0.000539	0.0100	mg/l	1.0					
Iron		0.0622	0.0101	0.0500	mg/l	1.0					
Potassium	J	0.0347	0.00643	0.100	mg/l	1.0					
Magnesium		0.0172	0.00235	0.0100	mg/l	1.0					
Manganese	J	0.00105	0.0000962	0.0100	mg/l	1.0					
Sodium		0.608	0.0156	0.100	mg/l	1.0					
Nickel		0.0106	0.000807	0.0100	mg/l	1.0					
Lead	U	ND	0.00113	0.00300	mg/l	1.0					
Antimony	UB	ND	0.000958	0.0100	mg/l	1.0					
Selenium	U	ND	0.00143	0.00500	mg/l	1.0					
Thallium	U	ND	0.00207	0.0100	mg/l	1.0					
Vanadium	U	ND	0.000234	0.0100	mg/l	1.0					
Zinc	JB	0.0175	0.00270	0.0200	mg/l	1.0					

The following prep procedures were performed:

Mercury
TRACE

ADF 07/24/95 1700 69543 1
 BBJ 07/19/95 1730 69183 3





GENERAL ENGINEERING LABORATORIES

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	
VA	00151	
WI	99988779	

CERTIFICATE OF ANALYSIS

Client: Sandia National Laboratories
PO Box 5800
Albuquerque, New Mexico 87185-1331

Contact: Ms. Pamela Puissant

Project Description: RFP #AJ2480

cc: SNLS00295

Report Date: July 31, 1995

Page 2 of 2

Sample ID : 022954-03 T1096-EB-005-000-W

M = Method	Method-Description
M1	EPA 7470
M2	EPA 6010A
M3	EPA 3005

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Edie Kent at (803) 769-7385.


Analytical Report Specialist

Attachment D

Attachment D

Gamma Spectroscopy Data for ER Site 96

ER/1302 ~~187~~/DAT
96

(1)

SMO ANALYTICAL DATA ROUTING FORM

Project Name: TAT Phase I

Case Number: 3626400

SNL Task Leader: Miller

Org/Mail Stop: 7582/1347

SMO Project Coordinator: Puisant

Sample Ship Date: 6/16/95

ARCOC

Lab

Lab ID

6/14/95
6/13/95

03717

SNL 7715

500461

03704

"

500453

03702

"

500450

Date Results Received:

Preliminary: _____ Final: 6/19, 6/15, 6/14/95

Corrections Requested From Laboratory: _____ Requestor: _____

Date Corrections Received: _____

COPY
ORIGINAL FILED IN
RECORDS CENTER BY
SMO WDM 7/10/95
(Initials) (Date)

Date Assigned to SMO Reviewer: _____

Reviewer: _____

Date Review Complete: _____

Signature: _____

Date of Preliminary Notification: _____

Person Notified: _____

Date of Final Transmittal: 7/10/95

Transmitted To: Miller

Transmitted By: WDM

Filed In Record Center: WDM

Comments: _____



To be completed by Customer

Shaded areas are for RPSD use only

Customer: <u>D. Miller</u>	Hazards/Special Instructions: <u>please notify 5-10 upon complete @ 845-0867</u>	Batch Log Number: <u>500453</u>
Organization: <u>7582</u>		Logged By: <u>me</u>
Project Location: <u>TA-1</u>		Analysis Type: <input checked="" type="checkbox"/> Gamma Spec
Phone: <u>845-0867</u>		<input type="checkbox"/> H-3
Date Results Needed: <u>6-15-95</u>		<input type="checkbox"/> Alpha/Beta
Suspect Isotopes: _____		<input type="checkbox"/> Alpha Spec
Other Information: <u>03704</u>	LIMS Login: _____	<input type="checkbox"/> Total U
	Results Faxed: _____	<input type="checkbox"/> Other
	Sample Disposal: _____	

Customer Sample ID	Sample Type	Date/Time Collected	Sample Volume	Requested Analysis	RPSD Sample ID	Rad Scan CPM	Sample Weight	Remarks
<u>022858-05</u>	<u>5</u>	<u>6/14/95 9:30</u>	<u>500ml</u>	<u>gamma spec</u>	<u>01</u>	<u>6300</u>	<u>717g</u>	
<u>022859-05</u>	↓	<u>9:45</u>	↓	↓	<u>02</u>	↓	<u>850g</u>	
<u>022860-05</u>	↓	<u>10:50</u>	↓	↓	<u>03</u>	↓	<u>810g</u>	
<u>022861-05</u>	↓	<u>13:00</u>	↓	↓	<u>04</u>	↓	<u>985g</u>	
<u>022862-05</u>	↓	<u>14:50</u>	↓	↓	<u>05</u>	↓	<u>805g</u>	
<u>LCS</u>		<u>1-NOV-90</u>		<u>R spec</u>	<u>06</u>	<u>NA</u>	<u>NA</u>	

Relinquished by [Signature] Date 6-14-95 Time 09:30
 Relinquished by [Signature] Date 6/15/95 Time 1340
 Relinquished by _____ Date _____ Time _____
 Relinquished by _____ Date _____ Time _____

Received by [Signature] Date 6/14/95 Time 09:30
 Received by [Signature] Date 6-15-95 Time 1340
 Received by _____ Date _____ Time _____
 Received by _____ Date _____ Time _____

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [869 Laboratory] *
 * 6-14-95 2:07:20 PM *

* Analyzed by: *Shawn Cole 6/15/95* Reviewed by: *[Signature] 6/15/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022858-05
 Lab Sample ID : 50045301

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 2SMAR
 Sample Quantity : 711.000 gram
 Sample Date/Time : 6-13-95 8:30:00 AM
 Acquire Start Date : 6-14-95 1:34:43 PM
 Detector Name : LAB02
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	6.26
TH-234	Not Detected	-----	7.52E-01
U-234	Not Detected	-----	2.41E+01
RA-226	1.60	1.04	1.59
PB-214	6.70E-01	1.32E-01	1.01E-01
BI-214	6.45E-01	1.34E-01	1.18E-01
PB-210	Not Detected	-----	3.91E+02
TH-232	6.15E-01	2.62E-01	3.52E-01
RA-228	7.80E-01	1.44E-01	2.14E-01
AC-228	9.13E-01	2.26E-01	2.03E-01
TH-228	8.14E-01	3.89E-01	8.44E-01
RA-224	Not Detected	-----	8.98E-01
PB-212	9.05E-01	2.22E-01	8.14E-02
BI-212	Not Detected	-----	9.77E-01
TL-208	6.97E-01	1.62E-01	1.47E-01
U-235	Not Detected	-----	4.47E-01
TH-231	Not Detected	-----	1.11
PA-231	Not Detected	-----	2.47
AC-227	Not Detected	-----	3.28
TH-227	Not Detected	-----	7.18E-01
RA-223	Not Detected	-----	3.80E-01
RN-219	Not Detected	-----	5.26E-01
PB-211	Not Detected	-----	1.24
TL-207	Not Detected	-----	2.68E+01
AM-241	Not Detected	-----	9.90E-01
PU-239	Not Detected	-----	5.27E+02
NP-237	Not Detected	-----	7.18E-01
PA-233	Not Detected	-----	1.11E-01
TH-229	Not Detected	-----	5.73E-01

[Summary Report] - Sample ID: 50045301

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	5.54E-02
AR-41	Not Detected	-----	4.65E+03
BA-133	Not Detected	-----	1.15E-01
BA-140	Not Detected	-----	2.21E-01
CD-109	Not Detected	-----	1.38
CD-115	Not Detected	-----	1.81E-01
CE-139	Not Detected	-----	5.89E-02
CE-141	Not Detected	-----	1.03E-01
CE-144	Not Detected	-----	4.47E-01
CO-56	Not Detected	-----	6.42E-02
CO-57	Not Detected	-----	6.16E-02
CO-58	Not Detected	-----	6.07E-02
CO-60	Not Detected	-----	6.97E-02
CR-51	Not Detected	-----	4.44E-01
CS-134	Not Detected	-----	9.57E-02
CS-137	Not Detected	-----	6.89E-02
CU-64	Not Detected	-----	6.41E+01
EU-152	Not Detected	-----	4.66E-01
EU-154	Not Detected	-----	3.29E-01
EU-155	Not Detected	-----	2.79E-01
FE-59	Not Detected	-----	1.30E-01
GD-153	Not Detected	-----	2.27E-01
HG-203	Not Detected	-----	5.65E-02
I-131	Not Detected	-----	5.52E-02
IN-115m	Not Detected	-----	1.16E+01
IR-192	Not Detected	-----	5.34E-02
K-40	1.56E+01	2.36	6.23E-01
LA-140	Not Detected	-----	1.10E-01
MN-54	Not Detected	-----	6.45E-02
MN-56	Not Detected	-----	1.70E+02
MO-99	Not Detected	-----	6.09E-01
NA-22	Not Detected	-----	8.23E-02
NA-24	Not Detected	-----	2.32E-01
NB-95	Not Detected	-----	4.20E-01
ND-147	Not Detected	-----	4.01E-01
NI-57	Not Detected	-----	1.52E-01
BE-7	Not Detected	-----	4.58E-01
RU-103	Not Detected	-----	4.83E-02
RU-106	Not Detected	-----	5.09E-01
SB-122	Not Detected	-----	9.57E-02
SB-124	Not Detected	-----	5.91E-02
SB-125	Not Detected	-----	1.54E-01
SC-46	Not Detected	-----	9.87E-02
SR-85	Not Detected	-----	7.26E-02
TA-182	Not Detected	-----	2.85E-01
TA-183	Not Detected	-----	1.01
TE-132	Not Detected	-----	7.03E-02
TL-201	Not Detected	-----	3.88E-01
XE-133	Not Detected	-----	3.78E-01
Y-88	Not Detected	-----	4.90E-02
ZN-65	Not Detected	-----	1.92E-01
ZR-95	Not Detected	-----	1.07E-01

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [869 Laboratory] *
 * 6-14-95 2:44:17 PM *

 * Analyzed by: *Sharon Cole 6/15/95* Reviewed by: *[Signature] 6/15/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022859-05
 Lab Sample ID : 50045302

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 2SMAR
 Sample Quantity : 850.000 gram
 Sample Date/Time : 6-13-95 9:45:00 AM
 Acquire Start Date : 6-14-95 2:11:44 PM
 Detector Name : LAB02
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	5.55
TH-234	Not Detected	-----	1.03
U-234	Not Detected	-----	2.10E+01
RA-226	1.63	8.83E-01	1.31
PB-214	7.68E-01	1.42E-01	1.03E-01
BI-214	6.69E-01	1.32E-01	1.13E-01
PB-210	Not Detected	-----	3.36E+02
TH-232	8.79E-01	2.71E-01	3.17E-01
RA-228	7.49E-01	2.60E-01	1.86E-01
AC-228	7.97E-01	1.83E-01	1.39E-01
TH-228	8.41E-01	4.07E-01	8.45E-01
RA-224	Not Detected	-----	7.67E-01
PB-212	7.91E-01	1.96E-01	6.57E-02
BI-212	1.11	5.12E-01	7.01E-01
TL-208	7.17E-01	1.53E-01	1.26E-01
U-235	Not Detected	-----	4.16E-01
TH-231	Not Detected	-----	1.01
PA-231	Not Detected	-----	2.25
AC-227	Not Detected	-----	2.99
TH-227	Not Detected	-----	6.24E-01
RA-223	Not Detected	-----	3.40E-01
RN-219	Not Detected	-----	4.78E-01
PB-211	Not Detected	-----	1.08
TL-207	Not Detected	-----	2.41E+01
AM-241	Not Detected	-----	8.94E-01
PU-239	Not Detected	-----	4.79E+02
NP-237	Not Detected	-----	4.34E-01
PA-233	Not Detected	-----	1.00E-01
TH-229	Not Detected	-----	5.27E-01

[Summary Report] - Sample ID: 50045302

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	4.78E-02
AR-41	Not Detected	-----	3.61E+03
BA-133	Not Detected	-----	1.06E-01
BA-140	Not Detected	-----	1.95E-01
CD-109	Not Detected	-----	1.50
CD-115	Not Detected	-----	1.64E-01
CE-139	Not Detected	-----	5.47E-02
CE-141	Not Detected	-----	9.44E-02
CE-144	Not Detected	-----	3.99E-01
CO-56	Not Detected	-----	5.74E-02
CO-57	Not Detected	-----	5.49E-02
CO-58	Not Detected	-----	5.18E-02
CO-60	Not Detected	-----	5.50E-02
CR-51	Not Detected	-----	4.04E-01
CS-134	Not Detected	-----	8.58E-02
CS-137	Not Detected	-----	5.76E-02
CU-64	Not Detected	-----	5.37E+01
EU-152	Not Detected	-----	4.34E-01
EU-154	Not Detected	-----	3.14E-01
EU-155	Not Detected	-----	2.54E-01
FE-59	Not Detected	-----	1.33E-01
GD-153	Not Detected	-----	2.07E-01
HG-203	Not Detected	-----	5.25E-02
I-131	Not Detected	-----	5.04E-02
IN-115m	Not Detected	-----	9.61
IR-192	Not Detected	-----	4.79E-02
K-40	1.76E+01	2.57	5.55E-01
LA-140	Not Detected	-----	9.41E-02
MN-54	Not Detected	-----	5.51E-02
MN-56	Not Detected	-----	1.28E+02
MO-99	Not Detected	-----	5.69E-01
NA-22	Not Detected	-----	7.58E-02
NA-24	Not Detected	-----	2.09E-01
NB-95	Not Detected	-----	3.65E-01
ND-147	Not Detected	-----	3.77E-01
NI-57	Not Detected	-----	1.30E-01
BE-7	Not Detected	-----	4.13E-01
RU-103	Not Detected	-----	4.59E-02
RU-106	Not Detected	-----	5.20E-01
SB-122	Not Detected	-----	9.35E-02
SB-124	Not Detected	-----	5.35E-02
SB-125	Not Detected	-----	1.39E-01
SC-46	Not Detected	-----	9.26E-02
SR-85	Not Detected	-----	6.10E-02
TA-182	Not Detected	-----	2.70E-01
TA-183	Not Detected	-----	9.23E-01
TE-132	Not Detected	-----	6.21E-02
TL-201	Not Detected	-----	3.48E-01
XE-133	Not Detected	-----	3.38E-01
Y-88	Not Detected	-----	4.52E-02
ZN-65	Not Detected	-----	1.79E-01
ZR-95	Not Detected	-----	1.04E-01

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [869 Laboratory] *
 * 6-14-95 3:21:14 PM *

 * Analyzed by: *George Col 6/15/95* Reviewed by: *JK 6/15/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022860-05
 Lab Sample ID : 50045303

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 2SMAR
 Sample Quantity : 810.000 gram
 Sample Date/Time : 6-13-95 10:50:00 AM
 Acquire Start Date : 6-14-95 2:48:41 PM
 Detector Name : LAB02
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	5.38
TH-234	Not Detected	-----	1.33
U-234	Not Detected	-----	2.08E+01
RA-226	1.23	7.90E-01	1.20
PB-214	6.82E-01	1.32E-01	1.04E-01
BI-214	5.88E-01	1.17E-01	9.11E-02
PB-210	Not Detected	-----	3.38E+02
TH-232	6.63E-01	2.20E-01	2.59E-01
RA-228	6.89E-01	2.18E-01	2.25E-01
AC-228	7.96E-01	1.99E-01	1.83E-01
TH-228	8.89E-01	4.04E-01	7.99E-01
RA-224	1.75	4.64E-01	7.25E-01
PB-212	7.80E-01	1.54E-01	6.97E-02
BI-212	1.05	4.01E-01	4.72E-01
TL-208	6.17E-01	1.41E-01	1.22E-01
U-235	Not Detected	-----	3.95E-01
TH-231	Not Detected	-----	1.02
PA-231	Not Detected	-----	2.24
AC-227	Not Detected	-----	2.90
TH-227	Not Detected	-----	6.37E-01
RA-223	Not Detected	-----	3.47E-01
RN-219	Not Detected	-----	4.24E-01
PB-211	Not Detected	-----	1.15
TL-207	Not Detected	-----	2.26E+01
AM-241	Not Detected	-----	8.70E-01
PU-239	Not Detected	-----	4.50E+02
NP-237	Not Detected	-----	6.76E-01
PA-233	Not Detected	-----	1.00E-01
TH-229	Not Detected	-----	4.86E-01

[Summary Report] - Sample ID: 50045303

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	5.31E-02
AR-41	Not Detected	-----	3.38E+03
BA-133	Not Detected	-----	1.07E-01
BA-140	Not Detected	-----	2.04E-01
CD-109	Not Detected	-----	2.32
CD-115	Not Detected	-----	1.54E-01
CE-139	Not Detected	-----	5.34E-02
CE-141	Not Detected	-----	9.12E-02
CE-144	Not Detected	-----	3.91E-01
CO-56	Not Detected	-----	5.52E-02
CO-57	Not Detected	-----	5.51E-02
CO-58	Not Detected	-----	5.41E-02
CO-60	Not Detected	-----	6.33E-02
CR-51	Not Detected	-----	3.80E-01
CS-134	Not Detected	-----	8.43E-02
CS-137	Not Detected	-----	5.89E-02
CU-64	Not Detected	-----	5.95E+01
EU-152	Not Detected	-----	4.04E-01
EU-154	Not Detected	-----	3.06E-01
EU-155	Not Detected	-----	2.43E-01
FE-59	Not Detected	-----	1.21E-01
GD-153	Not Detected	-----	1.92E-01
HG-203	Not Detected	-----	4.85E-02
I-131	Not Detected	-----	4.94E-02
IN-115m	Not Detected	-----	8.46
IR-192	Not Detected	-----	4.62E-02
K-40	1.62E+01	2.39	3.29E-01
LA-140	Not Detected	-----	8.15E-02
MN-54	Not Detected	-----	5.70E-02
MN-56	Not Detected	-----	1.09E+02
MO-99	Not Detected	-----	5.54E-01
NA-22	Not Detected	-----	8.10E-02
NA-24	Not Detected	-----	2.12E-01
NB-95	Not Detected	-----	3.69E-01
ND-147	Not Detected	-----	3.46E-01
NI-57	Not Detected	-----	1.44E-01
BE-7	Not Detected	-----	4.01E-01
RU-103	Not Detected	-----	4.80E-02
RU-106	Not Detected	-----	4.93E-01
SB-122	Not Detected	-----	8.57E-02
SB-124	Not Detected	-----	5.09E-02
SB-125	Not Detected	-----	1.40E-01
SC-46	Not Detected	-----	9.06E-02
SR-85	Not Detected	-----	6.40E-02
TA-182	Not Detected	-----	2.64E-01
TA-183	Not Detected	-----	8.88E-01
TE-132	Not Detected	-----	5.91E-02
TL-201	Not Detected	-----	3.37E-01
XE-133	Not Detected	-----	3.37E-01
Y-88	Not Detected	-----	4.18E-02
ZN-65	Not Detected	-----	1.81E-01
ZR-95	Not Detected	-----	9.61E-02

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [869 Laboratory] *
 * 6-14-95 3:58:43 PM *

 * Analyzed by: *George Col 6/15/95* Reviewed by: *JR 6/15/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022861-05
 Lab Sample ID : 50045304

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 2SMAR
 Sample Quantity : 985.000 gram
 Sample Date/Time : 6-13-95 1:00:00 PM
 Acquire Start Date : 6-14-95 3:26:17 PM
 Detector Name : LAB02
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	4.72
TH-234	Not Detected	-----	1.13
U-234	Not Detected	-----	1.66E+01
RA-226	1.53	7.74E-01	1.14
PB-214	6.36E-01	1.21E-01	9.57E-02
BI-214	5.09E-01	1.01E-01	8.13E-02
PB-210	Not Detected	-----	3.02E+02
TH-232	4.88E-01	1.72E-01	2.09E-01
RA-228	7.59E-01	3.65E-01	1.72E-01
AC-228	Not Detected	-----	2.94E-01
TH-228	1.09	4.30E-01	7.03E-01
RA-224	1.47	3.86E-01	5.81E-01
PB-212	7.24E-01	1.40E-01	5.81E-02
BI-212	5.72E-01	4.14E-01	6.26E-01
TL-208	5.36E-01	1.25E-01	1.18E-01
U-235	Not Detected	-----	3.63E-01
TH-231	Not Detected	-----	9.01E-01
PA-231	Not Detected	-----	1.87
AC-227	Not Detected	-----	2.59
TH-227	Not Detected	-----	5.45E-01
RA-223	Not Detected	-----	3.06E-01
RN-219	Not Detected	-----	4.15E-01
PB-211	Not Detected	-----	9.68E-01
TL-207	Not Detected	-----	1.92E+01
AM-241	Not Detected	-----	7.29E-01
PU-239	Not Detected	-----	4.16E+02
NP-237	Not Detected	-----	5.69E-01
PA-233	Not Detected	-----	8.19E-02
TH-229	Not Detected	-----	4.42E-01

[Summary Report] - Sample ID: 50045304

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	4.46E-02
AR-41	Not Detected	-----	1.51E+03
BA-133	Not Detected	-----	9.16E-02
BA-140	Not Detected	-----	1.59E-01
CD-109	Not Detected	-----	1.87
CD-115	Not Detected	-----	1.29E-01
CE-139	Not Detected	-----	4.81E-02
CE-141	Not Detected	-----	8.28E-02
CE-144	Not Detected	-----	3.65E-01
CO-56	Not Detected	-----	4.63E-02
CO-57	Not Detected	-----	4.68E-02
CO-58	Not Detected	-----	4.84E-02
CO-60	Not Detected	-----	5.07E-02
CR-51	Not Detected	-----	3.38E-01
CS-134	Not Detected	-----	7.15E-02
CS-137	Not Detected	-----	5.08E-02
CU-64	Not Detected	-----	4.36E+01
EU-152	Not Detected	-----	3.47E-01
EU-154	Not Detected	-----	2.62E-01
EU-155	Not Detected	-----	2.16E-01
FE-59	Not Detected	-----	1.07E-01
GD-153	Not Detected	-----	1.75E-01
HG-203	Not Detected	-----	4.55E-02
I-131	Not Detected	-----	4.57E-02
IN-115m	Not Detected	-----	5.71
IR-192	Not Detected	-----	3.87E-02
K-40	1.38E+01	2.03	3.60E-01
LA-140	Not Detected	-----	6.73E-02
MN-54	2.37E-02	1.91E-02	2.88E-02
MN-56	Not Detected	-----	6.03E+01
MO-99	Not Detected	-----	4.59E-01
NA-22	Not Detected	-----	6.18E-02
NA-24	Not Detected	-----	1.65E-01
NB-95	Not Detected	-----	3.12E-01
ND-147	Not Detected	-----	2.78E-01
NI-57	Not Detected	-----	1.15E-01
BE-7	Not Detected	-----	3.67E-01
RU-103	Not Detected	-----	3.86E-02
RU-106	Not Detected	-----	4.03E-01
SB-122	Not Detected	-----	7.51E-02
SB-124	Not Detected	-----	4.60E-02
SB-125	Not Detected	-----	1.15E-01
SC-46	Not Detected	-----	7.00E-02
SR-85	Not Detected	-----	5.45E-02
TA-182	Not Detected	-----	2.06E-01
TA-183	Not Detected	-----	7.39E-01
TE-132	Not Detected	-----	5.13E-02
TL-201	Not Detected	-----	2.91E-01
XE-133	Not Detected	-----	2.84E-01
Y-88	Not Detected	-----	4.07E-02
ZN-65	Not Detected	-----	1.39E-01
ZR-95	Not Detected	-----	8.02E-02

Not detected me

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [869 Laboratory] *
 * 6-14-95 4:35:29 PM *

 * Analyzed by: *Spencer Cole 9/15/95* Reviewed by: *[Signature] 2/15/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022862-05
 Lab Sample ID : 50045305

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 2SMAR
 Sample Quantity : 805.000 gram
 Sample Date/Time : 6-13-95 2:50:00 PM
 Acquire Start Date : 6-14-95 4:03:02 PM
 Detector Name : LAB02
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	5.62
TH-234	Not Detected	-----	1.31
U-234	Not Detected	-----	1.78E+01
RA-226	1.14	6.00E-01	8.69E-01
PB-214	6.55E-01	1.26E-01	9.36E-02
BI-214	5.52E-01	1.21E-01	1.15E-01
PB-210	Not Detected	-----	3.32E+02
TH-232	6.10E-01	2.22E-01	2.77E-01
RA-228	5.37E-01	2.56E-01	2.52E-01
AC-228	Not Detected	-----	3.23E-01
TH-228	8.53E-01	4.09E-01	7.82E-01
RA-224	Not Detected	-----	7.57E-01
PB-212	7.50E-01	1.89E-01	6.58E-02
BI-212	3.55E-01	3.60E-01	5.65E-01
TL-208	6.51E-01	1.53E-01	1.45E-01
U-235	Not Detected	-----	4.16E-01
TH-231	Not Detected	-----	1.06
PA-231	Not Detected	-----	2.10
AC-227	Not Detected	-----	2.82
TH-227	Not Detected	-----	6.01E-01
RA-223	Not Detected	-----	3.53E-01
RN-219	Not Detected	-----	4.63E-01
PB-211	Not Detected	-----	1.14
TL-207	Not Detected	-----	2.21E+01
AM-241	Not Detected	-----	9.00E-01
PU-239	Not Detected	-----	4.63E+02
NP-237	Not Detected	-----	6.52E-01
PA-233	Not Detected	-----	9.49E-02
TH-229	Not Detected	-----	5.04E-01

[Summary Report] - Sample ID: 50045305

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	5.18E-02
AR-41	Not Detected	-----	1.10E+03
BA-133	Not Detected	-----	1.03E-01
BA-140	Not Detected	-----	1.94E-01
CD-109	Not Detected	-----	2.18
CD-115	Not Detected	-----	1.49E-01
CE-139	Not Detected	-----	5.10E-02
CE-141	Not Detected	-----	9.42E-02
CE-144	Not Detected	-----	4.12E-01
CO-56	Not Detected	-----	6.06E-02
CO-57	Not Detected	-----	5.52E-02
CO-58	Not Detected	-----	5.28E-02
CO-60	Not Detected	-----	5.94E-02
CR-51	Not Detected	-----	3.91E-01
CS-134	Not Detected	-----	8.11E-02
CS-137	Not Detected	-----	6.02E-02
CU-64	Not Detected	-----	5.34E+01
EU-152	Not Detected	-----	4.39E-01
EU-154	Not Detected	-----	2.87E-01
EU-155	Not Detected	-----	2.49E-01
FE-59	Not Detected	-----	1.32E-01
GD-153	Not Detected	-----	2.01E-01
HG-203	Not Detected	-----	5.06E-02
I-131	Not Detected	-----	4.91E-02
IN-115m	Not Detected	-----	5.53
IR-192	Not Detected	-----	4.48E-02
K-40	1.586E+01	2.72	5.20E-01
LA-140	Not Detected	-----	9.99E-02
MN-54	Not Detected	-----	5.93E-02
MN-56	Not Detected	-----	5.69E+01
MO-99	Not Detected	-----	5.79E-01
NA-22	Not Detected	-----	7.44E-02
NA-24	Not Detected	-----	1.83E-01
NB-95	Not Detected	-----	3.41E-01
ND-147	Not Detected	-----	3.63E-01
NI-57	Not Detected	-----	1.36E-01
BE-7	Not Detected	-----	4.18E-01
RU-103	Not Detected	-----	4.78E-02
RU-106	Not Detected	-----	4.78E-01
SB-122	Not Detected	-----	9.12E-02
SB-124	Not Detected	-----	4.99E-02
SB-125	Not Detected	-----	1.42E-01
SC-46	Not Detected	-----	8.59E-02
SR-85	Not Detected	-----	6.25E-02
TA-182	Not Detected	-----	2.56E-01
TA-183	Not Detected	-----	9.02E-01
TE-132	Not Detected	-----	5.68E-02
TL-201	Not Detected	-----	3.22E-01
XE-133	Not Detected	-----	3.24E-01
Y-88	Not Detected	-----	3.95E-02
ZN-65	Not Detected	-----	1.69E-01
ZR-95	Not Detected	-----	9.39E-02

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [869 Laboratory] *
 * 6-14-95 4:53:41 PM *

 * Analyzed by: *James Cole 6/15/95* Reviewed by: *JR 6/15/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : LAB CONTROL SAMPLE ANALYSIS #CG1
 Lab Sample ID : 50045306

Sample Description : MIXED GAMMA STANDARD
 Sample Type : Liquid
 Sample Geometry : WMAR
 Sample Quantity : 1.000 Each
 Sample Date/Time : 11-01-90 12:00:00 PM
 Acquire Start Date : 6-14-95 4:41:29 PM
 Detector Name : LAB02
 Elapsed Live Time : 600 seconds
 Elapsed Real Time : 606 seconds

Comments:

Nuclide	Activity (pCi/Each)	2S Error	MDA
U-238	Not Detected	-----	2.63E+04
TH-234	Not Detected	-----	5.30E+03
U-234	Not Detected	-----	1.27E+05
RA-226	Not Detected	-----	6.65E+03
PB-214	Not Detected	-----	7.48E+02
BI-214	Not Detected	-----	6.73E+02
PB-210	Not Detected	-----	6.72E+06
TH-232	Not Detected	-----	2.20E+03
RA-228	Not Detected	-----	3.00E+03
AC-228	Not Detected	-----	1.86E+03
TH-228	Not Detected	-----	4.07E+04
RA-224	Not Detected	-----	3.34E+04
PB-212	Not Detected	-----	3.06E+03
BI-212	Not Detected	-----	2.72E+04
TL-208	Not Detected	-----	5.45E+03
U-235	Not Detected	-----	1.95E+03
TH-231	Not Detected	-----	4.38E+03
PA-231	Not Detected	-----	1.06E+04
AC-227	Not Detected	-----	1.72E+04
TH-227	Not Detected	-----	2.57E+03
RA-223	Not Detected	-----	1.00E+26
RN-219	Not Detected	-----	3.23E+03
PB-211	Not Detected	-----	9.61E+03
TL-207	Not Detected	-----	2.35E+05
AM-241	9.91E+04	1.93E+04	6.83E+03
PU-239	Not Detected	-----	2.29E+06
NP-237	Not Detected	-----	3.04E+03
PA-233	Not Detected	-----	6.67E+02
TH-229	Not Detected	-----	2.41E+03

[Summary Report] - Sample ID: 50045306

Nuclide	Activity (pCi/Each)	2S Error	MDA
AG-110m	Not Detected	-----	1.76E+05
AR-41	Not Detected	-----	1.00E+26
BA-133	Not Detected	-----	5.92E+02
BA-140	Not Detected	-----	1.00E+26
CD-109	3.49E+05	1.06E+05	1.35E+05
CD-115	Not Detected	-----	1.00E+26
CE-139	Not Detected	-----	1.32E+06
CE-141	Not Detected	-----	1.84E+18
CE-144	Not Detected	-----	1.21E+05
CO-56	Not Detected	-----	1.62E+09
CO-57	1.07E+04	1.55E+04	2.51E+04
CO-58	Not Detected	-----	5.65E+09
CO-60	7.63E+04	9.91E+03	5.19E+02
CR-51	Not Detected	-----	5.38E+21
CS-134	Not Detected	-----	1.53E+03
CS-137	7.09E+04	9.14E+03	4.69E+02
CU-64	Not Detected	-----	1.00E+26
EU-152	Not Detected	-----	3.67E+03
EU-154	Not Detected	-----	2.41E+03
EU-155	Not Detected	-----	2.34E+03
FE-59	Not Detected	-----	2.46E+14
GD-153	Not Detected	-----	1.17E+05
HG-203	Not Detected	-----	2.40E+13
I-131	Not Detected	-----	1.00E+26
IN-115m	Not Detected	-----	1.00E+26
IR-192	Not Detected	-----	2.31E+09
K-40	Not Detected	-----	1.75E+03
LA-140	Not Detected	-----	1.00E+26
MN-54	Not Detected	-----	1.75E+04
MN-56	Not Detected	-----	1.00E+26
MO-99	Not Detected	-----	1.00E+26
NA-22	Not Detected	-----	8.55E+02
NA-24	Not Detected	-----	1.00E+26
NB-95	Not Detected	-----	1.00E+26
ND-147	Not Detected	-----	1.00E+26
NI-57	Not Detected	-----	1.00E+26
BE-7	Not Detected	-----	1.17E+13
RU-103	Not Detected	-----	3.12E+15
RU-106	Not Detected	-----	7.79E+04
SB-122	Not Detected	-----	1.00E+26
SB-124	Not Detected	-----	8.75E+10
SB-125	Not Detected	-----	3.78E+03
SC-46	Not Detected	-----	5.61E+08
SR-85	Not Detected	-----	2.61E+10
TA-182	Not Detected	-----	3.67E+07
TA-183	Not Detected	-----	1.00E+26
TE-132	Not Detected	-----	1.00E+26
TL-201	Not Detected	-----	1.00E+26
XE-133	Not Detected	-----	1.00E+26
Y-88	Not Detected	-----	1.24E+07
ZN-65	Not Detected	-----	1.23E+05
ZR-95	Not Detected	-----	5.62E+10

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program *
 * Quality Assurance Report *

Report Date : 6-14-95 4:56:43 PM
 QA File : C:\GENIEPC\CAMFILES\LCS2.QAF
 Analyst : FCD
 Sample ID : 50045306
 Sample Quantity : 1.00 Each
 Sample Date : 11-01-90 12:00:00 PM
 Measurement Date : 6-14-95 4:41:29 PM
 Elapsed Live Time : 600 seconds
 Elapsed Real Time : 606 seconds

Parameter	Mean	1S Error	New Value	< LU : SD : UD : BS >
AM-241 Activity	9.688E-02	1.081E-02	9.915E-02	< : (In) ^{O.K} _{inc} > 6/15/95
CS-137 Activity	6.919E-02	5.636E-03	7.086E-02	< : : : >
CO-60 Activity	7.660E-02	6.099E-03	7.658E-02	< : : : >

Flags Key: LU = Boundary Test (Ab = Above, Be = Below)
 SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
 UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
 BS = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: Spencer Cole 6/15/95

ER/1302 096/DAT

2

SMO ANALYTICAL DATA ROUTING FORM

Project Name: TAT Phase I

Case Number: 3626400

SNL Task Leader: Miller

Org/Mail Stop: 7582/1347

SMO Project Coordinator: Puissant

Sample Ship Date: 6/20/95

ARCOC

Lab

Lab ID

03720

SNL 7715

500469

03714

"

500455

03715

"

500460

6/15/95
6/16/95

Date Results Received:

Preliminary: _____ Final: 6/21, 6/16, 6/19/95

Corrections Requested From Laboratory: _____ Requestor: _____

Date Corrections Received: _____

Date Assigned to SMO Reviewer: _____

Date Review Complete: _____

Date of Preliminary Notification: _____

Date of Final Transmittal: 7/10/95

Transmitted By: DM

Reviewer: _____

Signature: _____

Person Notified: _____

Transmitted To: Miller

Filed In Record Center: DM

COPY
ORIGINAL FILED IN
RECORDS CENTER BY
SMO DM 7/10/95
(initials) (date)

Comments: _____

ANALYSIS REQUEST AND CHAIN OF CUSTODY

1001-COC (9-94)

500455

AR/COC- 03714

Dept. No./Mail Stop: 7582/1347
 Project/Task Manager: D. Miller / H. Fleck
 Project Name: T-1 Soil Sampling (Phase 1)
 Record Center Code: ADS 1302 ER Site 96
 Logbook Ref No: 0133
 SMO Reference No.: CF0089

Date Samples Shipped: 6/15/95
 Carrier/Waybill No: HC 111
 Lab Contact: Amir M.
 Lab Destination: 7315
 SMO Contact/Phone: D. "Mac" McLaughlin / 845-0967
 Send Report to SMO: Deborah McLaughlin

Contract No.: 1111
 Case No.: 3626-400
 SMO Authorization: [Signature]
 Bill to: Sandia National Laboratories
 Supplier Services Department
 P.O. Box 5800 MS 0154
 Albuquerque, NM 87185-0154

Parameter & Method Requested									

Location Tech Area 1

Building 802 Room outside

Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Sample Matrix	Container Type	Volume	Preservative	Sample Collection Method	Sample Type	Lab Sample ID
22864-05	T1096-GP-006-008-S	11'9"	96	6/14/95 - 8:30	S	P	500ml	None	G	St	X
22865-05	T1096-GP-007-008-S	8'2"		9:45							X
22866-05	T1096-GP-008-008-S	7'6"		11:35							X
22867-05	T1096-GP-009-010-S	13'9"		13:00							X
22868-05	T1096-GP-010-009-S	12'8"		14:15							X

Reference LOV (available at SMO)

Container		Sample Collection Method	Sample Type	Lab Sample ID
Type	Volume			
P	500ml	G	St	X

Gamma Spec

RMMA Yes No Ref. No. _____
 Sample Disposal Return to Client Disposal by lab
 Turnaround Time Normal Rush Required Report Date _____

Sample Tracking
 Date Entered (mm/dd/yy): 6/2/95
 Entered by: [Signature]
 QC Inits: _____

Special Instructions/QC Requirements

Abnormal Conditions on Receipt

Sample Team Members	Name	Signature	Init	Company/Organization
	Matthew Strain	<u>[Signature]</u>	MS	IT corp / 7582
	Cathie Gober	<u>[Signature]</u>	CG	Sandia / 7582

Relinquished by <u>Matthew Strain</u> Org. <u>7582</u> Date <u>6/14/95</u> Time <u>15:50</u>	4. Relinquished by _____ Org. _____ Date _____ Time _____
Received by <u>John Rice</u> Org. <u>7513</u> Date <u>6/14/95</u> Time <u>15:50</u>	4. Received by _____ Org. _____ Date _____ Time _____
Relinquished by <u>[Signature]</u> Org. <u>SML 7513</u> Date <u>6-15-95</u> Time <u>1003</u>	5. Relinquished by _____ Org. _____ Date _____ Time _____
Received by <u>[Signature]</u> Org. <u>SML 7715</u> Date <u>6/15/95</u> Time <u>1003</u>	5. Received by _____ Org. _____ Date _____ Time _____
Relinquished by <u>[Signature]</u> Org. <u>SML 7715</u> Date <u>6/16/95</u> Time <u>1430</u>	6. Relinquished by _____ Org. _____ Date _____ Time _____
Received by <u>[Signature]</u> Org. <u>SML 7513</u> Date <u>6-16-95</u> Time <u>1430</u>	6. Received by _____ Org. _____ Date _____ Time _____

WHITE - To Accompany Samples, Laboratory Copy BLUE - To Accompany Samples, Return to SMO YELLOW - SMO Suspense Copy PINK - Field Copy



To be completed by Customer

Shaded areas are for RPSD use only

Customer: <u>D. Miller</u>	Hazards/Special Instructions: <u>Please notify SMO upon completion @ 845-0867</u>	Batch Log Number: <u>500455</u>
Organization: <u>7582</u>		Logged By: <u>FW</u>
Project Location: <u>TA-1</u>		Analysis Type: <input checked="" type="checkbox"/> Gamma Spec
Phone: <u>845-0867</u>		<input type="checkbox"/> H-3
Date Results Needed: <u>6-16-95</u>		<input type="checkbox"/> Alpha/Beta
Suspect Isotopes: _____		<input type="checkbox"/> Alpha Spec
Other Information: <u>03714</u>	LIMS Login _____	<input type="checkbox"/> Total U
	Results Faxed _____	<input type="checkbox"/> Other
	Sample Disposal _____	

Customer Sample ID	Sample Type	Date/Time Collected	Sample Volume	Requested Analysis	RPSD Sample ID	Rad Scan CPM	Sample Weight	Remarks
022864-05	5	6/14/95 - 8:20	500ml	Gamma Spec	01	~300	957g	
022865-05	↓	9:45	↓	↓	02	↓	643g	
022866-05	↓	11:35	↓	↓	03	↓	576g	
022867-05	↓	13:00	↓	↓	04	~300	929g	
LCS		14:00:50		γ spec	05	NA	NA	

Relinquished by <u>[Signature]</u>	Date <u>6-15-95</u>	Time <u>1003</u>	Received by <u>[Signature]</u>	Date <u>6/15/95</u>	Time <u>1003</u>
Relinquished by <u>[Signature]</u>	Date <u>6/16/95</u>	Time <u>1430</u>	Received by _____	Date _____	Time _____
Relinquished by _____	Date _____	Time _____	Received by _____	Date _____	Time _____
Relinquished _____	Date _____	Time _____	Received by _____	Date _____	Time _____

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-15-95 3:34:58 PM *

 * Analyzed by: *W 6/16/95* Reviewed by: *W 6/16/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022864-05
 Lab Sample ID : 50045501

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 2SMAR
 Sample Quantity : 957.000 gram
 Sample Date/Time : 6-14-95 8:20:00 AM
 Acquire Start Date : 6-15-95 3:00:29 PM
 Detector Name : LAB02
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	5.12
TH-234	Not Detected	-----	1.18
U-234	Not Detected	-----	1.91E+01
RA-226	1.23	7.73E-01	1.17
PB-214	6.28E-01	1.29E-01	1.20E-01
BI-214	5.52E-01	1.10E-01	9.21E-02
PB-210	Not Detected	-----	3.13E+02
TH-232	5.71E-01	1.91E-01	2.27E-01
RA-228	5.06E-01	4.94E-01	2.64E-01
AC-228	6.44E-01	1.86E-01	2.10E-01
TH-228	6.72E-01	3.28E-01	6.98E-01
RA-224	Not Detected	-----	7.08E-01
PB-212	6.77E-01	1.34E-01	6.59E-02
BI-212	6.69E-01	4.33E-01	6.43E-01
TL-208	6.17E-01	1.43E-01	1.38E-01
U-235	Not Detected	-----	3.86E-01
TH-231	Not Detected	-----	9.43E-01
PA-231	Not Detected	-----	2.02
AC-227	Not Detected	-----	2.66
TH-227	Not Detected	-----	5.59E-01
RA-223	Not Detected	-----	3.25E-01
RN-219	Not Detected	-----	4.65E-01
PB-211	Not Detected	-----	1.04
TL-207	Not Detected	-----	2.26E+01
AM-241	Not Detected	-----	7.97E-01
PU-239	Not Detected	-----	4.24E+02
NP-237	Not Detected	-----	5.98E-01
PA-233	Not Detected	-----	9.26E-02
TH-229	Not Detected	-----	4.92E-01

[Summary Report] - Sample ID: 50045501

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	4.70E-02
AR-41	Not Detected	-----	8.72E+03
BA-133	Not Detected	-----	9.62E-02
BA-140	Not Detected	-----	1.80E-01
CD-109	Not Detected	-----	1.27
CD-115	Not Detected	-----	1.48E-01
CE-139	Not Detected	-----	4.80E-02
CE-141	Not Detected	-----	8.82E-02
CE-144	Not Detected	-----	3.81E-01
CO-56	Not Detected	-----	5.54E-02
CO-57	Not Detected	-----	4.98E-02
CO-58	Not Detected	-----	4.66E-02
CO-60	Not Detected	-----	6.01E-02
CR-51	Not Detected	-----	3.69E-01
CS-134	Not Detected	-----	7.73E-02
CS-137	Not Detected	-----	5.36E-02
CU-64	Not Detected	-----	6.41E+01
EU-152	Not Detected	-----	3.88E-01
EU-154	Not Detected	-----	2.78E-01
EU-155	Not Detected	-----	2.33E-01
FE-59	Not Detected	-----	1.19E-01
GD-153	Not Detected	-----	1.95E-01
HG-203	Not Detected	-----	4.89E-02
I-131	Not Detected	-----	4.80E-02
IN-115m	Not Detected	-----	1.19E+01
IR-192	Not Detected	-----	4.41E-02
K-40	2.12E+01	3.01	5.05E-01
LA-140	Not Detected	-----	8.59E-02
MN-54	Not Detected	-----	3.06E-02
MN-56	Not Detected	-----	2.25E+02
MO-99	Not Detected	-----	5.57E-01
NA-22	Not Detected	-----	7.47E-02
NA-24	Not Detected	-----	2.16E-01
NB-95	Not Detected	-----	3.30E-01
ND-147	Not Detected	-----	3.25E-01
NI-57	Not Detected	-----	1.41E-01
BE-7	Not Detected	-----	3.71E-01
RU-103	Not Detected	-----	4.12E-02
RU-106	Not Detected	-----	4.38E-01
SB-122	Not Detected	-----	8.88E-02
SB-124	Not Detected	-----	4.94E-02
SB-125	Not Detected	-----	1.28E-01
SC-46	Not Detected	-----	7.99E-02
SR-85	Not Detected	-----	5.91E-02
TA-182	Not Detected	-----	2.31E-01
TA-183	Not Detected	-----	8.25E-01
TE-132	Not Detected	-----	5.92E-02
TL-201	Not Detected	-----	3.20E-01
XE-133	Not Detected	-----	3.19E-01
Y-88	Not Detected	-----	4.19E-02
ZN-65	Not Detected	-----	1.57E-01
ZR-95	Not Detected	-----	8.79E-02

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-15-95 6:44:56 PM *

 * Analyzed by: *JR* 6/16/95 Reviewed by: *JR* 6/16/95 *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022865-05
 Lab Sample ID : 50045502

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 2SMAR
 Sample Quantity : 643.000 gram
 Sample Date/Time : 6-14-95 9:45:00 AM
 Acquire Start Date : 6-15-95 6:12:35 PM
 Detector Name : LAB02
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	6.30
TH-234	5.59E-01	8.26E-01	1.32
U-234	Not Detected	-----	2.32E+01
RA-226	8.63E-01	5.18E-01	7.57E-01
PB-214	5.63E-01	1.28E-01	1.24E-01
BI-214	5.31E-01	1.19E-01	1.05E-01
PB-210	Not Detected	-----	3.73E+02
TH-232	5.08E-01	2.39E-01	3.27E-01
RA-228	4.92E-01	2.75E-01	3.91E-01
AC-228	Not Detected	-----	3.74E-01
TH-228	8.57E-01	4.85E-01	9.44E-01
RA-224	2.01	5.62E-01	7.94E-01
PB-212	7.25E-01	1.74E-01	7.06E-02
BI-212	8.88E-01	5.43E-01	7.89E-01
TL-208	5.11E-01	1.46E-01	1.57E-01
U-235	Not Detected	-----	4.52E-01
TH-231	Not Detected	-----	1.07
PA-231	Not Detected	-----	2.46
AC-227	Not Detected	-----	3.27
TH-227	Not Detected	-----	6.71E-01
RA-223	Not Detected	-----	3.72E-01
RN-219	Not Detected	-----	5.36E-01
PB-211	Not Detected	-----	1.31
TL-207	Not Detected	-----	2.75E+01
AM-241	Not Detected	-----	1.01
PU-239	Not Detected	-----	5.29E+02
NP-237	Not Detected	-----	6.88E-01
PA-233	Not Detected	-----	1.11E-01
TH-229	Not Detected	-----	5.62E-01

[Summary Report] - Sample ID: 50045502

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	5.64E-02
AR-41	Not Detected	-----	1.99E+04
BA-133	Not Detected	-----	1.15E-01
BA-140	Not Detected	-----	2.26E-01
CD-109	Not Detected	-----	2.37
CD-115	Not Detected	-----	1.88E-01
CE-139	Not Detected	-----	5.88E-02
CE-141	Not Detected	-----	1.05E-01
CE-144	Not Detected	-----	4.58E-01
CO-56	Not Detected	-----	6.19E-02
CO-57	Not Detected	-----	5.95E-02
CO-58	Not Detected	-----	6.21E-02
CO-60	Not Detected	-----	7.66E-02
CR-51	Not Detected	-----	4.33E-01
CS-134	Not Detected	-----	9.41E-02
CS-137	Not Detected	-----	6.48E-02
CU-64	Not Detected	-----	8.36E+01
EU-152	Not Detected	-----	4.55E-01
EU-154	Not Detected	-----	3.56E-01
EU-155	Not Detected	-----	2.73E-01
FE-59	Not Detected	-----	1.34E-01
GD-153	Not Detected	-----	2.21E-01
HG-203	Not Detected	-----	5.70E-02
I-131	Not Detected	-----	5.88E-02
IN-115m	Not Detected	-----	1.95E+01
IR-192	Not Detected	-----	4.92E-02
K-40	1.69E+01	2.57	7.00E-01
LA-140	Not Detected	-----	1.14E-01
MN-54	Not Detected	-----	6.41E-02
MN-56	Not Detected	-----	4.06E+02
MO-99	Not Detected	-----	6.73E-01
NA-22	Not Detected	-----	8.36E-02
NA-24	Not Detected	-----	3.05E-01
NB-95	Not Detected	-----	4.03E-01
ND-147	Not Detected	-----	4.11E-01
NI-57	Not Detected	-----	1.80E-01
BE-7	Not Detected	-----	4.97E-01
RU-103	Not Detected	-----	5.35E-02
RU-106	Not Detected	-----	5.33E-01
SB-122	Not Detected	-----	1.13E-01
SB-124	Not Detected	-----	5.96E-02
SB-125	Not Detected	-----	1.53E-01
SC-46	Not Detected	-----	9.59E-02
SR-85	Not Detected	-----	7.26E-02
TA-182	Not Detected	-----	2.77E-01
TA-183	Not Detected	-----	1.04
TE-132	Not Detected	-----	6.69E-02
TL-201	Not Detected	-----	3.89E-01
XE-133	Not Detected	-----	3.80E-01
Y-88	Not Detected	-----	5.12E-02
ZN-65	Not Detected	-----	1.90E-01
ZR-95	Not Detected	-----	1.09E-01

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-15-95 7:22:29 PM *

 * Analyzed by: *JD* 6/16/95 Reviewed by: *JD* 6/16/95 *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022866-05
 Lab Sample ID : 50045503

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 2SMAR
 Sample Quantity : 576.000 gram
 Sample Date/Time : 6-14-95 11:35:00 AM
 Acquire Start Date : 6-15-95 6:50:08 PM
 Detector Name : LAB02
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	6.55
TH-234	Not Detected	-----	1.57
U-234	Not Detected	-----	2.60E+01
RA-226	1.50	9.00E-01	1.34
PB-214	7.48E-01	1.52E-01	1.21E-01
BI-214	5.22E-01	1.23E-01	1.14E-01
PB-210	Not Detected	-----	4.27E+02
TH-232	7.53E-01	2.93E-01	3.75E-01
RA-228	5.90E-01	3.02E-01	3.14E-01
AC-228	Not Detected	-----	4.21E-01
TH-228	8.09E-01	4.73E-01	1.07
RA-224	Not Detected	-----	2.26
PB-212	6.27E-01	1.40E-01	1.32E-01
BI-212	9.45E-01	5.04E-01	6.88E-01
TL-208	6.78E-01	1.74E-01	1.70E-01
U-235	Not Detected	-----	4.98E-01
TH-231	Not Detected	-----	1.20
PA-231	Not Detected	-----	2.63
AC-227	Not Detected	-----	3.58
TH-227	Not Detected	-----	7.43E-01
RA-223	Not Detected	-----	4.14E-01
RN-219	Not Detected	-----	6.03E-01
PB-211	Not Detected	-----	1.39
TL-207	Not Detected	-----	3.13E+01
AM-241	Not Detected	-----	1.08
PU-239	Not Detected	-----	5.81E+02
NP-237	Not Detected	-----	7.73E-01
PA-233	Not Detected	-----	1.27E-01
TH-229	Not Detected	-----	6.29E-01

[Summary Report] - Sample ID: 50045503

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	7.09E-02
AR-41	Not Detected	-----	1.36E+04
BA-133	Not Detected	-----	1.29E-01
BA-140	Not Detected	-----	2.30E-01
CD-109	Not Detected	-----	2.59
CD-115	Not Detected	-----	2.01E-01
CE-139	Not Detected	-----	6.59E-02
CE-141	Not Detected	-----	1.14E-01
CE-144	Not Detected	-----	4.95E-01
CO-56	Not Detected	-----	7.87E-02
CO-57	Not Detected	-----	6.72E-02
CO-58	Not Detected	-----	6.46E-02
CO-60	Not Detected	-----	7.98E-02
CR-51	Not Detected	-----	4.96E-01
CS-134	Not Detected	-----	1.01E-01
CS-137	Not Detected	-----	8.19E-02
CU-64	Not Detected	-----	1.04E+02
EU-152	Not Detected	-----	5.47E-01
EU-154	Not Detected	-----	3.91E-01
EU-155	Not Detected	-----	2.93E-01
FE-59	Not Detected	-----	1.49E-01
GD-153	Not Detected	-----	2.49E-01
HG-203	Not Detected	-----	6.21E-02
I-131	Not Detected	-----	6.79E-02
IN-115m	Not Detected	-----	1.75E+01
IR-192	Not Detected	-----	5.85E-02
K-40	1.64E+01	2.55	8.05E-01
LA-140	Not Detected	-----	1.27E-01
MN-54	Not Detected	-----	7.12E-02
MN-56	Not Detected	-----	3.73E+02
MO-99	Not Detected	-----	6.98E-01
NA-22	Not Detected	-----	9.33E-02
NA-24	Not Detected	-----	2.68E-01
NB-95	Not Detected	-----	4.42E-01
ND-147	Not Detected	-----	4.24E-01
NI-57	Not Detected	-----	1.91E-01
BE-7	Not Detected	-----	5.35E-01
RU-103	Not Detected	-----	5.81E-02
RU-106	Not Detected	-----	5.95E-01
SB-122	Not Detected	-----	1.22E-01
SB-124	Not Detected	-----	6.97E-02
SB-125	Not Detected	-----	1.71E-01
SC-46	Not Detected	-----	1.03E-01
SR-85	Not Detected	-----	8.14E-02
TA-182	Not Detected	-----	3.02E-01
TA-183	Not Detected	-----	1.11
TE-132	Not Detected	-----	7.55E-02
TL-201	Not Detected	-----	4.30E-01
XE-133	Not Detected	-----	4.08E-01
Y-88	Not Detected	-----	6.68E-02
ZN-65	Not Detected	-----	2.09E-01
ZR-95	Not Detected	-----	1.21E-01

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-15-95 7:59:52 PM *

 * Analyzed by: *JP* 6/16/95 Reviewed by: *JP* 6/16/95 *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022867-05
 Lab Sample ID : 50045504

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 2SMAR
 Sample Quantity : 929.000 gram
 Sample Date/Time : 6-14-95 1:00:00 PM
 Acquire Start Date : 6-15-95 7:27:20 PM
 Detector Name : LAB02
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	5.17
TH-234	7.56E-01	6.47E-01	9.74E-01
U-234	Not Detected	-----	1.90E+01
RA-226	8.62E-01	6.20E-01	9.53E-01
PB-214	6.38E-01	1.19E-01	8.58E-02
BI-214	6.03E-01	1.12E-01	7.84E-02
PB-210	Not Detected	-----	3.01E+02
TH-232	6.09E-01	2.16E-01	2.70E-01
RA-228	4.63E-01	2.15E-01	2.92E-01
AC-228	Not Detected	-----	3.09E-01
TH-228	6.50E-01	3.26E-01	6.93E-01
RA-224	1.67	4.29E-01	6.23E-01
PB-212	7.22E-01	1.51E-01	5.92E-02
BI-212	6.40E-01	3.47E-01	4.82E-01
TL-208	6.52E-01	1.38E-01	1.10E-01
U-235	Not Detected	-----	3.75E-01
TH-231	Not Detected	-----	8.99E-01
PA-231	Not Detected	-----	1.91
AC-227	Not Detected	-----	2.83
TH-227	Not Detected	-----	5.57E-01
RA-223	Not Detected	-----	3.11E-01
RN-219	Not Detected	-----	4.28E-01
PB-211	Not Detected	-----	1.08
TL-207	Not Detected	-----	1.99E+01
AM-241	Not Detected	-----	8.10E-01
PU-239	Not Detected	-----	4.28E+02
NP-237	Not Detected	-----	5.75E-01
PA-233	Not Detected	-----	9.15E-02
TH-229	Not Detected	-----	4.80E-01

[Summary Report] - Sample ID: 50045504

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	4.57E-02
AR-41	Not Detected	-----	6.97E+03
BA-133	Not Detected	-----	9.75E-02
BA-140	Not Detected	-----	1.61E-01
CD-109	Not Detected	-----	1.99
CD-115	Not Detected	-----	1.43E-01
CE-139	Not Detected	-----	5.02E-02
CE-141	Not Detected	-----	8.68E-02
CE-144	Not Detected	-----	3.82E-01
CO-56	Not Detected	-----	5.20E-02
CO-57	Not Detected	-----	4.94E-02
CO-58	Not Detected	-----	4.78E-02
CO-60	Not Detected	-----	5.69E-02
CR-51	Not Detected	-----	3.71E-01
CS-134	Not Detected	-----	7.97E-02
CS-137	Not Detected	-----	4.90E-02
CU-64	Not Detected	-----	5.81E+01
EU-152	Not Detected	-----	3.71E-01
EU-154	Not Detected	-----	2.86E-01
EU-155	Not Detected	-----	2.31E-01
FE-59	Not Detected	-----	1.19E-01
GD-153	Not Detected	-----	1.86E-01
HG-203	Not Detected	-----	4.68E-02
I-131	Not Detected	-----	4.76E-02
IN-115m	Not Detected	-----	1.12E+01
IR-192	Not Detected	-----	4.35E-02
K-40	1.71E+01	2.48	4.31E-01
LA-140	Not Detected	-----	9.39E-02
MN-54	Not Detected	-----	4.95E-02
MN-56	Not Detected	-----	1.99E+02
MO-99	Not Detected	-----	5.57E-01
NA-22	Not Detected	-----	7.41E-02
NA-24	Not Detected	-----	2.03E-01
NB-95	Not Detected	-----	3.30E-01
ND-147	Not Detected	-----	3.10E-01
NI-57	Not Detected	-----	1.44E-01
BE-7	Not Detected	-----	3.66E-01
RU-103	Not Detected	-----	4.33E-02
RU-106	Not Detected	-----	4.47E-01
SB-122	Not Detected	-----	8.53E-02
SB-124	Not Detected	-----	4.97E-02
SB-125	Not Detected	-----	1.32E-01
SC-46	Not Detected	-----	7.98E-02
SR-85	Not Detected	-----	5.89E-02
TA-182	Not Detected	-----	2.36E-01
TA-183	Not Detected	-----	8.23E-01
TE-132	Not Detected	-----	5.66E-02
TL-201	Not Detected	-----	3.20E-01
XE-133	Not Detected	-----	3.23E-01
Y-88	Not Detected	-----	3.95E-02
ZN-65	Not Detected	-----	1.53E-01
ZR-95	Not Detected	-----	9.41E-02

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881' Laboratory] *
 * 6-16-95 8:31:32 AM *

 * Analyzed by: *JR 6/16/95* Reviewed by: *JR 6/16/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : LAB CONTROL SAMPLE ANALYSIS #CG134
 Lab Sample ID : 50045505

Sample Description : MIXED GAMMA STANDARD
 Sample Type : Liquid
 Sample Geometry : WMAR
 Sample Quantity : 1.000 Each
 Sample Date/Time : 11-01-90 12:00:00 PM
 Acquire Start Date : 6-16-95 8:19:11 AM
 Detector Name : LAB02
 Elapsed Live Time : 600 seconds
 Elapsed Real Time : 606 seconds

Comments:

Nuclide	Activity (pCi/Each)	2S Error	MDA
U-238	Not Detected	-----	2.61E+04
TH-234	Not Detected	-----	5.28E+03
U-234	Not Detected	-----	1.26E+05
RA-226	Not Detected	-----	6.59E+03
PB-214	Not Detected	-----	7.61E+02
BI-214	Not Detected	-----	6.83E+02
PB-210	Not Detected	-----	6.80E+06
TH-232	Not Detected	-----	2.15E+03
RA-228	Not Detected	-----	2.99E+03
AC-228	Not Detected	-----	1.89E+03
TH-228	Not Detected	-----	4.02E+04
RA-224	Not Detected	-----	3.37E+04
PB-212	Not Detected	-----	3.09E+03
BI-212	Not Detected	-----	2.77E+04
TL-208	Not Detected	-----	5.43E+03
U-235	Not Detected	-----	1.97E+03
TH-231	Not Detected	-----	4.31E+03
PA-231	Not Detected	-----	1.05E+04
AC-227	Not Detected	-----	1.74E+04
TH-227	Not Detected	-----	2.57E+03
RA-223	Not Detected	-----	1.00E+26
RN-219	Not Detected	-----	3.23E+03
PB-211	Not Detected	-----	9.75E+03
TL-207	Not Detected	-----	2.28E+05
AM-241	1.01E+05	1.98E+04	6.78E+03
PU-239	Not Detected	-----	2.27E+06
NP-237	Not Detected	-----	3.00E+03
PA-233	Not Detected	-----	6.72E+02
TH-229	Not Detected	-----	2.41E+03

[Summary Report] - Sample ID: 50045505

Nuclide	Activity (pCi/Each)	2S Error	MDA
AG-110m	Not Detected	-----	1.77E+05
AR-41	Not Detected	-----	1.00E+26
BA-133	Not Detected	-----	5.94E+02
BA-140	Not Detected	-----	1.00E+26
CD-109	3.34E+05	1.01E+05	1.29E+05
CD-115	Not Detected	-----	1.00E+26
CE-139	Not Detected	-----	1.33E+06
CE-141	Not Detected	-----	1.94E+18
CE-144	Not Detected	-----	1.23E+05
CO-56	Not Detected	-----	1.67E+09
CO-57	7.61E+03	9.76E+03	1.57E+04
CO-58	Not Detected	-----	5.76E+09
CO-60	7.77E+04	1.01E+04	5.56E+02
CR-51	Not Detected	-----	5.57E+21
CS-134	Not Detected	-----	1.51E+03
CS-137	7.11E+04	9.17E+03	5.05E+02
CU-64	Not Detected	-----	1.00E+26
EU-152	Not Detected	-----	3.63E+03
EU-154	Not Detected	-----	2.43E+03
EU-155	Not Detected	-----	2.35E+03
FE-59	Not Detected	-----	2.54E+14
GD-153	Not Detected	-----	1.16E+05
HG-203	Not Detected	-----	2.50E+13
I-131	Not Detected	-----	1.00E+26
IN-115m	Not Detected	-----	1.00E+26
IR-192	Not Detected	-----	2.35E+09
K-40	Not Detected	-----	1.90E+03
LA-140	Not Detected	-----	1.00E+26
MN-54	Not Detected	-----	1.72E+04
MN-56	Not Detected	-----	1.00E+26
MO-99	Not Detected	-----	1.00E+26
NA-22	Not Detected	-----	8.79E+02
NA-24	Not Detected	-----	1.00E+26
NB-95	Not Detected	-----	1.00E+26
ND-147	Not Detected	-----	1.00E+26
NI-57	Not Detected	-----	1.00E+26
BE-7	Not Detected	-----	1.21E+13
RU-103	Not Detected	-----	3.14E+15
RU-106	Not Detected	-----	8.08E+04
SB-122	Not Detected	-----	1.00E+26
SB-124	Not Detected	-----	8.75E+10
SB-125	Not Detected	-----	3.76E+03
SC-46	Not Detected	-----	5.75E+08
SR-85	Not Detected	-----	2.68E+10
TA-182	Not Detected	-----	3.74E+07
TA-183	Not Detected	-----	1.00E+26
TE-132	Not Detected	-----	1.00E+26
TL-201	Not Detected	-----	1.00E+26
XE-133	Not Detected	-----	1.00E+26
Y-88	Not Detected	-----	1.22E+07
ZN-65	Not Detected	-----	1.24E+05
ZR-95	Not Detected	-----	5.63E+10

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program *
 * Quality Assurance Report *

Report Date : 6-16-95 8:34:28 AM
 QA File : C:\GENIEPC\CAMFILES\LCS2.QAF
 Analyst : FCD
 Sample ID : 50045505
 Sample Quantity : 1.00 Each
 Sample Date : 11-01-90 12:00:00 PM
 Measurement Date : 6-16-95 8:19:11 AM
 Elapsed Live Time : 600 seconds
 Elapsed Real Time : 606 seconds

Parameter	Mean	1S Error	New Value	< LU : SD : UD : BS >
AM-241 Activity	9.682E-02	1.067E-02	1.012E-01	< : In : >
CS-137 Activity	6.922E-02	5.598E-03	7.108E-02	< : : : >
CO-60 Activity	7.661E-02	6.054E-03	7.818E-02	< : : : >

Flags Key: LU = Boundary Test (Ab = Above, Be = Below)
 SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
 UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
 BS = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: *[Signature]* 6/16/95

ER/1302 096/DAT

3

SMO ANALYTICAL DATA ROUTING FORM

Project Name: TAT Phase I Case Number: 3626400

SNL Task Leader: Miller Org/Mail Stop: 7582/1347

SMO Project Coordinator: Puissant Sample Ship Date: 6/20/95

ARCOC	Lab	Lab ID
<u>03720</u>	<u>SNL 7715</u>	<u>500469</u>
<u>03714</u>	<u>"</u>	<u>500455</u>
<u>03715</u>	<u>"</u>	<u>500460</u>

Date Results Received:

Preliminary: _____ Final: 6/21, 6/16, 6/19/95

Corrections Requested From Laboratory: _____ Requestor: _____

Date Corrections Received: _____

Date Assigned to SMO Reviewer: _____

Reviewer: _____

Date Review Complete: _____

Signature: _____

Date of Preliminary Notification: _____

Person Notified: _____

Date of Final Transmittal: DM 7/10/95

Transmitted To: Miller

Transmitted By: _____

Filed In Record Center: DM

Comments: _____

ORIGINAL COPY FILED IN RECORDS CENTER BY SMO DM 7/10/95 (Initials) (Date)

ANALYSIS REQUEST AND CHAIN OF CUSTODY

PAGE 1 OF 1

2001-COC (9-94) **BATCH #500469**

AR/COC- **03720**

Dept. No./Mail Stop: **7582/1347** ✓
 Project/Task Manager: **D. Mills / H. Fleck**
 Project Name: **TA-1 Soil Sampling-Phase I**
 Record Center Code: **ADS1202 ER S&I 96**
 Logbook Ref No.: **0133**
 SMO Reference No.: **CF0089**

Date Samples Shipped: **6/19/95**
 Carrier/Waybill No.: **HC**
 Lab Contact: **AMR M.**
 Lab Destination: **7715**
 SMO Contact/Phone: **D. "Mac" M. Laughlin 845-0867**
 Send Report to SMO: **Deborah M. Laughlin**

Contract No.: **N/A**
 Case No.: **3626.400**
 SMO Authorization: **[Signature]**
 Bill to: Sandia National Laboratories
 Supplier Services Department
 P.O. Box 5800 MS 0154
 Albuquerque, NM 87185-0154

Parameter & Method Requested

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Location Tech Area **TA-1**
 Building **Bldg. 852** Room **Outside**

Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Reference LOV (available at SMO)						Lab Sample ID		
					Sample Matrix	Type	Volume	Preservative	Sample Collection Method	Sample Type			
22886-05	CG 6/19/95												
22886-05	T1096-GP-022-004-S	4'	96	6/19/95-8:20	S	P	500ml	None	G	SA	X		
22887-05	T1096-GP-023-005-S	8'9"		-9:05							X		
22888-05	T1096-GP-024-005-S	9'		-10:45							X		
22889-05	T1096-GP-025-003-S	7'2"		-12:55							X		
22890-05	T1096-GP-026-003-S			CG 6/19/95									
22890-05	T1096-GP-024-005-S	5'	96	6/19/95-14:20	S	P	500ml	None	G	SA	X		
22891-05	T1096-GP-027-007-S	6'9"		-15:40							X		

GAMMA SPEC

RMMA Yes No Ref. No. _____
 Sample Disposal Return to Client Disposal by lab
 Turnaround Time Normal Rush Required Report Date _____

Sample Tracking
 Date Entered (mm/dd/yyyy): **6/29/95**
 Entered by: **[Signature]**

Special Instructions/QC Requirements

Abnormal Conditions on Receipt

Sample Team Members	Name	Signature	Init	Company/Organization
	MATTHEW SHAIN	<i>Matthew Shain</i>	MS	IT corp / 7582
	CATHIE GOHAR	<i>Cathie Gohar</i>	CG	SANDIA / 7582.

1. Relinquished by	Org.	Date	Time	4. Relinquished by	Org.	Date	Time
<i>Matthew Shain</i>	7582	6/19/95	1605				
<i>[Signature]</i>	7513	6/19/95	1815				
<i>[Signature]</i>	7513	6/20/95	0935				
<i>[Signature]</i>	SNL7715	6/20/95	0935				
<i>[Signature]</i>	SNL7715	6/21/95	1450				
<i>[Signature]</i>	7513	6/21/95	1450				



To be completed by Customer

Shaded areas are for RPSD use only

Customer: <u>D. Miller / H. Fleck</u>	Hazards/Special Instructions: <u>Please Notify S-10 upon completion @ 845-0867</u>	Batch Log Number: <u>500469</u>
Organization: <u>7582</u>		Logged By: <u>JW</u>
Project Location: <u>TA-1</u>		Analysis Type: <input checked="" type="checkbox"/> Gamma Spec
Phone: <u>845-0867</u>		<input type="checkbox"/> H-3
Date Results Needed: <u>6-28-95</u>		<input type="checkbox"/> Alpha/Beta
Suspect Isotopes: _____		<input type="checkbox"/> Alpha Spec
Other Information: <u>03720</u>		<input type="checkbox"/> Total U
		<input type="checkbox"/> Other
LIMS LogIn: _____		
Results Faxed: _____		
Sample Disposal: _____		

Customer Sample ID	Sample Type	Date/Time Collected	Sample Volume	Requested Analysis	RPSD Sample ID	Rad Scan CPM	Sample Weight	Remarks
022886-05	S	6/19/95-8:20	500ml	Gamma Spec.	01	<300	625g	
022887-05	↓	↓ -9:05	↓	↓	02	↓	804g	
022888-05	↓	↓ -10:45	↓	↓	03	↓	910g	
022889-05	↓	↓ -12:35	↓	↓	04	↓	770g	
022890-05	↓	↓ -14:20	↓	↓	05	↓	709g	
022891-05	↓	↓ -15:10	↓	↓	06	↓	618g	
LCS		1-200-90		γ spec	07	NA	NA	

Relinquished by [Signature] Date 6/20/95 Time 0935 Received by [Signature] Date 6/20/95 Time 0935
 Relinquished by [Signature] Date 6/21/95 Time 1450 Received by [Signature] Date 6-21-95 Time 1450
 Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____
 Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-20-95 6:59:30 PM *

 * Analyzed by: *JN 6/21/95* Reviewed by: *JN 6/21/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022886-05
 Lab Sample ID : 50046901

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 2SMAR
 Sample Quantity : 625.000 gram
 Sample Date/Time : 6-19-95 8:20:00 AM
 Acquire Start Date : 6-20-95 6:25:36 PM
 Detector Name : LAB02
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	6.46
TH-234	Not Detected	-----	1.58
U-234	Not Detected	-----	2.41E+01
RA-226	Not Detected	-----	1.53
PB-214	8.37E-01	1.56E-01	1.03E-01
BI-214	6.84E-01	1.38E-01	1.06E-01
PB-210	Not Detected	-----	4.06E+02
TH-232	7.91E-01	2.68E-01	3.14E-01
RA-228	6.41E-01	3.74E-01	2.80E-01
AC-228	Not Detected	-----	4.05E-01
TH-228	7.23E-01	3.32E-01	8.81E-01
RA-224	2.15	6.02E-01	8.76E-01
PB-212	8.55E-01	1.81E-01	8.44E-02
BI-212	8.20E-01	4.59E-01	6.36E-01
TL-208	7.62E-01	1.82E-01	1.70E-01
U-235	Not Detected	-----	4.43E-01
TH-231	Not Detected	-----	1.16
PA-231	Not Detected	-----	2.61
AC-227	Not Detected	-----	3.40
TH-227	Not Detected	-----	7.43E-01
RA-223	Not Detected	-----	4.04E-01
RN-219	Not Detected	-----	5.41E-01
PB-211	Not Detected	-----	1.26
TL-207	Not Detected	-----	2.51E+01
AM-241	Not Detected	-----	9.90E-01
PU-239	Not Detected	-----	5.38E+02
NP-237	Not Detected	-----	7.52E-01
PA-233	Not Detected	-----	1.18E-01
TH-229	Not Detected	-----	5.73E-01

[Summary Report] - Sample ID: 50046901

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	5.97E-02
AR-41	Not Detected	-----	3.42E+04
BA-133	Not Detected	-----	1.30E-01
BA-140	Not Detected	-----	2.25E-01
CD-109	Not Detected	-----	2.58
CD-115	Not Detected	-----	2.02E-01
CE-139	Not Detected	-----	5.98E-02
CE-141	Not Detected	-----	1.03E-01
CE-144	Not Detected	-----	4.77E-01
CO-56	Not Detected	-----	6.73E-02
CO-57	Not Detected	-----	6.35E-02
CO-58	Not Detected	-----	6.30E-02
CO-60	Not Detected	-----	6.18E-02
CR-51	Not Detected	-----	4.63E-01
CS-134	Not Detected	-----	1.03E-01
CS-137	Not Detected	-----	6.60E-02
CU-64	Not Detected	-----	8.42E+01
EU-152	Not Detected	-----	4.70E-01
EU-154	Not Detected	-----	3.63E-01
EU-155	Not Detected	-----	2.86E-01
FE-59	Not Detected	-----	1.28E-01
GD-153	Not Detected	-----	2.25E-01
HG-203	Not Detected	-----	6.16E-02
I-131	Not Detected	-----	6.21E-02
IN-115m	Not Detected	-----	2.64E+01
IR-192	Not Detected	-----	5.29E-02
K-40	1.47E+01	2.27	5.75E-01
LA-140	Not Detected	-----	1.36E-01
MN-54	Not Detected	-----	6.27E-02
MN-56	Not Detected	-----	6.85E+02
MO-99	Not Detected	-----	6.66E-01
NA-22	Not Detected	-----	8.51E-02
NA-24	Not Detected	-----	3.29E-01
NB-95	Not Detected	-----	4.53E-01
ND-147	Not Detected	-----	4.57E-01
NI-57	Not Detected	-----	1.78E-01
BE-7	Not Detected	-----	5.13E-01
RU-103	Not Detected	-----	5.54E-02
RU-106	Not Detected	-----	5.51E-01
SB-122	Not Detected	-----	1.14E-01
SB-124	Not Detected	-----	6.48E-02
SB-125	Not Detected	-----	1.68E-01
SC-46	Not Detected	-----	1.04E-01
SR-85	Not Detected	-----	7.49E-02
TA-182	Not Detected	-----	3.10E-01
TA-183	Not Detected	-----	1.04
TE-132	Not Detected	-----	7.39E-02
TL-201	Not Detected	-----	4.12E-01
XE-133	Not Detected	-----	4.11E-01
Y-88	Not Detected	-----	6.43E-02
ZN-65	Not Detected	-----	2.08E-01
ZR-95	Not Detected	-----	1.11E-01

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-20-95 7:38:46 PM *

 * Analyzed by: *JN 6/21/95* Reviewed by: *JN 6/21/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022887-05
 Lab Sample ID : 50046902

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 2SMAR
 Sample Quantity : 804.000 gram
 Sample Date/Time : 6-19-95 9:05:00 AM
 Acquire Start Date : 6-20-95 7:04:50 PM
 Detector Name : LAB02
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	5.93
TH-234	1.02	5.75E-01	8.35E-01
U-234	Not Detected	-----	2.07E+01
RA-226	1.92	7.62E-01	1.04
PB-214	8.69E-01	1.41E-01	7.94E-02
BI-214	7.28E-01	1.32E-01	8.40E-02
PB-210	Not Detected	-----	3.43E+02
TH-232	5.25E-01	2.40E-01	3.33E-01
RA-228	6.93E-01	2.57E-01	1.94E-01
AC-228	6.28E-01	1.94E-01	2.24E-01
TH-228	9.19E-01	4.32E-01	8.91E-01
RA-224	Not Detected	-----	7.34E-01
PB-212	7.73E-01	1.53E-01	6.38E-02
BI-212	8.92E-01	4.09E-01	5.36E-01
TL-208	7.20E-01	1.59E-01	1.39E-01
U-235	Not Detected	-----	4.14E-01
TH-231	Not Detected	-----	1.04
PA-231	Not Detected	-----	2.34
AC-227	Not Detected	-----	3.03
TH-227	Not Detected	-----	6.35E-01
RA-223	Not Detected	-----	3.57E-01
RN-219	Not Detected	-----	4.89E-01
PB-211	Not Detected	-----	1.07
TL-207	Not Detected	-----	2.41E+01
AM-241	Not Detected	-----	9.78E-01
PU-239	Not Detected	-----	4.73E+02
NP-237	Not Detected	-----	6.72E-01
PA-233	Not Detected	-----	1.02E-01
TH-229	Not Detected	-----	5.01E-01

[Summary Report] - Sample ID: 50046902

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	4.98E-02
AR-41	Not Detected	-----	3.21E+04
BA-133	Not Detected	-----	1.15E-01
BA-140	Not Detected	-----	1.96E-01
CD-109	Not Detected	-----	1.56
CD-115	Not Detected	-----	1.66E-01
CE-139	Not Detected	-----	5.46E-02
CE-141	Not Detected	-----	9.47E-02
CE-144	Not Detected	-----	4.08E-01
CO-56	Not Detected	-----	5.96E-02
CO-57	Not Detected	-----	5.64E-02
CO-58	Not Detected	-----	5.26E-02
CO-60	Not Detected	-----	6.33E-02
CR-51	Not Detected	-----	4.10E-01
CS-134	Not Detected	-----	9.01E-02
CS-137	Not Detected	-----	5.79E-02
CU-64	Not Detected	-----	8.86E+01
EU-152	Not Detected	-----	4.14E-01
EU-154	Not Detected	-----	3.07E-01
EU-155	Not Detected	-----	2.59E-01
FE-59	Not Detected	-----	1.23E-01
GD-153	Not Detected	-----	2.06E-01
HG-203	Not Detected	-----	5.33E-02
I-131	Not Detected	-----	5.02E-02
IN-115m	Not Detected	-----	2.13E+01
IR-192	Not Detected	-----	4.82E-02
K-40	1.40E+01	2.12	5.31E-01
LA-140	Not Detected	-----	1.16E-01
MN-54	Not Detected	-----	5.43E-02
MN-56	Not Detected	-----	5.90E+02
MO-99	Not Detected	-----	6.11E-01
NA-22	Not Detected	-----	7.51E-02
NA-24	Not Detected	-----	2.91E-01
NB-95	Not Detected	-----	3.86E-01
ND-147	Not Detected	-----	3.72E-01
NI-57	Not Detected	-----	1.67E-01
BE-7	Not Detected	-----	4.24E-01
RU-103	Not Detected	-----	4.46E-02
RU-106	Not Detected	-----	4.67E-01
SB-122	Not Detected	-----	1.00E-01
SB-124	Not Detected	-----	5.22E-02
SB-125	Not Detected	-----	1.51E-01
SC-46	Not Detected	-----	8.99E-02
SR-85	Not Detected	-----	6.63E-02
TA-182	Not Detected	-----	2.67E-01
TA-183	Not Detected	-----	1.01
TE-132	Not Detected	-----	6.20E-02
TL-201	Not Detected	-----	3.92E-01
XE-133	Not Detected	-----	3.66E-01
Y-88	Not Detected	-----	4.79E-02
ZN-65	Not Detected	-----	1.79E-01
ZR-95	Not Detected	-----	9.24E-02

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-20-95 8:18:53 PM *

 * Analyzed by: *JR* 6/21/95 Reviewed by: *JR* 6/21/95 *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022888-05
 Lab Sample ID : 50046903

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 2SMAR
 Sample Quantity : 901.000 gram
 Sample Date/Time : 6-19-95 10:45:00 AM
 Acquire Start Date : 6-20-95 7:44:55 PM
 Detector Name : LAB02
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	5.37
TH-234	Not Detected	-----	6.93E-01
U-234	Not Detected	-----	2.09E+01
RA-226	2.10	7.94E-01	1.08
PB-214	7.97E-01	1.44E-01	1.01E-01
BI-214	6.61E-01	1.23E-01	8.77E-02
PB-210	Not Detected	-----	3.32E+02
TH-232	5.61E-01	2.26E-01	3.00E-01
RA-228	5.13E-01	2.80E-01	4.06E-01
AC-228	7.67E-01	1.84E-01	1.60E-01
TH-228	1.06	3.38E-01	7.88E-01
RA-224	2.06	5.34E-01	7.62E-01
PB-212	7.73E-01	1.75E-01	6.91E-02
BI-212	8.93E-01	4.22E-01	5.73E-01
TL-208	7.12E-01	1.48E-01	1.13E-01
U-235	Not Detected	-----	4.03E-01
TH-231	Not Detected	-----	9.86E-01
PA-231	Not Detected	-----	2.13
AC-227	Not Detected	-----	2.91
TH-227	Not Detected	-----	5.97E-01
RA-223	Not Detected	-----	3.38E-01
RN-219	Not Detected	-----	4.57E-01
PB-211	Not Detected	-----	1.10
TL-207	Not Detected	-----	2.27E+01
AM-241	Not Detected	-----	8.67E-01
PU-239	Not Detected	-----	4.55E+02
NP-237	Not Detected	-----	6.34E-01
PA-233	Not Detected	-----	9.27E-02
TH-229	Not Detected	-----	5.06E-01

[Summary Report] - Sample ID: 50046903

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	4.73E-02
AR-41	Not Detected	-----	2.03E+04
BA-133	Not Detected	-----	1.06E-01
BA-140	Not Detected	-----	1.80E-01
CD-109	Not Detected	-----	2.12
CD-115	Not Detected	-----	1.56E-01
CE-139	Not Detected	-----	5.29E-02
CE-141	Not Detected	-----	9.51E-02
CE-144	Not Detected	-----	3.93E-01
CO-56	Not Detected	-----	5.31E-02
CO-57	Not Detected	-----	5.11E-02
CO-58	Not Detected	-----	5.02E-02
CO-60	Not Detected	-----	6.08E-02
CR-51	Not Detected	-----	4.11E-01
CS-134	Not Detected	-----	8.04E-02
CS-137	Not Detected	-----	5.52E-02
CU-64	Not Detected	-----	7.73E+01
EU-152	Not Detected	-----	3.97E-01
EU-154	Not Detected	-----	2.93E-01
EU-155	Not Detected	-----	2.39E-01
FE-59	Not Detected	-----	1.13E-01
GD-153	Not Detected	-----	2.06E-01
HG-203	Not Detected	-----	5.04E-02
I-131	Not Detected	-----	4.98E-02
IN-115m	Not Detected	-----	1.75E+01
IR-192	Not Detected	-----	4.60E-02
K-40	1.55E+01	2.27	3.89E-01
LA-140	Not Detected	-----	1.08E-01
MN-54	Not Detected	-----	5.76E-02
MN-56	Not Detected	-----	4.03E+02
MO-99	Not Detected	-----	5.55E-01
NA-22	Not Detected	-----	7.44E-02
NA-24	Not Detected	-----	2.36E-01
NB-95	Not Detected	-----	3.58E-01
ND-147	Not Detected	-----	3.50E-01
NI-57	Not Detected	-----	1.48E-01
BE-7	Not Detected	-----	3.87E-01
RU-103	Not Detected	-----	4.29E-02
RU-106	Not Detected	-----	4.38E-01
SB-122	Not Detected	-----	9.33E-02
SB-124	Not Detected	-----	4.87E-02
SB-125	Not Detected	-----	1.35E-01
SC-46	Not Detected	-----	8.84E-02
SR-85	Not Detected	-----	6.11E-02
TA-182	Not Detected	-----	2.62E-01
TA-183	Not Detected	-----	9.05E-01
TE-132	Not Detected	-----	6.12E-02
TL-201	Not Detected	-----	3.37E-01
XE-133	Not Detected	-----	3.30E-01
Y-88	Not Detected	-----	4.37E-02
ZN-65	Not Detected	-----	1.73E-01
ZR-95	Not Detected	-----	9.65E-02

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-23-95 11:49:37 AM *

 * Analyzed by: *George Cole 6/23/95* Reviewed by: *[Signature]* 6/26/95 *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022903-05
 Lab Sample ID : 50047603

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 2SMAR
 Sample Quantity : 643.000 gram
 Sample Date/Time : 6-21-95 12:48:00 PM
 Acquire Start Date : 6-23-95 11:15:28 AM
 Detector Name : LAB02
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	6.52
TH-234	Not Detected	-----	1.55
U-234	Not Detected	-----	2.43E+01
RA-226	1.42	7.63E-01	1.11
PB-214	8.59E-01	1.69E-01	1.41E-01
BI-214	6.83E-01	1.38E-01	1.09E-01
PB-210	Not Detected	-----	4.10E+02
TH-232	6.53E-01	2.64E-01	3.45E-01
RA-228	6.45E-01	2.58E-01	3.19E-01
AC-228	Not Detected	-----	3.95E-01
TH-228	8.03E-01	4.84E-01	1.05
RA-224	2.03	5.70E-01	8.34E-01
PB-212	7.89E-01	1.83E-01	7.83E-02
BI-212	8.36E-01	4.63E-01	6.42E-01
TL-208	7.39E-01	1.70E-01	1.44E-01
U-235	Not Detected	-----	4.65E-01
TH-231	Not Detected	-----	1.13
PA-231	Not Detected	-----	2.66
AC-227	Not Detected	-----	3.45
TH-227	Not Detected	-----	7.17E-01
RA-223	Not Detected	-----	4.04E-01
RN-219	Not Detected	-----	5.82E-01
PB-211	Not Detected	-----	1.28
TL-207	Not Detected	-----	2.56E+01
AM-241	Not Detected	-----	1.00
PU-239	Not Detected	-----	5.45E+02
NP-237	Not Detected	-----	7.38E-01
PA-233	Not Detected	-----	1.11E-01
TH-229	Not Detected	-----	5.94E-01

[Summary Report] - Sample ID: 50047603

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	5.99E-02
AR-41	Not Detected	-----	3.86E+06
BA-133	Not Detected	-----	1.30E-01
BA-140	Not Detected	-----	2.26E-01
CD-109	Not Detected	-----	2.46
CD-115	Not Detected	-----	2.31E-01
CE-139	Not Detected	-----	6.34E-02
CE-141	Not Detected	-----	1.07E-01
CE-144	Not Detected	-----	4.77E-01
CO-56	Not Detected	-----	7.20E-02
CO-57	Not Detected	-----	6.01E-02
CO-58	Not Detected	-----	6.64E-02
CO-60	Not Detected	-----	7.27E-02
CR-51	Not Detected	-----	4.75E-01
CS-134	Not Detected	-----	9.94E-02
CS-137	Not Detected	-----	6.70E-02
CU-64	Not Detected	-----	1.48E+02
EU-152	Not Detected	-----	4.69E-01
EU-154	Not Detected	-----	3.85E-01
EU-155	Not Detected	-----	2.89E-01
FE-59	Not Detected	-----	1.60E-01
GD-153	Not Detected	-----	2.36E-01
HG-203	Not Detected	-----	6.15E-02
I-131	Not Detected	-----	6.14E-02
IN-115m	Not Detected	-----	1.74E+02
IR-192	Not Detected	-----	5.52E-02
K-40	1.67E+01	2.54	7.10E-01
LA-140	Not Detected	-----	1.39E-01
MN-54	Not Detected	-----	6.75E-02
MN-56	Not Detected	-----	2.02E+04
MO-99	Not Detected	-----	8.19E-01
NA-22	Not Detected	-----	8.46E-02
NA-24	Not Detected	-----	5.60E-01
NB-95	Not Detected	-----	4.82E-01
ND-147	Not Detected	-----	4.23E-01
NI-57	Not Detected	-----	2.31E-01
BE-7	Not Detected	-----	4.96E-01
RU-103	Not Detected	-----	5.30E-02
RU-106	Not Detected	-----	5.75E-01
SB-122	Not Detected	-----	1.34E-01
SB-124	Not Detected	-----	6.37E-02
SB-125	Not Detected	-----	1.74E-01
SC-46	Not Detected	-----	1.05E-01
SR-85	Not Detected	-----	7.95E-02
TA-182	Not Detected	-----	3.12E-01
TA-183	Not Detected	-----	1.12
TE-132	Not Detected	-----	8.30E-02
TL-201	Not Detected	-----	4.74E-01
XE-133	Not Detected	-----	4.68E-01
Y-88	Not Detected	-----	5.59E-02
ZN-65	Not Detected	-----	2.07E-01
ZR-95	Not Detected	-----	1.16E-01

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-23-95 12:30:41 PM *

 * Analyzed by: *Edward Cole 6/23/95* Reviewed by: *[Signature] 6/22/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022904-05
 Lab Sample ID : 50047604

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 2SMAR
 Sample Quantity : 862.000 gram
 Sample Date/Time : 6-21-95 2:15:00 PM
 Acquire Start Date : 6-23-95 11:56:24 AM
 Detector Name : LAB02
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	5.39
TH-234	Not Detected	-----	1.30
U-234	Not Detected	-----	2.04E+01
RA-226	1.80	8.63E-01	1.25
PB-214	6.58E-01	1.27E-01	1.01E-01
BI-214	5.90E-01	1.14E-01	8.64E-02
PB-210	Not Detected	-----	3.23E+02
TH-232	4.68E-01	2.64E-01	3.89E-01
RA-228	5.99E-01	2.34E-01	2.96E-01
AC-228	7.54E-01	2.10E-01	2.30E-01
TH-228	6.50E-01	3.28E-01	6.83E-01
RA-224	Not Detected	-----	6.88E-01
PB-212	6.61E-01	1.35E-01	6.51E-02
BI-212	7.35E-01	4.14E-01	5.89E-01
TL-208	5.32E-01	1.27E-01	1.17E-01
U-235	Not Detected	-----	3.97E-01
TH-231	Not Detected	-----	9.47E-01
PA-231	Not Detected	-----	2.07
AC-227	Not Detected	-----	2.87
TH-227	Not Detected	-----	5.85E-01
RA-223	Not Detected	-----	3.42E-01
RN-219	Not Detected	-----	5.68E-01
PB-211	Not Detected	-----	1.06
TL-207	Not Detected	-----	2.44E+01
AM-241	Not Detected	-----	8.51E-01
PU-239	Not Detected	-----	3.17E+02
NP-237	Not Detected	-----	6.30E-01
PA-233	Not Detected	-----	9.84E-02
TH-229	Not Detected	-----	4.99E-01

[Summary Report] - Sample ID: 50047604

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	5.28E-02
AR-41	Not Detected	-----	2.58E+06
BA-133	Not Detected	-----	1.02E-01
BA-140	Not Detected	-----	1.98E-01
CD-109	Not Detected	-----	2.33
CD-115	Not Detected	-----	1.86E-01
CE-139	Not Detected	-----	5.24E-02
CE-141	Not Detected	-----	9.04E-02
CE-144	Not Detected	-----	4.01E-01
CO-56	Not Detected	-----	5.60E-02
CO-57	Not Detected	-----	5.36E-02
CO-58	Not Detected	-----	5.19E-02
CO-60	Not Detected	-----	5.91E-02
CR-51	Not Detected	-----	3.82E-01
CS-134	Not Detected	-----	8.13E-02
CS-137	Not Detected	-----	6.08E-02
CU-64	Not Detected	-----	1.48E+02
EU-152	Not Detected	-----	3.86E-01
EU-154	Not Detected	-----	2.94E-01
EU-155	Not Detected	-----	2.48E-01
FE-59	Not Detected	-----	1.20E-01
GD-153	Not Detected	-----	2.00E-01
HG-203	Not Detected	-----	5.03E-02
I-131	Not Detected	-----	5.15E-02
IN-115m	Not Detected	-----	1.25E+02
IR-192	Not Detected	-----	4.62E-02
K-40	1.98E+01	2.85	4.51E-01
LA-140	Not Detected	-----	1.28E-01
MN-54	Not Detected	-----	5.35E-02
MN-56	Not Detected	-----	1.28E+04
MO-99	Not Detected	-----	6.82E-01
NA-22	Not Detected	-----	7.86E-02
NA-24	Not Detected	-----	4.65E-01
NB-95	Not Detected	-----	3.92E-01
ND-147	Not Detected	-----	3.57E-01
NI-57	Not Detected	-----	1.80E-01
BE-7	Not Detected	-----	3.91E-01
RU-103	Not Detected	-----	4.49E-02
RU-106	Not Detected	-----	4.76E-01
SB-122	Not Detected	-----	1.13E-01
SB-124	Not Detected	-----	5.00E-02
SB-125	Not Detected	-----	1.43E-01
SC-46	Not Detected	-----	8.88E-02
SR-85	Not Detected	-----	6.40E-02
TA-182	Not Detected	-----	2.64E-01
TA-183	Not Detected	-----	9.51E-01
TE-132	Not Detected	-----	6.93E-02
TL-201	Not Detected	-----	3.98E-01
XE-133	Not Detected	-----	4.01E-01
Y-88	Not Detected	-----	4.86E-02
ZN-65	Not Detected	-----	1.74E-01
ZR-95	Not Detected	-----	9.89E-02

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-23-95 1:35:30 PM *

 * Analyzed by: *Young Col 6/23/95* Reviewed by: *[Signature] 2/26/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : LAB CONTROL SAMPLE ANALYSIS #CG134
 Lab Sample ID : 50047605

Sample Description : MIXED GAMMA_STANDARD
 Sample Type : Liquid
 Sample Geometry : WMAR
 Sample Quantity : 1.000 Each
 Sample Date/Time : 11-01-90 12:00:00 PM
 Acquire Start Date : 6-23-95 1:18:50 PM
 Detector Name : LAB02
 Elapsed Live Time : 600 seconds
 Elapsed Real Time : 606 seconds

Comments:

Nuclide	Activity (pCi/Each)	2S Error	MDA
U-238	Not Detected	-----	2.62E+04
TH-234	Not Detected	-----	5.22E+03
U-234	Not Detected	-----	1.22E+05
RA-226	Not Detected	-----	6.61E+03
PB-214	Not Detected	-----	7.55E+02
BI-214	Not Detected	-----	6.55E+02
PB-210	Not Detected	-----	6.88E+06
TH-232	Not Detected	-----	2.18E+03
RA-228	Not Detected	-----	3.00E+03
AC-228	Not Detected	-----	1.84E+03
TH-228	Not Detected	-----	4.03E+04
RA-224	Not Detected	-----	3.26E+04
PB-212	Not Detected	-----	3.01E+03
BI-212	Not Detected	-----	2.73E+04
TL-208	Not Detected	-----	5.50E+03
U-235	Not Detected	-----	1.98E+03
TH-231	Not Detected	-----	4.34E+03
PA-231	Not Detected	-----	1.04E+04
AC-227	Not Detected	-----	1.71E+04
TH-227	Not Detected	-----	2.57E+03
RA-223	Not Detected	-----	1.00E+26
RN-219	Not Detected	-----	3.22E+03
PB-211	Not Detected	-----	9.84E+03
TL-207	Not Detected	-----	2.33E+05
AM-241	9.72E+04	1.89E+04	6.89E+03
PU-239	Not Detected	-----	2.25E+06
NP-237	Not Detected	-----	3.05E+03
PA-233	Not Detected	-----	6.71E+02
TH-229	Not Detected	-----	2.40E+03

[Summary Report] - Sample ID: 50047605

Nuclide	Activity (pCi/Each)	2S Error	MDA
AG-110m	Not Detected	-----	1.80E+05
AR-41	Not Detected	-----	1.00E+26
BA-133	Not Detected	-----	5.95E+02
BA-140	Not Detected	-----	1.00E+26
CD-109	3.35E+05	8.42E+04	9.21E+04
CD-115	Not Detected	-----	1.00E+26
CE-139	Not Detected	-----	1.39E+06
CE-141	Not Detected	-----	2.25E+18
CE-144	Not Detected	-----	1.23E+05
CO-56	Not Detected	-----	1.72E+09
CO-57	Not Detected	-----	2.09E+04
CO-58	Not Detected	-----	6.04E+09
CO-60	7.71E+04	1.00E+04	6.16E+02
CR-51	Not Detected	-----	6.70E+21
CS-134	Not Detected	-----	1.52E+03
CS-137	7.11E+04	9.18E+03	4.26E+02
CU-64	Not Detected	-----	1.00E+26
EU-152	Not Detected	-----	3.55E+03
EU-154	Not Detected	-----	2.42E+03
EU-155	Not Detected	-----	2.36E+03
FE-59	Not Detected	-----	2.84E+14
GD-153	Not Detected	-----	1.18E+05
HG-203	Not Detected	-----	2.70E+13
I-131	Not Detected	-----	1.00E+26
IN-115m	Not Detected	-----	1.00E+26
IR-192	Not Detected	-----	2.56E+09
K-40	Not Detected	-----	1.77E+03
LA-140	Not Detected	-----	1.00E+26
MN-54	Not Detected	-----	1.76E+04
MN-56	Not Detected	-----	1.00E+26
MO-99	Not Detected	-----	1.00E+26
NA-22	Not Detected	-----	9.11E+02
NA-24	Not Detected	-----	1.00E+26
NB-95	Not Detected	-----	1.00E+26
ND-147	Not Detected	-----	1.00E+26
NI-57	Not Detected	-----	1.00E+26
BE-7	Not Detected	-----	1.34E+13
RU-103	Not Detected	-----	3.64E+15
RU-106	Not Detected	-----	8.39E+04
SB-122	Not Detected	-----	1.00E+26
SB-124	Not Detected	-----	9.60E+10
SB-125	Not Detected	-----	3.78E+03
SC-46	Not Detected	-----	6.01E+08
SR-85	Not Detected	-----	2.85E+10
TA-182	Not Detected	-----	3.86E+07
TA-183	Not Detected	-----	1.00E+26
TE-132	Not Detected	-----	1.00E+26
TL-201	Not Detected	-----	1.00E+26
XE-133	Not Detected	-----	1.00E+26
Y-88	Not Detected	-----	1.14E+07
ZN-65	Not Detected	-----	1.25E+05
ZR-95	Not Detected	-----	6.23E+10

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program *
 * Quality Assurance Report *

Report Date : 6-23-95 1:44:26 PM
 QA File : C:\GENIEPC\CAMFILES\LCS2.QAF
 Analyst : MEC
 Sample ID : 50047605
 Sample Quantity : 1.00 Each
 Sample Date : 11-01-90 12:00:00 PM
 Measurement Date : 6-23-95 1:18:50 PM
 Elapsed Live Time : 600 seconds
 Elapsed Real Time : 606 seconds

Parameter	Mean	1S Error	New Value	< LU	: SD	: UD	: BS
AM-241 Activity	9.770E-02	3.512E-03	9.723E-02	<	:	: In :	>
CS-137 Activity	6.968E-02	2.471E-03	7.113E-02	<	:	: O.K meu 6/23/95	>
CO-60 Activity	7.701E-02	2.588E-03	7.653E-02	<	:	:	>

Flags Key: LU = Boundary Test (Ab = Above, Be = Below)
 SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
 UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
 BS = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: S. J. [Signature] Cal 6/23/95

ER/1302 096/DAT

3

SMO ANALYTICAL DATA ROUTING FORM

Project Name: TAI Phase I Case Number: 3626400

SNL Task Leader: Miller Org/Mail Stop: 7582/1347

SMO Project Coordinator: Puissant Sample Ship Date: 6/23/95

ARCOC Lab Lab ID 6/22/95
6/21/95

03727 SNL 7715 500479

03725 " 500476

03722 " 500473

Date Results Received:

Preliminary: _____ Final: 6/27, 6/26, 6/22/95

Corrections Requested From Laboratory: _____ Requestor: _____

Date Corrections Received: _____

Date Assigned to SMO Reviewer: _____

Reviewer: _____
(Initials) (Date)

COPY
ORIGINAL FILED IN
RECORDS CENTER BY
SMO WDM 7/10/95

Date Review Complete: _____

Signature: _____

Date of Preliminary Notification: _____

Person Notified: _____

Date of Final Transmittal: 7/10/95

Transmitted To: Miller

Transmitted By: WDM

Filed In Record Center: WDM

Comments: _____

ANALYSIS REQUEST AND CHAIN OF CUSTODY

2001-COC (9-94)

500479

AR/COC-03727

Dept. No./Mail Stop: 7582/1347
 Project/Task Manager: D. Miller / H. Fleck
 Project Name: TA-1 Soil Sampling (Phase 1)
 Record Center Code: ADS 1302 ER Site 96
 Logbook Ref No.: 0133
 SMO Reference No.: CF0089

Date Samples Shipped: 6/23/95
 Carrier/Waybill No.: HC
 Lab Contact: AMIR M.
 Lab Destination: 7F15
 SMO Contact/Phone: D. "Mac" McLaughlin / 845-0867
 Send Report to SMO: Deborah McLaughlin

Contract No.: N/A
 Case No.: 3626.400
 SMO Authorization: [Signature]
 Bill to: Sandia National Laboratories
 Supplier Services Department
 P.O. Box 5800 MS 0154
 Albuquerque, NM 87185-0154

Parameter & Method Requested

GAMMA SPEC.																				
-------------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Location Tech Area TA-1

Building 890 Room Outside

Sample No. - Fraction ER Sample ID or Sample Location Detail

Beginning Depth in Ft. ER Site No. Date/Time Collected

Reference LOV (available at SMO)

Sample Matrix Container Type Volume Preservative Sample Collection Method Sample Type

22905	-05	S	T1096-GP-039-008-S	11'8"	96	6/22/95/8:30	S	P	500ml	NONE	G	SA	X
22908	-05	S	T1096-GP-040-004-S	7'8"		/9:35							X
22910	-05	S	T1096-GP-041-004-S	3'10"		/10:40							X
22911	-05	S	T1096-GP-042-005-S	8'10"		/10:11:30							X
						CG 6/22/95							
22912	-05	S	T1096-GP-043-005-S	5'2"	96	6/22/95/13:10	S	P	500ml	NONE	G	SA	X

RMMA Yes No Ref. No. _____

Sample Disposal Return to Client Disposal by lab

Furnaround Time Normal Rush Required Report Date _____

Sample Tracking
 Date Entered (m/d/y): 6/30/95
 Entered by: [Signature]

Special Instructions/QC Requirements

Abnormal Conditions on Receipt

Sample Team Members	Name	Signature	Init	Company/Organization
	MATTHEW SHAIN	<u>[Signature]</u>	M	IT Corp / 7582
	CATHIE GOHAR	<u>[Signature]</u>	CG	Sandia / 7582

1. Relinquished by <u>Matthew Shain</u>	Org. <u>7582</u>	Date <u>6/22/95</u>	Time <u>11:35</u>
1. Received by <u>John Cove</u>	Org. <u>7513</u>	Date <u>6/22/95</u>	Time <u>14:35</u>
2. Relinquished by <u>[Signature]</u>	Org. <u>7513</u>	Date <u>6-23-95</u>	Time <u>11:03</u>
2. Received by <u>[Signature]</u>	Org. <u>SNL 7715</u>	Date <u>6/23/95</u>	Time <u>11:03</u>
Relinquished by <u>[Signature]</u>	Org. <u>SNL 7715</u>	Date <u>6/27/95</u>	Time <u>0545</u>
Received by <u>[Signature]</u>	Org. <u>7513</u>	Date <u>6-27-95</u>	Time <u>0945</u>

4. Relinquished by	Org.	Date	Time
4. Received by	Org.	Date	Time
5. Relinquished by	Org.	Date	Time
5. Received by	Org.	Date	Time
6. Relinquished by	Org.	Date	Time
6. Received by	Org.	Date	Time



To be completed by Customer

Shaded areas are for RPSD use only

Customer: <u>D. Miller / H. Fleck</u>	Hazards/Special Instructions: <u>Please Notify S-10 upon completion @ 845-0867</u>	Batch Log Number: <u>500979</u>
Organization: <u>7582</u>		Logged By: <u>[Signature]</u>
Project Location: <u>TA-1</u>		Analysis Type: <input checked="" type="checkbox"/> Gamma Spec
Phone: <u>845-0867</u>		<input type="checkbox"/> H-3
Date Results Needed: <u>6-26-95</u>		<input type="checkbox"/> Alpha/Beta
Suspect Isotopes: _____		<input type="checkbox"/> Alpha Spec
Other Information: <u>03727</u>	<input type="checkbox"/> Total U	
		<input type="checkbox"/> Other
LIMS Login: _____		
Results Faxed: _____		
Sample Disposal: _____		

Customer Sample ID	Sample Type	Date/Time Collected	Sample Volume	Requested Analysis	RPSD Sample ID	Rad Scan CPM	Sample Weight	Remarks
022905-05	5	6/22/95 8:30	500ml	Gamma Spec	01	2300	836g	
022908-05	↓	9:35	↓	↓	02	↓	949g	
022910-05	↓	10:40	↓	↓	03	↓	579g	
022911-05	↓	11:20	↓	↓	04	↓	827g	
022912-05	↓	13:10	↓	↓	05	2300	658g	
LCS		1 Nov 90		δ spec	06	NA	NA	

Relinquished by <u>[Signature]</u>	Date <u>6-23-95</u>	Time <u>11:03</u>	Received by <u>[Signature]</u>	Date <u>6/23/95</u>	Time <u>1103</u>
Relinquished by <u>[Signature]</u>	Date <u>6/27/95</u>	Time <u>0945</u>	Received by <u>[Signature]</u>	Date <u>6-27-95</u>	Time <u>0945</u>
Relinquished by _____	Date _____	Time _____	Received by _____	Date _____	Time _____
Relinquished by _____	Date _____	Time _____	Received by _____	Date _____	Time _____

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-26-95 10:30:42 AM *

* Analyzed by: *Sample Calc 6/26/95* Reviewed by: *JT 6/26/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022905-05
 Lab Sample ID : 50047901

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 1SMAR
 Sample Quantity : 836.000 gram
 Sample Date/Time : 6-22-95 8:30:00 AM
 Acquire Start Date : 6-26-95 9:56:34 AM
 Detector Name : LAB01
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	2.29
TH-234	9.82E-01	4.17E-01	5.54E-01
U-234	Not Detected	-----	1.92E+01
RA-226	1.15	5.14E-01	6.03E-01
PB-214	5.60E-01	1.11E-01	9.40E-02
BI-214	5.24E-01	1.03E-01	8.43E-02
PB-210	Not Detected	-----	5.19E+01
TH-232	6.56E-01	2.86E-01	4.03E-01
RA-228	6.79E-01	2.39E-01	2.95E-01
AC-228	Not Detected	-----	3.17E-01
TH-228	Not Detected	-----	1.51
RA-224	1.48	3.99E-01	6.86E-01
PB-212	7.23E-01	1.38E-01	6.25E-02
BI-212	5.90E-01	3.76E-01	5.53E-01
TL-208	6.24E-01	1.41E-01	1.32E-01
U-235	Not Detected	-----	3.48E-01
TH-231	Not Detected	-----	6.65E-01
PA-231	Not Detected	-----	2.09
AC-227	Not Detected	-----	2.55
TH-227	Not Detected	-----	5.58E-01
RA-223	Not Detected	-----	2.70E-01
RN-219	Not Detected	-----	4.45E-01
PB-211	Not Detected	-----	1.04
TL-207	Not Detected	-----	2.21E+01
AM-241	Not Detected	-----	2.95E-01
PU-239	Not Detected	-----	3.79E+02
NP-237	Not Detected	-----	2.59E-01
PA-233	Not Detected	-----	9.58E-02
TH-229	Not Detected	-----	3.65E-01

[Summary Report] - Sample ID: 50047901

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	4.62E-02
AR-41	Not Detected	-----	8.19E+14
BA-133	Not Detected	-----	9.35E-02
BA-140	Not Detected	-----	2.08E-01
CD-109	Not Detected	-----	8.96E-01
CD-115	Not Detected	-----	3.59E-01
CE-139	Not Detected	-----	4.91E-02
CE-141	Not Detected	-----	8.56E-02
CE-144	Not Detected	-----	3.48E-01
CO-56	Not Detected	-----	5.79E-02
CO-57	Not Detected	-----	4.38E-02
CO-58	Not Detected	-----	5.01E-02
CO-60	Not Detected	-----	6.28E-02
CR-51	Not Detected	-----	4.05E-01
CS-134	Not Detected	-----	7.81E-02
CS-137	Not Detected	-----	5.23E-02
CU-64	Not Detected	-----	2.52E+03
EU-152	Not Detected	-----	3.99E-01
EU-154	Not Detected	-----	2.87E-01
EU-155	Not Detected	-----	1.82E-01
FE-59	Not Detected	-----	1.27E-01
GD-153	Not Detected	-----	1.53E-01
HG-203	Not Detected	-----	4.90E-02
I-131	Not Detected	-----	6.44E-02
IN-115m	Not Detected	-----	3.67E+05
IR-192	Not Detected	-----	4.57E-02
K-40	2.43E+01	3.41	5.60E-01
LA-140	Not Detected	-----	3.18E-01
MN-54	Not Detected	-----	5.91E-02
MN-56	Not Detected	-----	1.43E+10
MO-99	Not Detected	-----	1.05
NA-22	Not Detected	-----	7.28E-02
NA-24	Not Detected	-----	5.25
NB-95	Not Detected	-----	5.67E-01
ND-147	Not Detected	-----	4.12E-01
NI-57	Not Detected	-----	4.83E-01
BE-7	Not Detected	-----	3.84E-01
RU-103	Not Detected	-----	4.78E-02
RU-106	Not Detected	-----	4.58E-01
SB-122	Not Detected	-----	1.73E-01
SB-124	Not Detected	-----	5.18E-02
SB-125	Not Detected	-----	1.35E-01
SC-46	Not Detected	-----	8.59E-02
SR-85	Not Detected	-----	5.98E-02
TA-182	Not Detected	-----	2.50E-01
TA-183	Not Detected	-----	4.38E-01
TE-132	Not Detected	-----	1.08E-01
TL-201	Not Detected	-----	3.77E-01
XE-133	Not Detected	-----	5.88E-01
Y-88	Not Detected	-----	4.48E-02
ZN-65	Not Detected	-----	1.66E-01
ZR-95	Not Detected	-----	9.33E-02

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-26-95 11:45:58 AM *

* Analyzed by: *Spruyt Cole 6/26/95* Reviewed by: *JR 6/26/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022908-05
 Lab Sample ID : 50047902

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 1SMAR
 Sample Quantity : 949.000 gram
 Sample Date/Time : 6-22-95 9:35:00 AM
 Acquire Start Date : 6-26-95 11:11:47 AM
 Detector Name : LAB01
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	7.79E-01
TH-234	Not Detected	-----	8.07E-01
U-234	Not Detected	-----	1.76E+01
RA-226	1.40	7.14E-01	1.06
PB-214	6.44E-01	1.32E-01	1.30E-01
BI-214	5.85E-01	1.06E-01	7.59E-02
PB-210	Not Detected	-----	4.78E+01
TH-232	4.98E-01	1.92E-01	2.53E-01
RA-228	6.76E-01	4.27E-01	1.87E-01
AC-228	7.49E-01	1.64E-01	1.24E-01
TH-228	Not Detected	-----	1.41
RA-224	1.74	4.17E-01	6.07E-01
PB-212	6.59E-01	1.24E-01	5.74E-02
BI-212	6.58E-01	3.71E-01	5.36E-01
TL-208	5.49E-01	1.29E-01	1.30E-01
U-235	Not Detected	-----	3.25E-01
TH-231	Not Detected	-----	6.30E-01
PA-231	Not Detected	-----	1.95
AC-227	Not Detected	-----	2.43
TH-227	Not Detected	-----	4.93E-01
RA-223	Not Detected	-----	2.55E-01
RN-219	Not Detected	-----	2.93E-01
PB-211	Not Detected	-----	9.25E-01
TL-207	Not Detected	-----	2.06E+01
AM-241	Not Detected	-----	2.75E-01
PU-239	Not Detected	-----	3.53E+02
NP-237	Not Detected	-----	2.15E-01
PA-233	Not Detected	-----	8.54E-02
TH-229	Not Detected	-----	3.36E-01

[Summary Report] - Sample ID: 50047902

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	4.36E-02
AR-41	Not Detected	-----	8.87E+14
BA-133	Not Detected	-----	8.79E-02
BA-140	Not Detected	-----	2.00E-01
CD-109	Not Detected	-----	7.44E-01
CD-115	Not Detected	-----	3.31E-01
CE-139	Not Detected	-----	4.62E-02
CE-141	Not Detected	-----	8.10E-02
CE-144	Not Detected	-----	3.17E-01
CO-56	Not Detected	-----	5.32E-02
CO-57	Not Detected	-----	4.21E-02
CO-58	Not Detected	-----	4.90E-02
CO-60	Not Detected	-----	5.82E-02
CR-51	Not Detected	-----	3.69E-01
CS-134	Not Detected	-----	7.21E-02
CS-137	Not Detected	-----	4.92E-02
CU-64	Not Detected	-----	2.53E+03
EU-152	Not Detected	-----	3.74E-01
EU-154	Not Detected	-----	2.57E-01
EU-155	Not Detected	-----	1.68E-01
FE-59	Not Detected	-----	1.14E-01
GD-153	Not Detected	-----	1.43E-01
HG-203	Not Detected	-----	4.00E-02
I-131	Not Detected	-----	5.85E-02
IN-115m	Not Detected	-----	3.47E+05
IR-192	Not Detected	-----	4.09E-02
K-40	2.30E+01	3.21	3.60E-01
LA-140	Not Detected	-----	2.81E-01
MN-54	Not Detected	-----	5.18E-02
MN-56	Not Detected	-----	1.37E+10
MO-99	Not Detected	-----	1.02
NA-22	Not Detected	-----	6.49E-02
NA-24	Not Detected	-----	4.64
NB-95	Not Detected	-----	5.01E-01
ND-147	Not Detected	-----	3.72E-01
NI-57	Not Detected	-----	4.59E-01
BE-7	Not Detected	-----	3.64E-01
RU-103	Not Detected	-----	4.19E-02
RU-106	Not Detected	-----	4.28E-01
SB-122	Not Detected	-----	1.70E-01
SB-124	Not Detected	-----	4.71E-02
SB-125	Not Detected	-----	1.21E-01
SC-46	Not Detected	-----	8.46E-02
SR-85	Not Detected	-----	5.02E-02
TA-182	Not Detected	-----	2.48E-01
TA-183	Not Detected	-----	4.09E-01
TE-132	Not Detected	-----	9.67E-02
TL-201	Not Detected	-----	3.38E-01
XE-133	Not Detected	-----	5.58E-01
Y-88	Not Detected	-----	3.24E-02
ZN-65	Not Detected	-----	1.60E-01
ZR-95	Not Detected	-----	9.22E-02

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-26-95 12:25:11 PM *

 * Analyzed by: *Joseph Cole 6/26/95* Reviewed by: *[Signature]* 6/26/95 *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022910-05
 Lab Sample ID : 50047903

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 1SMAR
 Sample Quantity : 579.000 gram
 Sample Date/Time : 6-22-95 10:40:00 AM
 Acquire Start Date : 6-26-95 11:51:34 AM
 Detector Name : LAB01
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	2.62
TH-234	Not Detected	-----	1.10
U-234	Not Detected	-----	2.14E+01
RA-226	6.82E-01	5.74E-01	8.94E-01
PB-214	8.45E-01	1.53E-01	9.85E-02
BI-214	6.87E-01	1.39E-01	1.15E-01
PB-210	Not Detected	-----	6.06E+01
TH-232	4.75E-01	2.21E-01	3.03E-01
RA-228	5.29E-01	2.26E-01	2.85E-01
AC-228	Not Detected	-----	3.63E-01
TH-228	6.13E-01	3.60E-01	7.41E-01
RA-224	Not Detected	-----	6.86E-01
PB-212	6.83E-01	1.41E-01	7.07E-02
BI-212	9.08E-01	4.67E-01	6.39E-01
TL-208	6.11E-01	1.55E-01	1.53E-01
U-235	Not Detected	-----	4.15E-01
TH-231	Not Detected	-----	7.73E-01
PA-231	Not Detected	-----	2.60
AC-227	Not Detected	-----	2.97
TH-227	Not Detected	-----	6.46E-01
RA-223	Not Detected	-----	3.12E-01
RN-219	Not Detected	-----	4.98E-01
PB-211	Not Detected	-----	1.23
TL-207	Not Detected	-----	2.53E+01
AM-241	Not Detected	-----	3.38E-01
PU-239	Not Detected	-----	4.39E+02
NP-237	Not Detected	-----	4.94E-01
PA-233	Not Detected	-----	1.11E-01
TH-229	Not Detected	-----	3.98E-01

[Summary Report] - Sample ID: 50047903

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	5.63E-02
AR-41	Not Detected	-----	8.03E+14
BA-133	Not Detected	-----	1.26E-01
BA-140	Not Detected	-----	2.48E-01
CD-109	Not Detected	-----	9.74E-01
CD-115	Not Detected	-----	4.32E-01
CE-139	Not Detected	-----	5.60E-02
CE-141	Not Detected	-----	9.98E-02
CE-144	Not Detected	-----	4.02E-01
CO-56	Not Detected	-----	6.80E-02
CO-57	Not Detected	-----	4.91E-02
CO-58	Not Detected	-----	6.26E-02
CO-60	Not Detected	-----	7.21E-02
CR-51	Not Detected	-----	4.67E-01
CS-134	Not Detected	-----	1.02E-01
CS-137	Not Detected	-----	6.05E-02
CU-64	Not Detected	-----	2.69E+03
EU-152	Not Detected	-----	4.64E-01
EU-154	Not Detected	-----	3.35E-01
EU-155	Not Detected	-----	2.03E-01
FE-59	Not Detected	-----	1.34E-01
GD-153	Not Detected	-----	1.70E-01
HG-203	Not Detected	-----	4.24E-02
I-131	Not Detected	-----	7.54E-02
IN-115m	Not Detected	-----	4.27E+05
IR-192	Not Detected	-----	5.21E-02
K-40	1.39E+01	2.15	5.87E-01
LA-140	Not Detected	-----	3.57E-01
MN-54	Not Detected	-----	6.59E-02
MN-56	Not Detected	-----	1.57E+10
MO-99	Not Detected	-----	1.33
NA-22	Not Detected	-----	7.88E-02
NA-24	Not Detected	-----	5.52
NB-95	Not Detected	-----	6.54E-01
ND-147	Not Detected	-----	4.59E-01
NI-57	Not Detected	-----	6.20E-01
BE-7	Not Detected	-----	5.07E-01
RU-103	Not Detected	-----	5.71E-02
RU-106	Not Detected	-----	5.60E-01
SB-122	Not Detected	-----	2.13E-01
SB-124	Not Detected	-----	6.55E-02
SB-125	Not Detected	-----	1.52E-01
SC-46	Not Detected	-----	9.54E-02
SR-85	Not Detected	-----	7.24E-02
TA-182	Not Detected	-----	2.82E-01
TA-183	Not Detected	-----	5.02E-01
TE-132	Not Detected	-----	1.20E-01
TL-201	Not Detected	-----	4.09E-01
XE-133	Not Detected	-----	6.91E-01
Y-88	Not Detected	-----	5.85E-02
ZN-65	Not Detected	-----	1.95E-01
ZR-95	Not Detected	-----	1.05E-01

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-26-95 1:04:15 PM *

 * Analyzed by: *George Cole 6/26/95* Reviewed by: *[Signature] 6/26/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022911-05
 Lab Sample ID : 50047904

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 1SMAR
 Sample Quantity : 827.000 gram
 Sample Date/Time : 6-22-95 11:20:00 AM
 Acquire Start Date : 6-26-95 12:31:40 PM
 Detector Name : LAB01
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	2.31
TH-234	Not Detected	-----	6.14E-01
U-234	Not Detected	-----	1.85E+01
RA-226	8.84E-01	5.64E-01	8.55E-01
PB-214	7.32E-01	1.28E-01	8.10E-02
BI-214	5.86E-01	1.16E-01	9.94E-02
PB-210	Not Detected	-----	5.05E+01
TH-232	5.77E-01	1.98E-01	2.44E-01
RA-228	6.76E-01	2.28E-01	2.70E-01
AC-228	7.22E-01	1.79E-01	1.69E-01
TH-228	Not Detected	-----	1.50
RA-224	1.95	4.65E-01	6.37E-01
PB-212	7.22E-01	1.37E-01	6.16E-02
BI-212	3.31E-01	3.60E-01	5.72E-01
TL-208	6.45E-01	1.42E-01	1.27E-01
U-235	Not Detected	-----	3.40E-01
TH-231	Not Detected	-----	6.97E-01
PA-231	Not Detected	-----	2.07
AC-227	Not Detected	-----	2.63
TH-227	Not Detected	-----	5.46E-01
RA-223	Not Detected	-----	2.82E-01
RN-219	Not Detected	-----	3.36E-01
PB-211	Not Detected	-----	1.02
TL-207	Not Detected	-----	2.17E+01
AM-241	Not Detected	-----	3.07E-01
PU-239	Not Detected	-----	3.99E+02
NP-237	Not Detected	-----	2.40E-01
PA-233	Not Detected	-----	9.47E-02
TH-229	Not Detected	-----	3.63E-01

[Summary Report] - Sample ID: 50047904

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	4.96E-02
AR-41	Not Detected	-----	7.59E+14
BA-133	Not Detected	-----	1.01E-01
BA-140	Not Detected	-----	2.13E-01
CD-109	Not Detected	-----	8.28E-01
CD-115	Not Detected	-----	3.58E-01
CE-139	Not Detected	-----	5.10E-02
CE-141	Not Detected	-----	8.47E-02
CE-144	Not Detected	-----	3.58E-01
CO-56	Not Detected	-----	6.07E-02
CO-57	Not Detected	-----	4.48E-02
CO-58	Not Detected	-----	5.03E-02
CO-60	Not Detected	-----	6.18E-02
CR-51	Not Detected	-----	3.95E-01
CS-134	Not Detected	-----	8.20E-02
CS-137	Not Detected	-----	5.53E-02
CU-64	Not Detected	-----	2.74E+03
EU-152	Not Detected	-----	4.08E-01
EU-154	Not Detected	-----	2.78E-01
EU-155	Not Detected	-----	1.87E-01
FE-59	Not Detected	-----	1.23E-01
GD-153	Not Detected	-----	1.51E-01
HG-203	Not Detected	-----	4.93E-02
I-131	Not Detected	-----	6.19E-02
IN-115m	Not Detected	-----	3.54E+05
IR-192	Not Detected	-----	4.53E-02
K-40	2.01E+01	2.87	4.87E-01
LA-140	Not Detected	-----	3.22E-01
MN-54	Not Detected	-----	5.66E-02
MN-56	Not Detected	-----	1.40E+10
MO-99	Not Detected	-----	1.15
NA-22	Not Detected	-----	7.06E-02
NA-24	Not Detected	-----	4.98
NB-95	Not Detected	-----	5.53E-01
ND-147	Not Detected	-----	4.11E-01
NI-57	Not Detected	-----	5.35E-01
BE-7	Not Detected	-----	4.14E-01
RU-103	Not Detected	-----	4.85E-02
RU-106	Not Detected	-----	4.50E-01
SB-122	Not Detected	-----	1.87E-01
SB-124	Not Detected	-----	5.32E-02
SB-125	Not Detected	-----	1.36E-01
SC-46	Not Detected	-----	8.59E-02
SR-85	Not Detected	-----	5.99E-02
TA-182	Not Detected	-----	2.47E-01
TA-183	Not Detected	-----	4.55E-01
TE-132	Not Detected	-----	1.05E-01
TL-201	Not Detected	-----	3.63E-01
XE-133	Not Detected	-----	6.09E-01
Y-88	Not Detected	-----	2.90E-02
ZN-65	Not Detected	-----	1.68E-01
ZR-95	Not Detected	-----	9.23E-02

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-26-95 1:47:18 PM *

 * Analyzed by: *James Cole 6/26/95* Reviewed by: *[Signature]* *6/21/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022912-05
 Lab Sample ID : 50047905

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 1SMAR
 Sample Quantity : 658.000 gram
 Sample Date/Time : 6-22-95 1:10:00 PM
 Acquire Start Date : 6-26-95 1:09:07 PM
 Detector Name : LAB01
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	1.30	1.23	1.94
TH-234	Not Detected	-----	1.06
U-234	Not Detected	-----	2.26E+01
RA-226	2.09	8.51E-01	1.19
PB-214	8.13E-01	1.54E-01	1.23E-01
BI-214	6.35E-01	1.25E-01	9.91E-02
PB-210	Not Detected	-----	5.77E+01
TH-232	6.52E-01	2.52E-01	3.29E-01
RA-228	6.60E-01	2.57E-01	2.18E-01
AC-228	Not Detected	-----	3.40E-01
TH-228	Not Detected	-----	1.75
RA-224	1.99	5.28E-01	7.16E-01
PB-212	7.59E-01	1.82E-01	6.79E-02
BI-212	7.43E-01	4.95E-01	7.37E-01
TL-208	6.81E-01	1.54E-01	1.36E-01
U-235	Not Detected	-----	3.77E-01
TH-231	Not Detected	-----	7.56E-01
PA-231	Not Detected	-----	2.43
AC-227	Not Detected	-----	2.91
TH-227	Not Detected	-----	6.15E-01
RA-223	Not Detected	-----	3.06E-01
RN-219	3.19E-01	3.14E-01	4.94E-01
PB-211	Not Detected	-----	1.13
TL-207	Not Detected	-----	2.26E+01
AM-241	Not Detected	-----	3.29E-01
PU-239	Not Detected	-----	4.13E+02
NP-237	Not Detected	-----	4.93E-01
PA-233	Not Detected	-----	1.03E-01
TH-229	Not Detected	-----	3.91E-01

not detected see 6/6

[Summary Report] - Sample ID: 50047905

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	5.42E-02
AR-41	Not Detected	-----	4.69E+14
BA-133	Not Detected	-----	1.14E-01
BA-140	Not Detected	-----	2.28E-01
CD-109	Not Detected	-----	9.82E-01
CD-115	Not Detected	-----	4.01E-01
CE-139	Not Detected	-----	5.50E-02
CE-141	Not Detected	-----	9.27E-02
CE-144	Not Detected	-----	3.76E-01
CO-56	Not Detected	-----	6.57E-02
CO-57	Not Detected	-----	4.77E-02
CO-58	Not Detected	-----	6.05E-02
CO-60	Not Detected	-----	6.52E-02
CR-51	Not Detected	-----	4.72E-01
CS-134	Not Detected	-----	9.50E-02
CS-137	Not Detected	-----	5.96E-02
CU-64	Not Detected	-----	2.44E+03
EU-152	Not Detected	-----	4.50E-01
EU-154	Not Detected	-----	3.20E-01
EU-155	Not Detected	-----	2.00E-01
FE-59	Not Detected	-----	1.36E-01
GD-153	Not Detected	-----	1.65E-01
HG-203	Not Detected	-----	5.27E-02
I-131	Not Detected	-----	7.24E-02
IN-115m	Not Detected	-----	3.34E+05
IR-192	Not Detected	-----	5.26E-02
K-40	1.38E+01	2.11	6.18E-01
LA-140	Not Detected	-----	3.65E-01
MN-54	Not Detected	-----	6.51E-02
MN-56	Not Detected	-----	1.09E+10
MO-99	Not Detected	-----	1.10
NA-22	Not Detected	-----	7.01E-02
NA-24	Not Detected	-----	5.13
NB-95	Not Detected	-----	6.17E-01
ND-147	Not Detected	-----	4.45E-01
NI-57	Not Detected	-----	3.58E-01
BE-7	Not Detected	-----	4.66E-01
RU-103	Not Detected	-----	5.58E-02
RU-106	Not Detected	-----	4.95E-01
SB-122	Not Detected	-----	1.97E-01
SB-124	Not Detected	-----	6.09E-02
SB-125	Not Detected	-----	1.54E-01
SC-46	Not Detected	-----	9.47E-02
SR-85	Not Detected	-----	6.63E-02
TA-182	Not Detected	-----	2.76E-01
TA-183	Not Detected	-----	4.84E-01
TE-132	Not Detected	-----	1.12E-01
TL-201	Not Detected	-----	4.12E-01
XE-133	Not Detected	-----	6.83E-01
Y-88	Not Detected	-----	5.68E-02
ZN-65	Not Detected	-----	1.82E-01
ZR-95	Not Detected	-----	1.06E-01

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-26-95 2:34:48 PM *

* Analyzed by: *George Cole 6/26/95* Reviewed by: *[Signature] 6/26/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : LAB CONTROL SAMPLE ANALYSIS #CG134
 Lab Sample ID : 50047906

Sample Description : MIXED GAMMA_STANDARD
 Sample Type : Liquid
 Sample Geometry : WMAR
 Sample Quantity : 1.000 Each
 Sample Date/Time : 11-01-90 12:00:00 PM
 Acquire Start Date : 6-26-95 2:21:11 PM
 Detector Name : LAB01
 Elapsed Live Time : 600 seconds
 Elapsed Real Time : 608 seconds

Comments:

Nuclide	Activity (pCi/Each)	2S Error	MDA
U-238	Not Detected	-----	2.55E+04
TH-234	Not Detected	-----	3.93E+03
U-234	Not Detected	-----	1.12E+05
RA-226	Not Detected	-----	6.00E+03
PB-214	Not Detected	-----	7.05E+02
BI-214	Not Detected	-----	6.24E+02
PB-210	Not Detected	-----	1.27E+06
TH-232	Not Detected	-----	2.10E+03
RA-228	Not Detected	-----	2.70E+03
AC-228	Not Detected	-----	1.71E+03
TH-228	Not Detected	-----	3.70E+04
RA-224	Not Detected	-----	3.07E+04
PB-212	Not Detected	-----	2.80E+03
BI-212	Not Detected	-----	2.50E+04
TL-208	Not Detected	-----	5.12E+03
U-235	Not Detected	-----	1.63E+03
TH-231	Not Detected	-----	2.74E+03
PA-231	Not Detected	-----	9.56E+03
AC-227	Not Detected	-----	1.46E+04
TH-227	Not Detected	-----	2.36E+03
RA-223	Not Detected	-----	1.00E+26
RN-219	Not Detected	-----	2.93E+03
PB-211	Not Detected	-----	8.88E+03
TL-207	Not Detected	-----	2.15E+05
AM-241	1.10E+05	1.75E+04	2.19E+03
PU-239	7.00E+05	5.05E+05	1.21E+06
NP-237	Not Detected	-----	1.84E+03
PA-233	Not Detected	-----	6.28E+02
TH-229	Not Detected	-----	1.58E+03

[Summary Report] - Sample ID: 50047906

Nuclide	Activity (pCi/Each)	2S Error	MDA
AG-110m	Not Detected	-----	1.62E+05
AR-41	Not Detected	-----	1.00E+26
BA-133	Not Detected	-----	5.58E+02
BA-140	Not Detected	-----	1.00E+26
CD-109	3.47E+05	7.37E+04	7.06E+04
CD-115	Not Detected	-----	1.00E+26
CE-139	Not Detected	-----	1.24E+06
CE-141	Not Detected	-----	1.98E+18
CE-144	Not Detected	-----	9.90E+04
CO-56	Not Detected	-----	1.65E+09
CO-57	1.28E+04	6.68E+03	1.07E+04
CO-58	Not Detected	-----	5.93E+09
CO-60	7.34E+04	9.53E+03	4.47E+02
CR-51	Not Detected	-----	6.77E+21
CS-134	Not Detected	-----	1.41E+03
CS-137	6.85E+04	8.83E+03	3.97E+02
CU-64	Not Detected	-----	1.00E+26
EU-152	Not Detected	-----	3.36E+03
EU-154	Not Detected	-----	2.21E+03
EU-155	Not Detected	-----	1.59E+03
FE-59	Not Detected	-----	2.65E+14
GD-153	Not Detected	-----	7.70E+04
HG-203	Not Detected	-----	2.58E+13
I-131	Not Detected	-----	1.00E+26
IN-115m	Not Detected	-----	1.00E+26
IR-192	Not Detected	-----	2.45E+09
K-40	Not Detected	-----	1.61E+03
LA-140	Not Detected	-----	1.00E+26
MN-54	Not Detected	-----	1.67E+04
MN-56	Not Detected	-----	1.00E+26
MO-99	Not Detected	-----	1.00E+26
NA-22	Not Detected	-----	8.08E+02
NA-24	Not Detected	-----	1.00E+26
NB-95	Not Detected	-----	1.00E+26
ND-147	Not Detected	-----	1.00E+26
NI-57	Not Detected	-----	1.00E+26
BE-7	Not Detected	-----	1.29E+13
RU-103	Not Detected	-----	3.61E+15
RU-106	Not Detected	-----	7.16E+04
SB-122	Not Detected	-----	1.00E+26
SB-124	Not Detected	-----	9.18E+10
SB-125	Not Detected	-----	3.53E+03
SC-46	Not Detected	-----	5.62E+08
SR-85	Not Detected	-----	2.74E+10
TA-182	Not Detected	-----	3.55E+07
TA-183	Not Detected	-----	1.00E+26
TE-132	Not Detected	-----	1.00E+26
TL-201	Not Detected	-----	1.00E+26
XE-133	Not Detected	-----	1.00E+26
Y-88	Not Detected	-----	1.22E+07
ZN-65	Not Detected	-----	1.16E+05
ZR-95	Not Detected	-----	5.80E+10

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program *
 * Quality Assurance Report *

Report Date : 6-26-95 2:39:35 PM
 QA File : C:\GENIEPC\CAMFILES\LCS1.QAF
 Analyst : MEC
 Sample ID : 50047906
 Sample Quantity : 1.00 Each
 Sample Date : 11-01-90 12:00:00 PM
 Measurement Date : 6-26-95 2:21:11 PM
 Elapsed Live Time : 600 seconds
 Elapsed Real Time : 608 seconds

Parameter	Mean	1S Error	New Value	< LU : SD : UD : BS
AM-241 Activity	1.127E-01	4.846E-03	1.104E-01	< : : Ac: >
CS-137 Activity	6.832E-02	2.103E-03	6.848E-02	< : : O.K. >
CO-60 Activity	7.665E-02	2.914E-03	7.293E-02	< :In: 6/26/95 >

Flags Key: LU = Boundary Test (Ab = Above, Be = Below)
 SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
 UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
 BS = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: Sandra Cole 6/26/95

ER/1302 096/DAT

9

SMO ANALYTICAL DATA ROUTING FORM

Project Name: TAT Phase I Case Number: 3626400

SNL Task Leader: Miller Org/Mail Stop: 7582/1347

SMO Project Coordinator: Puissant Sample Ship Date: 6/27/95

ARCOG Lab Lab ID
03731 SNL 7715 500491

03733 " 500495

03728 " 500488

Date Results Received:

Preliminary: _____ Final: 6/29, 6/29, 6/28/95

Corrections Requested From Laboratory: _____ Requested _____

Date Corrections Received: _____

Date Assigned to SMO Reviewer: _____

Reviewer: _____

Date Review Complete: _____

Signature: _____

Date of Preliminary Notification: _____

Person Notified: _____

Date of Final Transmittal: 7/10/95

Transmitted To: Miller

Transmitted By: WJM

Filed In Record Center: WJM

Comments: _____

ORIGINAL FILED IN COPY RECORDS CENTER BY SMO WJM 7/10/95 (initials)

ANALYSIS REQUEST AND CHAIN OF CUSTODY

2001-COC (9-94)

500495

AR/COC-03733

Dept. No./Mail Stop: <u>7502/1217</u>		Date Samples Shipped: <u>6/29/95</u>		Contract No.: <u>NA</u>	
Project/Task Manager: <u>D. H. Hill / H. Fleck</u>		Carrier/Waybill No.: <u>NC</u>		Case No.: <u>3626.100</u>	
Project Name: <u>TA-1 Soil Sampling (Phase)</u>		Lab Contact: <u>Ann M.</u>		SMO Authorization: <u>Boyer</u>	
Record Center Code: <u>APC 202 ER Site 96</u>		Lab Destination: <u>FEL</u>		Bill to: Sandia National Laboratories Supplier Services Department P.O. Box 5800 MS 0154 Albuquerque, NM 87185-0154	
Logbook Ref No.: <u>0133</u>		SMO Contact/Phone: <u>D. Mac McLaughlin / 845-0567</u>		Send Report to SMO: <u>Deborah McLaughlin</u>	
SMO Reference No.: <u>CF0081</u>					

Parameter & Method Requested

<div style="border: 1px solid black; padding: 5px; display: inline-block; transform: rotate(90deg); transform-origin: left top;"> X GAMMA SPEC </div>																	

Location		Tech Area	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Reference LOV (available at SMO)					Lab Sample ID							
Building	Room					Sample Matrix	Container Type	Volume	Preservative	Sample Collection Method		Sample Type						
<u>405</u>	<u>Outside</u>	<u>TA-1</u>	<u>10'</u>	<u>16</u>	<u>6/29/95 10:10</u>	<u>S</u>	<u>P</u>	<u>50ml</u>	<u>None</u>	<u>G</u>	<u>SA</u>	<u>X</u>						

RMMA <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Ref. No. _____		Sample Tracking Date Entered (mm/dd/yy): <u>6/29/95</u>		Special Instructions/QC Requirements	Abnormal Conditions on Receipt
Sample Disposal <input checked="" type="checkbox"/> Return to Client <input type="checkbox"/> Disposal by lab		Entered by: _____			
Turnaround Time <input checked="" type="checkbox"/> Normal <input type="checkbox"/> Rush Required Report Date _____		QC inits: _____			
Sample Team Members	Name <u>MATTHEW SWAIN</u> <u>MATTHEW SWAIN</u>	Signature <u>[Signature]</u> <u>[Signature]</u>	Init <u>MS</u> <u>CG</u>	Company/Organization <u>77/7582</u> <u>SANDIA/7582</u>	
1. Relinquished by <u>[Signature]</u> Org. <u>7552</u> Date <u>6/29/95</u> Time <u>11:51</u>	1. Received by <u>[Signature]</u> Org. <u>SMU 7513</u> Date <u>6/29/95</u> Time <u>11:51</u>		4. Relinquished by _____ Org. _____ Date _____ Time _____		
2. Relinquished by <u>[Signature]</u> Org. <u>SMU 7513</u> Date <u>6/29/95</u> Time <u>13:19</u>	2. Received by <u>[Signature]</u> Org. <u>SMU 7513</u> Date <u>6/29/95</u> Time <u>13:19</u>		4. Received by _____ Org. _____ Date _____ Time _____		
3. Relinquished by <u>[Signature]</u> Org. <u>SMU 7513</u> Date <u>6/29/95</u> Time <u>17:19</u>	3. Received by <u>[Signature]</u> Org. <u>SMU 7513</u> Date <u>6/29/95</u> Time <u>17:19</u>		5. Relinquished by _____ Org. _____ Date _____ Time _____		
4. Relinquished by <u>[Signature]</u> Org. <u>SMU 7513</u> Date <u>6/29/95</u> Time <u>10:55</u>	4. Received by <u>[Signature]</u> Org. <u>SMU 7513</u> Date <u>6/29/95</u> Time <u>10:55</u>		5. Received by _____ Org. _____ Date _____ Time _____		
5. Relinquished by <u>[Signature]</u> Org. <u>SMU 7513</u> Date <u>6/29/95</u> Time <u>10:55</u>	5. Received by <u>[Signature]</u> Org. <u>SMU 7513</u> Date <u>6/29/95</u> Time <u>10:55</u>		6. Relinquished by _____ Org. _____ Date _____ Time _____		
6. Relinquished by <u>[Signature]</u> Org. <u>SMU 7513</u> Date <u>6/29/95</u> Time <u>10:55</u>	6. Received by <u>[Signature]</u> Org. <u>SMU 7513</u> Date <u>6/29/95</u> Time <u>10:55</u>		6. Received by _____ Org. _____ Date _____ Time _____		

/HITE - To AC Labor Copy
 many Samples, BLUE - To Accompany Samples, Return to SMO
 YELLOW - SMO S
 use Copy
 PINK - Field Copy



To be completed by Customer

Shaded areas are for RPSD use only

Customer: <u>D. Miller / H. F. Bull</u>	Hazards/Special Instructions: <i>Please note SMO upon completion @ 845-0867</i>	Batch Log Number: <u>500495</u>
Organization: <u>7582</u>		Logged By: <u>JM</u>
Project Location: <u>JA-1</u>		Analysis Type: <input checked="" type="checkbox"/> Gamma Spec
Phone: <u>845-0867</u>		<input type="checkbox"/> H-3
Date Results Needed: <u>6/30/95</u>		<input type="checkbox"/> Alpha/Beta
Suspect Isotopes: _____		<input type="checkbox"/> Alpha Spec
Other Information: <u>03733</u>	<input type="checkbox"/> Total U	<input type="checkbox"/> Other
LIMS Login _____		
Results Faxed _____		
Sample ID/spdsal _____		

Customer Sample ID	Sample Type	Date/Time Collected	Sample Volume	Requested Analysis	RPSD Sample ID	Rad Scan CPM	Sample Weight	Remarks
<u>022953-05</u>	<u>S</u>	<u>6/21/95-10:30</u>	<u>500ml</u>	<u>Gamma. spec.</u>	<u>01</u>	<u>2300</u>	<u>624g</u>	
<u>LCS</u>		<u>1/20/90</u>		<u>β spec</u>	<u>02</u>	<u>NA</u>	<u>NA</u>	

Relinquished by <u>D. Miller</u>	Date <u>6/20/95</u>	Time <u>13:19</u>	Received by <u>[Signature]</u>	Date <u>6/28/95</u>	Time <u>1319</u>
Relinquished by <u>[Signature]</u>	Date <u>6/28/95</u>	Time <u>1055</u>	Received by <u>[Signature]</u>	Date <u>6-29-95</u>	Time <u>1055</u>
Relinquished by _____	Date _____	Time _____	Received by _____	Date _____	Time _____
Relinquished by _____	Date _____	Time _____	Received by _____	Date _____	Time _____

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-29-95 1:21:09 AM *

 * Analyzed by: *JR* 6/29/95 Reviewed by: *JR* 6/29/95 *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022953-05
 Lab Sample ID : 50049501

Sample Description : MARINELLI SOLID SAMPLE
 Sample Type : Solid
 Sample Geometry : 2SMAR
 Sample Quantity : 624.000 gram
 Sample Date/Time : 6-28-95 10:50:00 PM
 Acquire Start Date : 6-29-95 12:48:35 AM
 Detector Name : LAB02
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	6.88
TH-234	1.38	9.36E-01	1.34
U-234	Not Detected	-----	2.64E+01
RA-226	1.49	8.19E-01	1.20
PB-214	8.71E-01	1.92E-01	1.95E-01
BI-214	7.78E-01	1.57E-01	1.31E-01
PB-210	Not Detected	-----	4.29E+02
TH-232	5.56E-01	3.20E-01	4.71E-01
RA-228	7.17E-01	2.94E-01	3.76E-01
AC-228	6.64E-01	2.38E-01	2.97E-01
TH-228	8.73E-01	4.45E-01	9.33E-01
RA-224	2.27	6.22E-01	9.41E-01
PB-212	8.68E-01	1.88E-01	8.93E-02
BI-212	1.19	5.25E-01	6.76E-01
TL-208	6.87E-01	1.66E-01	1.52E-01
U-235	Not Detected	-----	5.10E-01
TH-231	Not Detected	-----	1.24
PA-231	Not Detected	-----	2.80
AC-227	Not Detected	-----	3.62
TH-227	Not Detected	-----	7.64E-01
RA-223	Not Detected	-----	3.84E-01
RN-219	Not Detected	-----	6.23E-01
PB-211	Not Detected	-----	1.47
TL-207	Not Detected	-----	3.06E+01
AM-241	Not Detected	-----	1.06
PU-239	Not Detected	-----	5.91E+02
NP-237	Not Detected	-----	6.01E-01
PA-233	Not Detected	-----	1.24E-01
TH-229	Not Detected	-----	6.41E-01

[Summary Report] - Sample ID: 50049501

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	6.04E-02
AR-41	Not Detected	-----	1.80E-01
BA-133	Not Detected	-----	1.36E-01
BA-140	Not Detected	-----	2.27E-01
CD-109	Not Detected	-----	2.06
CD-115	Not Detected	-----	1.35E-01
CE-139	Not Detected	-----	6.60E-02
CE-141	Not Detected	-----	1.13E-01
CE-144	Not Detected	-----	5.13E-01
CO-56	Not Detected	-----	7.18E-02
CO-57	Not Detected	-----	6.85E-02
CO-58	Not Detected	-----	6.57E-02
CO-60	Not Detected	-----	7.88E-02
CR-51	Not Detected	-----	4.81E-01
CS-134	Not Detected	-----	1.08E-01
CS-137	Not Detected	-----	7.59E-02
CU-64	Not Detected	-----	1.83E+01
EU-152	Not Detected	-----	5.09E-01
EU-154	Not Detected	-----	3.72E-01
EU-155	Not Detected	-----	3.07E-01
FE-59	Not Detected	-----	1.42E-01
GD-153	Not Detected	-----	2.51E-01
HG-203	Not Detected	-----	6.29E-02
I-131	Not Detected	-----	5.87E-02
IN-115m	Not Detected	-----	1.88E-01
IR-192	Not Detected	-----	5.69E-02
K-40	1.66E+01	2.53	6.07E-01
LA-140	Not Detected	-----	8.22E-02
MN-54	Not Detected	-----	6.80E-02
MN-56	Not Detected	-----	1.32E-01
MO-99	Not Detected	-----	5.10E-01
NA-22	Not Detected	-----	8.93E-02
NA-24	Not Detected	-----	8.07E-02
NB-95	Not Detected	-----	3.60E-01
ND-147	Not Detected	-----	4.39E-01
NI-57	Not Detected	-----	1.07E-01
BE-7	Not Detected	-----	4.96E-01
RU-103	Not Detected	-----	5.72E-02
RU-106	Not Detected	-----	6.35E-01
SB-122	Not Detected	-----	8.57E-02
SB-124	Not Detected	-----	6.63E-02
SB-125	Not Detected	-----	1.78E-01
SC-46	Not Detected	-----	1.15E-01
SR-85	Not Detected	-----	7.78E-02
TA-182	Not Detected	-----	3.40E-01
TA-183	Not Detected	-----	9.33E-01
TE-132	Not Detected	-----	6.05E-02
TL-201	Not Detected	-----	3.34E-01
XE-133	Not Detected	-----	2.91E-01
Y-88	Not Detected	-----	5.07E-02
ZN-65	Not Detected	-----	2.24E-01
ZR-95	Not Detected	-----	1.14E-01

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-29-95 7:28:33 AM *

 * Analyzed by: *JR 6/29/95* Reviewed by: *JR 6/29/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : LAB CONTROL SAMPLE ANALYSIS #CG134
 Lab Sample ID : 50049502

Sample Description : MIXED GAMMA STANDARD
 Sample Type : Liquid
 Sample Geometry : WMAR
 Sample Quantity : 1.000 Each
 Sample Date/Time : 11-01-90 12:00:00 PM
 Acquire Start Date : 6-29-95 7:14:54 AM
 Detector Name : LAB02
 Elapsed Live Time : 600 seconds
 Elapsed Real Time : 606 seconds

Comments:

Nuclide	Activity (pCi/Each)	2S Error	MDA
U-238	Not Detected	-----	2.58E+04
TH-234	Not Detected	-----	5.36E+03
U-234	Not Detected	-----	1.25E+05
RA-226	Not Detected	-----	6.59E+03
PB-214	Not Detected	-----	7.43E+02
BI-214	Not Detected	-----	6.60E+02
PB-210	Not Detected	-----	6.75E+06
TH-232	Not Detected	-----	2.21E+03
RA-228	Not Detected	-----	3.06E+03
AC-228	Not Detected	-----	1.91E+03
TH-228	Not Detected	-----	4.08E+04
RA-224	Not Detected	-----	3.43E+04
PB-212	Not Detected	-----	3.13E+03
BI-212	Not Detected	-----	2.73E+04
TL-208	Not Detected	-----	5.46E+03
U-235	Not Detected	-----	1.98E+03
TH-231	Not Detected	-----	4.34E+03
PA-231	Not Detected	-----	1.05E+04
AC-227	Not Detected	-----	1.70E+04
TH-227	Not Detected	-----	2.60E+03
RA-223	Not Detected	-----	1.00E+26
RN-219	Not Detected	-----	3.21E+03
PB-211	Not Detected	-----	9.82E+03
TL-207	Not Detected	-----	2.39E+05
AM-241	9.85E+04	1.93E+04	7.53E+03
PU-239	Not Detected	-----	2.25E+06
NP-237	Not Detected	-----	2.98E+03
PA-233	Not Detected	-----	6.67E+02
TH-229	Not Detected	-----	2.43E+03

[Summary Report] - Sample ID: 50049502

Nuclide	Activity (pCi/Each)	2S Error	MDA
AG-110m	Not Detected	-----	1.83E+05
AR-41	Not Detected	-----	1.00E+26
BA-133	Not Detected	-----	5.79E+02
BA-140	Not Detected	-----	1.00E+26
CD-109	3.39E+05	1.13E+05	1.51E+05
CD-115	Not Detected	-----	1.00E+26
CE-139	Not Detected	-----	1.42E+06
CE-141	Not Detected	-----	2.52E+18
CE-144	Not Detected	-----	1.26E+05
CO-56	Not Detected	-----	1.82E+09
CO-57	1.35E+04	1.04E+04	1.63E+04
CO-58	Not Detected	-----	6.51E+09
CO-60	7.75E+04	1.01E+04	5.29E+02
CR-51	Not Detected	-----	7.73E+21
CS-134	Not Detected	-----	1.49E+03
CS-137	7.11E+04	9.18E+03	3.72E+02
CU-64	Not Detected	-----	1.00E+26
EU-152	Not Detected	-----	3.65E+03
EU-154	Not Detected	-----	2.44E+03
EU-155	Not Detected	-----	2.33E+03
FE-59	Not Detected	-----	2.98E+14
GD-153	Not Detected	-----	1.24E+05
HG-203	Not Detected	-----	3.00E+13
I-131	Not Detected	-----	1.00E+26
IN-115m	Not Detected	-----	1.00E+26
IR-192	Not Detected	-----	2.69E+09
K-40	Not Detected	-----	1.95E+03
LA-140	Not Detected	-----	1.00E+26
MN-54	Not Detected	-----	1.77E+04
MN-56	Not Detected	-----	1.00E+26
MO-99	Not Detected	-----	1.00E+26
NA-22	Not Detected	-----	8.96E+02
NA-24	Not Detected	-----	1.00E+26
NB-95	Not Detected	-----	1.00E+26
ND-147	Not Detected	-----	1.00E+26
NI-57	Not Detected	-----	1.00E+26
BE-7	Not Detected	-----	1.44E+13
RU-103	Not Detected	-----	3.86E+15
RU-106	Not Detected	-----	8.36E+04
SB-122	Not Detected	-----	1.00E+26
SB-124	Not Detected	-----	9.90E+10
SB-125	Not Detected	-----	3.86E+03
SC-46	Not Detected	-----	6.27E+08
SR-85	Not Detected	-----	3.07E+10
TA-182	Not Detected	-----	3.99E+07
TA-183	Not Detected	-----	1.00E+26
TE-132	Not Detected	-----	1.00E+26
TL-201	Not Detected	-----	1.00E+26
XE-133	Not Detected	-----	1.00E+26
Y-88	Not Detected	-----	1.23E+07
ZN-65	Not Detected	-----	1.28E+05
ZR-95	Not Detected	-----	6.40E+10

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program *
 * Quality Assurance Report *

Report Date : 6-29-95 7:33:29 AM
 QA File : C:\GENIEPC\CAMFILES\LCS2.QAF
 Analyst : FCD
 Sample ID : 50049502
 Sample Quantity : 1.00 Each
 Sample Date : 11-01-90 12:00:00 PM
 Measurement Date : 6-29-95 7:14:54 AM
 Elapsed Live Time : 600 seconds
 Elapsed Real Time : 606 seconds

Parameter	Mean	1S Error	New Value	< LU : SD : UD : BS >
AM-241 Activity	9.773E-02	3.462E-03	9.854E-02	< : <u>In</u> : <i>OK</i> <i>2/11</i> >
CS-137 Activity	6.972E-02	2.449E-03	7.115E-02	< : : : >
CO-60 Activity	7.701E-02	2.552E-03	7.732E-02	< : : : >

Flags Key: LU = Boundary Test (Ab = Above , Be = Below)
 SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
 UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
 BS = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: *JR* 6/28/95

EK/1302

096 / DAT

10

SMO ANALYTICAL DATA ROUTING FORM

Project Name: TAI Phase I Case Number: 3626400

SNL Task Leader: Miller Org/Mail Stop: 7584 / 1148

SMO Project Coordinator: Puissant Sample Ship Date: 7/18/95

ARCOC Lab Lab ID 7/14/95
7/10/95

03795 7715 500560

03791 " 500547

63735 " 500525

Date Results Received:

Preliminary: _____ Final: 7/20/95, 7/17/95, 7/12/95

Corrections Requested From Laboratory: _____ Requestor: _____

Date Corrections Received: _____

Date Assigned to SMO Reviewer: _____ Reviewer: _____

Date Review Complete: _____ Signature: _____

Date of Preliminary Notification: _____ Person Notified: _____

Date of Final Transmittal: 8/16/95 Transmitted To: Miller

Transmitted By: [Signature] Filed In Record Center: [Signature]

Comments: _____

ANALYSIS REQUEST AND CHAIN OF CUSTODY

2001-COC (0 91)

500525

AR/COC-03735

Dept. No./Mail Stop: **7582 / 1347**
 Project/Task Manager: **D. Miller / H. Fleck**
 Project Name: **TA-1 Soil Sampling (Phase 1)**
 Record Center Code: **ADS 1302 ER Site 96**
 Logbook Ref No: **0133**
 SMO Reference No.: **CF0089**

ER Site No.: **96**
 Carrier/Waybill No.: **Hand Delivered**
 Lab Contact: **Amir M.**
 Lab Destination: **7715**
 SMO Contact/Phone: **D. Mac McLaughlin / 845-0867**
 Send Report to SMO: **Deborah McLaughlin**

Contract No.: **N/A**
 Case No.: **3626.400**
 SMO Authorization: **MSL**
 Bill to: **Sandia National Laboratories
 Supplier Services Department
 P.O. Box 5800 MS 0154
 Albuquerque, NM 87185-0154**

Parameter & Method Requested

Gamma. Spec.

Location		Tech Area outside TA-1		Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Reference LOV (available at SMO)					Lab Sample ID
							Sample Matrix	Type	Volume	Preservative	Sample Collection Method	
Building 821, 884, 958 Room outside		Sample No. - Fraction	ER Sample ID or Sample Location Detail									
22956	-05	T1096-GP-046-004-S	8'	96	7/10/95 - 10:00	S	P	500ml	None	G	SA	X
22957	-05	T1096-GP-047-006-S	9'7"		11:15	↓	↓	↓	↓	↓	↓	X
22958	-05	T1096-GP-048-007-S	11'		13:15	↓	↓	↓	↓	↓	↓	X
22959	-05	T1096-GP-049-007-S	11'		13:55	↓	↓	↓	↓	↓	DU	X

RMMA Yes No Ref. No. _____
 Sample Disposal Return to Client Disposal by lab
 Turnaround Time Normal Rush Required Report Date _____

Sample Tracking
 Date Entered: **7/12/95**
 Entered by: **[Signature]**

Special Instructions/QC Requirements
Please call Sand when complete.

Abnormal Conditions on Receipt

Sample Team Members

Name	Signature	Init	Company/Organization
Matthew Shain	<i>Matthew Shain</i>	MS	ST Corp / 7582

1. Relinquished by [Signature] Org. 7582 Date 7/10/95 Time 15:00	4. Relinquished by _____ Org. _____ Date _____ Time _____
1. Received by [Signature] Org. 7513/RC Date 7/10/95 Time 15:00	4. Received by _____ Org. _____ Date _____ Time _____
2. Relinquished by [Signature] Org. 7513/RC Date 7/10/95 Time 15:30	5. Relinquished by _____ Org. _____ Date _____ Time _____
2. Received by [Signature] Org. 7715 Date 7/10/95 Time 15:30	5. Received by _____ Org. _____ Date _____ Time _____
3. Relinquished by [Signature] Org. SML 7715 Date 7/12/95 Time 12:00	6. Relinquished by _____ Org. _____ Date _____ Time _____
3. Received by [Signature] Org. SMA 75 Date 7-12-95 Time 12:00	6. Received by _____ Org. _____ Date _____ Time _____

ANALYSIS REQUEST AND CHAIN OF CUSTODY

AR/COC-03735

RP 2001 (REV. 12-94)

500525

Dept. No./Mail Stop: 7582 / 1347 Project/Task Manager: D. Miller / H. Fleck Project Name: TA-1 Soil Sampling (Phase 1) Record Center Code: ADS 1304 ERSite 96 Logbook Ref No: 0133 SMO Reference No.: CF0089	Date Samples Shipped: 7/10/95 Carrier/Waybill No.: Hand Deliv. Lab Contact: Amir M. J. Lab Destination: 7715 SMO Contact/Phone: D. MacLaughlin / 845-0967 Send Report to SMO: Deborah MacLaughlin	Contract No.: N/A Case No.: 3626 400 SMO Authorization: None Bill to: Sandia National Laboratories Supplier Services Department P.O. Box 5800 MS 0154 Albuquerque, NM 87185-0154	Parameter & Method Requested
---	--	---	---

Location		Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Reference LOV (available at SMO)					Lab Sample ID	
Tech Area outside TA-1					Sample Matrix	Container	Preservative	Sample Collection Method	Sample Type		
Building	Room				Type	Volume					
821,584,955	outside										
Sample No. - Fraction	ER Sample ID or Sample Location Detail										
022956-05	11076-GP-046-004-S	8'	76	7/10/95 - 10:00	S	P	500ml	None	G	SA	X
022957-05	11096-GP-047-006-S	9'		11:15							X
022958-05	11076-GP-048-007-S	11'		13:15							X
022959-05	11096-GP-049-007-S	11'		13:55							X

GAMMA SPC

RMMA <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Ref. No. _____	Sample Tracking Date Entered (mm/dd/yy): 7/13/95 Entered by: [Signature]	Special Instructions/OC Requirements Please call SMO when complete. [Signature]	Abnormal Conditions on Receipt
Sample Disposal <input checked="" type="checkbox"/> Return to Client <input type="checkbox"/> Disposal by lab	Turnaround Time <input checked="" type="checkbox"/> Normal <input type="checkbox"/> Rush Required Report Date _____	QC Inits. _____	
Sample Team Members Name: Matthew Shain Signature: [Signature] Init: MS Company/Organization: IT Corp / 7582			

1. Relinquished by [Signature] Org. 7582 Date 7/10/95 Time 15:00	4. Relinquished by _____ Org. _____ Date _____ Time _____
1. Received by [Signature] Org. 7513/IC Date 7/10/95 Time 15:00	4. Received by _____ Org. _____ Date _____ Time _____
2. Relinquished by [Signature] Org. 7513/IC Date 7/10/95 Time 15:30	5. Relinquished by _____ Org. _____ Date _____ Time _____
2. Received by [Signature] Org. 7715 Date 7/10/95 Time 15:30	5. Received by _____ Org. _____ Date _____ Time _____
3. Relinquished by [Signature] Org. SM 7715 Date 7/12/95 Time 12:00	6. Relinquished by _____ Org. _____ Date _____ Time _____
3. Received by [Signature] Org. SM 7715 Date 7-12-95 Time 12:00	6. Received by _____ Org. _____ Date _____ Time _____



To be completed by Customer

Shaded areas are for RPSD use only

Customer: O. Miller
 Organization: 7582
 Project Location: TA-1
 Phone: 845-0867
 Date Results Needed: _____
 Suspect Isotopes: _____
 Other Information: 03735

Hazards/Special Instructions:
Please Notify SMO upon
Completion @ 845-0867

Batch Log Number: 500525
 Logged By: Klee
 Analysis Type: Gamma Spec
 H-3
 Alpha/Beta
 Alpha Spec
 Total U
 Other
 LIMS Login _____
 Results Faxed _____
 Sample Disposal _____

Customer Sample ID	Sample Type	Date/Time Collected	Sample Volume	Requested Analysis	RPSD Sample ID	Rad Scan CPM	Sample Weight	Remarks
22956-05	S	7/9/95 10:00	500ml	Gamma Spec.	01	460	895	
22957-05	↓	11:15	↓	↓	02	↓	822	
22958-05	↓	13:15	↓	↓	03	↓	835	
22959-05	↓	13:55	↓	↓	04	↓	811	
LLS		1/10/90		1 spec	05	NA	NA	

Relinquished by [Signature] Date 7/10/95 Time 1530 Received by [Signature] Date 7/10/95 Time 1530
 Relinquished by [Signature] Date 7/12/95 Time 1200 Received by [Signature] Date 7/12/95 Time 1200
 Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____
 Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 7-11-95 4:25:44 PM *

 * Analyzed by: *JH 7/12/95* Reviewed by: *JH 7/12/95* *

Customer : D.MILLER/D.BISWELL (7582/SMO)
 Customer Sample ID : 022956-05
 Lab Sample ID : 50052501

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 2SMAR
 Sample Quantity : 895.000 gram
 Sample Date/Time : 7-10-95 10:00:00 AM
 Acquire Start Date : 7-11-95 3:50:26 PM
 Detector Name : LAB02
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	4.77
TH-234	Not Detected	-----	1.11
U-234	Not Detected	-----	1.87E+01
RA-226	1.36	7.05E-01	1.03
PB-214	6.62E-01	1.35E-01	1.19E-01
BI-214	5.05E-01	1.00E-01	7.84E-02
PB-210	Not Detected	-----	4.49E+02
TH-232	6.50E-01	2.26E-01	2.79E-01
RA-228	4.80E-01	1.94E-01	2.45E-01
AC-228	6.65E-01	1.63E-01	1.42E-01
TH-228	Not Detected	-----	1.13
RA-224	Not Detected	-----	6.15E-01
PB-212	6.17E-01	1.34E-01	5.82E-02
BI-212	6.81E-01	3.78E-01	5.36E-01
TL-208	6.01E-01	1.26E-01	9.06E-02
U-235	Not Detected	-----	3.38E-01
TH-231	Not Detected	-----	8.38E-01
PA-231	Not Detected	-----	1.57
AC-227	Not Detected	-----	2.43
TH-227	Not Detected	-----	5.08E-01
RA-223	Not Detected	-----	2.87E-01
RN-219	Not Detected	-----	4.03E-01
PB-211	Not Detected	-----	8.99E-01
TL-207	Not Detected	-----	2.13E+01
AM-241	Not Detected	-----	7.95E-01
PU-239	Not Detected	-----	4.01E+02
NP-237	Not Detected	-----	5.35E-01
PA-233	Not Detected	-----	8.44E-02
TH-229	Not Detected	-----	4.00E-01

[Summary Report] - Sample ID: 50052501

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	4.31E-02
AR-41	Not Detected	-----	5.66E+03
BA-133	Not Detected	-----	9.06E-02
BA-140	Not Detected	-----	1.65E-01
CD-109	Not Detected	-----	1.85
CD-115	Not Detected	-----	1.44E-01
CE-139	Not Detected	-----	4.41E-02
CE-141	Not Detected	-----	8.07E-02
CE-144	Not Detected	-----	3.49E-01
CO-56	Not Detected	-----	5.27E-02
CO-57	Not Detected	-----	4.40E-02
CO-58	Not Detected	-----	4.43E-02
CO-60	Not Detected	-----	5.54E-02
CR-51	Not Detected	-----	3.27E-01
CS-134	Not Detected	-----	7.21E-02
CS-137	Not Detected	-----	4.95E-02
CU-64	Not Detected	-----	5.66E+01
EU-152	Not Detected	-----	3.75E-01
EU-154	Not Detected	-----	2.65E-01
EU-155	Not Detected	-----	2.06E-01
FE-59	Not Detected	-----	1.10E-01
GD-153	Not Detected	-----	1.58E-01
HG-203	Not Detected	-----	4.34E-02
I-131	Not Detected	-----	4.81E-02
IN-115m	Not Detected	-----	1.03E+01
IR-192	Not Detected	-----	4.08E-02
K-40	1.62E+01	2.37	4.61E-01
LA-140	Not Detected	-----	8.48E-02
MN-54	Not Detected	-----	4.95E-02
MN-56	Not Detected	-----	1.71E+02
MO-99	Not Detected	-----	4.95E-01
NA-22	Not Detected	-----	6.68E-02
NA-24	Not Detected	-----	1.97E-01
NB-95	Not Detected	-----	2.92E-01
ND-147	Not Detected	-----	3.18E-01
NI-57	Not Detected	-----	1.33E-01
BE-7	Not Detected	-----	3.61E-01
RU-103	Not Detected	-----	4.12E-02
RU-106	Not Detected	-----	4.03E-01
SB-122	Not Detected	-----	7.95E-02
SB-124	Not Detected	-----	4.51E-02
SB-125	Not Detected	-----	1.16E-01
SC-46	Not Detected	-----	8.03E-02
SR-85	Not Detected	-----	5.28E-02
TA-182	Not Detected	-----	2.38E-01
TA-183	Not Detected	-----	8.16E-01
TE-132	Not Detected	-----	5.26E-02
TL-201	Not Detected	-----	3.16E-01
XE-133	Not Detected	-----	2.78E-01
Y-88	Not Detected	-----	4.06E-02
ZN-65	Not Detected	-----	1.53E-01
ZR-95	Not Detected	-----	8.90E-02

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 7-11-95 5:39:37 PM *

 * Analyzed by: *DR* 7/12/95 Reviewed by: *DR* 7/12/95 *

Customer : D.MILLER/D.BISWELL (7582/SMO)
 Customer Sample ID : 022957-05
 Lab Sample ID : 50052502

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 2SMAR
 Sample Quantity : 822.000 gram
 Sample Date/Time : 7-10-95 11:15:00 AM
 Acquire Start Date : 7-11-95 5:06:41 PM
 Detector Name : LAB02
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	5.39
TH-234	6.64E-01	3.95E-01	7.90E-01
U-234	Not Detected	-----	1.98E+01
RA-226	1.47	7.11E-01	1.02
PB-214	7.21E-01	1.37E-01	9.93E-02
BI-214	6.24E-01	1.16E-01	7.82E-02
PB-210	Not Detected	-----	4.95E+02
TH-232	5.76E-01	2.53E-01	3.49E-01
RA-228	6.71E-01	2.58E-01	2.13E-01
AC-228	Not Detected	-----	3.13E-01
TH-228	6.07E-01	3.37E-01	7.31E-01
RA-224	Not Detected	-----	7.23E-01
PB-212	7.09E-01	1.46E-01	6.89E-02
BI-212	7.49E-01	4.43E-01	6.43E-01
TL-208	5.88E-01	1.32E-01	1.12E-01
U-235	Not Detected	-----	3.80E-01
TH-231	Not Detected	-----	9.60E-01
PA-231	Not Detected	-----	1.74
AC-227	Not Detected	-----	2.82
TH-227	Not Detected	-----	5.74E-01
RA-223	Not Detected	-----	3.25E-01
RN-219	Not Detected	-----	4.39E-01
PB-211	Not Detected	-----	9.95E-01
TL-207	Not Detected	-----	2.27E+01
AM-241	Not Detected	-----	9.45E-01
PU-239	Not Detected	-----	4.25E+02
NP-237	Not Detected	-----	6.08E-01
PA-233	Not Detected	-----	9.57E-02
TH-229	Not Detected	-----	4.49E-01

[Summary Report] - Sample ID: 50052502

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	5.09E-02
AR-41	Not Detected	-----	6.00E+03
BA-133	Not Detected	-----	9.84E-02
BA-140	Not Detected	-----	1.98E-01
CD-109	Not Detected	-----	2.00
CD-115	Not Detected	-----	1.56E-01
CE-139	Not Detected	-----	4.91E-02
CE-141	Not Detected	-----	8.91E-02
CE-144	Not Detected	-----	3.79E-01
CO-56	Not Detected	-----	5.70E-02
CO-57	Not Detected	-----	4.73E-02
CO-58	Not Detected	-----	5.43E-02
CO-60	Not Detected	-----	6.11E-02
CR-51	Not Detected	-----	3.86E-01
CS-134	Not Detected	-----	7.93E-02
CS-137	Not Detected	-----	5.96E-02
CU-64	Not Detected	-----	5.54E+01
EU-152	Not Detected	-----	3.85E-01
EU-154	Not Detected	-----	2.79E-01
EU-155	Not Detected	-----	2.23E-01
FE-59	Not Detected	-----	1.25E-01
GD-153	Not Detected	-----	1.76E-01
HG-203	Not Detected	-----	4.76E-02
I-131	Not Detected	-----	5.21E-02
IN-115m	Not Detected	-----	1.12E+01
IR-192	Not Detected	-----	4.48E-02
K-40	1.96E+01	2.83	4.45E-01
LA-140	Not Detected	-----	8.80E-02
MN-54	Not Detected	-----	5.85E-02
MN-56	Not Detected	-----	1.86E+02
MO-99	Not Detected	-----	5.50E-01
NA-22	Not Detected	-----	7.13E-02
NA-24	Not Detected	-----	2.18E-01
NB-95	Not Detected	-----	3.31E-01
ND-147	Not Detected	-----	3.51E-01
NI-57	Not Detected	-----	1.48E-01
BE-7	Not Detected	-----	4.04E-01
RU-103	Not Detected	-----	4.50E-02
RU-106	Not Detected	-----	4.80E-01
SB-122	Not Detected	-----	8.20E-02
SB-124	Not Detected	-----	4.71E-02
SB-125	Not Detected	-----	1.24E-01
SC-46	Not Detected	-----	8.55E-02
SR-85	Not Detected	-----	5.88E-02
TA-182	Not Detected	-----	2.52E-01
TA-183	Not Detected	-----	9.70E-01
TE-132	Not Detected	-----	5.53E-02
TL-201	Not Detected	-----	3.47E-01
XE-133	Not Detected	-----	2.99E-01
Y-88	Not Detected	-----	4.22E-02
ZN-65	Not Detected	-----	1.70E-01
ZR-95	Not Detected	-----	9.12E-02

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 7-12-95 6:15:51 AM *

 * Analyzed by: *JR 7/12/95* Reviewed by: *JR 7/12/95* *

Customer : D.MILLER/D.BISWELL (7582/SMO)
 Customer Sample ID : 022958-05
 Lab Sample ID : 50052503

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 2SMAR
 Sample Quantity : 835.000 gram
 Sample Date/Time : 7-10-95 1:15:00 PM
 Acquire Start Date : 7-12-95 5:43:25 AM
 Detector Name : LAB02
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	5.15
TH-234	Not Detected	-----	1.15
U-234	Not Detected	-----	1.86E+01
RA-226	1.70	8.58E-01	1.26
PB-214	7.39E-01	1.35E-01	8.02E-02
BI-214	5.39E-01	1.11E-01	9.68E-02
PB-210	Not Detected	-----	4.86E+02
TH-232	6.64E-01	2.16E-01	2.49E-01
RA-228	5.43E-01	3.34E-01	2.36E-01
AC-228	Not Detected	-----	3.08E-01
TH-228	6.16E-01	3.21E-01	7.01E-01
RA-224	Not Detected	-----	6.34E-01
PB-212	7.13E-01	1.44E-01	6.36E-02
BI-212	8.59E-01	3.63E-01	4.55E-01
TL-208	6.10E-01	1.47E-01	1.46E-01
U-235	Not Detected	-----	3.78E-01
TH-231	Not Detected	-----	9.08E-01
PA-231	Not Detected	-----	1.71
AC-227	Not Detected	-----	2.70
TH-227	Not Detected	-----	5.59E-01
RA-223	Not Detected	-----	3.26E-01
RN-219	Not Detected	-----	4.26E-01
PB-211	Not Detected	-----	8.87E-01
TL-207	Not Detected	-----	2.04E+01
AM-241	Not Detected	-----	8.36E-01
PU-239	Not Detected	-----	4.52E+02
NP-237	Not Detected	-----	5.56E-01
PA-233	Not Detected	-----	9.09E-02
TH-229	Not Detected	-----	4.02E-01

[Summary Report] - Sample ID: 50052503

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	4.76E-02
AR-41	Not Detected	-----	2.99E+05
BA-133	Not Detected	-----	1.00E-01
BA-140	Not Detected	-----	1.65E-01
CD-109	Not Detected	-----	1.83
CD-115	Not Detected	-----	1.66E-01
CE-139	Not Detected	-----	4.69E-02
CE-141	Not Detected	-----	8.64E-02
CE-144	Not Detected	-----	3.90E-01
CO-56	Not Detected	-----	5.44E-02
CO-57	Not Detected	-----	4.68E-02
CO-58	Not Detected	-----	4.69E-02
CO-60	Not Detected	-----	5.48E-02
CR-51	Not Detected	-----	3.66E-01
CS-134	Not Detected	-----	7.74E-02
CS-137	Not Detected	-----	5.15E-02
CU-64	Not Detected	-----	1.04E+02
EU-152	Not Detected	-----	4.14E-01
EU-154	Not Detected	-----	2.69E-01
EU-155	Not Detected	-----	2.20E-01
FE-59	Not Detected	-----	1.10E-01
GD-153	Not Detected	-----	1.64E-01
HG-203	Not Detected	-----	4.38E-02
I-131	Not Detected	-----	4.79E-02
IN-115m	Not Detected	-----	5.36E+01
IR-192	Not Detected	-----	4.30E-02
K-40	1.33E+01	2.00	4.47E-01
LA-140	Not Detected	-----	1.05E-01
MN-54	Not Detected	-----	5.69E-02
MN-56	Not Detected	-----	3.06E+03
MO-99	Not Detected	-----	5.63E-01
NA-22	Not Detected	-----	6.44E-02
NA-24	Not Detected	-----	3.01E-01
NB-95	Not Detected	-----	3.47E-01
ND-147	Not Detected	-----	2.90E-01
NI-57	Not Detected	-----	1.53E-01
BE-7	Not Detected	-----	3.61E-01
RU-103	Not Detected	-----	4.21E-02
RU-106	Not Detected	-----	4.35E-01
SB-122	Not Detected	-----	9.04E-02
SB-124	Not Detected	-----	4.87E-02
SB-125	Not Detected	-----	1.20E-01
SC-46	Not Detected	-----	7.98E-02
SR-85	Not Detected	-----	5.77E-02
TA-182	Not Detected	-----	2.35E-01
TA-183	Not Detected	-----	9.11E-01
TE-132	Not Detected	-----	5.85E-02
TL-201	Not Detected	-----	4.00E-01
XE-133	Not Detected	-----	3.45E-01
Y-88	Not Detected	-----	4.73E-02
ZN-65	Not Detected	-----	1.63E-01
ZR-95	Not Detected	-----	8.98E-02

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 7-12-95 6:52:53 AM *

* Analyzed by: *JR 7/12/95* Reviewed by: *JR 7/12/95*

Customer : D.MILLER/D.BISWELL (7582/SMO)
 Customer Sample ID : 022959-05
 Lab Sample ID : 50052504

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 2SMAR
 Sample Quantity : 861.000 gram
 Sample Date/Time : 7-10-95 1:55:00 PM
 Acquire Start Date : 7-12-95 6:20:21 AM
 Detector Name : LAB02
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	5.16
TH-234	1.36	7.40E-01	9.79E-01
U-234	Not Detected	-----	1.84E+01
RA-226	1.19	8.64E-01	1.34
PB-214	7.85E-01	1.54E-01	1.28E-01
BI-214	5.91E-01	1.17E-01	9.78E-02
PB-210	Not Detected	-----	4.59E+02
TH-232	5.70E-01	1.99E-01	2.40E-01
RA-228	5.87E-01	2.27E-01	2.00E-01
AC-228	8.95E-01	1.92E-01	1.27E-01
TH-228	7.12E-01	3.42E-01	7.53E-01
RA-224	1.89	4.66E-01	5.92E-01
PB-212	7.14E-01	1.42E-01	6.04E-02
BI-212	6.49E-01	3.90E-01	5.65E-01
TL-208	6.30E-01	1.43E-01	1.31E-01
U-235	Not Detected	-----	3.71E-01
TH-231	Not Detected	-----	8.95E-01
PA-231	Not Detected	-----	1.69
AC-227	Not Detected	-----	2.72
TH-227	Not Detected	-----	5.46E-01
RA-223	Not Detected	-----	3.10E-01
RN-219	Not Detected	-----	4.32E-01
PB-211	Not Detected	-----	9.96E-01
TL-207	Not Detected	-----	2.11E+01
AM-241	Not Detected	-----	8.35E-01
PU-239	Not Detected	-----	4.40E+02
NP-237	Not Detected	-----	5.69E-01
PA-233	Not Detected	-----	9.07E-02
TH-229	Not Detected	-----	4.22E-01

[Summary Report] - Sample ID: 50052504

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	4.19E-02
AR-41	Not Detected	-----	3.12E+05
BA-133	Not Detected	-----	9.80E-02
BA-140	Not Detected	-----	1.57E-01
CD-109	Not Detected	-----	1.91
CD-115	Not Detected	-----	1.64E-01
CE-139	Not Detected	-----	4.52E-02
CE-141	Not Detected	-----	8.55E-02
CE-144	Not Detected	-----	3.76E-01
CO-56	Not Detected	-----	5.11E-02
CO-57	Not Detected	-----	4.63E-02
CO-58	Not Detected	-----	4.71E-02
CO-60	Not Detected	-----	5.54E-02
CR-51	Not Detected	-----	3.57E-01
CS-134	Not Detected	-----	7.78E-02
CS-137	Not Detected	-----	4.85E-02
CU-64	Not Detected	-----	1.12E+02
EU-152	Not Detected	-----	3.68E-01
EU-154	Not Detected	-----	2.57E-01
EU-155	Not Detected	-----	2.14E-01
FE-59	Not Detected	-----	1.07E-01
GD-153	Not Detected	-----	1.60E-01
HG-203	Not Detected	-----	4.38E-02
I-131	Not Detected	-----	4.55E-02
IN-115m	Not Detected	-----	5.24E+01
IR-192	Not Detected	-----	4.30E-02
K-40	1.42E+01	2.11	4.57E-01
LA-140	Not Detected	-----	1.17E-01
MN-54	Not Detected	-----	5.26E-02
MN-56	Not Detected	-----	2.84E+03
MO-99	Not Detected	-----	5.62E-01
NA-22	Not Detected	-----	6.55E-02
NA-24	Not Detected	-----	3.41E-01
NB-95	Not Detected	-----	3.42E-01
ND-147	Not Detected	-----	3.08E-01
NI-57	Not Detected	-----	1.64E-01
BE-7	Not Detected	-----	3.58E-01
RU-103	Not Detected	-----	4.41E-02
RU-106	Not Detected	-----	3.92E-01
SB-122	Not Detected	-----	9.08E-02
SB-124	Not Detected	-----	4.88E-02
SB-125	Not Detected	-----	1.25E-01
SC-46	Not Detected	-----	8.34E-02
SR-85	Not Detected	-----	5.40E-02
TA-182	Not Detected	-----	2.44E-01
TA-183	Not Detected	-----	9.09E-01
TE-132	Not Detected	-----	5.94E-02
TL-201	Not Detected	-----	3.58E-01
XE-133	Not Detected	-----	3.38E-01
Y-88	Not Detected	-----	3.83E-02
ZN-65	Not Detected	-----	1.63E-01
ZR-95	Not Detected	-----	8.68E-02

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 7-12-95 8:44:27 AM *

 * Analyzed by: *JN 7/12/95* Reviewed by: *JN 7/12/95* *

Customer : D.MILLER/D.BISWELL (7582/SMO)
 Customer Sample ID : LAB CONTROL SAMPLE ANALYSIS #CG134
 Lab Sample ID : 50052505

Sample Description : MIXED GAMMA_STANDARD
 Sample Type : Liquid
 Sample Geometry : WMAR
 Sample Quantity : 1.000 Each
 Sample Date/Time : 11-01-90 12:00:00 PM
 Acquire Start Date : 7-12-95 8:30:43 AM
 Detector Name : LAB02
 Elapsed Live Time : 600 seconds
 Elapsed Real Time : 606 seconds

Comments:

Nuclide	Activity (pCi/Each)	2S Error	MDA
U-238	Not Detected	-----	2.15E+04
TH-234	Not Detected	-----	4.71E+03
U-234	Not Detected	-----	1.16E+05
RA-226	Not Detected	-----	5.85E+03
PB-214	Not Detected	-----	6.97E+02
BI-214	Not Detected	-----	6.46E+02
PB-210	Not Detected	-----	1.08E+07
TH-232	Not Detected	-----	2.03E+03
RA-228	Not Detected	-----	2.79E+03
AC-228	Not Detected	-----	1.77E+03
TH-228	Not Detected	-----	3.61E+04
RA-224	Not Detected	-----	3.15E+04
PB-212	Not Detected	-----	2.87E+03
BI-212	Not Detected	-----	2.55E+04
TL-208	Not Detected	-----	5.41E+03
U-235	Not Detected	-----	1.85E+03
TH-231	Not Detected	-----	3.85E+03
PA-231	Not Detected	-----	9.18E+03
AC-227	Not Detected	-----	1.61E+04
TH-227	Not Detected	-----	2.28E+03
RA-223	Not Detected	-----	1.00E+26
RN-219	Not Detected	-----	2.88E+03
PB-211	Not Detected	-----	8.41E+03
TL-207	Not Detected	-----	2.14E+05
AM-241	9.49E+04	1.70E+04	6.60E+03
PU-239	Not Detected	-----	2.15E+06
NP-237	Not Detected	-----	2.73E+03
PA-233	Not Detected	-----	6.22E+02
TH-229	Not Detected	-----	2.03E+03

[Summary Report] - Sample ID: 50052505

Nuclide	Activity (pCi/Each)	2S Error	MDA
AG-110m	Not Detected	-----	1.80E+05
AR-41	Not Detected	-----	1.00E+26
BA-133	Not Detected	-----	5.47E+02
BA-140	Not Detected	-----	1.00E+26
CD-109	3.56E+05	9.87E+04	1.19E+05
CD-115	Not Detected	-----	1.00E+26
CE-139	Not Detected	-----	1.35E+06
CE-141	Not Detected	-----	3.14E+18
CE-144	Not Detected	-----	1.23E+05
CO-56	Not Detected	-----	1.92E+09
CO-57	8.21E+03	7.66E+03	1.21E+04
CO-58	Not Detected	-----	7.00E+09
CO-60	7.39E+04	9.62E+03	5.13E+02
CR-51	Not Detected	-----	9.87E+21
CS-134	Not Detected	-----	1.48E+03
CS-137	6.82E+04	8.81E+03	5.38E+02
CU-64	Not Detected	-----	1.00E+26
EU-152	Not Detected	-----	3.41E+03
EU-154	Not Detected	-----	2.24E+03
EU-155	Not Detected	-----	2.13E+03
FE-59	Not Detected	-----	3.62E+14
GD-153	Not Detected	-----	1.05E+05
HG-203	Not Detected	-----	3.17E+13
I-131	Not Detected	-----	1.00E+26
IN-115m	Not Detected	-----	1.00E+26
IR-192	Not Detected	-----	2.79E+09
K-40	Not Detected	-----	1.69E+03
LA-140	Not Detected	-----	1.00E+26
MN-54	Not Detected	-----	1.77E+04
MN-56	Not Detected	-----	1.00E+26
MO-99	Not Detected	-----	1.00E+26
NA-22	Not Detected	-----	8.06E+02
NA-24	Not Detected	-----	1.00E+26
NE-95	Not Detected	-----	1.00E+26
ND-147	Not Detected	-----	1.00E+26
NI-57	Not Detected	-----	1.00E+26
BE-7	Not Detected	-----	1.60E+13
RU-103	Not Detected	-----	4.68E+15
RU-106	Not Detected	-----	7.61E+04
SB-122	Not Detected	-----	1.00E+26
SB-124	Not Detected	-----	1.13E+11
SB-125	Not Detected	-----	3.39E+03
SC-46	Not Detected	-----	6.69E+08
SR-85	Not Detected	-----	3.17E+10
TA-182	Not Detected	-----	4.16E+07
TA-183	Not Detected	-----	1.00E+26
TE-132	Not Detected	-----	1.00E+26
TL-201	Not Detected	-----	1.00E+26
XE-133	Not Detected	-----	1.00E+26
Y-88	Not Detected	-----	1.34E+07
ZN-65	Not Detected	-----	1.23E+05
ZR-95	Not Detected	-----	7.06E+10

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program *
 * Quality Assurance Report *

Report Date : 7-12-95 8:49:38 AM
 QA File : C:\GENIEPC\CAMFILES\LCS2.QAF
 Analyst : FCD
 Sample ID : 50052505
 Sample Quantity : 1.00 Each
 Sample Date : 11-01-90 12:00:00 PM
 Measurement Date : 7-12-95 8:30:43 AM
 Elapsed Live Time : 600 seconds
 Elapsed Real Time : 606 seconds

Parameter	Mean	1S Error	New Value	< LU	: SD	: UD	: BS	:
AM-241 Activity	9.744E-02	3.746E-03	9.487E-02	<	:	:	:	>
CS-137 Activity	6.967E-02	2.428E-03	6.819E-02	<	:	:	:	>
CO-60 Activity	7.691E-02	2.535E-03	7.425E-02	<	In	:	:	>

OK 7/12/95

Flags Key: LU = Boundary Test (Ab = Above, Be = Below)
 SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
 UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
 BS = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: *JJ 7/12/95*

ER/1302

096/DAT

11

SMO ANALYTICAL DATA ROUTING FORM

Project Name: FAI Phase I Case Number: 3626400

SNL Task Leader: Miller Org/Mail Stop: 7582-1148

SMO Project Coordinator: Pissant Sample Ship Date: 7/14/95
7/11/95

ARCO	Lab	Lab ID
<u>03789</u>	<u>7715</u>	<u>500548</u>
<u>03785</u>	<u>"</u>	<u>500533</u>
<u> </u>	<u> </u>	<u> </u>

Date Results Received:

Preliminary: _____ Final: 7/19/95 7/13/95

Corrections Requested From Laboratory: _____ Requestor: _____

Date Corrections Received: _____

Date Assigned to SMO Reviewer: _____

Reviewer: _____

Date Review Complete: _____

Signature: _____

Date of Preliminary Notification: _____

Person Notified: _____

Date of Final Transmittal: 8/16/95

Transmitted To: Miller

Transmitted By: [Signature]

Filed In Record Center: [Signature]

Comments: _____

ANALYSIS REQUEST AND CHAIN OF CUSTODY

01-COC (8-94) 506533

AR/COC- 03785

apt. No./Mail Stop: 7582/1347
 ject/Task Manager: D. Miller / H. Fleck
 Project Name: TA-1 Soil Sampling (Phase 1)
 Record Center Code: ADS B02 ER S.12 96
 Logbook Ref No: 0133
 MO Reference No.: CF0089

Date Samples Shipped: 7/11/95
 Carrier/Waybill No.: 16C
 Lab Contact: Amir M.
 Lab Destination: 7715
 SMO Contact/Phone: D. Mac McLaughlin/815-0867
 Send Report to SMO: Deborah McLaughlin

Contract No.: N/A
 Case No.: 3626-400
 SMO Authorization: DMcLaughlin
 Bill to: Sandia National Laboratories
 Supplier Services Department
 P.O. Box 5800 MS 0154
 Albuquerque, NM 87185-0154

Parameter & Method Requested

Building		Room		Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Reference LOV (available at SMO)					Lab Sample ID	
							Sample Matrix	Container		Preservative	Sample Collection Method		Sample Type
Sample No. - Fraction	ER Sample ID or Sample Location Detail						Type	Volume					
22961-05	T1096-GP-050-005-S			9'	96	7/11/95-8:20	S	P	300ml	None	G	SA	X
22962-05	T1096-GP-051-004-S			7'8"		10:15							X
22963-05	T1096-GP-052-004-S			7'8"		11:00							X
22965-05	T1096-GP-053-006-S			9'8"		12:40							X
22966-05	T1096-GP-054-007-S			11'		14:05							X

Gamma Specs

VIMA Yes No Ref. No. _____

Sample Disposal Return to Client Disposal by lab

turnaround Time Normal Rush Required Report Date _____

Sample Members	Name	Signature	Init	Company/Organization
	Matthew Shain	<i>Matthew Shain</i>	MS	IT Corp / 7582
	Cathie Gohar	<i>Cathie Gohar</i>	CG	Sandia / 7582

Special Instructions/QC Requirements

Abnormal Conditions on Receipt

Relinquished by <u>Matthew Shain</u> Org. <u>7582</u> Date <u>7/11/95</u> Time <u>1543</u>	4. Relinquished by _____ Org. _____ Date _____ Time _____
Received by <u>[Signature]</u> Org. <u>SMO 7513</u> Date <u>7-11-95</u> Time <u>1543</u>	4. Received by _____ Org. _____ Date _____ Time _____
Relinquished by <u>[Signature]</u> Org. <u>SMO 223</u> Date <u>7-11-95</u> Time <u>1657</u>	5. Relinquished by _____ Org. _____ Date _____ Time _____
Received by <u>[Signature]</u> Org. <u>SNL 7715</u> Date <u>7/11/95</u> Time <u>1657</u>	5. Received by _____ Org. _____ Date _____ Time _____
Relinquished by <u>[Signature]</u> Org. <u>SNL 7715</u> Date <u>7/13/95</u> Time <u>1530</u>	6. Relinquished by _____ Org. _____ Date _____ Time _____
Received by <u>[Signature]</u> Org. <u>SMO 7513</u> Date <u>7-13-95</u> Time <u>1530</u>	6. Received by _____ Org. _____ Date _____ Time _____

ANALYSIS REQUEST AND CHAIN OF CUSTODY

RF 2001-COC (9-94) 501533

AR/COC- 03785

Dept. No./Mail Stop: <u>4032/1247</u> Project/Task Manager: <u>D. Miller / H. Fleck</u> Project Name: <u>TA-1 Soil Sampling (Phase 1)</u> Record Center Code: <u>ADG Bldg ER Site 96</u> Logbook Ref No: <u>0133</u> SMO Reference No.: <u>CF0059</u>	Date Samples Shipped: <u>7/11/95</u> Carrier/Waybill No.: <u>16C</u> Lab Contact: <u>Amir M.</u> Lab Destination: <u>7715</u> SMO Contact/Phone: <u>D. MacLaughlin / 315-0567</u> Send Report to SMO: <u>Deborah McLaughlin</u>	Contract No.: <u>N/A</u> Case No.: <u>3626-400</u> SMO Authorization: <u>[Signature]</u> Bill to: Sandia National Laboratories Supplier Services Department P.O. Box 5800 MS 0154 Albuquerque, NM 87185-0154	Parameter & Method Requested
--	--	--	---

Location		Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Reference LOV (available at SMO)					Lab Sample ID	
Building	Room				Sample Matrix	Container Type	Volume	Preservative	Sample Collection Method		Sample Type
<u>592,807</u>	<u>Outside</u>										
<u>022961</u>	<u>-05</u>	<u>9'</u>	<u>96</u>	<u>7/11/95 - 8:20</u>	<u>S</u>	<u>P</u>	<u>300ml</u>	<u>None</u>	<u>G</u>	<u>SA</u>	<u>X</u>
<u>022962</u>	<u>-05</u>	<u>7'8"</u>		<u>10:15</u>							<u>X</u>
<u>022963</u>	<u>-05</u>	<u>7'8"</u>		<u>11:00</u>							<u>X</u>
<u>022965</u>	<u>-05</u>	<u>7'8"</u>		<u>12:40</u>							<u>X</u>
<u>022966</u>	<u>-05</u>	<u>11'</u>		<u>14:05</u>							<u>X</u>

RMMA <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Ref. No. _____ Sample Disposal <input checked="" type="checkbox"/> Return to Client <input type="checkbox"/> Disposal by lab Turnaround Time <input checked="" type="checkbox"/> Normal <input type="checkbox"/> Rush Required Report Date _____ Sample Team Members: Name: <u>Matthew Shein</u> Signature: <u>[Signature]</u> Init: <u>MS</u> Company/Org: <u>IT Corp / 7532</u> Name: <u>Celina Gobal</u> Signature: <u>[Signature]</u> Init: <u>CG</u> Company/Org: <u>Enders / 7532</u>	Sample Tracking Date Entered (mm/dd/yy): <u>7/11/95</u> Entered by: <u>Amir</u> QC initials: _____	Special Instructions/OC Requirements Abnormal Conditions on Receipt
---	---	--

1. Relinquished by <u>Matthew Shein</u> Org. <u>7532</u> Date <u>7/11/95</u> Time <u>1543</u> 1. Received by <u>[Signature]</u> Org. <u>5007513</u> Date <u>7-11-95</u> Time <u>1543</u> 2. Relinquished by <u>[Signature]</u> Org. <u>5007513</u> Date <u>7-11-95</u> Time <u>1651</u> 2. Received by <u>[Signature]</u> Org. <u>SMC 7715</u> Date <u>7/11/95</u> Time <u>1657</u> 3. Relinquished by <u>[Signature]</u> Org. <u>SMC 7715</u> Date <u>7/13/95</u> Time <u>1530</u> 3. Received by <u>[Signature]</u> Org. <u>5118751</u> Date <u>7-13-95</u> Time <u>1530</u>	4. Relinquished by _____ Org. _____ Date _____ Time _____ 4. Received by _____ Org. _____ Date _____ Time _____ 5. Relinquished by _____ Org. _____ Date _____ Time _____ 5. Received by _____ Org. _____ Date _____ Time _____ 6. Relinquished by _____ Org. _____ Date _____ Time _____ 6. Received by _____ Org. _____ Date _____ Time _____
---	--

WHITE - To Accompany Samples, Laboratory Copy
BLUE - To Accompany Samples, Return to SMO
YELLOW - SMO Suspense Copy
PINK - Field Copy



To be completed by Customer

Shaded areas are for RPSD use only

Customer: <u>D. Miller/H. Fleck</u>	Hazards/Special Instructions:	Batch Log Number: <u>500533</u>
Organization: <u>7582</u>		Logged By: <u>Fwo</u>
Project Location: <u>TA-1</u>		Analysis Type: <input checked="" type="checkbox"/> Gamma Spec <input type="checkbox"/> H-3 <input type="checkbox"/> Alpha/Beta <input type="checkbox"/> Alpha Spec <input type="checkbox"/> Total U <input type="checkbox"/> Other
Phone: <u>645-0867</u>		
Date Results Needed: <u>7-13-95</u>		
Suspect Isotopes:		
Other Information: <u>03785</u>		
LIMS Login _____	Results Faxed _____	
Sample Disposal _____		

Customer Sample ID	Sample Type	Date/Time Collected	Sample Volume	Requested Analysis	RPSD Sample ID	Rad Scan mR/hr	Sample Weight	Remarks
022961-05	S	7/11/95-8:20	500ml	Gamma Spec.	01	2300	692	
022962-05	↓	- 10:45	↓	↓	02	↓	628	
022963-05	↓	- 11:00	↓	↓	03	↓	671	
022965-05	↓	- 12:10	↓	↓	04	↓	910	
022966-05	↓	- 14:05	↓	↓	05	2300	763	
LCS		1 Nov 90		Y Spec	06	NA	NA	

Relinquished by <u>[Signature]</u>	Date <u>7-11-95</u>	Time <u>1657</u>	Received by <u>[Signature]</u>	Date <u>7/11/95</u>	Time <u>1657</u>
Relinquished by <u>[Signature]</u>	Date <u>7/13/95</u>	Time <u>1530</u>	Received by <u>[Signature]</u>	Date <u>7-13-95</u>	Time <u>2530</u>
Relinquished by _____	Date _____	Time _____	Received by _____	Date _____	Time _____
Relinquished by _____	Date _____	Time _____	Received by _____	Date _____	Time _____

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 7-12-95 2:49:45 PM *

 * Analyzed by: *Edward Cole 7/13/95* Reviewed by: *JK 7/13/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022961-05
 Lab Sample ID : 50053301

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 2SMAR
 Sample Quantity : 692.000 gram
 Sample Date/Time : 7-11-95 8:20:00 AM
 Acquire Start Date : 7-12-95 2:16:39 PM
 Detector Name : LAB02
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	5.91
TH-234	Not Detected	-----	1.01
U-234	Not Detected	-----	2.23E+01
RA-226	2.38	8.59E-01	1.13
PB-214	8.22E-01	1.60E-01	1.21E-01
BI-214	6.70E-01	1.34E-01	1.09E-01
PB-210	Not Detected	-----	5.37E+02
TH-232	6.75E-01	2.98E-01	4.11E-01
RA-228	7.31E-01	2.80E-01	2.39E-01
AC-228	7.96E-01	2.12E-01	2.10E-01
TH-228	Not Detected	-----	1.39
RA-224	Not Detected	-----	8.03E-01
PB-212	8.53E-01	1.77E-01	7.49E-02
BI-212	1.65	5.52E-01	6.32E-01
TL-208	7.07E-01	1.66E-01	1.55E-01
U-235	Not Detected	-----	4.17E-01
TH-231	Not Detected	-----	1.03
PA-231	Not Detected	-----	1.93
AC-227	Not Detected	-----	3.04
TH-227	Not Detected	-----	6.58E-01
RA-223	Not Detected	-----	3.51E-01
RN-219	Not Detected	-----	5.06E-01
PB-211	Not Detected	-----	1.12
TL-207	Not Detected	-----	2.51E+01
AM-241	Not Detected	-----	9.47E-01
PU-239	Not Detected	-----	5.16E+02
NP-237	6.07E-01	5.06E-01	7.89E-01
PA-233	Not Detected	-----	1.05E-01
TH-229	Not Detected	-----	5.09E-01

not detected JK 7/13/95

[Summary Report] - Sample ID: 50053301

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	5.07E-02
AR-41	Not Detected	-----	7.01E+03
BA-133	Not Detected	-----	1.14E-01
BA-140	Not Detected	-----	2.14E-01
CD-109	Not Detected	-----	2.41
CD-115	Not Detected	-----	1.78E-01
CE-139	Not Detected	-----	5.49E-02
CE-141	Not Detected	-----	9.64E-02
CE-144	Not Detected	-----	4.41E-01
CO-56	Not Detected	-----	5.76E-02
CO-57	Not Detected	-----	5.43E-02
CO-58	Not Detected	-----	5.84E-02
CO-60	Not Detected	-----	6.41E-02
CR-51	Not Detected	-----	4.31E-01
CS-134	Not Detected	-----	9.39E-02
CS-137	Not Detected	-----	5.86E-02
CU-64	Not Detected	-----	7.42E+01
EU-152	Not Detected	-----	4.29E-01
EU-154	Not Detected	-----	3.64E-01
EU-155	Not Detected	-----	2.43E-01
FE-59	Not Detected	-----	1.42E-01
GD-153	Not Detected	-----	2.06E-01
HG-203	Not Detected	-----	5.52E-02
I-131	Not Detected	-----	5.44E-02
IN-115m	Not Detected	-----	1.29E+01
IR-192	Not Detected	-----	5.04E-02
K-40	1.77E+01	2.61	4.52E-01
LA-140	Not Detected	-----	1.34E-01
MN-54	Not Detected	-----	6.28E-02
MN-56	Not Detected	-----	1.92E+02
MO-99	Not Detected	-----	6.16E-01
NA-22	Not Detected	-----	8.64E-02
NA-24	Not Detected	-----	2.68E-01
NB-95	Not Detected	-----	3.75E-01
ND-147	Not Detected	-----	3.89E-01
NI-57	Not Detected	-----	1.70E-01
BE-7	Not Detected	-----	4.62E-01
RU-103	Not Detected	-----	5.10E-02
RU-106	Not Detected	-----	5.54E-01
SB-122	Not Detected	-----	9.78E-02
SB-124	Not Detected	-----	5.79E-02
SB-125	Not Detected	-----	1.49E-01
SC-46	Not Detected	-----	9.41E-02
SR-85	Not Detected	-----	6.72E-02
TA-182	Not Detected	-----	2.77E-01
TA-183	Not Detected	-----	9.72E-01
TE-132	Not Detected	-----	6.46E-02
TL-201	Not Detected	-----	4.02E-01
XE-133	Not Detected	-----	3.42E-01
Y-88	Not Detected	-----	4.35E-02
ZN-65	Not Detected	-----	1.81E-01
ZR-95	Not Detected	-----	1.04E-01

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 7-12-95 3:28:57 PM *

* Analyzed by: *Stephen Cole* 7/13/95 Reviewed by: *W* 7/13/95 *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022962-05
 Lab Sample ID : 50053302

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 2SMAR
 Sample Quantity : 628.000 gram
 Sample Date/Time : 7-11-95 10:15:00 AM
 Acquire Start Date : 7-12-95 2:55:09 PM
 Detector Name : LAB02
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	5.84
TH-234	Not Detected	-----	1.38
U-234	Not Detected	-----	2.23E+01
RA-226	1.48	7.82E-01	1.14
PB-214	7.52E-01	1.52E-01	1.19E-01
BI-214	6.41E-01	1.29E-01	9.78E-02
PB-210	Not Detected	-----	5.54E+02
TH-232	5.53E-01	2.17E-01	2.71E-01
RA-228	5.87E-01	2.34E-01	2.82E-01
AC-228	Not Detected	-----	3.83E-01
TH-228	9.93E-01	4.37E-01	7.42E-01
RA-224	1.73	5.00E-01	7.53E-01
PB-212	7.20E-01	1.55E-01	7.28E-02
BI-212	6.42E-01	4.10E-01	5.87E-01
TL-208	5.38E-01	1.39E-01	1.31E-01
U-235	Not Detected	-----	4.40E-01
TH-231	Not Detected	-----	1.06
PA-231	Not Detected	-----	1.89
AC-227	Not Detected	-----	3.04
TH-227	Not Detected	-----	6.41E-01
RA-223	Not Detected	-----	3.53E-01
RN-219	Not Detected	-----	5.11E-01
PB-211	Not Detected	-----	1.08
TL-207	Not Detected	-----	2.50E+01
AM-241	Not Detected	-----	1.01
PU-239	Not Detected	-----	5.28E+02
NP-237	Not Detected	-----	6.58E-01
PA-233	Not Detected	-----	1.11E-01
TH-229	Not Detected	-----	4.78E-01

[Summary Report] - Sample ID: 50053302

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	5.19E-02
AR-41	Not Detected	-----	4.23E+03
BA-133	Not Detected	-----	1.17E-01
BA-140	Not Detected	-----	2.08E-01
CD-109	Not Detected	-----	2.16
CD-115	Not Detected	-----	1.67E-01
CE-139	Not Detected	-----	5.65E-02
CE-141	Not Detected	-----	1.01E-01
CE-144	Not Detected	-----	4.39E-01
CO-56	Not Detected	-----	6.93E-02
CO-57	Not Detected	-----	5.42E-02
CO-58	Not Detected	-----	5.65E-02
CO-60	Not Detected	-----	6.36E-02
CR-51	Not Detected	-----	4.40E-01
CS-134	Not Detected	-----	9.66E-02
CS-137	Not Detected	-----	6.48E-02
CU-64	Not Detected	-----	6.14E+01
EU-152	Not Detected	-----	5.09E-01
EU-154	Not Detected	-----	3.23E-01
EU-155	Not Detected	-----	2.48E-01
FE-59	Not Detected	-----	1.29E-01
GD-153	Not Detected	-----	1.91E-01
HG-203	Not Detected	-----	5.22E-02
I-131	Not Detected	-----	6.04E-02
IN-115m	Not Detected	-----	1.01E+01
IR-192	Not Detected	-----	5.20E-02
K-40	1.39E+01	2.14	4.45E-01
LA-140	Not Detected	-----	1.07E-01
MN-54	Not Detected	-----	7.00E-02
MN-56	Not Detected	-----	1.64E+02
MO-99	Not Detected	-----	6.47E-01
NA-22	Not Detected	-----	8.27E-02
NA-24	Not Detected	-----	2.44E-01
NB-95	Not Detected	-----	3.66E-01
ND-147	Not Detected	-----	3.90E-01
NI-57	Not Detected	-----	1.50E-01
BE-7	Not Detected	-----	4.46E-01
RU-103	Not Detected	-----	5.15E-02
RU-106	Not Detected	-----	5.37E-01
SB-122	Not Detected	-----	1.03E-01
SB-124	Not Detected	-----	5.79E-02
SB-125	Not Detected	-----	1.41E-01
SC-46	Not Detected	-----	9.87E-02
SR-85	Not Detected	-----	6.68E-02
TA-182	Not Detected	-----	2.86E-01
TA-183	Not Detected	-----	1.03
TE-132	Not Detected	-----	6.19E-02
TL-201	Not Detected	-----	3.96E-01
XE-133	Not Detected	-----	3.31E-01
Y-88	Not Detected	-----	5.24E-02
ZN-65	Not Detected	-----	1.86E-01
ZR-95	Not Detected	-----	1.02E-01

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 7-12-95 4:09:14 PM *

* Analyzed by: *George Cole 7/13/95* Reviewed by: *JK 7/13/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022963-05
 Lab Sample ID : 50053303

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 2SMAR
 Sample Quantity : 671.000 gram
 Sample Date/Time : 7-11-95 11:00:00 AM
 Acquire Start Date : 7-12-95 3:35:22 PM
 Detector Name : LAB02
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	5.84
TH-234	Not Detected	-----	1.37
U-234	Not Detected	-----	2.32E+01
RA-226	1.51	7.15E-01	1.01
PB-214	7.52E-01	1.48E-01	1.09E-01
BI-214	5.87E-01	1.22E-01	1.01E-01
PB-210	Not Detected	-----	5.62E+02
TH-232	6.63E-01	2.30E-01	2.72E-01
RA-228	7.32E-01	-2.84E-01	2.12E-01
AC-228	Not Detected	-----	3.53E-01
TH-228	8.87E-01	4.07E-01	7.95E-01
RA-224	Not Detected	-----	7.39E-01
PB-212	7.28E-01	1.54E-01	7.18E-02
BI-212	8.90E-01	4.23E-01	5.53E-01
TL-208	6.77E-01	1.62E-01	1.53E-01
U-235	Not Detected	-----	4.32E-01
TH-231	Not Detected	-----	1.04
PA-231	Not Detected	-----	1.87
AC-227	Not Detected	-----	3.06
TH-227	Not Detected	-----	6.40E-01
RA-223	Not Detected	-----	3.49E-01
RN-219	Not Detected	-----	4.79E-01
PB-211	Not Detected	-----	1.19
TL-207	Not Detected	-----	2.60E+01
AM-241	Not Detected	-----	9.30E-01
PU-239	Not Detected	-----	5.00E+02
NP-237	Not Detected	-----	6.55E-01
PA-233	Not Detected	-----	1.03E-01
TH-229	Not Detected	-----	5.03E-01

[Summary Report] - Sample ID: 50053303

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	5.27E-02
AR-41	Not Detected	-----	3.97E+03
BA-133	Not Detected	-----	1.13E-01
BA-140	Not Detected	-----	1.95E-01
CD-109	Not Detected	-----	2.22
CD-115	Not Detected	-----	1.67E-01
CE-139	Not Detected	-----	5.27E-02
CE-141	Not Detected	-----	9.61E-02
CE-144	Not Detected	-----	4.19E-01
CO-56	Not Detected	-----	6.78E-02
CO-57	Not Detected	-----	5.56E-02
CO-58	Not Detected	-----	5.46E-02
CO-60	Not Detected	-----	7.40E-02
CR-51	Not Detected	-----	4.06E-01
CS-134	Not Detected	-----	9.22E-02
CS-137	Not Detected	-----	6.46E-02
CU-64	Not Detected	-----	6.51E+01
EU-152	Not Detected	-----	4.86E-01
EU-154	Not Detected	-----	3.39E-01
EU-155	Not Detected	-----	2.49E-01
FE-59	Not Detected	-----	1.32E-01
GD-153	Not Detected	-----	1.90E-01
HG-203	Not Detected	-----	5.25E-02
I-131	Not Detected	-----	5.29E-02
IN-115m	Not Detected	-----	1.00E+01
IR-192	Not Detected	-----	4.87E-02
K-40	1.58E+01	2.38	5.96E-01
LA-140	Not Detected	-----	1.19E-01
MN-54	Not Detected	-----	6.55E-02
MN-56	Not Detected	-----	1.57E+02
MO-99	Not Detected	-----	6.50E-01
NA-22	Not Detected	-----	8.06E-02
NA-24	Not Detected	-----	2.41E-01
NB-95	Not Detected	-----	3.64E-01
ND-147	Not Detected	-----	3.67E-01
NI-57	Not Detected	-----	1.57E-01
BE-7	Not Detected	-----	4.67E-01
RU-103	Not Detected	-----	5.27E-02
RU-106	Not Detected	-----	4.82E-01
SB-122	Not Detected	-----	9.56E-02
SB-124	Not Detected	-----	5.82E-02
SB-125	Not Detected	-----	1.34E-01
SC-46	Not Detected	-----	9.75E-02
SR-85	Not Detected	-----	6.63E-02
TA-182	Not Detected	-----	2.81E-01
TA-183	Not Detected	-----	9.47E-01
TE-132	Not Detected	-----	6.26E-02
TL-201	Not Detected	-----	3.63E-01
XE-133	Not Detected	-----	3.19E-01
Y-88	Not Detected	-----	5.29E-02
ZN-65	Not Detected	-----	1.95E-01
ZR-95	Not Detected	-----	1.06E-01

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 7-12-95 4:48:29 PM *

* Analyzed by: *Spencer Cole 7/13/95* Reviewed by: *JK 7/13/95*

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022965-05
 Lab Sample ID : 50053304

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 2SMAR
 Sample Quantity : 910.000 gram
 Sample Date/Time : 7-11-95 12:40:00 PM
 Acquire Start Date : 7-12-95 4:16:04 PM
 Detector Name : LAB02
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	4.88
TH-234	Not Detected	-----	1.11
U-234	Not Detected	-----	1.82E+01
RA-226	9.01E-01	6.87E-01	1.07
PB-214	5.65E-01	1.22E-01	1.17E-01
BI-214	4.35E-01	1.01E-01	1.04E-01
PB-210	Not Detected	-----	1.23
TH-232	4.55E-01	1.71E-01	2.13E-01
RA-228	3.48E-01	1.76E-01	2.41E-01
AC-228	Not Detected	-----	2.93E-01
TH-228	4.77E-01	3.16E-01	6.94E-01
RA-224	Not Detected	-----	1.50
PB-212	4.26E-01	1.02E-01	1.05E-01
BI-212	5.08E-01	3.24E-01	4.70E-01
TL-208	4.64E-01	1.22E-01	1.31E-01
U-235	Not Detected	-----	3.58E-01
TH-231	Not Detected	-----	8.43E-01
PA-231	Not Detected	-----	1.52
AC-227	Not Detected	-----	2.54
TH-227	Not Detected	-----	4.84E-01
RA-223	Not Detected	-----	2.86E-01
RN-219	Not Detected	-----	4.09E-01
PB-211	Not Detected	-----	9.26E-01
TL-207	Not Detected	-----	2.06E+01
AM-241	Not Detected	-----	8.08E-01
PU-239	Not Detected	-----	4.02E+02
NP-237	Not Detected	-----	5.30E-01
PA-233	Not Detected	-----	8.49E-02
TH-229	Not Detected	-----	4.19E-01

[Summary Report] - Sample ID: 50053304

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	4.71E-02
AR-41	Not Detected	-----	2.52E+03
BA-133	Not Detected	-----	8.50E-02
BA-140	Not Detected	-----	1.72E-01
CD-109	Not Detected	-----	1.78
CD-115	Not Detected	-----	1.25E-01
CE-139	Not Detected	-----	4.41E-02
CE-141	Not Detected	-----	8.18E-02
CE-144	Not Detected	-----	3.49E-01
CO-56	Not Detected	-----	5.13E-02
CO-57	Not Detected	-----	4.28E-02
CO-58	Not Detected	-----	4.91E-02
CO-60	Not Detected	-----	5.65E-02
CR-51	Not Detected	-----	3.62E-01
CS-134	Not Detected	-----	7.17E-02
CS-137	Not Detected	-----	5.71E-02
CU-64	Not Detected	-----	5.11E+01
EU-152	Not Detected	-----	3.66E-01
EU-154	Not Detected	-----	2.57E-01
EU-155	Not Detected	-----	2.06E-01
FE-59	Not Detected	-----	1.10E-01
GD-153	Not Detected	-----	1.66E-01
HG-203	Not Detected	-----	4.37E-02
I-131	Not Detected	-----	4.62E-02
IN-115m	Not Detected	-----	6.52
IR-192	Not Detected	-----	4.10E-02
K-40	2.20E+01	3.11	4.08E-01
LA-140	Not Detected	-----	8.47E-02
MN-54	Not Detected	-----	4.99E-02
MN-56	Not Detected	-----	9.13E+01
MO-99	Not Detected	-----	5.18E-01
NA-22	Not Detected	-----	6.77E-02
NA-24	Not Detected	-----	2.08E-01
NB-95	Not Detected	-----	2.74E-01
ND-147	Not Detected	-----	3.21E-01
NI-57	Not Detected	-----	1.32E-01
BE-7	Not Detected	-----	3.52E-01
RU-103	Not Detected	-----	4.01E-02
RU-106	Not Detected	-----	3.98E-01
SB-122	Not Detected	-----	8.21E-02
SB-124	Not Detected	-----	4.72E-02
SB-125	Not Detected	-----	1.13E-01
SC-46	Not Detected	-----	7.88E-02
SR-85	Not Detected	-----	5.31E-02
TA-182	Not Detected	-----	2.32E-01
TA-183	Not Detected	-----	8.19E-01
TE-132	Not Detected	-----	4.95E-02
TL-201	Not Detected	-----	3.12E-01
XE-133	Not Detected	-----	2.67E-01
Y-88	Not Detected	-----	3.99E-02
ZN-65	Not Detected	-----	1.50E-01
ZR-95	Not Detected	-----	9.17E-02

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 7-12-95 5:25:41 PM *

 * Analyzed by: *Edward Cole 7/13/95* Reviewed by: *JK 7/13/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022966-05
 Lab Sample ID : 50053305

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 2SMAR
 Sample Quantity : 763.000 gram
 Sample Date/Time : 7-11-95 2:05:00 PM
 Acquire Start Date : 7-12-95 4:52:59 PM
 Detector Name : LAB02
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	5.58
TH-234	1.05	5.65E-01	8.06E-01
U-234	Not Detected	-----	2.18E+01
RA-226	1.19	6.80E-01	1.01
PB-214	6.55E-01	1.40E-01	1.30E-01
BI-214	5.99E-01	1.18E-01	9.05E-02
PB-210	Not Detected	-----	1.27
TH-232	7.10E-01	2.43E-01	2.94E-01
RA-228	7.05E-01	-2.67E-01	2.55E-01
AC-228	6.75E-01	1.89E-01	1.98E-01
TH-228	8.97E-01	4.03E-01	7.06E-01
RA-224	1.51	4.38E-01	7.26E-01
PB-212	7.71E-01	1.57E-01	6.93E-02
BI-212	1.09	5.31E-01	7.38E-01
TL-208	6.06E-01	1.47E-01	1.42E-01
U-235	Not Detected	-----	4.00E-01
TH-231	Not Detected	-----	9.44E-01
PA-231	Not Detected	-----	1.78
AC-227	Not Detected	-----	2.93
TH-227	Not Detected	-----	6.15E-01
RA-223	Not Detected	-----	3.28E-01
RN-219	Not Detected	-----	4.77E-01
PB-211	Not Detected	-----	1.04
TL-207	Not Detected	-----	2.35E+01
AM-241	Not Detected	-----	9.56E-01
PU-239	Not Detected	-----	4.79E+02
NP-237	Not Detected	-----	4.19E-01
PA-233	Not Detected	-----	1.02E-01
TH-229	Not Detected	-----	4.60E-01

[Summary Report] - Sample ID: 50053305

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	5.45E-02
AR-41	Not Detected	-----	1.98E+03
BA-133	Not Detected	-----	1.03E-01
BA-140	Not Detected	-----	2.04E-01
CD-109	Not Detected	-----	1.44
CD-115	Not Detected	-----	1.57E-01
CE-139	Not Detected	-----	5.06E-02
CE-141	Not Detected	-----	9.02E-02
CE-144	Not Detected	-----	4.04E-01
CO-56	Not Detected	-----	6.07E-02
CO-57	Not Detected	-----	5.32E-02
CO-58	Not Detected	-----	5.69E-02
CO-60	Not Detected	-----	7.20E-02
CR-51	Not Detected	-----	3.93E-01
CS-134	Not Detected	-----	8.21E-02
CS-137	Not Detected	-----	5.66E-02
CU-64	Not Detected	-----	5.99E+01
EU-152	Not Detected	-----	4.33E-01
EU-154	Not Detected	-----	3.26E-01
EU-155	Not Detected	-----	2.31E-01
FE-59	Not Detected	-----	1.34E-01
GD-153	Not Detected	-----	1.82E-01
HG-203	Not Detected	-----	5.00E-02
I-131	Not Detected	-----	5.54E-02
IN-115m	Not Detected	-----	7.32
IR-192	Not Detected	-----	4.72E-02
K-40	2.16E+01	3.11	6.20E-01
LA-140	Not Detected	-----	1.06E-01
MN-54	Not Detected	-----	5.72E-02
MN-56	Not Detected	-----	8.72E+01
MO-99	Not Detected	-----	5.54E-01
NA-22	Not Detected	-----	7.35E-02
NA-24	Not Detected	-----	2.20E-01
NB-95	Not Detected	-----	3.44E-01
ND-147	Not Detected	-----	3.81E-01
NI-57	Not Detected	-----	1.50E-01
BE-7	Not Detected	-----	4.18E-01
RU-103	Not Detected	-----	4.75E-02
RU-106	Not Detected	-----	5.05E-01
SB-122	Not Detected	-----	9.48E-02
SB-124	Not Detected	-----	5.13E-02
SB-125	Not Detected	-----	1.32E-01
SC-46	Not Detected	-----	9.20E-02
SR-85	Not Detected	-----	6.27E-02
TA-182	Not Detected	-----	2.72E-01
TA-183	Not Detected	-----	9.64E-01
TE-132	Not Detected	-----	5.83E-02
TL-201	Not Detected	-----	3.46E-01
XE-133	Not Detected	-----	3.09E-01
Y-88	Not Detected	-----	4.31E-02
ZN-65	Not Detected	-----	1.79E-01
ZR-95	Not Detected	-----	1.01E-01

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 7-12-95 5:45:17 PM *

 * Analyzed by: *James Cole* 7/13/95 Reviewed by: *[Signature]* 7/13/95 *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : LAB CONTROL SAMPLE ANALYSIS #CG134
 Lab Sample ID : 50053306

Sample Description : MIXED GAMMA_STANDARD
 Sample Type : Liquid
 Sample Geometry : WMAR
 Sample Quantity : 1.000 Each
 Sample Date/Time : 11-01-90 12:00:00 PM
 Acquire Start Date : 7-12-95 5:31:51 PM
 Detector Name : LAB02
 Elapsed Live Time : 600 seconds
 Elapsed Real Time : 606 seconds

Comments:

Nuclide	Activity (pCi/Each)	2S Error	MDA
U-238	Not Detected	-----	2.14E+04
TH-234	Not Detected	-----	4.71E+03
U-234	Not Detected	-----	1.17E+05
RA-226	Not Detected	-----	6.02E+03
PB-214	Not Detected	-----	7.06E+02
BI-214	Not Detected	-----	6.60E+02
PB-210	Not Detected	-----	4.46E+03
TH-232	Not Detected	-----	2.02E+03
RA-228	Not Detected	-----	2.79E+03
AC-228	Not Detected	-----	1.76E+03
TH-228	Not Detected	-----	3.73E+04
RA-224	Not Detected	-----	3.18E+04
PB-212	Not Detected	-----	2.90E+03
BI-212	Not Detected	-----	2.54E+04
TL-208	Not Detected	-----	5.28E+03
U-235	Not Detected	-----	1.84E+03
TH-231	Not Detected	-----	3.88E+03
PA-231	Not Detected	-----	9.48E+03
AC-227	Not Detected	-----	1.62E+04
TH-227	Not Detected	-----	2.29E+03
RA-223	Not Detected	-----	1.00E+26
RN-219	Not Detected	-----	2.88E+03
PB-211	Not Detected	-----	8.46E+03
TL-207	Not Detected	-----	2.22E+05
AM-241	9.29E+04	1.66E+04	6.36E+03
PU-239	Not Detected	-----	2.16E+06
NP-237	Not Detected	-----	2.67E+03
PA-233	Not Detected	-----	6.25E+02
TH-229	Not Detected	-----	2.08E+03

[Summary Report] - Sample ID: 50053306

Nuclide	Activity (pCi/Each)	2S Error	MDA
AG-110m	Not Detected	-----	1.80E+05
AR-41	Not Detected	-----	1.00E+26
BA-133	Not Detected	-----	5.60E+02
BA-140	Not Detected	-----	1.00E+26
CD-109	3.02E+05	8.68E+04	1.06E+05
CD-115	Not Detected	-----	1.00E+26
CE-139	Not Detected	-----	1.35E+06
CE-141	Not Detected	-----	3.16E+18
CE-144	Not Detected	-----	1.26E+05
CO-56	Not Detected	-----	1.99E+09
CO-57	Not Detected	-----	1.96E+04
CO-58	Not Detected	-----	7.16E+09
CO-60	7.56E+04	9.85E+03	5.91E+02
CR-51	Not Detected	-----	9.98E+21
CS-134	Not Detected	-----	1.48E+03
CS-137	6.80E+04	8.78E+03	4.04E+02
CU-64	Not Detected	-----	1.00E+26
EU-152	Not Detected	-----	3.51E+03
EU-154	Not Detected	-----	2.26E+03
EU-155	Not Detected	-----	2.18E+03
FE-59	Not Detected	-----	3.55E+14
GD-153	Not Detected	-----	1.09E+05
HG-203	Not Detected	-----	3.22E+13
I-131	Not Detected	-----	1.00E+26
IN-115m	Not Detected	-----	1.00E+26
IR-192	Not Detected	-----	2.82E+09
K-40	Not Detected	-----	1.62E+03
LA-140	Not Detected	-----	1.00E+26
MN-54	Not Detected	-----	1.81E+04
MN-56	Not Detected	-----	1.00E+26
MO-99	Not Detected	-----	1.00E+26
NA-22	Not Detected	-----	8.04E+02
NA-24	Not Detected	-----	1.00E+26
NB-95	Not Detected	-----	1.00E+26
ND-147	Not Detected	-----	1.00E+26
NI-57	Not Detected	-----	1.00E+26
BE-7	Not Detected	-----	1.57E+13
RU-103	Not Detected	-----	4.78E+15
RU-106	Not Detected	-----	7.86E+04
SB-122	Not Detected	-----	1.00E+26
SB-124	Not Detected	-----	1.12E+11
SB-125	Not Detected	-----	3.33E+03
SC-46	Not Detected	-----	6.53E+08
SR-85	Not Detected	-----	3.20E+10
TA-182	Not Detected	-----	3.98E+07
TA-183	Not Detected	-----	1.00E+26
TE-132	Not Detected	-----	1.00E+26
TL-201	Not Detected	-----	1.00E+26
XE-133	Not Detected	-----	1.00E+26
Y-88	Not Detected	-----	1.25E+07
ZN-65	Not Detected	-----	1.25E+05
ZR-95	Not Detected	-----	7.19E+10

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program *
 * Quality Assurance Report *

Report Date : 7-12-95 5:50:33 PM
 QA File : C:\GENIEPC\CAMFILES\LCS2.QAF
 Analyst : FCD
 Sample ID : 50053306
 Sample Quantity : 1.00 Each
 Sample Date : 11-01-90 12:00:00 PM
 Measurement Date : 7-12-95 5:31:51 PM
 Elapsed Live Time : 600 seconds
 Elapsed Real Time : 606 seconds

Parameter	Mean	1S Error	New Value	< LU	: SD	: UD	: BS	:
AM-241 Activity	9.741E-02	3.725E-03	9.294E-02	<	: In	: ^{O.K.} 7/13/95	:	>
CS-137 Activity	6.965E-02	2.423E-03	6.798E-02	<	:	:	:	>
CO-60 Activity	7.688E-02	2.540E-03	7.484E-02	<	:	:	:	>

Flags Key: LU = Boundary Test (Ab = Above, Be = Below)
 SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
 UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
 BS = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: Spencer Cole 7/13/95

EK/1302

096 / DAT

12

SMO ANALYTICAL DATA ROUTING FORM

Project Name: TAI Phase I

Case Number: 3626400

SNL Task Leader: Miller

Org/Mail Stop: 7584 / 1148

SMO Project Coordinator: Puissant

Sample Ship Date: 7/18/95

ARCOG

Lab

Lab ID

7/14/95
7/10/95

03795

7715

500560

03791

"

500547

63735

"

500525

Date Results Received:

Preliminary: _____ Final: 7/20/95, 7/17/95, 7/12/95

Corrections Requested From Laboratory: _____ Requestor: _____

Date Corrections Received: _____

Date Assigned to SMO Reviewer: _____

Reviewer: _____

Date Review Complete: _____

Signature: _____

Date of Preliminary Notification: _____

Person Notified: _____

Date of Final Transmittal: 8/16/95

Transmitted To: Miller

Transmitted By: [Signature]

Filed In Record Center: [Signature]

Comments: _____

ANALYSIS REQUEST AND CHAIN OF CUSTODY

3001 (COC. 0 94)

500560

AR/COC-1 03795

Dept. No./Mail Stop: 7587 1347 Project/Task Manager: D. Miller / H. Fleck Project Name: TA-1 Soil Sampling (Phase 1) Record Center Code: ADS 1302 ER Site 19796 Logbook Ref No: 0133	Date Sample Shipped: 7/18/95 Carrier/Waybill No.: ATC Lab Contact: Amir M. Lab Destination: 7715 SMO Contact/Phone: D. "Mac" McLaughlin / 845-0867 Send Report to SMO: Deborah McLaughlin	Contract No.: N/A Case No.: 3626400 SMO Authorization: [Signature] Bill to: Sandia National Laboratories Supplier Services Department P.O. Box 5800 MS 0154 Albuquerque, NM 87185 0154	Parameter & Method Requested
---	--	--	---

Location		Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Sample Matrix	Reference LOV (available at SMO)					Lab Sample ID	
Tech Area TA-1						Type	Volume	Preservative	Sample Collection Method	Sample Type		
Building 805	Room outside											
Sample No.	- Fraction	ER Sample ID or Sample Location Detail										
22993	- 05	11096-6P-055-005-5	9'1"	96	7/17/95 - 8:30	S	P	500ml	None	G	SA	X

Gamma Spec.

IMMA <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Ref. No. _____	Sample Tracking Date Entered (mm/dd/yyyy): 7/21/95 Entered by: [Signature]	Special Instructions/QC Requirements	Abnormal Conditions on Receipt
Sample Disposal <input checked="" type="checkbox"/> Return to Client <input type="checkbox"/> Disposal by lab	Turnaround Time <input checked="" type="checkbox"/> Normal <input type="checkbox"/> Rush Required Report Date _____	QC Inits. _____	_____
Sample Team Members:	Name: Matthew Shain Signature: [Signature] Init: MS Company/Organization: 3T Corp. / 7582	Name: Cathie Gohel Signature: [Signature] Init: CG Company/Organization: Sandia / 7580	_____

Relinquished by: Matthew Shain Org: 7582 Date: 7/17/95 Time: 16:27	Relinquished by: _____ Org: _____ Date: _____ Time: _____	Received by: [Signature] Org: 7513 Date: 7/17/95 Time: 16:27	Received by: _____ Org: _____ Date: _____ Time: _____
Relinquished by: [Signature] Org: SMA 7517 Date: 7/18/95 Time: 1050	Relinquished by: _____ Org: _____ Date: _____ Time: _____	Relinquished by: [Signature] Org: SMA 7715 Date: 7/18/95 Time: 1050	Relinquished by: _____ Org: _____ Date: _____ Time: _____
Relinquished by: [Signature] Org: SMA 7715 Date: 7/20/95 Time: 1225	Relinquished by: _____ Org: _____ Date: _____ Time: _____	Relinquished by: [Signature] Org: 7513 Date: 7/20/95 Time: 1225	Relinquished by: _____ Org: _____ Date: _____ Time: _____

WHITE - To Accompany Samples, Lab Copy
 BLUE - To Accompany Samples, Return to SMO
 YELLOW - SMO Sense Copy
 PINK - Field Copy

ANALYSIS REQUEST AND CHAIN OF CUSTODY

BF 1001 (2/10/04)

500560

AR/COC-03795

Dept: No./Mail Stop: <u>7587/1347</u> Project/Task Manager: <u>D. Miller / H. Fleck</u> Project Name: <u>TA-1 Soil Sampling (Musc)</u> Record Center Code: <u>ADS 1302 ER Site 2896</u> Logbook Ref No.: <u>0133</u>	Date Samples Shipped: <u>7/18/95</u> Carrier/Waybill No.: <u>HC</u> Lab Contact: <u>AMir M.</u> Lab Destination: <u>7715</u> SMO Contact/Phone: <u>D. "Mac" McLaughlin/845-0964</u> Send Report to SMO: <u>Deborah McLaughlin</u>	Contract No.: <u>N/A</u> Case No.: <u>3626400</u> SMO Authorization: <u>[Signature]</u> Bill to: <u>Sandia National Laboratories</u> Supplier Services Department P.O. Box 5800 MS 0154 Albuquerque, NM 87185-0154	Parameter & Method Requested
--	--	--	---

Location		Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Reference LOV (available at SMO)					Lab Sample ID	
Tech Area <u>TA-1</u>					Sample Matrix	Container		Preservative	Sample Collection Method		Sample Type
Building <u>805</u>	Room <u>outside</u>					Type	Volume				
Sample No. - Fraction	ER Sample ID or Sample Location Detail										
<u>022993 - 05</u>	<u>T1096-6P-055-005-5</u>	<u>9'1"</u>	<u>76</u>	<u>7/17/95 - 9:30</u>	<u>S</u>	<u>P</u>	<u>500ml</u>	<u>None</u>	<u>G</u>	<u>SA</u>	

Gamma Spec

RMMA <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Ref. No. _____	Sample Tracking Date Entered (mm/dd/yy) <u>7/20/95</u> Entered by: <u>[Signature]</u>	Special Instructions/OC Requirements	Abnormal Conditions on Receipt															
Sample Disposal <input checked="" type="checkbox"/> Return to Client <input type="checkbox"/> Disposal by lab	Turnaround Time <input checked="" type="checkbox"/> Normal <input type="checkbox"/> Rush Required Report Date _____																	
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Sample Team Members</th> <th>Name</th> <th>Signature</th> <th>Init</th> <th>Company/Organization</th> </tr> </thead> <tbody> <tr> <td></td> <td><u>Matthew Spain</u></td> <td><u>[Signature]</u></td> <td><u>MA</u></td> <td><u>11 CAD / 7582</u></td> </tr> <tr> <td></td> <td><u>Callie Greer</u></td> <td><u>[Signature]</u></td> <td><u>CG</u></td> <td><u>Sandia / 7582</u></td> </tr> </tbody> </table>	Sample Team Members	Name	Signature	Init	Company/Organization		<u>Matthew Spain</u>	<u>[Signature]</u>	<u>MA</u>	<u>11 CAD / 7582</u>		<u>Callie Greer</u>	<u>[Signature]</u>	<u>CG</u>	<u>Sandia / 7582</u>			
Sample Team Members	Name	Signature	Init	Company/Organization														
	<u>Matthew Spain</u>	<u>[Signature]</u>	<u>MA</u>	<u>11 CAD / 7582</u>														
	<u>Callie Greer</u>	<u>[Signature]</u>	<u>CG</u>	<u>Sandia / 7582</u>														

1. Relinquished by <u>[Signature]</u> Org. <u>7582</u> Date <u>7/17/95</u> Time <u>16:27</u> 1. Received by <u>[Signature]</u> Org. <u>7513</u> Date <u>7/17/95</u> Time <u>16:27</u> 2. Relinquished by <u>[Signature]</u> Org. <u>SMA 7513</u> Date <u>7/18/95</u> Time <u>10:50</u> 2. Received by <u>[Signature]</u> Org. <u>SNL 7715</u> Date <u>7/18/95</u> Time <u>10:50</u> 3. Relinquished by <u>[Signature]</u> Org. <u>SNL 7715</u> Date <u>7/20/95</u> Time <u>12:25</u> 3. Received by <u>[Signature]</u> Org. <u>7502</u> Date <u>7/20/95</u> Time <u>12:25</u>	4. Relinquished by _____ Org. _____ Date _____ Time _____ 4. Received by _____ Org. _____ Date _____ Time _____ 5. Relinquished by _____ Org. _____ Date _____ Time _____ 6. Received by _____ Org. _____ Date _____ Time _____ 6. Relinquished by _____ Org. _____ Date _____ Time _____ 6. Received by _____ Org. _____ Date _____ Time _____
--	--



To be completed by Customer

Shaded areas are for RPSD use only

Customer: <u>D. Miller/H. Fleck</u>	Hazards/Special Instructions: <u>Please Notify S10</u> <u>upon completion @ 845-0807</u>	Batch Log Number: <u>500560</u>
Organization: <u>7582</u>		Logged By: <u>JW</u>
Project Location: <u>TA-1</u>		Analysis Type: <input checked="" type="checkbox"/> Gamma Spec <input type="checkbox"/> H-3 <input type="checkbox"/> Alpha/Beta <input type="checkbox"/> Alpha Spec <input type="checkbox"/> Total U <input type="checkbox"/> Other
Phone: <u>845-0667</u>		
Date Results Needed: <u>7/20/95</u>		
Suspect Isotopes: _____		
Other Information: <u>03795</u>		
LIMS Login: _____	Results Forwarded: _____	
Sample Disposal: _____		

Customer Sample ID	Sample Type	Date/Time Collected	Sample Volume	Requested Analysis	RPSD Sample ID	Rad Scan CPM	Sample Weight	Remarks
<u>022993-05</u>	<u>S</u>	<u>7/17/95 8:30</u>	<u>500ml</u>	<u>Gamma-Spec</u>	<u>01</u>	<u>1300</u>	<u>613</u>	
<u>LCS</u>		<u>1/10/95</u>		<u>X Spec</u>	<u>02</u>	<u>N/A</u>	<u>N/A</u>	

Relinquished by [Signature] Date 7/18/95 Time 1650 Received by [Signature] Date 7/18/95 Time 1050
 Relinquished by [Signature] Date 7/20/95 Time 1225 Received by [Signature] Date 7/20/95 Time 1225
 Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____
 Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 7-18-95 8:17:32 PM *

* Analyzed by: *JR 7/19/95* Reviewed by: *JR 7/19/95* *

Customer : D.MILLER/D.McLAUGHLIN (7582/SMO)
 Customer Sample ID : 022993-05
 Lab Sample ID : 50056001

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 2SMAR
 Sample Quantity : 693.000 gram
 Sample Date/Time : 7-17-95 8:30:00 AM
 Acquire Start Date : 7-18-95 7:43:50 PM
 Detector Name : LAB02
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	5.74
TH-234	Not Detected	-----	1.28
U-234	Not Detected	-----	2.03E+01
RA-226	1.80	8.01E-01	1.13
PB-214	6.76E-01	1.34E-01	9.78E-02
BI-214	6.31E-01	1.33E-01	1.18E-01
PB-210	Not Detected	-----	1.38
TH-232	5.73E-01	2.36E-01	3.09E-01
RA-228	7.44E-01	2.58E-01	3.00E-01
AC-228	Not Detected	-----	3.31E-01
TH-228	Not Detected	-----	1.30
RA-224	Not Detected	-----	7.72E-01
PB-212	5.68E-01	1.28E-01	7.22E-02
BI-212	5.59E-01	3.73E-01	5.41E-01
TL-208	6.34E-01	1.63E-01	1.71E-01
U-235	Not Detected	-----	4.16E-01
TH-231	Not Detected	-----	9.78E-01
PA-231	Not Detected	-----	1.81
AC-227	Not Detected	-----	2.95
TH-227	Not Detected	-----	5.78E-01
RA-223	Not Detected	-----	3.36E-01
RN-219	Not Detected	-----	4.58E-01
PB-211	Not Detected	-----	1.04
TL-207	Not Detected	-----	2.41E+01
AM-241	Not Detected	-----	9.63E-01
PU-239	2.16E+02	2.07E+02	3.26E+02
NP-237	Not Detected	-----	6.22E-01
PA-233	Not Detected	-----	1.05E-01
TH-229	Not Detected	-----	4.55E-01

Not detected JR 7/19/95

[Summary Report] - Sample ID: 50056001

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	4.80E-02
AR-41	Not Detected	-----	4.90E+04
BA-133	Not Detected	-----	1.07E-01
BA-140	Not Detected	-----	1.92E-01
CD-109	Not Detected	-----	2.16
CD-115	Not Detected	-----	1.79E-01
CE-139	Not Detected	-----	5.30E-02
CE-141	Not Detected	-----	9.67E-02
CE-144	Not Detected	-----	4.01E-01
CO-56	Not Detected	-----	5.93E-02
CO-57	Not Detected	-----	5.31E-02
CO-58	Not Detected	-----	5.33E-02
CO-60	Not Detected	-----	6.30E-02
CR-51	Not Detected	-----	3.85E-01
CS-134	Not Detected	-----	8.91E-02
CS-137	Not Detected	-----	5.75E-02
CU-64	Not Detected	-----	8.81E+01
EU-152	Not Detected	-----	4.28E-01
EU-154	Not Detected	-----	3.02E-01
EU-155	Not Detected	-----	2.44E-01
FE-59	Not Detected	-----	1.26E-01
GD-153	Not Detected	-----	1.85E-01
HG-203	Not Detected	-----	5.03E-02
I-131	Not Detected	-----	5.12E-02
IN-115m	Not Detected	-----	2.75E+01
IR-192	Not Detected	-----	4.56E-02
K-40	1.49E+01	2.26	5.90E-01
LA-140	Not Detected	-----	1.14E-01
MN-54	Not Detected	-----	5.59E-02
MN-56	Not Detected	-----	8.18E+02
MO-99	Not Detected	-----	6.97E-01
NA-22	Not Detected	-----	7.57E-02
NA-24	Not Detected	-----	3.34E-01
NB-95	Not Detected	-----	3.48E-01
ND-147	Not Detected	-----	3.55E-01
NI-57	Not Detected	-----	1.63E-01
BE-7	Not Detected	-----	4.04E-01
RU-103	Not Detected	-----	5.18E-02
RU-106	Not Detected	-----	4.69E-01
SB-122	Not Detected	-----	1.03E-01
SB-124	Not Detected	-----	5.65E-02
SB-125	Not Detected	-----	1.33E-01
SC-46	Not Detected	-----	9.05E-02
SR-85	Not Detected	-----	6.66E-02
TA-182	Not Detected	-----	2.69E-01
TA-183	Not Detected	-----	1.02
TE-132	Not Detected	-----	6.31E-02
TL-201	Not Detected	-----	3.97E-01
XE-133	Not Detected	-----	3.41E-01
Y-88	Not Detected	-----	4.76E-02
ZN-65	Not Detected	-----	1.76E-01
ZR-95	Not Detected	-----	9.89E-02

ANALYSIS REQUEST AND CHAIN OF CUSTODY

2001-COC (9-94)

500460

AR/COC-03715

Dept. No./Mail Stop: 7582/1347
 Project/Task Manager: D. Miller/H. Fleck
 Project Name: TA-1 Soil Sampling Phase I
 Record Center Code: ADS 1302 ER Site 96
 Logbook Ref No.: 0133
 SMO Reference No.: CF0089

Date Samples Shipped: 6/16/95
 Carrier/Waybill No.: HC
 Lab Contact: AMIR M.
 Lab Destination: 7715
 SMO Contact/Phone: D. Mac McLaughlin 845-0807
 Send Report to SMO: Deborah McLaughlin

Contract No.: N/A
 Case No.: 3626-400
 SMO Authorizations: [Signature]
 Bill to: Sandia National Laboratories
 Supplier Services Department
 P.O. Box 5800 MS 0154
 Albuquerque, NM 87185-0154

Parameter & Method Requested

GAMMA SPEC.

Location		Tech Area	Building	Room	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Reference LOV (available at SMO)					Lab Sample ID	
									Sample Matrix	Type	Volume	Preservative	Sample Collection Method		Sample Type
22869	-05		835	Outside	T1096-GP-011-006	5'6"	96	6/15/95-8:48	S	P	500 ml	NONE	G	SA	X
22871	-05				T1096-GP-012-006	5'6"	96	6/15/95-9:20	S	P	500 ml	NONE	G	DU	X
22872	-05				T1096-GP-013-005	4'8"	96	6/15/95-10:20						SA	X
22873	-05				T1096-GP-014-003	3'0"		6/15/95-10:55							X
22874	-05				T1096-GP-015-005	5'0"		6/15/95-12:43							X
22875	-05				T1096-GP-016-005	5'		6/15/95-13:30							X
22876	-05				T1096-GP-017-005	5'		6/15/95-14:05							X
22877	-05				T1096-GP-018-005	5'		6/15/95-14:50							X

RMMA Yes No Ref. No. _____

Sample Disposal Return to Client Disposal by lab

Turnaround Time Normal Rush Required Report Date _____

Sample Team Members	Name	Signature	Init	Company/Organization
	MATTHEW SHAIN	<i>Matthew Shain</i>	MS	ITCORP/7582
	CATHIE GOHAR	<i>Cathie Gohar</i>	CG	SANDIA/7582

Sample Tracking # _____ Date Entered (mm/dd/yy) 6/16/95
 Entered by: [Signature]

Special Instructions/QC Requirements

Abnormal Conditions on Receipt

Relinquished by <u>Matthew Shain</u> Org. <u>7582</u> Date <u>6/15/95</u> Time <u>1535</u>	4. Relinquished by _____ Org. _____ Date _____ Time _____
Received by <u>John Roy</u> Org. <u>7513</u> Date <u>6/15/95</u> Time <u>1535</u>	4. Received by _____ Org. _____ Date _____ Time _____
Relinquished by <u>[Signature]</u> Org. <u>7513</u> Date <u>6/16/95</u> Time <u>0918</u>	5. Relinquished by _____ Org. _____ Date _____ Time _____
Received by <u>Sonja E...</u> Org. <u>7715</u> Date <u>6/16/95</u> Time <u>0918</u>	5. Received by _____ Org. _____ Date _____ Time _____
Relinquished by <u>[Signature]</u> Org. <u>SNL7715</u> Date <u>6/19/95</u> Time <u>1440</u>	6. Relinquished by _____ Org. _____ Date _____ Time _____
Received by <u>[Signature]</u> Org. <u>SNL7715</u> Date <u>6/19/95</u> Time <u>1440</u>	6. Received by _____ Org. _____ Date _____ Time _____



To be completed by Customer

Shaded areas are for RPSD use only

Customer: <u>D. Miller / H. Fleck</u>	Hazards/Special Instructions: <u>Please notify SMO upon completion @ 845-0867</u>	Batch Log Number: <u>500460</u>
Organization: <u>7582</u>		Logged By: <u>SPG</u>
Project Location: <u>7A-1</u>		Analysis Type: <input checked="" type="checkbox"/> Gamma Spec
Phone: <u>845-0867</u>		<input type="checkbox"/> H-3
Date Results Needed: <u>6-19-95</u>		<input type="checkbox"/> Alpha/Beta
Suspect Isotopes: _____		<input type="checkbox"/> Alpha Spec
Other Information: <u>03715</u>	LIMS Login: _____	<input type="checkbox"/> Total U
	Results Faxed: _____	<input type="checkbox"/> Other
	Sample Disposal: _____	

Customer Sample ID	Sample Type	Date/Time Collected	Sample Volume	Requested Analysis	RPSD Sample ID	Rad Scan CPM	Sample Weight	Remarks
022869-05	S	6/15/95-8:18	500ml	Gamma Spec.	01	4300	698	
022871-05		9:20			02	4300	633	
022872-05		10:20			03	4300	704	
022873-05		10:55			04	4300	691	
022874-05		12:43			05	4300	761	
022875-05		13:30			06	4300	667	
022876-05		14:05			07	4300	659	
022877-05	✓	14:50	✓	✓	08	4300	728	
LCS	—	1-1000-90	—	8	09			

Relinquished by <u>[Signature]</u>	Date <u>6-16-95</u>	Time <u>09:18</u>	Received by <u>[Signature]</u>	Date <u>6/16/95</u>	Time <u>09:18</u>
Relinquished by <u>[Signature]</u>	Date <u>6/19/95</u>	Time <u>1440</u>	Received by <u>[Signature]</u>	Date <u>6/19/95</u>	Time <u>1440</u>
Relinquished by _____	Date _____	Time _____	Received by _____	Date _____	Time _____
Relinquished by _____	Date _____	Time _____	Received by _____	Date _____	Time _____

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-16-95 12:14:23 PM *

 * Analyzed by: *JJ 6/19/95* Reviewed by: *JJ 6/19/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022869-05
 Lab Sample ID : 50046001

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 2SMAR
 Sample Quantity : 698.000 gram
 Sample Date/Time : 6-15-95 8:48:00 AM
 Acquire Start Date : 6-16-95 11:41:57 AM
 Detector Name : LAB02
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	6.28
TH-234	Not Detected	-----	1.43
U-234	Not Detected	-----	2.34E+01
RA-226	1.42	9.83E-01	1.51
PB-214	7.38E-01	1.59E-01	1.56E-01
BI-214	5.94E-01	1.25E-01	1.05E-01
PB-210	Not Detected	-----	3.86E+02
TH-232	7.77E-01	2.68E-01	3.26E-01
RA-228	8.52E-01	3.06E-01	2.07E-01
AC-228	Not Detected	-----	3.61E-01
TH-228	6.32E-01	3.73E-01	8.57E-01
RA-224	1.74	4.75E-01	7.12E-01
PB-212	8.57E-01	1.69E-01	6.75E-02
BI-212	9.00E-01	4.78E-01	6.64E-01
TL-208	7.36E-01	1.79E-01	1.79E-01
U-235	Not Detected	-----	4.16E-01
TH-231	Not Detected	-----	1.13
PA-231	Not Detected	-----	2.32
AC-227	Not Detected	-----	3.28
TH-227	Not Detected	-----	6.80E-01
RA-223	Not Detected	-----	3.86E-01
RN-219	Not Detected	-----	5.18E-01
PB-211	Not Detected	-----	1.29
TL-207	Not Detected	-----	2.51E+01
AM-241	Not Detected	-----	9.12E-01
PU-239	Not Detected	-----	5.25E+02
NP-237	Not Detected	-----	7.15E-01
PA-233	Not Detected	-----	1.10E-01
TH-229	Not Detected	-----	5.42E-01

[Summary Report] - Sample ID: 50046001

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	5.76E-02
AR-41	Not Detected	-----	2.37E+03
BA-133	Not Detected	-----	1.17E-01
BA-140	Not Detected	-----	1.96E-01
CD-109	Not Detected	-----	2.42
CD-115	Not Detected	-----	1.77E-01
CE-139	Not Detected	-----	5.92E-02
CE-141	Not Detected	-----	9.63E-02
CE-144	Not Detected	-----	4.25E-01
CO-56	Not Detected	-----	6.21E-02
CO-57	Not Detected	-----	5.90E-02
CO-58	Not Detected	-----	5.65E-02
CO-60	Not Detected	-----	7.20E-02
CR-51	Not Detected	-----	4.19E-01
CS-134	Not Detected	-----	9.31E-02
CS-137	Not Detected	-----	6.64E-02
CU-64	Not Detected	-----	5.90E+01
EU-152	Not Detected	-----	4.50E-01
EU-154	Not Detected	-----	3.48E-01
EU-155	Not Detected	-----	2.64E-01
FE-59	Not Detected	-----	1.37E-01
GD-153	Not Detected	-----	2.26E-01
HG-203	Not Detected	-----	5.57E-02
I-131	Not Detected	-----	5.24E-02
IN-115m	Not Detected	-----	8.35
IR-192	Not Detected	-----	5.18E-02
K-40	1.56E+01	2.37	6.82E-01
LA-140	Not Detected	-----	1.03E-01
MN-54	Not Detected	-----	6.07E-02
MN-56	Not Detected	-----	9.16E+01
MO-99	Not Detected	-----	6.20E-01
NA-22	Not Detected	-----	7.83E-02
NA-24	Not Detected	-----	2.34E-01
NB-95	Not Detected	-----	3.92E-01
ND-147	Not Detected	-----	3.67E-01
NI-57	Not Detected	-----	1.62E-01
BE-7	Not Detected	-----	4.68E-01
RU-103	Not Detected	-----	5.06E-02
RU-106	Not Detected	-----	5.21E-01
SB-122	Not Detected	-----	1.00E-01
SB-124	Not Detected	-----	6.10E-02
SB-125	Not Detected	-----	1.45E-01
SC-46	Not Detected	-----	9.62E-02
SR-85	Not Detected	-----	6.91E-02
TA-182	Not Detected	-----	2.86E-01
TA-183	Not Detected	-----	9.20E-01
TE-132	Not Detected	-----	6.71E-02
TL-201	Not Detected	-----	3.83E-01
XE-133	Not Detected	-----	3.59E-01
Y-88	Not Detected	-----	4.99E-02
ZN-65	Not Detected	-----	1.92E-01
ZR-95	Not Detected	-----	1.09E-01

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-16-95 12:51:14 PM *

* Analyzed by: *JP 6/19/95* Reviewed by: *JP 6/15/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022871-05
 Lab Sample ID : 50046002

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 2SMAR
 Sample Quantity : 633.000 gram
 Sample Date/Time : 6-15-95 9:20:00 AM
 Acquire Start Date : 6-16-95 12:18:53 PM
 Detector Name : LAB02
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	6.61
TH-234	Not Detected	-----	1.49
U-234	Not Detected	-----	2.31E+01
RA-226	1.85	9.97E-01	1.47
PB-214	6.81E-01	1.41E-01	1.17E-01
BI-214	6.00E-01	1.30E-01	1.14E-01
PB-210	Not Detected	-----	3.85E+02
TH-232	7.47E-01	2.91E-01	3.77E-01
RA-228	4.66E-01	3.03E-01	4.49E-01
AC-228	Not Detected	-----	3.93E-01
TH-228	9.25E-01	5.38E-01	1.05
RA-224	Not Detected	-----	2.19
PB-212	6.93E-01	1.38E-01	1.05E-01
BI-212	4.56E-01	5.22E-01	8.33E-01
TL-208	6.75E-01	1.73E-01	1.76E-01
U-235	Not Detected	-----	4.64E-01
TH-231	Not Detected	-----	1.16
PA-231	Not Detected	-----	2.52
AC-227	Not Detected	-----	3.30
TH-227	Not Detected	-----	7.25E-01
RA-223	Not Detected	-----	3.93E-01
RN-219	Not Detected	-----	5.69E-01
PB-211	Not Detected	-----	1.30
TL-207	Not Detected	-----	2.62E+01
AM-241	Not Detected	-----	1.03
PU-239	Not Detected	-----	5.51E+02
NP-237	Not Detected	-----	7.38E-01
PA-233	Not Detected	-----	1.19E-01
TH-229	Not Detected	-----	5.82E-01

[Summary Report] - Sample ID: 50046002

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	6.20E-02
AR-41	Not Detected	-----	2.52E+03
BA-133	Not Detected	-----	1.24E-01
BA-140	Not Detected	-----	2.17E-01
CD-109	Not Detected	-----	2.47
CD-115	Not Detected	-----	1.84E-01
CE-139	Not Detected	-----	5.90E-02
CE-141	Not Detected	-----	1.04E-01
CE-144	Not Detected	-----	4.75E-01
CO-56	Not Detected	-----	6.66E-02
CO-57	Not Detected	-----	6.06E-02
CO-58	Not Detected	-----	5.83E-02
CO-60	Not Detected	-----	7.38E-02
CR-51	Not Detected	-----	4.81E-01
CS-134	Not Detected	-----	1.00E-01
CS-137	Not Detected	-----	7.17E-02
CU-64	Not Detected	-----	5.71E+01
EU-152	Not Detected	-----	5.07E-01
EU-154	Not Detected	-----	3.54E-01
EU-155	Not Detected	-----	2.88E-01
FE-59	Not Detected	-----	1.30E-01
GD-153	Not Detected	-----	2.33E-01
HG-203	Not Detected	-----	6.12E-02
I-131	Not Detected	-----	6.03E-02
IN-115m	Not Detected	-----	8.80
IR-192	Not Detected	-----	5.46E-02
K-40	1.48E+01	2.30	6.58E-01
LA-140	Not Detected	-----	1.32E-01
MN-54	Not Detected	-----	7.24E-02
MN-56	Not Detected	-----	1.00E+02
MO-99	Not Detected	-----	6.57E-01
NA-22	Not Detected	-----	8.81E-02
NA-24	Not Detected	-----	2.45E-01
NB-95	Not Detected	-----	4.15E-01
ND-147	Not Detected	-----	4.18E-01
NI-57	Not Detected	-----	1.71E-01
BE-7	Not Detected	-----	4.97E-01
RU-103	Not Detected	-----	5.42E-02
RU-106	Not Detected	-----	5.60E-01
SB-122	Not Detected	-----	1.04E-01
SB-124	Not Detected	-----	6.53E-02
SB-125	Not Detected	-----	1.61E-01
SC-46	Not Detected	-----	1.06E-01
SR-85	Not Detected	-----	7.62E-02
TA-182	Not Detected	-----	3.11E-01
TA-183	Not Detected	-----	1.03
TE-132	Not Detected	-----	7.07E-02
TL-201	Not Detected	-----	3.81E-01
XE-133	Not Detected	-----	3.63E-01
Y-88	Not Detected	-----	6.34E-02
ZN-65	Not Detected	-----	2.11E-01
ZR-95	Not Detected	-----	1.06E-01

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-16-95 1:28:40 PM *

 * Analyzed by: *JR 6/19/95* Reviewed by: *JR 6/19/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022872-05
 Lab Sample ID : 50046003

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 2SMAR
 Sample Quantity : 704.000 gram
 Sample Date/Time : 6-15-95 10:20:00 AM
 Acquire Start Date : 6-16-95 12:56:10 PM
 Detector Name : LAB02
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	6.00
TH-234	6.28E-01	6.41E-01	9.89E-01
U-234	Not Detected	-----	2.37E+01
RA-226	1.26	7.22E-01	1.07
PB-214	6.47E-01	1.38E-01	1.26E-01
BI-214	7.06E-01	1.36E-01	9.71E-02
PB-210	Not Detected	-----	3.68E+02
TH-232	8.07E-01	2.54E-01	2.86E-01
RA-228	7.30E-01	3.33E-01	4.59E-01
AC-228	Not Detected	-----	3.72E-01
TH-228	8.43E-01	4.45E-01	9.71E-01
RA-224	1.76	5.36E-01	7.86E-01
PB-212	8.46E-01	1.95E-01	7.30E-02
BI-212	8.48E-01	4.54E-01	6.29E-01
TL-208	6.63E-01	1.60E-01	1.51E-01
U-235	Not Detected	-----	4.44E-01
TH-231	Not Detected	-----	1.13
PA-231	Not Detected	-----	2.29
AC-227	Not Detected	-----	3.24
TH-227	Not Detected	-----	6.90E-01
RA-223	Not Detected	-----	3.81E-01
RN-219	Not Detected	-----	5.28E-01
PB-211	Not Detected	-----	1.25
TL-207	Not Detected	-----	2.52E+01
AM-241	Not Detected	-----	9.34E-01
PU-239	Not Detected	-----	5.14E+02
NP-237	Not Detected	-----	7.11E-01
PA-233	Not Detected	-----	1.11E-01
TH-229	Not Detected	-----	5.62E-01

[Summary Report] - Sample ID: 50046003

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	5.30E-02
AR-41	Not Detected	-----	2.02E+03
BA-133	Not Detected	-----	1.12E-01
BA-140	Not Detected	-----	2.08E-01
CD-109	Not Detected	-----	2.47
CD-115	Not Detected	-----	1.74E-01
CE-139	Not Detected	-----	5.75E-02
CE-141	Not Detected	-----	1.01E-01
CE-144	Not Detected	-----	4.41E-01
CO-56	Not Detected	-----	6.78E-02
CO-57	Not Detected	-----	6.15E-02
CO-58	Not Detected	-----	5.57E-02
CO-60	Not Detected	-----	7.04E-02
CR-51	Not Detected	-----	4.28E-01
CS-134	Not Detected	-----	9.90E-02
CS-137	Not Detected	-----	6.35E-02
CU-64	Not Detected	-----	5.81E+01
EU-152	Not Detected	-----	4.79E-01
EU-154	Not Detected	-----	3.52E-01
EU-155	Not Detected	-----	2.82E-01
FE-59	Not Detected	-----	1.43E-01
GD-153	Not Detected	-----	2.16E-01
HG-203	Not Detected	-----	5.33E-02
I-131	Not Detected	-----	5.63E-02
IN-115m	Not Detected	-----	7.87
IR-192	Not Detected	-----	5.26E-02
K-40	1.62E+01	2.44	5.92E-01
LA-140	Not Detected	-----	1.15E-01
MN-54	Not Detected	-----	6.53E-02
MN-56	Not Detected	-----	9.24E+01
MO-99	Not Detected	-----	6.07E-01
NA-22	Not Detected	-----	7.64E-02
NA-24	Not Detected	-----	2.13E-01
NB-95	Not Detected	-----	3.94E-01
ND-147	Not Detected	-----	3.80E-01
NI-57	Not Detected	-----	1.44E-01
BE-7	Not Detected	-----	4.47E-01
RU-103	Not Detected	-----	5.20E-02
RU-106	Not Detected	-----	5.23E-01
SB-122	Not Detected	-----	9.45E-02
SB-124	Not Detected	-----	6.02E-02
SB-125	Not Detected	-----	1.55E-01
SC-46	Not Detected	-----	9.56E-02
SR-85	Not Detected	-----	6.96E-02
TA-182	Not Detected	-----	2.82E-01
TA-183	Not Detected	-----	9.27E-01
TE-132	Not Detected	-----	6.47E-02
TL-201	Not Detected	-----	3.65E-01
XE-133	Not Detected	-----	3.76E-01
Y-88	Not Detected	-----	5.46E-02
ZN-65	Not Detected	-----	1.89E-01
ZR-95	Not Detected	-----	1.11E-01

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-16-95 2:05:54 PM *

 * Analyzed by: *W 6/15/95* Reviewed by: *W 6/15/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022873-05
 Lab Sample ID : 50046004

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 2SMAR
 Sample Quantity : 691.000 gram
 Sample Date/Time : 6-15-95 10:55:00 AM
 Acquire Start Date : 6-16-95 1:33:18 PM
 Detector Name : LAB02
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	5.80
TH-234	1.11	6.09E-01	8.46E-01
U-234	Not Detected	-----	2.18E+01
RA-226	1.53	6.32E-01	8.47E-01
PB-214	6.68E-01	1.41E-01	1.27E-01
BI-214	5.33E-01	1.19E-01	1.08E-01
PB-210	Not Detected	-----	3.54E+02
TH-232	6.68E-01	2.13E-01	2.31E-01
RA-228	7.74E-01	2.85E-01	2.06E-01
AC-228	Not Detected	-----	3.43E-01
TH-228	1.01	4.45E-01	8.14E-01
RA-224	1.88	5.09E-01	7.30E-01
PB-212	7.16E-01	1.48E-01	6.95E-02
BI-212	6.79E-01	4.47E-01	6.53E-01
TL-208	6.25E-01	1.58E-01	1.56E-01
U-235	Not Detected	-----	4.26E-01
TH-231	Not Detected	-----	1.08
PA-231	Not Detected	-----	2.36
AC-227	Not Detected	-----	3.09
TH-227	Not Detected	-----	6.45E-01
RA-223	Not Detected	-----	3.66E-01
RN-219	Not Detected	-----	5.09E-01
PB-211	Not Detected	-----	1.21
TL-207	Not Detected	-----	2.59E+01
AM-241	Not Detected	-----	9.10E-01
PU-239	Not Detected	-----	5.05E+02
NP-237	Not Detected	-----	4.43E-01
PA-233	Not Detected	-----	1.08E-01
TH-229	Not Detected	-----	5.26E-01

[Summary Report] - Sample ID: 50046004

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	5.40E-02
AR-41	Not Detected	-----	1.99E+03
BA-133	Not Detected	-----	1.14E-01
BA-140	Not Detected	-----	2.15E-01
CD-109	Not Detected	-----	1.52
CD-115	Not Detected	-----	1.66E-01
CE-139	Not Detected	-----	5.81E-02
CE-141	Not Detected	-----	9.73E-02
CE-144	Not Detected	-----	4.35E-01
CO-56	Not Detected	-----	6.99E-02
CO-57	Not Detected	-----	5.60E-02
CO-58	Not Detected	-----	5.02E-02
CO-60	Not Detected	-----	6.09E-02
CR-51	Not Detected	-----	4.30E-01
CS-134	Not Detected	-----	9.21E-02
CS-137	Not Detected	-----	6.24E-02
CU-64	Not Detected	-----	5.37E+01
EU-152	Not Detected	-----	4.99E-01
EU-154	Not Detected	-----	3.45E-01
EU-155	Not Detected	-----	2.54E-01
FE-59	Not Detected	-----	1.26E-01
GD-153	Not Detected	-----	2.12E-01
HG-203	Not Detected	-----	5.54E-02
I-131	Not Detected	-----	5.63E-02
IN-115m	Not Detected	-----	7.56
IR-192	Not Detected	-----	5.23E-02
K-40	1.38E+01	2.14	6.59E-01
LA-140	Not Detected	-----	9.63E-02
MN-54	Not Detected	-----	6.18E-02
MN-56	Not Detected	-----	9.61E+01
MO-99	Not Detected	-----	5.60E-01
NA-22	Not Detected	-----	7.69E-02
NA-24	Not Detected	-----	2.19E-01
NB-95	Not Detected	-----	3.69E-01
ND-147	Not Detected	-----	4.03E-01
NI-57	Not Detected	-----	1.59E-01
BE-7	Not Detected	-----	4.62E-01
RU-103	Not Detected	-----	4.60E-02
RU-106	Not Detected	-----	5.30E-01
SB-122	Not Detected	-----	9.45E-02
SB-124	Not Detected	-----	5.69E-02
SB-125	Not Detected	-----	1.62E-01
SC-46	Not Detected	-----	9.08E-02
SR-85	Not Detected	-----	6.94E-02
TA-182	Not Detected	-----	2.69E-01
TA-183	Not Detected	-----	9.04E-01
TE-132	Not Detected	-----	6.14E-02
TL-201	Not Detected	-----	3.54E-01
XE-133	Not Detected	-----	3.62E-01
Y-88	Not Detected	-----	6.03E-02
ZN-65	Not Detected	-----	1.84E-01
ZR-95	Not Detected	-----	9.68E-02

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-16-95 2:43:41 PM *

 * Analyzed by: *W* 6/19/95 Reviewed by: *W* 6/15/95 *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022874-05
 Lab Sample ID : 50046005

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 2SMAR
 Sample Quantity : 761.000 gram
 Sample Date/Time : 6-15-95 12:43:00 PM
 Acquire Start Date : 6-16-95 2:10:16 PM
 Detector Name : LAB02
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	4.89
TH-234	Not Detected	-----	1.29
U-234	Not Detected	-----	1.90E+01
RA-226	9.69E-01	9.68E-01	1.54
PB-214	4.73E-01	1.02E-01	8.77E-02
BI-214	4.87E-01	1.02E-01	7.79E-02
PB-210	Not Detected	-----	3.30E+02
TH-232	3.15E-01	1.75E-01	2.49E-01
RA-228	5.94E-01	2.37E-01	1.76E-01
AC-228	Not Detected	-----	3.14E-01
TH-228	Not Detected	-----	1.48
RA-224	Not Detected	-----	1.72
PB-212	4.73E-01	1.05E-01	9.85E-02
BI-212	8.60E-01	3.66E-01	4.44E-01
TL-208	5.06E-01	1.23E-01	1.07E-01
U-235	Not Detected	-----	3.80E-01
TH-231	Not Detected	-----	9.31E-01
PA-231	Not Detected	-----	2.06
AC-227	Not Detected	-----	2.81
TH-227	Not Detected	-----	5.77E-01
RA-223	Not Detected	-----	3.11E-01
RN-219	Not Detected	-----	4.58E-01
PB-211	Not Detected	-----	1.09
TL-207	Not Detected	-----	2.21E+01
AM-241	Not Detected	-----	8.01E-01
PU-239	Not Detected	-----	4.46E+02
NP-237	Not Detected	-----	5.93E-01
PA-233	Not Detected	-----	9.29E-02
TH-229	Not Detected	-----	4.75E-01

[Summary Report] - Sample ID: 50046005

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	4.65E-02
AR-41	Not Detected	-----	1.18E+03
BA-133	Not Detected	-----	9.86E-02
BA-140	Not Detected	-----	1.94E-01
CD-109	Not Detected	-----	1.17
CD-115	Not Detected	-----	1.36E-01
CE-139	Not Detected	-----	5.11E-02
CE-141	Not Detected	-----	8.80E-02
CE-144	Not Detected	-----	3.83E-01
CO-56	Not Detected	-----	5.05E-02
CO-57	Not Detected	-----	5.12E-02
CO-58	Not Detected	-----	4.53E-02
CO-60	Not Detected	-----	6.87E-02
CR-51	Not Detected	-----	3.65E-01
CS-134	Not Detected	-----	7.91E-02
CS-137	Not Detected	-----	5.20E-02
CU-64	Not Detected	-----	5.18E+01
EU-152	Not Detected	-----	3.70E-01
EU-154	Not Detected	-----	2.70E-01
EU-155	Not Detected	-----	2.34E-01
FE-59	Not Detected	-----	1.08E-01
GD-153	Not Detected	-----	1.91E-01
HG-203	Not Detected	-----	4.88E-02
I-131	Not Detected	-----	4.81E-02
IN-115m	Not Detected	-----	5.23
IR-192	Not Detected	-----	4.25E-02
K-40	1.24E+01	1.93	6.13E-01
LA-140	Not Detected	-----	8.43E-02
MN-54	Not Detected	-----	5.44E-02
MN-56	Not Detected	-----	5.05E+01
MO-99	Not Detected	-----	4.80E-01
NA-22	Not Detected	-----	6.28E-02
NA-24	Not Detected	-----	1.72E-01
NB-95	Not Detected	-----	3.28E-01
ND-147	Not Detected	-----	3.48E-01
NI-57	Not Detected	-----	1.29E-01
BE-7	Not Detected	-----	3.92E-01
RU-103	Not Detected	-----	4.41E-02
RU-106	Not Detected	-----	4.54E-01
SB-122	Not Detected	-----	8.18E-02
SB-124	Not Detected	-----	5.11E-02
SB-125	Not Detected	-----	1.30E-01
SC-46	Not Detected	-----	7.94E-02
SR-85	Not Detected	-----	6.38E-02
TA-182	Not Detected	-----	2.36E-01
TA-183	Not Detected	-----	8.03E-01
TE-132	Not Detected	-----	5.74E-02
TL-201	Not Detected	-----	3.36E-01
XE-133	Not Detected	-----	3.11E-01
Y-88	Not Detected	-----	4.94E-02
ZN-65	Not Detected	-----	1.49E-01
ZR-95	Not Detected	-----	8.40E-02

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-16-95 3:27:06 PM *

 * Analyzed by: *JJ 6/19/95* Reviewed by: *JJ 6/19/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022875-05
 Lab Sample ID : 50046006

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 2SMAR
 Sample Quantity : 667.000 gram
 Sample Date/Time : 6-15-95 1:30:00 PM
 Acquire Start Date : 6-16-95 2:49:15 PM
 Detector Name : LAB02
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	6.19
TH-234	Not Detected	-----	1.49
U-234	Not Detected	-----	2.36E+01
RA-226	2.45	1.15	1.66
PB-214	6.89E-01	1.40E-01	1.17E-01
BI-214	6.79E-01	1.31E-01	8.83E-02
PB-210	Not Detected	-----	3.89E+02
TH-232	6.97E-01	2.37E-01	2.77E-01
RA-228	8.20E-01	2.63E-01	2.77E-01
AC-228	Not Detected	-----	3.99E-01
TH-228	8.86E-01	4.88E-01	9.71E-01
RA-224	1.73	5.17E-01	8.79E-01
PB-212	8.66E-01	2.18E-01	7.55E-02
BI-212	1.00	4.72E-01	6.22E-01
TL-208	8.20E-01	1.74E-01	1.27E-01
U-235	Not Detected	-----	4.33E-01
TH-231	Not Detected	-----	1.20
PA-231	Not Detected	-----	2.44
AC-227	Not Detected	-----	3.35
TH-227	Not Detected	-----	7.28E-01
RA-223	Not Detected	-----	4.02E-01
RN-219	Not Detected	-----	5.12E-01
PB-211	Not Detected	-----	1.35
TL-207	Not Detected	-----	2.64E+01
AM-241	Not Detected	-----	1.04
PU-239	Not Detected	-----	5.33E+02
NP-237	Not Detected	-----	7.67E-01
PA-233	Not Detected	-----	1.19E-01
TH-229	Not Detected	-----	5.60E-01

[Summary Report] - Sample ID: 50046006

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	5.98E-02
AR-41	Not Detected	-----	1.35E+03
BA-133	Not Detected	-----	1.22E-01
BA-140	Not Detected	-----	2.17E-01
CD-109	Not Detected	-----	2.55
CD-115	Not Detected	-----	1.72E-01
CE-139	Not Detected	-----	6.05E-02
CE-141	Not Detected	-----	1.00E-01
CE-144	Not Detected	-----	4.67E-01
CO-56	Not Detected	-----	7.26E-02
CO-57	Not Detected	-----	6.12E-02
CO-58	Not Detected	-----	6.20E-02
CO-60	Not Detected	-----	7.48E-02
CR-51	Not Detected	-----	4.71E-01
CS-134	Not Detected	-----	9.99E-02
CS-137	Not Detected	-----	6.72E-02
CU-64	Not Detected	-----	5.62E+01
EU-152	Not Detected	-----	5.05E-01
EU-154	Not Detected	-----	3.57E-01
EU-155	Not Detected	-----	2.77E-01
FE-59	Not Detected	-----	1.26E-01
GD-153	Not Detected	-----	2.31E-01
HG-203	Not Detected	-----	5.85E-02
I-131	Not Detected	-----	6.01E-02
IN-115m	Not Detected	-----	6.50
IR-192	Not Detected	-----	5.55E-02
K-40	1.59E+01	2.41	5.65E-01
LA-140	Not Detected	-----	1.10E-01
MN-54	Not Detected	-----	6.46E-02
MN-56	Not Detected	-----	7.01E+01
MO-99	Not Detected	-----	6.21E-01
NA-22	Not Detected	-----	8.32E-02
NA-24	Not Detected	-----	2.06E-01
NB-95	Not Detected	-----	4.13E-01
ND-147	Not Detected	-----	4.03E-01
NI-57	Not Detected	-----	1.57E-01
BE-7	Not Detected	-----	4.83E-01
RU-103	Not Detected	-----	5.11E-02
RU-106	Not Detected	-----	5.97E-01
SB-122	Not Detected	-----	1.06E-01
SB-124	Not Detected	-----	6.33E-02
SB-125	Not Detected	-----	1.63E-01
SC-46	Not Detected	-----	1.05E-01
SR-85	Not Detected	-----	7.56E-02
TA-182	Not Detected	-----	3.07E-01
TA-183	Not Detected	-----	1.02
TE-132	Not Detected	-----	6.88E-02
TL-201	Not Detected	-----	3.97E-01
XE-133	Not Detected	-----	3.60E-01
Y-88	Not Detected	-----	4.44E-02
ZN-65	Not Detected	-----	1.95E-01
ZR-95	Not Detected	-----	1.17E-01

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-16-95 4:12:44 PM *

 * Analyzed by: *JJ 6/15/95* Reviewed by: *JJ 6/15/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022876-05
 Lab Sample ID : 50046007

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 2SMAR
 Sample Quantity : 659.000 gram
 Sample Date/Time : 6-15-95 2:05:00 PM
 Acquire Start Date : 6-16-95 3:36:07 PM
 Detector Name : LAB02
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	5.92
TH-234	Not Detected	-----	1.47
U-234	Not Detected	-----	2.27E+01
RA-226	Not Detected	-----	1.35
PB-214	5.73E-01	1.38E-01	1.46E-01
BI-214	4.77E-01	1.13E-01	1.08E-01
PB-210	Not Detected	-----	3.40E+02
TH-232	5.78E-01	2.74E-01	3.81E-01
RA-228	4.97E-01	2.04E-01	2.40E-01
AC-228	Not Detected	-----	3.51E-01
TH-228	5.65E-01	3.76E-01	8.87E-01
RA-224	Not Detected	-----	7.30E-01
PB-212	6.32E-01	1.38E-01	7.10E-02
BI-212	9.13E-01	5.18E-01	7.35E-01
TL-208	4.39E-01	1.40E-01	1.65E-01
U-235	Not Detected	-----	4.37E-01
TH-231	Not Detected	-----	1.12
PA-231	Not Detected	-----	2.34
AC-227	Not Detected	-----	3.01
TH-227	Not Detected	-----	6.35E-01
RA-223	Not Detected	-----	3.75E-01
RN-219	Not Detected	-----	5.11E-01
PB-211	Not Detected	-----	1.23
TL-207	Not Detected	-----	2.54E+01
AM-241	Not Detected	-----	9.39E-01
PU-239	Not Detected	-----	4.99E+02
NP-237	Not Detected	-----	6.97E-01
PA-233	Not Detected	-----	1.10E-01
TH-229	Not Detected	-----	5.29E-01

[Summary Report] - Sample ID: 50046007

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	5.83E-02
AR-41	Not Detected	-----	1.34E+03
BA-133	Not Detected	-----	1.11E-01
BA-140	Not Detected	-----	1.99E-01
CD-109	Not Detected	-----	2.37
CD-115	Not Detected	-----	1.70E-01
CE-139	Not Detected	-----	5.74E-02
CE-141	Not Detected	-----	9.82E-02
CE-144	Not Detected	-----	4.23E-01
CO-56	Not Detected	-----	6.09E-02
CO-57	Not Detected	-----	5.71E-02
CO-58	Not Detected	-----	5.19E-02
CO-60	Not Detected	-----	6.92E-02
CR-51	Not Detected	-----	4.30E-01
CS-134	Not Detected	-----	8.88E-02
CS-137	Not Detected	-----	6.73E-02
CU-64	Not Detected	-----	4.75E+01
EU-152	Not Detected	-----	4.34E-01
EU-154	Not Detected	-----	3.23E-01
EU-155	Not Detected	-----	2.54E-01
FE-59	Not Detected	-----	1.27E-01
GD-153	Not Detected	-----	2.16E-01
HG-203	Not Detected	-----	5.50E-02
I-131	Not Detected	-----	5.35E-02
IN-115m	Not Detected	-----	6.61
IR-192	Not Detected	-----	5.18E-02
K-40	1.27E+01	2.00	5.72E-01
LA-140	Not Detected	-----	1.09E-01
MN-54	Not Detected	-----	5.55E-02
MN-56	Not Detected	-----	6.20E+01
MO-99	Not Detected	-----	5.98E-01
NA-22	Not Detected	-----	8.20E-02
NA-24	Not Detected	-----	2.20E-01
NB-95	Not Detected	-----	3.62E-01
ND-147	Not Detected	-----	3.94E-01
NI-57	Not Detected	-----	1.44E-01
BE-7	Not Detected	-----	4.51E-01
RU-103	Not Detected	-----	5.03E-02
RU-106	Not Detected	-----	5.36E-01
SB-122	Not Detected	-----	8.68E-02
SB-124	Not Detected	-----	5.41E-02
SB-125	Not Detected	-----	1.46E-01
SC-46	Not Detected	-----	9.55E-02
SR-85	Not Detected	-----	6.82E-02
TA-182	Not Detected	-----	2.79E-01
TA-183	Not Detected	-----	9.42E-01
TE-132	Not Detected	-----	6.18E-02
TL-201	Not Detected	-----	3.56E-01
XE-133	Not Detected	-----	3.46E-01
Y-88	Not Detected	-----	5.43E-02
ZN-65	Not Detected	-----	1.82E-01
ZR-95	Not Detected	-----	9.87E-02

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-16-95 4:53:15 PM *

 * Analyzed by: *J* 6/19/95 Reviewed by: *J* 6/10/95 *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022877-05
 Lab Sample ID : 50046008

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 2SMAR
 Sample Quantity : 728.000 gram
 Sample Date/Time : 6-15-95 2:50:00 PM
 Acquire Start Date : 6-16-95 4:17:57 PM
 Detector Name : LAB02
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	5.72
TH-234	Not Detected	-----	1.34
U-234	Not Detected	-----	1.96E+01
RA-226	1.17	6.88E-01	1.02
PB-214	7.83E-01	1.51E-01	1.20E-01
BI-214	6.35E-01	1.25E-01	9.44E-02
PB-210	Not Detected	-----	3.60E+02
TH-232	5.47E-01	2.20E-01	2.84E-01
RA-228	6.94E-01	3.05E-01	4.13E-01
AC-228	Not Detected	-----	3.31E-01
TH-228	Not Detected	-----	1.56
RA-224	Not Detected	-----	7.31E-01
PB-212	6.24E-01	1.33E-01	6.69E-02
BI-212	6.04E-01	4.17E-01	6.15E-01
TL-208	5.95E-01	1.57E-01	1.66E-01
U-235	Not Detected	-----	4.12E-01
TH-231	Not Detected	-----	1.05
PA-231	Not Detected	-----	2.17
AC-227	Not Detected	-----	3.02
TH-227	Not Detected	-----	6.02E-01
RA-223	Not Detected	-----	3.55E-01
RN-219	Not Detected	-----	4.84E-01
PB-211	Not Detected	-----	1.20
TL-207	Not Detected	-----	2.43E+01
AM-241	Not Detected	-----	8.90E-01
PU-239	Not Detected	-----	4.86E+02
NP-237	Not Detected	-----	6.59E-01
PA-233	Not Detected	-----	9.97E-02
TH-229	Not Detected	-----	5.12E-01

[Summary Report] - Sample ID: 50046008

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	5.39E-02
AR-41	Not Detected	-----	1.03E+03
BA-133	Not Detected	-----	1.11E-01
BA-140	Not Detected	-----	2.07E-01
CD-109	Not Detected	-----	2.15
CD-115	Not Detected	-----	1.48E-01
CE-139	Not Detected	-----	5.44E-02
CE-141	Not Detected	-----	9.34E-02
CE-144	Not Detected	-----	4.14E-01
CO-56	Not Detected	-----	6.36E-02
CO-57	Not Detected	-----	5.65E-02
CO-58	Not Detected	-----	5.58E-02
CO-60	Not Detected	-----	6.31E-02
CR-51	Not Detected	-----	3.98E-01
CS-134	Not Detected	-----	8.96E-02
CS-137	Not Detected	-----	5.90E-02
CU-64	Not Detected	-----	5.14E+01
EU-152	Not Detected	-----	4.66E-01
EU-154	Not Detected	-----	3.11E-01
EU-155	Not Detected	-----	2.54E-01
FE-59	Not Detected	-----	1.12E-01
GD-153	Not Detected	-----	2.03E-01
HG-203	Not Detected	-----	5.23E-02
I-131	Not Detected	-----	5.15E-02
IN-115m	Not Detected	-----	5.71
IR-192	Not Detected	-----	4.84E-02
K-40	1.27E+01	1.96	4.46E-01
LA-140	Not Detected	-----	9.73E-02
MN-54	Not Detected	-----	6.15E-02
MN-56	Not Detected	-----	6.39E+01
MO-99	Not Detected	-----	5.52E-01
NA-22	Not Detected	-----	7.85E-02
NA-24	Not Detected	-----	1.84E-01
NB-95	Not Detected	-----	3.43E-01
ND-147	Not Detected	-----	3.76E-01
NI-57	Not Detected	-----	1.53E-01
BE-7	Not Detected	-----	4.45E-01
RU-103	Not Detected	-----	4.59E-02
RU-106	Not Detected	-----	4.95E-01
SB-122	Not Detected	-----	9.29E-02
SB-124	Not Detected	-----	5.83E-02
SB-125	Not Detected	-----	1.54E-01
SC-46	Not Detected	-----	9.14E-02
SR-85	Not Detected	-----	6.29E-02
TA-182	Not Detected	-----	2.70E-01
TA-183	Not Detected	-----	8.89E-01
TE-132	Not Detected	-----	5.99E-02
TL-201	Not Detected	-----	3.52E-01
XE-133	Not Detected	-----	3.19E-01
Y-88	Not Detected	-----	4.65E-02
ZN-65	Not Detected	-----	1.78E-01
ZR-95	Not Detected	-----	9.38E-02

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-16-95 5:18:54 PM *

 * Analyzed by: *JR 6/19/95* Reviewed by: *JR 6/19/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : LAB CONTROL SAMPLE ANALYSIS #CG134
 Lab Sample ID : 50046009

Sample Description : MIXED GAMMA STANDARD
 Sample Type : Liquid
 Sample Geometry : WMAR
 Sample Quantity : 1.000 Each
 Sample Date/Time : 11-01-90 12:00:00 PM
 Acquire Start Date : 6-16-95 5:06:43 PM
 Detector Name : LAB02
 Elapsed Live Time : 600 seconds
 Elapsed Real Time : 606 seconds

Comments:

Nuclide	Activity (pCi/Each)	2S Error	MDA
U-238	Not Detected	-----	2.60E+04
TH-234	Not Detected	-----	5.24E+03
U-234	Not Detected	-----	1.23E+05
RA-226	Not Detected	-----	6.62E+03
PB-214	Not Detected	-----	7.64E+02
BI-214	Not Detected	-----	6.92E+02
PB-210	Not Detected	-----	6.75E+06
TH-232	Not Detected	-----	2.21E+03
RA-228	Not Detected	-----	3.02E+03
AC-228	Not Detected	-----	1.88E+03
TH-228	Not Detected	-----	4.07E+04
RA-224	Not Detected	-----	3.31E+04
PB-212	Not Detected	-----	3.02E+03
BI-212	Not Detected	-----	2.76E+04
TL-208	Not Detected	-----	5.46E+03
U-235	Not Detected	-----	1.98E+03
TH-231	Not Detected	-----	4.38E+03
PA-231	Not Detected	-----	1.06E+04
AC-227	Not Detected	-----	1.70E+04
TH-227	Not Detected	-----	2.63E+03
RA-223	Not Detected	-----	1.00E+26
RN-219	Not Detected	-----	3.28E+03
PB-211	Not Detected	-----	9.86E+03
TL-207	Not Detected	-----	2.34E+05
AM-241	1.01E+05	1.97E+04	7.07E+03
PU-239	Not Detected	-----	2.23E+06
NP-237	Not Detected	-----	3.02E+03
PA-233	Not Detected	-----	6.62E+02
TH-229	Not Detected	-----	2.43E+03

[Summary Report] - Sample ID: 50046009

Nuclide	Activity (pCi/Each)	2S Error	MDA
AG-110m	Not Detected	-----	1.78E+05
AR-41	Not Detected	-----	1.00E+26
BA-133	Not Detected	-----	5.95E+02
BA-140	Not Detected	-----	1.00E+26
CD-109	3.02E+05	1.07E+05	1.45E+05
CD-115	Not Detected	-----	1.00E+26
CE-139	Not Detected	-----	1.35E+06
CE-141	Not Detected	-----	1.95E+18
CE-144	Not Detected	-----	1.23E+05
CO-56	Not Detected	-----	1.65E+09
CO-57	1.94E+04	1.22E+04	1.89E+04
CO-58	Not Detected	-----	5.77E+09
CO-60	7.71E+04	1.00E+04	5.57E+02
CR-51	Not Detected	-----	5.62E+21
CS-134	Not Detected	-----	1.54E+03
CS-137	7.14E+04	9.21E+03	4.75E+02
CU-64	Not Detected	-----	1.00E+26
EU-152	Not Detected	-----	3.62E+03
EU-154	Not Detected	-----	2.42E+03
EU-155	Not Detected	-----	2.31E+03
FE-59	Not Detected	-----	2.57E+14
GD-153	Not Detected	-----	1.18E+05
HG-203	Not Detected	-----	2.49E+13
I-131	Not Detected	-----	1.00E+26
IN-115m	Not Detected	-----	1.00E+26
IR-192	Not Detected	-----	2.37E+09
K-40	Not Detected	-----	1.67E+03
LA-140	Not Detected	-----	1.00E+26
MN-54	Not Detected	-----	1.74E+04
MN-56	Not Detected	-----	1.00E+26
MO-99	Not Detected	-----	1.00E+26
NA-22	Not Detected	-----	8.71E+02
NA-24	Not Detected	-----	1.00E+26
NB-95	Not Detected	-----	1.00E+26
ND-147	Not Detected	-----	1.00E+26
NI-57	Not Detected	-----	1.00E+26
BE-7	Not Detected	-----	1.21E+13
RU-103	Not Detected	-----	3.20E+15
RU-106	Not Detected	-----	8.06E+04
SB-122	Not Detected	-----	1.00E+26
SB-124	Not Detected	-----	9.03E+10
SB-125	Not Detected	-----	3.81E+03
SC-46	Not Detected	-----	5.92E+08
SR-85	Not Detected	-----	2.72E+10
TA-182	Not Detected	-----	3.89E+07
TA-183	Not Detected	-----	1.00E+26
TE-132	Not Detected	-----	1.00E+26
TL-201	Not Detected	-----	1.00E+26
XE-133	Not Detected	-----	1.00E+26
Y-88	Not Detected	-----	1.11E+07
ZN-65	Not Detected	-----	1.28E+05
ZR-95	Not Detected	-----	5.77E+10

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program *
 * Quality Assurance Report *

Report Date : 6-16-95 5:21:58 PM
 QA File : C:\GENIEPC\CAMFILES\LCS2.QAF
 Analyst : FCD
 Sample ID : 50046009
 Sample Quantity : 1.00 Each
 Sample Date : 11-01-90 12:00:00 PM
 Measurement Date : 6-16-95 5:06:43 PM
 Elapsed Live Time : 600 seconds
 Elapsed Real Time : 606 seconds

Parameter	Mean	1S Error	New Value	< LU : SD : UD : BS >
AM-241 Activity	9.690E-02	1.057E-02	1.006E-01	< : <u>In</u> ^{OK} <i>[Signature]</i> / 6/19/95 >
CS-137 Activity	6.924E-02	5.573E-03	7.138E-02	< : : : >
CO-60 Activity	7.662E-02	6.024E-03	7.662E-02	< : : : >

Flags Key: LU = Boundary Test (Ab = Above, Be = Below)
 SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
 UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
 BS = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: *[Signature]* 6/19/95

ER/1302 ~~187~~/DAT
96

(2)

COPY

SMO ANALYTICAL DATA ROUTING FORM

ORIGINAL FILED IN
RECORDS CENTER BY
SMO WDM 7/10/95
(Date)

Project Name: TAT Phase I

Case Number: 36264

SNL Task Leader: Miller

Org/Mail Stop: 7582/1347

SMO Project Coordinator: Puisseau

Sample Ship Date: 6/16/95

ARCOC

Lab

Lab ID

03717

SNL 7715

500461

03704

"

500453

03702

"

500450

Date Results Received:

Preliminary: _____ Final: 6/19, 6/15, 6/14/95

Corrections Requested From Laboratory: _____ Requestor: _____

Date Corrections Received: _____

Date Assigned to
SMO Reviewer: _____

Reviewer: _____

Date Review
Complete: _____

Signature: _____

Date of Preliminary
Notification: _____

Person
Notified: _____

Date of Final
Transmittal: 7/10/95

Transmitted
To: Miller

Transmitted By: WDM

Filed In
Record Center: WDM

Comments: _____

500461
CG 6/15/95

ANALYSIS REQUEST AND CHAIN OF CUSTODY

AR/COC-03717

2001-COC (9-94)

Dept. No./Mail Stop: 7582/1347
 Project/Task Manager: D. Miller / H. Fleck
 Project Name: TA-1 Soil Sampling (Phase I)
 Record Center Code: ADS 1302 ER Site 96a
 Logbook Ref No: 0133
 SMO Reference No.: CF0089

Date Samples Shipped: 6/16/95
 Carrier/Waybill No.: HC
 Lab Contact: AMIR M.
 Lab Destination: 7715
 SMO Contact/Phone: D. Mac / M. Laughlin 815-0867
 Send Report to SMO: Deborah M. Laughlin

Contract No.: N/A
 Case No.: 3626.400
 SMO Authorization: [Signature]
 Bill to: Sandia National Laboratories
 Supplier Services Department
 P.O. Box 5800 MS 0154
 Albuquerque, NM 87185-0154

Parameter & Method Requested

GAMMA SPEC

Location		Tech Area		Reference LOV (available at SMO)										Lab Sample ID
Building <u>847</u>		Room <u>Outside</u>		Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Sample Matrix	Container		Preservative	Sample Collection Method	Sample Type	X	
Sample No. - Fraction	ER Sample ID or Sample Location Detail	Type	Volume											
22880-05	T1096-GP-019-005-S	S	500ml	9'	76	6/16/95-8:38	S	P	NONE	G	SA	X		
22881-05	T1096-GP-020-005-S	S		5'		9:18						X		
22882-05	T1096-GP-021-005-S	S				10:10						X		

RMMA Yes No Ref. No. _____

Sample Tracking
 Date Entered (mm/dd/yy): 6/22/95
 Entered by: [Signature]

Special Instructions/QC Requirements

Abnormal Conditions on Receipt

Sample Disposal Return to Client Disposal by lab

Turnaround Time Normal Rush Required Report Date _____

Sample Team Members	Name	Signature	Init	Company/Organization
	Matthew Shein	<u>[Signature]</u>	MS	ITCORP/7582
	CATHIE GOHAR	<u>[Signature]</u>	CG	SANDIA/7582

1. Relinquished by <u>[Signature]</u>	Org. <u>IT/7582</u>	Date <u>6/16/95</u>	Time <u>1130</u>	4. Relinquished by	Org.	Date	Time
1. Received by <u>[Signature]</u>	Org. <u>7513</u>	Date <u>6/16/95</u>	Time <u>1130</u>	4. Received by	Org.	Date	Time
2. Relinquished by <u>[Signature]</u>	Org. <u>7513</u>	Date <u>6/16/95</u>	Time <u>1430</u>	5. Relinquished by	Org.	Date	Time
2. Received by <u>[Signature]</u>	Org. <u>SNL7715</u>	Date <u>6/16/95</u>	Time <u>1430</u>	5. Received by	Org.	Date	Time
3. Relinquished by <u>[Signature]</u>	Org. <u>SNL7715</u>	Date <u>6/19/95</u>	Time <u>1440</u>	6. Relinquished by	Org.	Date	Time
3. Received by <u>[Signature]</u>	Org. <u>SML7513</u>	Date <u>6/19/95</u>	Time <u>1440</u>	6. Received by	Org.	Date	Time



To be completed by Customer

Shaded areas are for RPSD use only

Customer: <u>D. Miller/H. Fleck</u>	Hazards/Special Instructions: <u>please notify S10 upon completion @ 845-0869</u>	Batch Log Number: <u>500461</u>
Organization: <u>7582</u>		Logged By: <u>FW</u>
Project Location: <u>A-1 Soil Sampling</u>		Analysis Type: <input checked="" type="checkbox"/> Gamma Spec
Phone: <u>845-0867</u>		<input type="checkbox"/> H-3
Date Results Needed: <u>6/19/95</u>		<input type="checkbox"/> Alpha/Beta
Suspect Isotopes: <u>85Spec</u>		<input type="checkbox"/> Alpha Spec
Other Information: <u>03717</u>		<input type="checkbox"/> Total U
		<input type="checkbox"/> Other

Customer Sample ID	Sample Type	Date/Time Collected	Sample Volume	Requested Analysis	RPSD Sample ID	Rad Scan CPM	Sample Weight	Remarks
022880-05	S	6/16/95 - 8:38	500ml	Gamma spec	01	2300	731g	
022881-05	↓	↓ - 9:18	↓	↓	02	2300	688g	
022892-05	↓	↓ - 10:10	↓	↓	03	2300	601g	
LCS		1 NOV 90		Y spec	04	NA	NA	

Relinquished by [Signature] Date 6-16-95 Time 1430 Received by [Signature] Date 6/14/95 Time 1430
 Relinquished by [Signature] Date 6/19/95 Time 1440 Received by [Signature] Date 6/19/95 Time 1440
 Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____
 Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-16-95 3:36:07 PM *

 * Analyzed by: *JR* 6/19/95 Reviewed by: *JR* 6/19/95 *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022880-05
 Lab Sample ID : 50046101

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 1SMAR
 Sample Quantity : 731.000 gram
 Sample Date/Time : 6-16-95 8:38:00 AM
 Acquire Start Date : 6-16-95 3:02:59 PM
 Detector Name : LAB01
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	2.30
TH-234	8.56E-01	3.90E-01	5.34E-01
U-234	Not Detected	-----	1.91E+01
RA-226	1.19	6.52E-01	9.66E-01
PB-214	6.12E-01	1.17E-01	8.94E-02
BI-214	4.61E-01	1.02E-01	9.70E-02
PB-210	Not Detected	-----	5.11E+01
TH-232	4.31E-01	1.85E-01	2.47E-01
RA-228	6.49E-01	4.02E-01	2.04E-01
AC-228	8.06E-01	1.91E-01	1.61E-01
TH-228	8.38E-01	5.06E-01	8.16E-01
RA-224	Not Detected	-----	1.68
PB-212	5.90E-01	1.16E-01	9.14E-02
BI-212	5.90E-01	3.83E-01	5.62E-01
TL-208	5.49E-01	1.34E-01	1.30E-01
U-235	Not Detected	-----	3.45E-01
TH-231	Not Detected	-----	6.80E-01
PA-231	Not Detected	-----	2.10
AC-227	Not Detected	-----	2.62
TH-227	Not Detected	-----	5.60E-01
RA-223	Not Detected	-----	2.19E-01
RN-219	Not Detected	-----	2.33E-01
PB-211	Not Detected	-----	9.89E-01
TL-207	Not Detected	-----	2.16E+01
AM-241	Not Detected	-----	3.03E-01
PU-239	Not Detected	-----	3.87E+02
NP-237	Not Detected	-----	2.65E-01
PA-233	Not Detected	-----	9.21E-02
TH-229	Not Detected	-----	3.51E-01

[Summary Report] - Sample ID: 50046101

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	4.88E-02
AR-41	Not Detected	-----	8.68E-01
BA-133	Not Detected	-----	1.00E-01
BA-140	Not Detected	-----	1.78E-01
CD-109	Not Detected	-----	9.10E-01
CD-115	Not Detected	-----	1.10E-01
CE-139	Not Detected	-----	4.76E-02
CE-141	Not Detected	-----	7.64E-02
CE-144	Not Detected	-----	3.42E-01
CO-56	Not Detected	-----	5.80E-02
CO-57	Not Detected	-----	4.36E-02
CO-58	Not Detected	-----	5.57E-02
CO-60	Not Detected	-----	5.41E-02
CR-51	Not Detected	-----	3.63E-01
CS-134	Not Detected	-----	7.84E-02
CS-137	Not Detected	-----	5.73E-02
CU-64	Not Detected	-----	1.60E+01
EU-152	Not Detected	-----	3.95E-01
EU-154	Not Detected	-----	2.76E-01
EU-155	Not Detected	-----	1.76E-01
FE-59	Not Detected	-----	1.19E-01
GD-153	Not Detected	-----	1.46E-01
HG-203	Not Detected	-----	4.77E-02
I-131	Not Detected	-----	4.51E-02
IN-115m	Not Detected	-----	2.85E-01
IR-192	Not Detected	-----	4.37E-02
K-40	1.43E+01	2.14	5.61E-01
LA-140	Not Detected	-----	6.15E-02
MN-54	Not Detected	-----	5.09E-02
MN-56	Not Detected	-----	3.50E-01
MO-99	Not Detected	-----	4.25E-01
NA-22	Not Detected	-----	6.53E-02
NA-24	Not Detected	-----	7.22E-02
NB-95	Not Detected	-----	2.74E-01
ND-147	Not Detected	-----	3.36E-01
NI-57	Not Detected	-----	8.29E-02
BE-7	Not Detected	-----	3.87E-01
RU-103	Not Detected	-----	4.72E-02
RU-106	Not Detected	-----	4.37E-01
SB-122	Not Detected	-----	7.31E-02
SB-124	Not Detected	-----	5.59E-02
SB-125	Not Detected	-----	1.38E-01
SC-46	Not Detected	-----	7.93E-02
SR-85	Not Detected	-----	5.74E-02
TA-182	Not Detected	-----	2.32E-01
TA-183	Not Detected	-----	2.69E-01
TE-132	Not Detected	-----	4.51E-02
TL-201	Not Detected	-----	1.54E-01
XE-133	Not Detected	-----	1.80E-01
Y-88	Not Detected	-----	4.21E-02
ZN-65	Not Detected	-----	1.58E-01
ZR-95	Not Detected	-----	9.53E-02

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-16-95 4:15:30 PM *

 * Analyzed by: *JR 6/19/95* Reviewed by: *JR 6/15/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022881-05
 Lab Sample ID : 50046102

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : LSMAR
 Sample Quantity : 688.000 gram
 Sample Date/Time : 6-16-95 9:18:00 AM
 Acquire Start Date : 6-16-95 3:42:04 PM
 Detector Name : LAB01
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	2.46
TH-234	Not Detected	-----	7.95E-01
U-234	Not Detected	-----	2.12E+01
RA-226	1.30	5.52E-01	7.58E-01
PB-214	7.39E-01	1.39E-01	1.06E-01
BI-214	6.28E-01	1.19E-01	8.49E-02
PB-210	Not Detected	-----	5.63E+01
TH-232	6.26E-01	2.19E-01	2.68E-01
RA-228	6.09E-01	5.47E-01	2.73E-01
AC-228	6.81E-01	1.78E-01	1.68E-01
TH-228	4.92E-01	3.33E-01	8.15E-01
RA-224	1.96	4.97E-01	6.78E-01
PB-212	7.23E-01	1.42E-01	6.32E-02
BI-212	7.54E-01	4.79E-01	7.08E-01
TL-208	6.28E-01	1.39E-01	1.14E-01
U-235	Not Detected	-----	3.69E-01
TH-231	Not Detected	-----	7.24E-01
PA-231	Not Detected	-----	2.34
AC-227	Not Detected	-----	2.72
TH-227	Not Detected	-----	6.00E-01
RA-223	Not Detected	-----	2.34E-01
RN-219	Not Detected	-----	4.78E-01
PB-211	Not Detected	-----	1.07
TL-207	Not Detected	-----	2.23E+01
AM-241	Not Detected	-----	3.20E-01
PU-239	Not Detected	-----	4.32E+02
NP-237	Not Detected	-----	4.68E-01
PA-233	Not Detected	-----	9.89E-02
TH-229	Not Detected	-----	3.87E-01

[Summary Report] - Sample ID: 50046102

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	5.04E-02
AR-41	Not Detected	-----	8.41E-01
BA-133	Not Detected	-----	1.09E-01
BA-140	Not Detected	-----	1.89E-01
CD-109	Not Detected	-----	1.39
CD-115	Not Detected	-----	1.18E-01
CE-139	Not Detected	-----	5.15E-02
CE-141	Not Detected	-----	8.45E-02
CE-144	Not Detected	-----	3.76E-01
CO-56	Not Detected	-----	5.90E-02
CO-57	Not Detected	-----	4.76E-02
CO-58	Not Detected	-----	5.43E-02
CO-60	Not Detected	-----	6.32E-02
CR-51	Not Detected	-----	4.05E-01
CS-134	Not Detected	-----	8.88E-02
CS-137	Not Detected	-----	5.72E-02
CU-64	Not Detected	-----	1.73E+01
EU-152	Not Detected	-----	4.17E-01
EU-154	Not Detected	-----	3.02E-01
EU-155	Not Detected	-----	2.00E-01
FE-59	Not Detected	-----	1.10E-01
GD-153	Not Detected	-----	1.64E-01
HG-203	Not Detected	-----	5.14E-02
I-131	Not Detected	-----	4.77E-02
IN-115m	Not Detected	-----	3.06E-01
IR-192	Not Detected	-----	4.72E-02
K-40	1.40E+01	2.11	4.00E-01
LA-140	Not Detected	-----	6.21E-02
MN-54	Not Detected	-----	5.84E-02
MN-56	Not Detected	-----	3.55E-01
MO-99	Not Detected	-----	4.42E-01
NA-22	Not Detected	-----	6.83E-02
NA-24	Not Detected	-----	7.67E-02
NE-95	Not Detected	-----	2.94E-01
ND-147	Not Detected	-----	3.55E-01
NI-57	Not Detected	-----	9.12E-02
BE-7	Not Detected	-----	4.40E-01
RU-103	Not Detected	-----	4.69E-02
RU-106	Not Detected	-----	4.83E-01
SB-122	Not Detected	-----	7.36E-02
SB-124	Not Detected	-----	6.06E-02
SB-125	Not Detected	-----	1.49E-01
SC-46	Not Detected	-----	8.52E-02
SR-85	Not Detected	-----	6.14E-02
TA-182	Not Detected	-----	2.47E-01
TA-183	Not Detected	-----	2.84E-01
TE-132	Not Detected	-----	4.84E-02
TL-201	Not Detected	-----	1.68E-01
XE-133	Not Detected	-----	1.96E-01
Y-88	Not Detected	-----	4.70E-02
ZN-65	Not Detected	-----	1.72E-01
ZR-95	Not Detected	-----	9.85E-02

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-16-95 4:55:10 PM *

 * Analyzed by: *JA 6/19/95* Reviewed by: *JA 6/19/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022882-05
 Lab Sample ID : 50046103

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 1SMAR
 Sample Quantity : 601.000 gram
 Sample Date/Time : 6-16-95 10:10:00 AM
 Acquire Start Date : 6-16-95 4:21:54 PM
 Detector Name : LAB01
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	2.75
TH-234	1.42	6.03E-01	7.11E-01
U-234	Not Detected	-----	2.25E+01
RA-226	1.75	1.06	1.62
PB-214	8.66E-01	1.55E-01	1.00E-01
BI-214	7.53E-01	1.43E-01	1.06E-01
PB-210	1.43E+01	2.71E+01	2.27E+01
TH-232	6.92E-01	2.52E-01	3.17E-01
RA-228	7.46E-01	7.57E-01	2.71E-01
AC-228	7.04E-01	2.06E-01	2.22E-01
TH-228	Not Detected	-----	1.92
RA-224	2.16	5.51E-01	7.74E-01
PB-212	8.38E-01	1.63E-01	7.35E-02
BI-212	9.94E-01	5.05E-01	6.98E-01
TL-208	7.36E-01	1.70E-01	1.55E-01
U-235	Not Detected	-----	4.12E-01
TH-231	Not Detected	-----	8.10E-01
PA-231	Not Detected	-----	2.67
AC-227	Not Detected	-----	3.24
TH-227	Not Detected	-----	6.83E-01
RA-223	Not Detected	-----	2.63E-01
RN-219	Not Detected	-----	3.61E-01
PB-211	Not Detected	-----	1.34
TL-207	Not Detected	-----	2.51E+01
AM-241	Not Detected	-----	3.74E-01
PU-239	Not Detected	-----	4.57E+02
NP-237	Not Detected	-----	3.33E-01
PA-233	Not Detected	-----	1.15E-01
TH-229	Not Detected	-----	4.21E-01

[Summary Report] - Sample ID: 50046103

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	5.75E-02
AR-41	Not Detected	-----	8.08E-01
BA-133	Not Detected	-----	1.28E-01
BA-140	Not Detected	-----	2.08E-01
CD-109	Not Detected	-----	1.15
CD-115	Not Detected	-----	1.41E-01
CE-139	Not Detected	-----	5.95E-02
CE-141	Not Detected	-----	9.38E-02
CE-144	Not Detected	-----	4.06E-01
CO-56	Not Detected	-----	6.82E-02
CO-57	Not Detected	-----	5.04E-02
CO-58	Not Detected	-----	6.36E-02
CO-60	Not Detected	-----	6.94E-02
CR-51	Not Detected	-----	4.84E-01
CS-134	Not Detected	-----	1.05E-01
CS-137	Not Detected	-----	6.55E-02
CU-64	Not Detected	-----	2.02E+01
EU-152	Not Detected	-----	4.81E-01
EU-154	Not Detected	-----	3.35E-01
EU-155	Not Detected	-----	2.25E-01
FE-59	Not Detected	-----	1.27E-01
GD-153	Not Detected	-----	1.81E-01
HG-203	Not Detected	-----	5.71E-02
I-131	Not Detected	-----	5.81E-02
IN-115m	Not Detected	-----	3.56E-01
IR-192	Not Detected	-----	5.42E-02
K-40	1.45E+01	2.21	4.55E-01
LA-140	Not Detected	-----	7.80E-02
MN-54	Not Detected	-----	6.42E-02
MN-56	Not Detected	-----	3.89E-01
MO-99	Not Detected	-----	5.05E-01
NA-22	Not Detected	-----	7.66E-02
NA-24	Not Detected	-----	9.56E-02
NB-95	Not Detected	-----	3.34E-01
ND-147	Not Detected	-----	3.89E-01
NI-57	Not Detected	-----	1.09E-01
BE-7	Not Detected	-----	4.52E-01
RU-103	Not Detected	-----	5.58E-02
RU-106	Not Detected	-----	5.79E-01
SB-122	Not Detected	-----	8.27E-02
SB-124	Not Detected	-----	6.90E-02
SB-125	Not Detected	-----	1.61E-01
SC-46	Not Detected	-----	1.07E-01
SR-85	Not Detected	-----	7.13E-02
TA-182	Not Detected	-----	3.09E-01
TA-183	Not Detected	-----	3.31E-01
TE-132	Not Detected	-----	5.57E-02
TL-201	Not Detected	-----	1.84E-01
XE-133	Not Detected	-----	2.24E-01
Y-88	Not Detected	-----	4.99E-02
ZN-65	Not Detected	-----	2.08E-01
ZR-95	Not Detected	-----	1.13E-01

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-16-95 5:34:59 PM *

 * Analyzed by: *JP 2/11/95* Reviewed by: *JP 6/11/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : LAB CONTROL SAMPLE ANALYSIS #CG134
 Lab Sample ID : 50046104

Sample Description : MIXED GAMMA STANDARD
 Sample Type : Liquid
 Sample Geometry : WMAR
 Sample Quantity : 1.000 Each
 Sample Date/Time : 11-01-90 12:00:00 PM
 Acquire Start Date : 6-16-95 5:22:43 PM
 Detector Name : LAB01
 Elapsed Live Time : 600 seconds
 Elapsed Real Time : 608 seconds

Comments:

Nuclide	Activity (pCi/Each)	2S Error	MDA
U-238	Not Detected	-----	2.55E+04
TH-234	Not Detected	-----	3.90E+03
U-234	Not Detected	-----	1.12E+05
RA-226	Not Detected	-----	6.05E+03
PB-214	Not Detected	-----	7.18E+02
BI-214	Not Detected	-----	6.37E+02
PB-210	Not Detected	-----	1.26E+06
TH-232	Not Detected	-----	2.07E+03
RA-228	Not Detected	-----	2.65E+03
AC-228	Not Detected	-----	1.74E+03
TH-228	Not Detected	-----	3.61E+04
RA-224	Not Detected	-----	3.09E+04
PB-212	Not Detected	-----	2.83E+03
BI-212	Not Detected	-----	2.51E+04
TL-208	Not Detected	-----	5.11E+03
U-235	Not Detected	-----	1.60E+03
TH-231	Not Detected	-----	2.75E+03
PA-231	Not Detected	-----	9.41E+03
AC-227	Not Detected	-----	1.47E+04
TH-227	Not Detected	-----	2.40E+03
RA-223	Not Detected	-----	1.00E+26
RN-219	Not Detected	-----	2.94E+03
PB-211	Not Detected	-----	8.64E+03
TL-207	Not Detected	-----	2.14E+05
AM-241	1.13E+05	1.79E+04	2.76E+03
PU-239	Not Detected	-----	1.75E+06
NP-237	Not Detected	-----	1.82E+03
PA-233	Not Detected	-----	6.17E+02
TH-229	Not Detected	-----	1.59E+03

[Summary Report] - Sample ID: 50046104

Nuclide	Activity (pCi/Each)	2S Error	MDA
AG-110m	Not Detected	-----	1.59E+05
AR-41	Not Detected	-----	1.00E+26
BA-133	Not Detected	-----	5.61E+02
BA-140	Not Detected	-----	1.00E+26
CD-109	2.98E+05	6.55E+04	6.53E+04
CD-115	Not Detected	-----	1.00E+26
CE-139	Not Detected	-----	1.18E+06
CE-141	Not Detected	-----	1.58E+18
CE-144	Not Detected	-----	9.69E+04
CO-56	Not Detected	-----	1.55E+09
CO-57	1.16E+04	8.10E+03	1.26E+04
CO-58	Not Detected	-----	5.39E+09
CO-60	7.39E+04	9.58E+03	4.96E+02
CR-51	Not Detected	-----	5.28E+21
CS-134	Not Detected	-----	1.46E+03
CS-137	6.83E+04	8.80E+03	4.77E+02
CU-64	Not Detected	-----	1.00E+26
EU-152	Not Detected	-----	3.37E+03
EU-154	Not Detected	-----	2.24E+03
EU-155	Not Detected	-----	1.58E+03
FE-59	Not Detected	-----	2.25E+14
GD-153	Not Detected	-----	7.56E+04
HG-203	Not Detected	-----	2.23E+13
I-131	Not Detected	-----	1.00E+26
IN-115m	Not Detected	-----	1.00E+26
IR-192	Not Detected	-----	2.22E+09
K-40	Not Detected	-----	1.65E+03
LA-140	Not Detected	-----	1.00E+26
MN-54	Not Detected	-----	1.61E+04
MN-56	Not Detected	-----	1.00E+26
MO-99	Not Detected	-----	1.00E+26
NA-22	Not Detected	-----	7.78E+02
NA-24	Not Detected	-----	1.00E+26
NB-95	Not Detected	-----	1.00E+26
ND-147	Not Detected	-----	1.00E+26
NI-57	Not Detected	-----	1.00E+26
BE-7	Not Detected	-----	1.14E+13
RU-103	Not Detected	-----	3.04E+15
RU-106	Not Detected	-----	7.03E+04
SB-122	Not Detected	-----	1.00E+26
SB-124	Not Detected	-----	8.46E+10
SB-125	Not Detected	-----	3.49E+03
SC-46	Not Detected	-----	5.14E+08
SR-85	Not Detected	-----	2.47E+10
TA-182	Not Detected	-----	3.35E+07
TA-183	Not Detected	-----	1.00E+26
TE-132	Not Detected	-----	1.00E+26
TL-201	Not Detected	-----	1.00E+26
XE-133	Not Detected	-----	1.00E+26
Y-88	Not Detected	-----	1.03E+07
ZN-65	Not Detected	-----	1.12E+05
ZR-95	Not Detected	-----	5.19E+10

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program *
 * Quality Assurance Report *

Report Date : 6-16-95 5:38:05 PM
 QA File : C:\GENIEPC\CAMFILES\LCS1.QAF
 Analyst : FCD
 Sample ID : 50046104
 Sample Quantity : 1.00 Each
 Sample Date : 11-01-90 12:00:00 PM
 Measurement Date : 6-16-95 5:22:43 PM
 Elapsed Live Time : 600 seconds
 Elapsed Real Time : 608 seconds

Parameter	Mean	1S Error	New Value	< LU : SD : UD : BS >
AM-241 Activity	1.125E-01	6.777E-03	1.126E-01	< : : Ac: >
CS-137 Activity	6.838E-02	2.400E-03	6.829E-02	< : : : >
CO-60 Activity	7.722E-02	2.846E-03	7.321E-02	< : In : : >

Handwritten notes:
 A large circle is drawn around the 'Ac:' in the first row.
 'ok' is written above the 'In' in the third row.
 '6/15/95' is written below the 'In' in the third row.

Flags Key: LU = Boundary Test (Ab = Above, Be = Below)
 SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
 UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
 BS = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: *JD* *6/15/95*

ER/1302 096/DAT

5

SMO ANALYTICAL DATA ROUTING FORM

Project Name: TAT Phase I Case Number: 3626400

SNL Task Leader: Miller Org/Mail Stop: 7582/1347

SMO Project Coordinator: Auissant Sample Ship Date: 6/20/95

ARCOC	Lab	Lab ID
<u>03720</u>	<u>SNL 7715</u>	<u>500469</u>
<u>03714</u>	<u>"</u>	<u>500455</u>
<u>03715</u>	<u>"</u>	<u>500460</u>

Date Results Received:

Preliminary: _____ Final: 6/21, 6/16, 6/19/95

Corrections Requested From Laboratory: _____ Requestor: _____

Date Corrections Received: _____

Date Assigned to SMO Reviewer: _____

Reviewer: _____

BBPV
ORIGINAL FILED IN
RECORDS CENTER BY
SMO WDM 7/10/95
(Initials) (Date)

Date Review Complete: _____

Signature: _____

Date of Preliminary Notification: _____

Person Notified: _____

Date of Final Transmittal: 7/10/95

Transmitted To: Miller

Transmitted By: WDM

Filed In Record Center: WDM

Comments: _____

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-21-95 12:26:56 PM *

* Analyzed by: *Spring Cole 6/21/95* Reviewed by: *JC 6/21/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022894-05
 Lab Sample ID : 50047302

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 1SMAR
 Sample Quantity : 842.000 gram
 Sample Date/Time : 6-20-95 9:40:00 AM
 Acquire Start Date : 6-21-95 11:52:50 AM
 Detector Name : LAB01
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	2.04
TH-234	Not Detected	-----	4.99E-01
U-234	Not Detected	-----	1.74E+01
RA-226	1.24	5.29E-01	7.37E-01
PB-214	5.57E-01	1.09E-01	8.96E-02
BI-214	4.49E-01	9.66E-02	9.02E-02
PB-210	Not Detected	-----	4.63E+01
TH-232	4.90E-01	1.88E-01	2.44E-01
RA-228	6.06E-01	3.10E-01	1.74E-01
AC-228	5.84E-01	1.58E-01	1.60E-01
TH-228	6.47E-01	3.19E-01	6.63E-01
RA-224	1.53	4.11E-01	6.08E-01
PB-212	6.36E-01	1.36E-01	5.25E-02
BI-212	6.33E-01	3.44E-01	4.82E-01
TL-208	5.17E-01	1.27E-01	1.30E-01
U-235	Not Detected	-----	2.99E-01
TH-231	Not Detected	-----	6.01E-01
PA-231	Not Detected	-----	1.92
AC-227	Not Detected	-----	2.26
TH-227	Not Detected	-----	4.89E-01
RA-223	Not Detected	-----	2.04E-01
RN-219	Not Detected	-----	2.81E-01
PB-211	Not Detected	-----	9.46E-01
TL-207	Not Detected	-----	1.94E+01
AM-241	Not Detected	-----	2.65E-01
PU-239	Not Detected	-----	3.37E+02
NP-237	Not Detected	-----	3.84E-01
PA-233	Not Detected	-----	8.32E-02
TH-229	Not Detected	-----	3.12E-01

[Summary Report] - Sample ID: 50047302

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	4.36E-02
AR-41	Not Detected	-----	1.40E+03
BA-133	Not Detected	-----	9.07E-02
BA-140	Not Detected	-----	1.59E-01
CD-109	Not Detected	-----	7.63E-01
CD-115	Not Detected	-----	1.31E-01
CE-139	Not Detected	-----	4.24E-02
CE-141	Not Detected	-----	6.81E-02
CE-144	Not Detected	-----	3.07E-01
CO-56	Not Detected	-----	5.10E-02
CO-57	Not Detected	-----	3.94E-02
CO-58	Not Detected	-----	4.65E-02
CO-60	Not Detected	-----	5.02E-02
CR-51	Not Detected	-----	3.44E-01
CS-134	Not Detected	-----	7.00E-02
CS-137	Not Detected	-----	4.99E-02
CU-64	Not Detected	-----	4.66E+01
EU-152	Not Detected	-----	3.71E-01
EU-154	Not Detected	-----	2.56E-01
EU-155	Not Detected	-----	1.60E-01
FE-59	Not Detected	-----	1.07E-01
GD-153	Not Detected	-----	1.30E-01
HG-203	Not Detected	-----	4.23E-02
I-131	Not Detected	-----	4.41E-02
IN-115m	Not Detected	-----	5.61
IR-192	Not Detected	-----	4.04E-02
K-40	1.41E+01	2.07	3.56E-01
LA-140	Not Detected	-----	7.41E-02
MN-54	Not Detected	-----	5.05E-02
MN-56	Not Detected	-----	6.26E+01
MO-99	Not Detected	-----	4.89E-01
NA-22	Not Detected	-----	5.95E-02
NA-24	Not Detected	-----	1.68E-01
NB-95	Not Detected	-----	2.81E-01
ND-147	Not Detected	-----	2.81E-01
NI-57	Not Detected	-----	1.09E-01
BE-7	Not Detected	-----	3.59E-01
RU-103	Not Detected	-----	4.13E-02
RU-106	Not Detected	-----	4.12E-01
SB-122	Not Detected	-----	7.84E-02
SB-124	Not Detected	-----	4.93E-02
SB-125	Not Detected	-----	1.22E-01
SC-46	Not Detected	-----	6.62E-02
SR-85	Not Detected	-----	5.07E-02
TA-182	Not Detected	-----	1.96E-01
TA-183	Not Detected	-----	2.63E-01
TE-132	Not Detected	-----	4.90E-02
TL-201	Not Detected	-----	1.71E-01
XE-133	Not Detected	-----	2.12E-01
Y-88	Not Detected	-----	4.36E-02
ZN-65	Not Detected	-----	1.34E-01
ZR-95	Not Detected	-----	8.40E-02

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-21-95 1:07:16 PM *

* Analyzed by: *S. J. Cole 6/21/95* Reviewed by: *[Signature] 6/21/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022895-05
 Lab Sample ID : 50047303

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 1SMAR
 Sample Quantity : 952.000 gram
 Sample Date/Time : 6-20-95 10:55:00 AM
 Acquire Start Date : 6-21-95 12:34:02 PM
 Detector Name : LAB01
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	1.97
TH-234	Not Detected	-----	4.85E-01
U-234	Not Detected	-----	1.54E+01
RA-226	1.23	5.67E-01	8.16E-01
PB-214	6.29E-01	1.13E-01	8.14E-02
BI-214	5.25E-01	9.98E-02	7.84E-02
PB-210	Not Detected	-----	4.54E+01
TH-232	5.05E-01	1.85E-01	2.38E-01
RA-228	6.71E-01	2.15E-01	1.88E-01
AC-228	6.46E-01	1.58E-01	1.47E-01
TH-228	5.59E-01	2.80E-01	6.18E-01
RA-224	1.69	3.99E-01	5.37E-01
PB-212	5.95E-01	1.14E-01	5.18E-02
BI-212	7.52E-01	3.36E-01	4.47E-01
TL-208	4.85E-01	1.11E-01	1.03E-01
U-235	Not Detected	-----	3.02E-01
TH-231	Not Detected	-----	5.87E-01
PA-231	Not Detected	-----	1.81
AC-227	Not Detected	-----	2.27
TH-227	Not Detected	-----	4.68E-01
RA-223	Not Detected	-----	2.00E-01
RN-219	Not Detected	-----	2.48E-01
PB-211	Not Detected	-----	9.09E-01
TL-207	Not Detected	-----	2.06E+01
AM-241	Not Detected	-----	2.59E-01
PU-239	Not Detected	-----	3.29E+02
NP-237	Not Detected	-----	2.40E-01
PA-233	Not Detected	-----	8.41E-02
TH-229	Not Detected	-----	3.05E-01

[Summary Report] - Sample ID: 50047303

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	4.17E-02
AR-41	Not Detected	-----	1.07E+03
BA-133	Not Detected	-----	8.65E-02
BA-140	Not Detected	-----	1.49E-01
CD-109	Not Detected	-----	8.24E-01
CD-115	Not Detected	-----	1.20E-01
CE-139	Not Detected	-----	4.15E-02
CE-141	Not Detected	-----	7.06E-02
CE-144	Not Detected	-----	2.96E-01
CO-56	Not Detected	-----	4.64E-02
CO-57	Not Detected	-----	3.70E-02
CO-58	Not Detected	-----	4.73E-02
CO-60	Not Detected	-----	5.08E-02
CR-51	Not Detected	-----	3.28E-01
CS-134	Not Detected	-----	7.15E-02
CS-137	Not Detected	-----	4.71E-02
CU-64	Not Detected	-----	4.45E+01
EU-152	Not Detected	-----	3.26E-01
EU-154	Not Detected	-----	2.44E-01
EU-155	Not Detected	-----	1.56E-01
FE-59	Not Detected	-----	9.68E-02
GD-153	Not Detected	-----	1.27E-01
HG-203	Not Detected	-----	4.17E-02
I-131	Not Detected	-----	4.20E-02
IN-115m	Not Detected	-----	4.76
IR-192	Not Detected	-----	3.87E-02
K-40	1.56E+01	2.24	3.88E-01
LA-140	Not Detected	-----	7.03E-02
MN-54	Not Detected	-----	4.54E-02
MN-56	Not Detected	-----	4.89E+01
MO-99	Not Detected	-----	4.50E-01
NA-22	Not Detected	-----	5.59E-02
NA-24	Not Detected	-----	1.52E-01
NB-95	Not Detected	-----	2.68E-01
ND-147	Not Detected	-----	2.85E-01
NI-57	Not Detected	-----	1.09E-01
BE-7	Not Detected	-----	3.22E-01
RU-103	Not Detected	-----	3.96E-02
RU-106	Not Detected	-----	3.89E-01
SB-122	Not Detected	-----	7.44E-02
SB-124	Not Detected	-----	4.83E-02
SB-125	Not Detected	-----	1.09E-01
SC-46	Not Detected	-----	7.15E-02
SR-85	Not Detected	-----	4.99E-02
TA-182	Not Detected	-----	2.08E-01
TA-183	Not Detected	-----	2.57E-01
TE-132	Not Detected	-----	4.86E-02
TL-201	Not Detected	-----	1.58E-01
XE-133	Not Detected	-----	2.03E-01
Y-88	Not Detected	-----	3.71E-02
ZN-65	Not Detected	-----	1.39E-01
ZR-95	Not Detected	-----	7.86E-02

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-21-95 1:47:27 PM *

* Analyzed by: *John Col* 6/21/95 Reviewed by: *J.P.* 6/21/95 *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022896-05
 Lab Sample ID : 50047304

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 1SMAR
 Sample Quantity : 724.000 gram
 Sample Date/Time : 6-20-95 12:50:00 PM
 Acquire Start Date : 6-21-95 1:13:13 PM
 Detector Name : LAB01
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	2.03
TH-234	Not Detected	-----	5.14E-01
U-234	Not Detected	-----	1.76E+01
RA-226	1.54	6.81E-01	9.66E-01
PB-214	5.18E-01	1.06E-01	9.14E-02
BI-214	4.14E-01	9.13E-02	8.09E-02
PB-210	Not Detected	-----	4.78E+01
TH-232	4.93E-01	1.95E-01	2.53E-01
RA-228	2.12E-01	1.60E-01	2.40E-01
AC-228	5.65E-01	1.54E-01	1.47E-01
TH-228	Not Detected	-----	1.43
RA-224	Not Detected	-----	1.50
PB-212	4.49E-01	9.52E-02	8.42E-02
BI-212	2.33E-01	3.21E-01	5.21E-01
TL-208	4.09E-01	1.08E-01	1.07E-01
U-235	Not Detected	-----	2.99E-01
TH-231	Not Detected	-----	6.03E-01
PA-231	Not Detected	-----	1.98
AC-227	Not Detected	-----	2.38
TH-227	Not Detected	-----	4.99E-01
RA-223	Not Detected	-----	2.05E-01
RN-219	Not Detected	-----	3.93E-01
PB-211	Not Detected	-----	9.44E-01
TL-207	Not Detected	-----	1.82E+01
AM-241	Not Detected	-----	2.62E-01
PU-239	Not Detected	-----	3.40E+02
NP-237	Not Detected	-----	3.87E-01
PA-233	Not Detected	-----	8.85E-02
TH-229	Not Detected	-----	3.12E-01

[Summary Report] - Sample ID: 50047304

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	4.39E-02
AR-41	Not Detected	-----	6.39E+02
BA-133	Not Detected	-----	9.22E-02
BA-140	Not Detected	-----	1.56E-01
CD-109	Not Detected	-----	7.26E-01
CD-115	Not Detected	-----	1.24E-01
CE-139	Not Detected	-----	4.40E-02
CE-141	Not Detected	-----	6.80E-02
CE-144	Not Detected	-----	3.13E-01
CO-56	Not Detected	-----	5.50E-02
CO-57	Not Detected	-----	3.93E-02
CO-58	Not Detected	-----	4.43E-02
CO-60	Not Detected	-----	5.42E-02
CR-51	Not Detected	-----	3.56E-01
CS-134	Not Detected	-----	7.55E-02
CS-137	Not Detected	-----	5.05E-02
CU-64	Not Detected	-----	4.00E+01
EU-152	Not Detected	-----	4.08E-01
EU-154	Not Detected	-----	2.54E-01
EU-155	Not Detected	-----	1.57E-01
FE-59	Not Detected	-----	1.04E-01
GD-153	Not Detected	-----	1.31E-01
HG-203	Not Detected	-----	4.21E-02
I-131	Not Detected	-----	4.48E-02
IN-115m	Not Detected	-----	4.08
IR-192	Not Detected	-----	4.18E-02
K-40	1.11E+01	1.70	3.95E-01
LA-140	Not Detected	-----	7.93E-02
MN-54	Not Detected	-----	5.21E-02
MN-56	Not Detected	-----	4.13E+01
MO-99	Not Detected	-----	4.44E-01
NA-22	Not Detected	-----	5.97E-02
NA-24	Not Detected	-----	1.45E-01
NB-95	Not Detected	-----	2.82E-01
ND-147	Not Detected	-----	2.91E-01
NI-57	Not Detected	-----	1.16E-01
BE-7	Not Detected	-----	3.40E-01
RU-103	Not Detected	-----	3.98E-02
RU-106	Not Detected	-----	4.26E-01
SB-122	Not Detected	-----	7.92E-02
SB-124	Not Detected	-----	5.06E-02
SB-125	Not Detected	-----	1.17E-01
SC-46	Not Detected	-----	7.47E-02
SR-85	Not Detected	-----	5.46E-02
TA-182	Not Detected	-----	2.17E-01
TA-183	Not Detected	-----	2.58E-01
TE-132	Not Detected	-----	4.99E-02
TL-201	Not Detected	-----	1.69E-01
XE-133	Not Detected	-----	2.07E-01
Y-88	Not Detected	-----	4.88E-02
ZN-65	Not Detected	-----	1.41E-01
ZR-95	Not Detected	-----	8.29E-02

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-21-95 2:26:51 PM *

* Analyzed by: *Sharon Cole 6/21/95* Reviewed by: *JR 6/21/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022897-05
 Lab Sample ID : 50047305

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 1SMAR
 Sample Quantity : 787.000 gram
 Sample Date/Time : 6-20-95 1:20:00 PM
 Acquire Start Date : 6-21-95 1:54:27 PM
 Detector Name : LAB01
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	1.17	1.05	1.65
TH-234	Not Detected	-----	4.32E-01
U-234	Not Detected	-----	1.59E+01
RA-226	1.23	6.29E-01	9.21E-01
PB-214	4.13E-01	8.28E-02	6.05E-02
BI-214	3.99E-01	8.23E-02	6.20E-02
PB-210	Not Detected	-----	4.09E+01
TH-232	3.06E-01	1.65E-01	2.37E-01
RA-228	2.84E-01	2.13E-01	1.54E-01
AC-228	3.69E-01	1.13E-01	1.11E-01
TH-228	Not Detected	-----	1.18
RA-224	1.42	3.87E-01	5.14E-01
PB-212	3.68E-01	8.19E-02	5.05E-02
BI-212	Not Detected	-----	6.42E-01
TL-208	3.04E-01	9.31E-02	1.05E-01
U-235	Not Detected	-----	2.71E-01
TH-231	Not Detected	-----	2.91E-01
PA-231	Not Detected	-----	1.64
AC-227	Not Detected	-----	2.08
TH-227	Not Detected	-----	4.10E-01
RA-223	Not Detected	-----	1.76E-01
RN-219	Not Detected	-----	3.55E-01
PB-211	Not Detected	-----	7.89E-01
TL-207	Not Detected	-----	1.66E+01
AM-241	Not Detected	-----	2.26E-01
PU-239	Not Detected	-----	3.05E+02
NP-237	Not Detected	-----	1.93E-01
PA-233	Not Detected	-----	8.28E-02
TH-229	Not Detected	-----	2.75E-01

[Summary Report] - Sample ID: 50047305

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	3.98E-02
AR-41	Not Detected	-----	5.51E+02
BA-133	Not Detected	-----	7.92E-02
BA-140	Not Detected	-----	1.27E-01
CD-109	Not Detected	-----	6.64E-01
CD-115	Not Detected	-----	1.11E-01
CE-139	Not Detected	-----	3.86E-02
CE-141	Not Detected	-----	6.40E-02
CE-144	Not Detected	-----	2.71E-01
CO-56	Not Detected	-----	4.46E-02
CO-57	Not Detected	-----	3.29E-02
CO-58	Not Detected	-----	4.05E-02
CO-60	Not Detected	-----	4.42E-02
CR-51	Not Detected	-----	3.07E-01
CS-134	Not Detected	-----	6.48E-02
CS-137	Not Detected	-----	4.90E-02
CU-64	Not Detected	-----	3.13E+01
EU-152	Not Detected	-----	3.15E-01
EU-154	Not Detected	-----	2.11E-01
EU-155	Not Detected	-----	1.48E-01
FE-59	Not Detected	-----	8.55E-02
GD-153	Not Detected	-----	1.13E-01
HG-203	Not Detected	-----	3.79E-02
I-131	Not Detected	-----	3.81E-02
IN-115m	Not Detected	-----	3.77
IR-192	Not Detected	-----	3.70E-02
K-40	7.14	1.17	4.09E-01
LA-140	Not Detected	-----	7.52E-02
MN-54	Not Detected	-----	4.31E-02
MN-56	Not Detected	-----	3.52E+01
MO-99	Not Detected	-----	3.94E-01
NA-22	Not Detected	-----	4.84E-02
NA-24	Not Detected	-----	1.02E-01
NB-95	Not Detected	-----	2.32E-01
ND-147	Not Detected	-----	2.73E-01
NI-57	Not Detected	-----	9.87E-02
BE-7	Not Detected	-----	2.95E-01
RU-103	Not Detected	-----	3.69E-02
RU-106	Not Detected	-----	3.95E-01
SB-122	Not Detected	-----	6.91E-02
SB-124	Not Detected	-----	4.06E-02
SB-125	Not Detected	-----	1.07E-01
SC-46	Not Detected	-----	6.13E-02
SR-85	Not Detected	-----	4.87E-02
TA-182	Not Detected	-----	1.79E-01
TA-183	Not Detected	-----	2.23E-01
TE-132	Not Detected	-----	4.25E-02
TL-201	Not Detected	-----	1.40E-01
XE-133	Not Detected	-----	1.81E-01
Y-88	Not Detected	-----	3.26E-02
ZN-65	Not Detected	-----	1.15E-01
ZR-95	Not Detected	-----	6.84E-02

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-21-95 3:03:56 PM *

 * Analyzed by: *James Cal 6/21/95* Reviewed by: *JR 6/21/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022898-05
 Lab Sample ID : 50047306

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 1SMAR
 Sample Quantity : 795.000 gram
 Sample Date/Time : 6-20-95 2:10:00 PM
 Acquire Start Date : 6-21-95 2:31:28 PM
 Detector Name : LAB01
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	2.05
TH-234	9.07E-01	4.10E-01	5.09E-01
U-234	Not Detected	-----	1.76E+01
RA-226	1.06	5.68E-01	8.37E-01
PB-214	6.87E-01	1.24E-01	8.59E-02
BI-214	5.03E-01	1.03E-01	8.80E-02
PB-210	Not Detected	-----	4.71E+01
TH-232	5.99E-01	2.05E-01	2.52E-01
RA-228	4.51E-01	1.80E-01	2.23E-01
AC-228	Not Detected	-----	2.82E-01
TH-228	Not Detected	-----	1.48
RA-224	Not Detected	-----	5.78E-01
PB-212	5.83E-01	1.16E-01	5.22E-02
BI-212	Not Detected	-----	7.80E-01
TL-208	5.23E-01	1.27E-01	1.25E-01
U-235	Not Detected	-----	3.21E-01
TH-231	Not Detected	-----	6.13E-01
PA-231	Not Detected	-----	2.05
AC-227	Not Detected	-----	2.40
TH-227	Not Detected	-----	4.96E-01
RA-223	Not Detected	-----	2.08E-01
RN-219	2.41E-01	2.21E-01	3.45E-01
PB-211	Not Detected	-----	8.97E-01
TL-207	Not Detected	-----	2.03E+01
AM-241	Not Detected	-----	2.67E-01
PU-239	Not Detected	-----	3.49E+02
NP-237	Not Detected	-----	3.98E-01
PA-233	Not Detected	-----	8.69E-02
TH-229	Not Detected	-----	3.23E-01

[Summary Report] - Sample ID: 50047306

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	4.40E-02
AR-41	Not Detected	-----	6.24E+02
BA-133	Not Detected	-----	9.80E-02
BA-140	Not Detected	-----	1.59E-01
CD-109	Not Detected	-----	8.60E-01
CD-115	Not Detected	-----	1.28E-01
CE-139	Not Detected	-----	4.54E-02
CE-141	Not Detected	-----	7.30E-02
CE-144	Not Detected	-----	3.18E-01
CO-56	Not Detected	-----	5.12E-02
CO-57	Not Detected	-----	3.98E-02
CO-58	Not Detected	-----	4.60E-02
CO-60	Not Detected	-----	5.50E-02
CR-51	Not Detected	-----	3.43E-01
CS-134	Not Detected	-----	7.60E-02
CS-137	Not Detected	-----	5.07E-02
CU-64	Not Detected	-----	4.46E+01
EU-152	Not Detected	-----	3.65E-01
EU-154	Not Detected	-----	2.51E-01
EU-155	Not Detected	-----	1.62E-01
FE-59	Not Detected	-----	9.67E-02
GD-153	Not Detected	-----	1.40E-01
HG-203	Not Detected	-----	4.28E-02
I-131	Not Detected	-----	4.75E-02
IN-115m	Not Detected	-----	4.22
IR-192	Not Detected	-----	4.02E-02
K-40	1.13E+01	1.74	5.40E-01
LA-140	Not Detected	-----	8.57E-02
MN-54	Not Detected	-----	4.63E-02
MN-56	Not Detected	-----	3.82E+01
MO-99	Not Detected	-----	4.45E-01
NA-22	Not Detected	-----	5.73E-02
NA-24	Not Detected	-----	1.44E-01
NB-95	Not Detected	-----	2.81E-01
ND-147	Not Detected	-----	2.95E-01
NI-57	Not Detected	-----	1.08E-01
BE-7	Not Detected	-----	3.45E-01
RU-103	Not Detected	-----	4.13E-02
RU-106	Not Detected	-----	4.28E-01
SB-122	Not Detected	-----	7.72E-02
SB-124	Not Detected	-----	4.66E-02
SB-125	Not Detected	-----	1.21E-01
SC-46	Not Detected	-----	7.36E-02
SR-85	Not Detected	-----	5.03E-02
TA-182	Not Detected	-----	2.17E-01
TA-183	Not Detected	-----	2.62E-01
TE-132	Not Detected	-----	4.95E-02
TL-201	Not Detected	-----	1.68E-01
XE-133	Not Detected	-----	2.14E-01
Y-88	Not Detected	-----	4.08E-02
ZN-65	Not Detected	-----	1.41E-01
ZR-95	Not Detected	-----	8.44E-02

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-21-95 3:22:17 PM *

 * Analyzed by: *S. Garcia Cal 6/21/95* Reviewed by: *JR 6/21/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : LAB CONTROL SAMPLE ANALYSIS #CG134
 Lab Sample ID : 50047307

Sample Description : MIXED GAMMA_STANDARD
 Sample Type : Liquid
 Sample Geometry : WMAR
 Sample Quantity : 1.000 Each
 Sample Date/Time : 11-01-90 12:00:00 PM
 Acquire Start Date : 6-21-95 3:10:03 PM
 Detector Name : LAB01
 Elapsed Live Time : 600 seconds
 Elapsed Real Time : 608 seconds

Comments:

Nuclide	Activity (pCi/Each)	2S Error	MDA
U-238	Not Detected	-----	2.56E+04
TH-234	Not Detected	-----	3.95E+03
U-234	Not Detected	-----	1.13E+05
RA-226	Not Detected	-----	6.07E+03
PB-214	Not Detected	-----	7.17E+02
BI-214	Not Detected	-----	6.12E+02
PB-210	Not Detected	-----	1.26E+06
TH-232	Not Detected	-----	2.08E+03
RA-228	Not Detected	-----	2.67E+03
AC-228	Not Detected	-----	1.73E+03
TH-228	Not Detected	-----	3.67E+04
RA-224	Not Detected	-----	3.06E+04
PB-212	Not Detected	-----	2.79E+03
BI-212	Not Detected	-----	2.56E+04
TL-208	Not Detected	-----	5.01E+03
U-235	Not Detected	-----	1.63E+03
TH-231	Not Detected	-----	2.74E+03
PA-231	Not Detected	-----	9.53E+03
AC-227	Not Detected	-----	1.46E+04
TH-227	Not Detected	-----	2.35E+03
RA-223	Not Detected	-----	1.00E+26
RN-219	Not Detected	-----	2.91E+03
PB-211	Not Detected	-----	8.77E+03
TL-207	Not Detected	-----	2.16E+05
AM-241	1.13E+05	1.79E+04	2.51E+03
PU-239	Not Detected	-----	1.76E+06
NP-237	Not Detected	-----	1.83E+03
PA-233	Not Detected	-----	6.20E+02
TH-229	Not Detected	-----	1.58E+03

[Summary Report] - Sample ID: 50047307

Nuclide	Activity (pCi/Each)	2S Error	MDA
AG-110m	Not Detected	-----	1.60E+05
AR-41	Not Detected	-----	1.00E+26
BA-133	Not Detected	-----	5.69E+02
BA-140	Not Detected	-----	1.00E+26
CD-109	3.71E+05	8.10E+04	8.17E+04
CD-115	Not Detected	-----	1.00E+26
CE-139	Not Detected	-----	1.21E+06
CE-141	Not Detected	-----	1.76E+18
CE-144	Not Detected	-----	9.72E+04
CO-56	Not Detected	-----	1.59E+09
CO-57	8.29E+03	7.16E+03	1.13E+04
CO-58	Not Detected	-----	5.76E+09
CO-60	7.41E+04	9.62E+03	5.27E+02
CR-51	Not Detected	-----	5.92E+21
CS-134	Not Detected	-----	1.38E+03
CS-137	6.83E+04	8.84E+03	2.61E+02
CU-64	Not Detected	-----	1.00E+26
EU-152	Not Detected	-----	3.41E+03
EU-154	Not Detected	-----	2.28E+03
EU-155	Not Detected	-----	1.61E+03
FE-59	Not Detected	-----	2.49E+14
GD-153	Not Detected	-----	7.54E+04
HG-203	Not Detected	-----	2.36E+13
I-131	Not Detected	-----	1.00E+26
IN-115m	Not Detected	-----	1.00E+26
IR-192	Not Detected	-----	2.34E+09
K-40	Not Detected	-----	1.63E+03
LA-140	Not Detected	-----	1.00E+26
MN-54	Not Detected	-----	1.67E+04
MN-56	Not Detected	-----	1.00E+26
MO-99	Not Detected	-----	1.00E+26
NA-22	Not Detected	-----	7.87E+02
NA-24	Not Detected	-----	1.00E+26
NB-95	Not Detected	-----	1.00E+26
ND-147	Not Detected	-----	1.00E+26
NI-57	Not Detected	-----	1.00E+26
BE-7	Not Detected	-----	1.21E+13
RU-103	Not Detected	-----	3.26E+15
RU-106	Not Detected	-----	7.29E+04
SB-122	Not Detected	-----	1.00E+26
SB-124	Not Detected	-----	8.50E+10
SB-125	Not Detected	-----	3.46E+03
SC-46	Not Detected	-----	5.49E+08
SR-85	Not Detected	-----	2.61E+10
TA-182	Not Detected	-----	3.51E+07
TA-183	Not Detected	-----	1.00E+26
TE-132	Not Detected	-----	1.00E+26
TL-201	Not Detected	-----	1.00E+26
XE-133	Not Detected	-----	1.00E+26
Y-88	Not Detected	-----	1.16E+07
ZN-65	Not Detected	-----	1.17E+05
ZR-95	Not Detected	-----	5.50E+10

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program *
 * Quality Assurance Report *

Report Date : 6-21-95 3:25:02 PM
 QA File : C:\GENIEPC\CAMFILES\LCS1.QAF
 Analyst : FCD
 Sample ID : 50047307
 Sample Quantity : 1.00 Each
 Sample Date : 11-01-90 12:00:00 PM
 Measurement Date : 6-21-95 3:10:03 PM
 Elapsed Live Time : 600 seconds
 Elapsed Real Time : 608 seconds

Parameter	Mean	1S Error	New Value	< LU : SD : UD : BS >
AM-241 Activity	1.128E-01	5.388E-03	1.127E-01	< : : <u>Ac</u> >
CS-137 Activity	6.836E-02	2.208E-03	6.828E-02	< : : <u>O.K.</u> >
CO-60 Activity	7.684E-02	2.920E-03	7.379E-02	< <u>:In</u> : <u>6/21/95</u> >

Flags Key: LU = Boundary Test (Ab = Above , Be = Below)
 SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
 UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
 BS = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: Spencer Cole 6/21/95

ER/0302 096/DAT

7

SMO ANALYTICAL DATA ROUTING FORM

Project Name: TAZ Phase I Case Number: 3626400

SNL Task Leader: Miller Org/Mail Stop: 7582/1347

SMO Project Coordinator: Puissant Sample Ship Date: 6/23/95

ARCOG Lab Lab ID 6/22/95
6/21/95

03727 SNL 7715 500479

03725 " 500476

03722 " 500473

Date Results Received:

Preliminary: _____ Final: 6/17, 6/26, 6/22/95

Corrections Requested From Laboratory: _____ Requestor: _____

Date Corrections Received: _____

Date Assigned to SMO Reviewer: _____

Reviewer: _____

COPY
ORIGINAL FILED IN
RECORDS CENTER BY
SMO WDM 7/10/95
(Initials) (Date)

Date Review Complete: _____

Signature: _____

Date of Preliminary Notification: _____

Person Notified: _____

Date of Final Transmittal: 7/10/95

Transmitted To: Miller

Transmitted By: WDM

Filed In Record Center: WDM

Comments: _____



To be completed by Customer

Shaded areas are for RPSD use only

Customer: <u>D. Miller / H. Fleck</u>	Hazards/Special Instructions: <u>Please Notify SNO upon completion @ 845-0867</u>	Batch Log Number: <u>500426</u>
Organization: <u>7582</u>		Logged By: <u>me</u>
Project Location: <u>TA-1</u>		Analysis Type: <input checked="" type="checkbox"/> Gamma Spec
Phone: <u>845-0867</u>		<input type="checkbox"/> H-3
Date Results Needed: <u>6-23-95</u>		<input type="checkbox"/> Alpha/Beta
Suspect Isotopes: _____		<input type="checkbox"/> Alpha Spec
Other Information: <u>03725</u>	LIMS Login: _____	<input type="checkbox"/> Total U
	Results Faxed _____	<input type="checkbox"/> Other
	Sample Disposal _____	

Customer Sample ID	Sample Type	Date/Time Collected	Sample Volume	Requested Analysis	RPSD Sample ID	Rad Scan mR/hr	Sample Weight	Remarks
022901-05	S	6/21/95-1000	500ml	Gamma. spec	01	2300	700g	
022902-05	↓	↓ -11:05	↓	↓	02	↓	797g	
022903-05	↓	↓ -12:48	↓	↓	03	↓	643g	
022904-5	↓	↓ -14:15	↓	↓	04	↓	862g	
LCS		1-1000-90			05			

Relinquished by [Signature] Date 6-22-95 Time 0907 Received by [Signature] Date 6/22/95 Time 0907

Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____

Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____

Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-23-95 10:28:29 AM *

 * Analyzed by: *George Cole 6/23/95* Reviewed by: *JH 6/26/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022901-05
 Lab Sample ID : 50047601

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 2SMAR
 Sample Quantity : 700.000 gram
 Sample Date/Time : 6-21-95 10:00:00 AM
 Acquire Start Date : 6-23-95 9:53:25 AM
 Detector Name : LAB02
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	6.25
TH-234	Not Detected	-----	1.48
U-234	Not Detected	-----	2.56E+01
RA-226	1.90	9.21E-01	1.33
PB-214	8.06E-01	1.56E-01	1.24E-01
BI-214	6.95E-01	1.35E-01	9.88E-02
PB-210	Not Detected	-----	3.73E+02
TH-232	6.34E-01	2.47E-01	3.17E-01
RA-228	5.18E-01	2.39E-01	3.17E-01
AC-228	Not Detected	-----	3.89E-01
TH-228	6.63E-01	3.78E-01	8.54E-01
RA-224	2.12	5.82E-01	8.01E-01
PB-212	7.11E-01	1.52E-01	7.05E-02
BI-212	8.37E-01	4.80E-01	6.83E-01
TL-208	6.50E-01	1.60E-01	1.56E-01
U-235	Not Detected	-----	4.59E-01
TH-231	Not Detected	-----	1.10
PA-231	Not Detected	-----	2.53
AC-227	Not Detected	-----	3.22
TH-227	Not Detected	-----	6.60E-01
RA-223	Not Detected	-----	3.88E-01
RN-219	Not Detected	-----	5.47E-01
PB-211	Not Detected	-----	1.26
TL-207	Not Detected	-----	2.62E+01
AM-241	Not Detected	-----	9.64E-01
PU-239	Not Detected	-----	4.97E+02
NP-237	Not Detected	-----	7.00E-01
PA-233	Not Detected	-----	1.07E-01
TH-229	Not Detected	-----	5.55E-01

[Summary Report] - Sample ID: 50047601

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	5.71E-02
AR-41	Not Detected	-----	8.25E+06
BA-133	Not Detected	-----	1.22E-01
BA-140	Not Detected	-----	2.35E-01
CD-109	Not Detected	-----	2.42
CD-115	Not Detected	-----	2.24E-01
CE-139	Not Detected	-----	6.09E-02
CE-141	Not Detected	-----	1.07E-01
CE-144	Not Detected	-----	4.28E-01
CO-56	Not Detected	-----	7.32E-02
CO-57	Not Detected	-----	6.15E-02
CO-58	Not Detected	-----	6.08E-02
CO-60	Not Detected	-----	8.34E-02
CR-51	Not Detected	-----	4.63E-01
CS-134	Not Detected	-----	9.88E-02
CS-137	Not Detected	-----	6.31E-02
CU-64	Not Detected	-----	2.17E+02
EU-152	Not Detected	-----	5.22E-01
EU-154	Not Detected	-----	3.55E-01
EU-155	Not Detected	-----	2.76E-01
FE-59	Not Detected	-----	1.53E-01
GD-153	Not Detected	-----	2.21E-01
HG-203	Not Detected	-----	6.16E-02
I-131	Not Detected	-----	6.35E-02
IN-115m	Not Detected	-----	2.07E+02
IR-192	Not Detected	-----	5.43E-02
K-40	2.23E+01	3.24	6.70E-01
LA-140	Not Detected	-----	1.58E-01
MN-54	Not Detected	-----	6.53E-02
MN-56	Not Detected	-----	3.02E+04
MO-99	Not Detected	-----	7.93E-01
NA-22	Not Detected	-----	8.96E-02
NA-24	Not Detected	-----	6.39E-01
NB-95	Not Detected	-----	4.47E-01
ND-147	Not Detected	-----	4.29E-01
NI-57	Not Detected	-----	2.38E-01
BE-7	Not Detected	-----	4.53E-01
RU-103	Not Detected	-----	4.94E-02
RU-106	Not Detected	-----	6.00E-01
SB-122	Not Detected	-----	1.28E-01
SB-124	Not Detected	-----	6.08E-02
SB-125	Not Detected	-----	1.55E-01
SC-46	Not Detected	-----	1.08E-01
SR-85	Not Detected	-----	6.84E-02
TA-182	Not Detected	-----	3.17E-01
TA-183	Not Detected	-----	1.08
TE-132	Not Detected	-----	8.23E-02
TL-201	Not Detected	-----	4.57E-01
XE-133	Not Detected	-----	4.67E-01
Y-88	Not Detected	-----	5.14E-02
ZN-65	Not Detected	-----	2.09E-01
ZR-95	Not Detected	-----	1.15E-01

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-23-95 11:08:57 AM *

 * Analyzed by: *George Cole 6/23/95* Reviewed by: *JJ 6/26/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022902-05
 Lab Sample ID : 50047602

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 2SMAR
 Sample Quantity : 794.000 gram
 Sample Date/Time : 6-21-95 11:05:00 AM
 Acquire Start Date : 6-23-95 10:34:58 AM
 Detector Name : LAB02
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	5.93
TH-234	Not Detected	-----	1.42
U-234	Not Detected	-----	2.08E+01
RA-226	1.55	8.57E-01	1.28
PB-214	6.91E-01	1.49E-01	8.20E-02
BI-214	6.81E-01	1.30E-01	9.66E-02
PB-210	Not Detected	-----	3.51E+02
TH-232	6.58E-01	2.47E-01	3.17E-01
RA-228	7.43E-01	2.73E-01	2.21E-01
AC-228	Not Detected	-----	3.41E-01
TH-228	1.03	4.15E-01	7.94E-01
RA-224	1.91	4.97E-01	7.22E-01
PB-212	7.90E-01	1.56E-01	7.22E-02
BI-212	9.75E-01	4.95E-01	6.91E-01
TL-208	6.38E-01	1.55E-01	1.54E-01
U-235	Not Detected	-----	4.27E-01
TH-231	Not Detected	-----	1.09
PA-231	Not Detected	-----	2.32
AC-227	Not Detected	-----	3.06
TH-227	Not Detected	-----	6.49E-01
RA-223	Not Detected	-----	3.94E-01
RN-219	Not Detected	-----	5.10E-01
PB-211	Not Detected	-----	1.22
TL-207	Not Detected	-----	2.46E+01
AM-241	Not Detected	-----	9.43E-01
PU-239	Not Detected	-----	4.91E+02
NP-237	Not Detected	-----	6.85E-01
PA-233	Not Detected	-----	1.10E-01
TH-229	Not Detected	-----	5.04E-01

[Summary Report] - Sample ID: 50047602

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	5.72E-02
AR-41	Not Detected	-----	6.27E+06
BA-133	Not Detected	-----	1.10E-01
BA-140	Not Detected	-----	2.05E-01
CD-109	Not Detected	-----	1.44
CD-115	Not Detected	-----	2.11E-01
CE-139	Not Detected	-----	5.74E-02
CE-141	Not Detected	-----	9.92E-02
CE-144	Not Detected	-----	4.21E-01
CO-56	Not Detected	-----	6.53E-02
CO-57	Not Detected	-----	5.66E-02
CO-58	Not Detected	-----	6.01E-02
CO-60	Not Detected	-----	6.70E-02
CR-51	Not Detected	-----	4.14E-01
CS-134	Not Detected	-----	8.98E-02
CS-137	Not Detected	-----	6.32E-02
CU-64	Not Detected	-----	1.57E+02
EU-152	Not Detected	-----	4.51E-01
EU-154	Not Detected	-----	3.31E-01
EU-155	Not Detected	-----	2.56E-01
FE-59	Not Detected	-----	1.32E-01
GD-153	Not Detected	-----	2.07E-01
HG-203	Not Detected	-----	5.18E-02
I-131	Not Detected	-----	5.68E-02
IN-115m	Not Detected	-----	1.84E+02
IR-192	Not Detected	-----	4.96E-02
K-40	2.26E+01	3.23	4.42E-01
LA-140	Not Detected	-----	1.49E-01
MN-54	Not Detected	-----	5.89E-02
MN-56	Not Detected	-----	2.43E+04
MO-99	Not Detected	-----	7.57E-01
NA-22	Not Detected	-----	7.64E-02
NA-24	Not Detected	-----	5.49E-01
NB-95	Not Detected	-----	4.40E-01
ND-147	Not Detected	-----	3.88E-01
NI-57	Not Detected	-----	2.17E-01
BE-7	Not Detected	-----	4.13E-01
RU-103	Not Detected	-----	5.10E-02
RU-106	Not Detected	-----	5.25E-01
SB-122	Not Detected	-----	1.18E-01
SB-124	Not Detected	-----	5.66E-02
SB-125	Not Detected	-----	1.50E-01
SC-46	Not Detected	-----	9.45E-02
SR-85	Not Detected	-----	6.59E-02
TA-182	Not Detected	-----	2.76E-01
TA-183	Not Detected	-----	1.05
TE-132	Not Detected	-----	7.59E-02
TL-201	Not Detected	-----	4.23E-01
XE-133	Not Detected	-----	4.76E-01
Y-88	Not Detected	-----	4.16E-02
ZN-65	Not Detected	-----	1.87E-01
ZR-95	Not Detected	-----	1.10E-01

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 7-19-95 8:37:36 AM *

 * Analyzed by: *JK 7/19/95* Reviewed by: *JK 7/19/95* *

Customer : D.MILLER/D.McLAUGHLIN (7582/SMO)
 Customer Sample ID : LAB CONTROL SAMPLE ANALYSIS #CG134
 Lab Sample ID : 50056002

Sample Description : MIXED GAMMA_STANDARD
 Sample Type : Liquid
 Sample Geometry : WMAR
 Sample Quantity : 1.000 Each
 Sample Date/Time : 11-01-90 12:00:00 PM
 Acquire Start Date : 7-19-95 8:25:16 AM
 Detector Name : LAB02
 Elapsed Live Time : 600 seconds
 Elapsed Real Time : 606 seconds

Comments:

Nuclide	Activity (pCi/Each)	2S Error	MDA
U-238	Not Detected	-----	2.17E+04
TH-234	Not Detected	-----	4.71E+03
U-234	Not Detected	-----	1.17E+05
RA-226	Not Detected	-----	5.77E+03
PB-214	Not Detected	-----	7.02E+02
BI-214	Not Detected	-----	6.40E+02
PB-210	Not Detected	-----	4.56E+03
TH-232	Not Detected	-----	2.03E+03
RA-228	Not Detected	-----	2.78E+03
AC-228	Not Detected	-----	1.74E+03
TH-228	Not Detected	-----	3.65E+04
RA-224	Not Detected	-----	3.15E+04
PB-212	Not Detected	-----	2.84E+03
BI-212	Not Detected	-----	2.58E+04
TL-208	Not Detected	-----	5.38E+03
U-235	Not Detected	-----	1.88E+03
TH-231	Not Detected	-----	3.87E+03
PA-231	Not Detected	-----	9.20E+03
AC-227	Not Detected	-----	1.62E+04
TH-227	Not Detected	-----	2.25E+03
RA-223	Not Detected	-----	1.00E+26
RN-219	Not Detected	-----	2.91E+03
PB-211	Not Detected	-----	8.48E+03
TL-207	Not Detected	-----	2.19E+05
AM-241	9.17E+04	1.64E+04	6.11E+03
PU-239	Not Detected	-----	2.13E+06
NP-237	Not Detected	-----	2.70E+03
PA-233	Not Detected	-----	6.24E+02
TH-229	Not Detected	-----	2.05E+03

[Summary Report] - Sample ID: 50056002

Nuclide	Activity (pCi/Each)	2S Error	MDA
AG-110m	Not Detected	-----	1.83E+05
AR-41	Not Detected	-----	1.00E+26
BA-133	Not Detected	-----	5.58E+02
BA-140	Not Detected	-----	1.00E+26
CD-109	3.32E+05	1.00E+05	1.27E+05
CD-115	Not Detected	-----	1.00E+26
CE-139	Not Detected	-----	1.42E+06
CE-141	Not Detected	-----	3.67E+18
CE-144	Not Detected	-----	1.27E+05
CO-56	Not Detected	-----	2.11E+09
CO-57	1.75E+04	1.69E+04	2.69E+04
CO-58	Not Detected	-----	7.53E+09
CO-60	7.47E+04	9.73E+03	4.99E+02
CR-51	Not Detected	-----	1.18E+22
CS-134	Not Detected	-----	1.48E+03
CS-137	6.80E+04	8.78E+03	4.50E+02
CU-64	Not Detected	-----	1.00E+26
EU-152	Not Detected	-----	3.42E+03
EU-154	Not Detected	-----	2.31E+03
EU-155	Not Detected	-----	2.13E+03
FE-59	Not Detected	-----	3.97E+14
GD-153	Not Detected	-----	1.11E+05
HG-203	Not Detected	-----	3.51E+13
I-131	Not Detected	-----	1.00E+26
IN-115m	Not Detected	-----	1.00E+26
IR-192	Not Detected	-----	3.03E+09
K-40	Not Detected	-----	1.65E+03
LA-140	Not Detected	-----	1.00E+26
MN-54	Not Detected	-----	1.77E+04
MN-56	Not Detected	-----	1.00E+26
MO-99	Not Detected	-----	1.00E+26
NA-22	Not Detected	-----	8.28E+02
NA-24	Not Detected	-----	1.00E+26
NB-95	Not Detected	-----	1.00E+26
ND-147	Not Detected	-----	1.00E+26
NI-57	Not Detected	-----	1.00E+26
BE-7	Not Detected	-----	1.76E+13
RU-103	Not Detected	-----	5.37E+15
RU-106	Not Detected	-----	7.91E+04
SB-122	Not Detected	-----	1.00E+26
SB-124	Not Detected	-----	1.23E+11
SB-125	Not Detected	-----	3.32E+03
SC-46	Not Detected	-----	7.17E+08
SR-85	Not Detected	-----	3.37E+10
TA-182	Not Detected	-----	4.30E+07
TA-183	Not Detected	-----	1.00E+26
TE-132	Not Detected	-----	1.00E+26
TL-201	Not Detected	-----	1.00E+26
XE-133	Not Detected	-----	1.00E+26
Y-88	Not Detected	-----	1.33E+07
ZN-65	Not Detected	-----	1.29E+05
ZR-95	Not Detected	-----	7.53E+10

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-20-95 8:58:45 PM *

 * Analyzed by: *JT 6/21/95* Reviewed by: *JT 6/21/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022889-05
 Lab Sample ID : 50046904

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 2SMAR
 Sample Quantity : 770.000 gram
 Sample Date/Time : 6-19-95 12:55:00 PM
 Acquire Start Date : 6-20-95 8:25:01 PM
 Detector Name : LAB02
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	5.76
TH-234	Not Detected	-----	1.40
U-234	Not Detected	-----	2.12E+01
RA-226	1.68	8.78E-01	1.29
PB-214	7.11E-01	1.37E-01	1.05E-01
BI-214	6.57E-01	1.30E-01	1.05E-01
PB-210	Not Detected	-----	3.63E+02
TH-232	6.64E-01	2.29E-01	2.76E-01
RA-228	8.44E-01	2.81E-01	1.87E-01
AC-228	Not Detected	-----	3.45E-01
TH-228	9.07E-01	4.10E-01	8.28E-01
RA-224	1.85	4.85E-01	6.67E-01
PB-212	7.45E-01	1.49E-01	6.62E-02
BI-212	7.02E-01	4.04E-01	5.70E-01
TL-208	6.92E-01	1.54E-01	1.31E-01
U-235	Not Detected	-----	4.14E-01
TH-231	Not Detected	-----	1.04
PA-231	Not Detected	-----	2.34
AC-227	Not Detected	-----	3.01
TH-227	Not Detected	-----	6.26E-01
RA-223	Not Detected	-----	3.49E-01
RN-219	Not Detected	-----	4.78E-01
PB-211	Not Detected	-----	1.19
TL-207	Not Detected	-----	2.35E+01
AM-241	Not Detected	-----	8.81E-01
PU-239	Not Detected	-----	4.69E+02
NP-237	Not Detected	-----	6.57E-01
PA-233	Not Detected	-----	1.04E-01
TH-229	Not Detected	-----	5.15E-01

[Summary Report] - Sample ID: 50046904

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	4.99E-02
AR-41	Not Detected	-----	1.22E+04
BA-133	Not Detected	-----	1.11E-01
BA-140	Not Detected	-----	1.89E-01
CD-109	Not Detected	-----	1.35
CD-115	Not Detected	-----	1.67E-01
CE-139	Not Detected	-----	5.36E-02
CE-141	Not Detected	-----	9.69E-02
CE-144	Not Detected	-----	4.09E-01
CO-56	Not Detected	-----	5.56E-02
CO-57	Not Detected	-----	5.39E-02
CO-58	Not Detected	-----	5.36E-02
CO-60	Not Detected	-----	6.30E-02
CR-51	Not Detected	-----	4.17E-01
CS-134	Not Detected	-----	9.02E-02
CS-137	Not Detected	-----	6.13E-02
CU-64	Not Detected	-----	7.18E+01
EU-152	Not Detected	-----	4.45E-01
EU-154	Not Detected	-----	3.19E-01
EU-155	Not Detected	-----	2.47E-01
FE-59	Not Detected	-----	1.24E-01
GD-153	Not Detected	-----	2.09E-01
HG-203	Not Detected	-----	5.24E-02
I-131	Not Detected	-----	5.39E-02
IN-115m	Not Detected	-----	1.51E+01
IR-192	Not Detected	-----	4.89E-02
K-40	1.35E+01	2.04	4.23E-01
LA-140	Not Detected	-----	1.09E-01
MN-54	Not Detected	-----	6.22E-02
MN-56	Not Detected	-----	2.82E+02
MO-99	Not Detected	-----	5.92E-01
NA-22	Not Detected	-----	6.98E-02
NA-24	Not Detected	-----	2.68E-01
NB-95	Not Detected	-----	3.72E-01
ND-147	Not Detected	-----	3.81E-01
NI-57	Not Detected	-----	1.52E-01
BE-7	Not Detected	-----	4.11E-01
RU-103	Not Detected	-----	4.74E-02
RU-106	Not Detected	-----	5.04E-01
SB-122	Not Detected	-----	9.71E-02
SB-124	Not Detected	-----	5.53E-02
SB-125	Not Detected	-----	1.46E-01
SC-46	Not Detected	-----	8.71E-02
SR-85	Not Detected	-----	6.66E-02
TA-182	Not Detected	-----	2.54E-01
TA-183	Not Detected	-----	8.99E-01
TE-132	Not Detected	-----	6.28E-02
TL-201	Not Detected	-----	3.64E-01
XE-133	Not Detected	-----	3.63E-01
Y-88	Not Detected	-----	4.65E-02
ZN-65	Not Detected	-----	1.72E-01
ZR-95	Not Detected	-----	1.09E-01

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-20-95 9:38:20 PM *

 * Analyzed by: *JR 6/21/95* Reviewed by: *JR 6/21/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022890-05
 Lab Sample ID : 50046905

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 2SMAR
 Sample Quantity : 709.000 gram
 Sample Date/Time : 6-19-95 2:20:00 PM
 Acquire Start Date : 6-20-95 9:04:39 PM
 Detector Name : LAB02
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	6.23
TH-234	Not Detected	-----	1.46
U-234	Not Detected	-----	2.31E+01
RA-226	8.48E-01	7.79E-01	1.23
PB-214	9.29E-01	1.69E-01	1.18E-01
BI-214	7.99E-01	1.51E-01	1.10E-01
PB-210	Not Detected	-----	3.76E+02
TH-232	7.35E-01	2.55E-01	3.10E-01
RA-228	6.98E-01	2.66E-01	3.28E-01
AC-228	Not Detected	-----	3.78E-01
TH-228	Not Detected	-----	1.84
RA-224	2.18	5.46E-01	7.52E-01
PB-212	8.09E-01	1.63E-01	7.16E-02
BI-212	8.22E-01	4.76E-01	6.79E-01
TL-208	6.63E-01	1.70E-01	1.77E-01
U-235	Not Detected	-----	4.51E-01
TH-231	Not Detected	-----	1.20
PA-231	Not Detected	-----	2.56
AC-227	Not Detected	-----	3.12
TH-227	Not Detected	-----	6.84E-01
RA-223	Not Detected	-----	4.13E-01
RN-219	Not Detected	-----	5.37E-01
PB-211	Not Detected	-----	1.30
TL-207	Not Detected	-----	2.35E+01
AM-241	Not Detected	-----	9.89E-01
PU-239	Not Detected	-----	5.34E+02
NP-237	Not Detected	-----	7.60E-01
PA-233	Not Detected	-----	1.05E-01
TH-229	Not Detected	-----	5.76E-01

[Summary Report] - Sample ID: 50046905

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	5.60E-02
AR-41	Not Detected	-----	9.87E+03
BA-133	Not Detected	-----	1.28E-01
BA-140	Not Detected	-----	2.18E-01
CD-109	Not Detected	-----	2.50
CD-115	Not Detected	-----	1.79E-01
CE-139	Not Detected	-----	5.82E-02
CE-141	Not Detected	-----	1.04E-01
CE-144	Not Detected	-----	4.50E-01
CO-56	Not Detected	-----	6.39E-02
CO-57	Not Detected	-----	5.87E-02
CO-58	Not Detected	-----	5.49E-02
CO-60	Not Detected	-----	6.74E-02
CR-51	Not Detected	-----	4.43E-01
CS-134	Not Detected	-----	1.03E-01
CS-137	Not Detected	-----	6.42E-02
CU-64	Not Detected	-----	6.97E+01
EU-152	Not Detected	-----	4.34E-01
EU-154	Not Detected	-----	3.54E-01
EU-155	Not Detected	-----	2.75E-01
FE-59	Not Detected	-----	1.36E-01
GD-153	Not Detected	-----	2.31E-01
HG-203	Not Detected	-----	5.49E-02
I-131	Not Detected	-----	5.60E-02
IN-115m	Not Detected	-----	1.46E+01
IR-192	Not Detected	-----	5.16E-02
K-40	1.54E+01	2.33	4.84E-01
LA-140	Not Detected	-----	1.19E-01
MN-54	Not Detected	-----	6.06E-02
MN-56	Not Detected	-----	2.65E+02
MO-99	Not Detected	-----	5.91E-01
NA-22	Not Detected	-----	8.14E-02
NA-24	Not Detected	-----	2.72E-01
NB-95	Not Detected	-----	4.05E-01
ND-147	Not Detected	-----	3.86E-01
NI-57	Not Detected	-----	1.63E-01
BE-7	Not Detected	-----	4.49E-01
RU-103	Not Detected	-----	5.17E-02
RU-106	Not Detected	-----	5.66E-01
SB-122	Not Detected	-----	1.03E-01
SB-124	Not Detected	-----	6.10E-02
SB-125	Not Detected	-----	1.60E-01
SC-46	Not Detected	-----	1.03E-01
SR-85	Not Detected	-----	6.73E-02
TA-182	Not Detected	-----	3.03E-01
TA-183	Not Detected	-----	9.96E-01
TE-132	Not Detected	-----	7.05E-02
TL-201	Not Detected	-----	3.95E-01
XE-133	Not Detected	-----	3.91E-01
Y-88	Not Detected	-----	5.55E-02
ZN-65	Not Detected	-----	1.98E-01
ZR-95	Not Detected	-----	1.08E-01

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-20-95 10:18:04 PM *

 * Analyzed by: *JR 6/21/95* Reviewed by: *JR 6/21/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022891-05
 Lab Sample ID : 50046906

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 2SMAR
 Sample Quantity : 618.000 gram
 Sample Date/Time : 6-19-95 3:40:00 PM
 Acquire Start Date : 6-20-95 9:44:17 PM
 Detector Name : LAB02
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	7.03
TH-234	Not Detected	-----	1.71
U-234	Not Detected	-----	2.76E+01
RA-226	1.43	1.18	1.85
PB-214	9.56E-01	1.82E-01	1.42E-01
BI-214	8.47E-01	1.59E-01	1.07E-01
PB-210	Not Detected	-----	3.98E+02
TH-232	6.87E-01	2.95E-01	3.98E-01
RA-228	7.88E-01	2.98E-01	2.55E-01
AC-228	Not Detected	-----	4.28E-01
TH-228	1.22	5.16E-01	9.41E-01
RA-224	Not Detected	-----	9.17E-01
PB-212	9.15E-01	2.19E-01	8.48E-02
BI-212	1.23	5.45E-01	7.08E-01
TL-208	6.86E-01	1.74E-01	1.73E-01
U-235	Not Detected	-----	5.03E-01
TH-231	Not Detected	-----	1.24
PA-231	Not Detected	-----	2.85
AC-227	Not Detected	-----	3.46
TH-227	Not Detected	-----	7.77E-01
RA-223	Not Detected	-----	4.27E-01
RN-219	Not Detected	-----	6.16E-01
PB-211	Not Detected	-----	1.48
TL-207	Not Detected	-----	2.92E+01
AM-241	Not Detected	-----	1.11
PU-239	Not Detected	-----	5.62E+02
NP-237	Not Detected	-----	7.88E-01
PA-233	Not Detected	-----	1.21E-01
TH-229	Not Detected	-----	6.25E-01

[Summary Report] - Sample ID: 50046906

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	6.38E-02
AR-41	Not Detected	-----	8.43E+03
BA-133	Not Detected	-----	1.40E-01
BA-140	Not Detected	-----	2.44E-01
CD-109	Not Detected	-----	2.71
CD-115	Not Detected	-----	1.94E-01
CE-139	Not Detected	-----	6.36E-02
CE-141	Not Detected	-----	1.17E-01
CE-144	Not Detected	-----	4.95E-01
CO-56	Not Detected	-----	6.87E-02
CO-57	Not Detected	-----	6.71E-02
CO-58	Not Detected	-----	6.22E-02
CO-60	Not Detected	-----	7.62E-02
CR-51	Not Detected	-----	5.10E-01
CS-134	Not Detected	-----	1.10E-01
CS-137	Not Detected	-----	7.23E-02
CU-64	Not Detected	-----	8.21E+01
EU-152	Not Detected	-----	5.08E-01
EU-154	Not Detected	-----	3.68E-01
EU-155	Not Detected	-----	2.97E-01
FE-59	Not Detected	-----	1.38E-01
GD-153	Not Detected	-----	2.56E-01
HG-203	Not Detected	-----	6.38E-02
I-131	Not Detected	-----	6.71E-02
IN-115m	Not Detected	-----	1.43E+01
IR-192	Not Detected	-----	5.91E-02
K-40	1.49E+01	2.31	6.88E-01
LA-140	Not Detected	-----	1.39E-01
MN-54	Not Detected	-----	7.16E-02
MN-56	Not Detected	-----	2.37E+02
MO-99	Not Detected	-----	6.73E-01
NA-22	Not Detected	-----	8.46E-02
NA-24	Not Detected	-----	2.62E-01
NB-95	Not Detected	-----	4.54E-01
ND-147	Not Detected	-----	4.29E-01
NI-57	Not Detected	-----	1.71E-01
BE-7	Not Detected	-----	5.29E-01
RU-103	Not Detected	-----	5.45E-02
RU-106	Not Detected	-----	6.18E-01
SB-122	Not Detected	-----	1.08E-01
SB-124	Not Detected	-----	6.66E-02
SB-125	Not Detected	-----	1.84E-01
SC-46	Not Detected	-----	1.08E-01
SR-85	Not Detected	-----	7.95E-02
TA-182	Not Detected	-----	3.19E-01
TA-183	Not Detected	-----	1.14
TE-132	Not Detected	-----	7.41E-02
TL-201	Not Detected	-----	4.39E-01
XE-133	Not Detected	-----	4.29E-01
Y-88	Not Detected	-----	7.23E-02
ZN-65	Not Detected	-----	2.10E-01
ZR-95	Not Detected	-----	1.17E-01

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-21-95 9:07:29 AM *

 * Analyzed by: *JR 6/21/95* Reviewed by: *JR 6/21/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : LAB CONTROL SAMPLE ANALYSIS #CG134
 Lab Sample ID : 50046907

Sample Description : MIXED GAMMA_STANDARD
 Sample Type : Liquid
 Sample Geometry : WMAR
 Sample Quantity : 1.000 Each
 Sample Date/Time : 11-01-90 12:00:00 PM
 Acquire Start Date : 6-21-95 8:55:14 AM
 Detector Name : LAB02
 Elapsed Live Time : 600 seconds
 Elapsed Real Time : 606 seconds

Comments:

Nuclide	Activity (pCi/Each)	2S Error	MDA
U-238	Not Detected	-----	2.62E+04
TH-234	Not Detected	-----	5.14E+03
U-234	Not Detected	-----	1.26E+05
RA-226	Not Detected	-----	6.60E+03
PB-214	Not Detected	-----	7.48E+02
BI-214	Not Detected	-----	6.81E+02
PB-210	Not Detected	-----	6.71E+06
TH-232	Not Detected	-----	2.20E+03
RA-228	Not Detected	-----	3.01E+03
AC-228	Not Detected	-----	1.90E+03
TH-228	Not Detected	-----	4.04E+04
RA-224	Not Detected	-----	3.40E+04
PB-212	Not Detected	-----	3.13E+03
BI-212	Not Detected	-----	2.78E+04
TL-208	Not Detected	-----	5.58E+03
U-235	Not Detected	-----	1.98E+03
TH-231	Not Detected	-----	4.26E+03
PA-231	Not Detected	-----	1.05E+04
AC-227	Not Detected	-----	1.73E+04
TH-227	Not Detected	-----	2.62E+03
RA-223	Not Detected	-----	1.00E+26
RN-219	Not Detected	-----	3.22E+03
PB-211	Not Detected	-----	9.86E+03
TL-207	Not Detected	-----	2.32E+05
AM-241	9.34E+04	1.83E+04	7.16E+03
PU-239	Not Detected	-----	2.25E+06
NP-237	Not Detected	-----	2.99E+03
PA-233	Not Detected	-----	6.70E+02
TH-229	Not Detected	-----	2.41E+03

[Summary Report] - Sample ID: 50046907

Nuclide	Activity (pCi/Each)	2S Error	MDA
AG-110m	Not Detected	-----	1.80E+05
AR-41	Not Detected	-----	1.00E+26
BA-133	Not Detected	-----	5.93E+02
BA-140	Not Detected	-----	1.00E+26
CD-109	3.17E+05	8.68E+04	1.03E+05
CD-115	Not Detected	-----	1.00E+26
CE-139	Not Detected	-----	1.33E+06
CE-141	Not Detected	-----	2.15E+18
CE-144	Not Detected	-----	1.23E+05
CO-56	Not Detected	-----	1.71E+09
CO-57	1.53E+04	1.24E+04	1.95E+04
CO-58	Not Detected	-----	5.91E+09
CO-60	7.87E+04	1.02E+04	4.72E+02
CR-51	Not Detected	-----	6.34E+21
CS-134	Not Detected	-----	1.54E+03
CS-137	7.16E+04	9.24E+03	4.55E+02
CU-64	Not Detected	-----	1.00E+26
EU-152	Not Detected	-----	3.58E+03
EU-154	Not Detected	-----	2.45E+03
EU-155	Not Detected	-----	2.32E+03
FE-59	Not Detected	-----	2.72E+14
GD-153	Not Detected	-----	1.18E+05
HG-203	Not Detected	-----	2.60E+13
I-131	Not Detected	-----	1.00E+26
IN-115m	Not Detected	-----	1.00E+26
IR-192	Not Detected	-----	2.46E+09
K-40	Not Detected	-----	1.81E+03
LA-140	Not Detected	-----	1.00E+26
MN-54	Not Detected	-----	1.78E+04
MN-56	Not Detected	-----	1.00E+26
MO-99	Not Detected	-----	1.00E+26
NA-22	Not Detected	-----	9.19E+02
NA-24	Not Detected	-----	1.00E+26
NB-95	Not Detected	-----	1.00E+26
ND-147	Not Detected	-----	1.00E+26
NI-57	Not Detected	-----	1.00E+26
BE-7	Not Detected	-----	1.29E+13
RU-103	Not Detected	-----	3.48E+15
RU-106	Not Detected	-----	8.03E+04
SB-122	Not Detected	-----	1.00E+26
SB-124	Not Detected	-----	9.41E+10
SB-125	Not Detected	-----	3.83E+03
SC-46	Not Detected	-----	6.07E+08
SR-85	Not Detected	-----	2.77E+10
TA-182	Not Detected	-----	3.90E+07
TA-183	Not Detected	-----	1.00E+26
TE-132	Not Detected	-----	1.00E+26
TL-201	Not Detected	-----	1.00E+26
XE-133	Not Detected	-----	1.00E+26
Y-88	Not Detected	-----	1.15E+07
ZN-65	Not Detected	-----	1.27E+05
ZR-95	Not Detected	-----	6.00E+10

ER/1302 096/DAT

6

SMO ANALYTICAL DATA ROUTING FORM

Project Name: TAI Phase I Case Number: 3626400

SNL Task Leader: Miller Org/Mail Stop: 7582/1347

SMO Project Coordinator: Puissant Sample Ship Date: 6/23/95

ARCOG Lab Lab ID
03727 SNL 7715 500479
03725 " 500476
03722 " 500473

Date Results Received:

Preliminary: _____ Final: 6/27, 6/26, 6/22/95

Corrections Requested From Laboratory: _____ Requestor: _____

Date Corrections Received: _____

Date Assigned to SMO Reviewer: _____

COPY
ORIGINAL FILED IN
RECORDS CENTER BY
SMO WDM 7/10/95
(Initials) (Date)

Date Review Complete: _____

Signature: _____

Date of Preliminary Notification: _____

Person Notified: _____

Date of Final Transmittal: 7/10/95

Transmitted To: Miller

Transmitted By: WDM

Filed In Record Center: WDM

Comments: _____

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-21-95 11:47:02 AM *

 * Analyzed by: *James Cole 6/21/95* Reviewed by: *JR 6/21/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022892-05
 Lab Sample ID : 50047301

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 1SMAR
 Sample Quantity : 914.000 gram
 Sample Date/Time : 6-20-95 8:45:00 AM
 Acquire Start Date : 6-21-95 11:10:50 AM
 Detector Name : LAB01
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	2.00
TH-234	1.32	6.86E-01	6.02E-01
U-234	Not Detected	-----	1.69E+01
RA-226	1.60	5.49E-01	7.12E-01
PB-214	6.61E-01	1.16E-01	7.59E-02
BI-214	5.69E-01	1.04E-01	7.38E-02
PB-210	Not Detected	-----	4.57E+01
TH-232	5.77E-01	1.88E-01	2.26E-01
RA-228	5.39E-01	1.69E-01	1.77E-01
AC-228	6.91E-01	1.64E-01	1.45E-01
TH-228	4.72E-01	2.77E-01	6.46E-01
RA-224	1.66	3.94E-01	5.25E-01
PB-212	6.76E-01	1.26E-01	4.96E-02
BI-212	1.04	4.16E-01	5.43E-01
TL-208	6.56E-01	1.45E-01	1.37E-01
U-235	Not Detected	-----	2.97E-01
TH-231	Not Detected	-----	5.79E-01
PA-231	Not Detected	-----	1.81
AC-227	Not Detected	-----	2.27
TH-227	Not Detected	-----	4.91E-01
RA-223	Not Detected	-----	1.97E-01
RN-219	Not Detected	-----	3.20E-01
PB-211	Not Detected	-----	8.62E-01
TL-207	Not Detected	-----	1.79E+01
AM-241	Not Detected	-----	2.58E-01
PU-239	Not Detected	-----	3.38E+02
NP-237	Not Detected	-----	2.65E-01
PA-233	Not Detected	-----	7.97E-02
TH-229	Not Detected	-----	3.05E-01

[Summary Report] - Sample ID: 50047301

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	4.00E-02
AR-41	Not Detected	-----	1.38E+03
BA-133	Not Detected	-----	8.96E-02
BA-140	Not Detected	-----	1.59E-01
CD-109	Not Detected	-----	9.13E-01
CD-115	Not Detected	-----	1.22E-01
CE-139	Not Detected	-----	4.16E-02
CE-141	Not Detected	-----	6.93E-02
CE-144	Not Detected	-----	3.07E-01
CO-56	Not Detected	-----	4.76E-02
CO-57	Not Detected	-----	3.76E-02
CO-58	Not Detected	-----	4.20E-02
CO-60	Not Detected	-----	5.06E-02
CR-51	Not Detected	-----	3.20E-01
CS-134	Not Detected	-----	7.34E-02
CS-137	Not Detected	-----	4.65E-02
CU-64	Not Detected	-----	4.20E+01
EU-152	Not Detected	-----	3.51E-01
EU-154	Not Detected	-----	2.48E-01
EU-155	Not Detected	-----	1.55E-01
FE-59	Not Detected	-----	9.28E-02
GD-153	Not Detected	-----	1.31E-01
HG-203	Not Detected	-----	4.08E-02
I-131	Not Detected	-----	4.47E-02
IN-115m	Not Detected	-----	5.39
IR-192	Not Detected	-----	3.77E-02
K-40	1.23E+01	1.83	5.01E-01
LA-140	Not Detected	-----	7.72E-02
MN-54	Not Detected	-----	4.78E-02
MN-56	Not Detected	-----	6.19E+01
MO-99	Not Detected	-----	4.26E-01
NA-22	Not Detected	-----	5.70E-02
NA-24	Not Detected	-----	1.55E-01
NB-95	Not Detected	-----	2.82E-01
ND-147	Not Detected	-----	2.75E-01
NI-57	Not Detected	-----	1.07E-01
BE-7	Not Detected	-----	3.35E-01
RU-103	Not Detected	-----	3.86E-02
RU-106	Not Detected	-----	3.84E-01
SB-122	Not Detected	-----	7.49E-02
SB-124	Not Detected	-----	4.80E-02
SB-125	Not Detected	-----	1.14E-01
SC-46	Not Detected	-----	7.48E-02
SR-85	Not Detected	-----	5.10E-02
TA-182	Not Detected	-----	2.18E-01
TA-183	Not Detected	-----	2.57E-01
TE-132	Not Detected	-----	4.77E-02
TL-201	Not Detected	-----	1.70E-01
XE-133	Not Detected	-----	2.04E-01
Y-88	Not Detected	-----	4.09E-02
ZN-65	Not Detected	-----	1.48E-01
ZR-95	Not Detected	-----	8.07E-02

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-26-95 2:34:48 PM *

 * Analyzed by: *George Cole 6/26/95* Reviewed by: *[Signature] 6/26/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : LAB CONTROL SAMPLE ANALYSIS #CG134
 Lab Sample ID : 50047906

Sample Description : MIXED GAMMA_STANDARD
 Sample Type : Liquid
 Sample Geometry : WMAR
 Sample Quantity : 1.000 Each
 Sample Date/Time : 11-01-90 12:00:00 PM
 Acquire Start Date : 6-26-95 2:21:11 PM
 Detector Name : LAB01
 Elapsed Live Time : 600 seconds
 Elapsed Real Time : 608 seconds

Comments:

Nuclide	Activity (pCi/Each)	2S Error	MDA
U-238	Not Detected	-----	2.55E+04
TH-234	Not Detected	-----	3.93E+03
U-234	Not Detected	-----	1.12E+05
RA-226	Not Detected	-----	6.00E+03
PB-214	Not Detected	-----	7.05E+02
BI-214	Not Detected	-----	6.24E+02
PB-210	Not Detected	-----	1.27E+06
TH-232	Not Detected	-----	2.10E+03
RA-228	Not Detected	-----	2.70E+03
AC-228	Not Detected	-----	1.71E+03
TH-228	Not Detected	-----	3.70E+04
RA-224	Not Detected	-----	3.07E+04
PB-212	Not Detected	-----	2.80E+03
BI-212	Not Detected	-----	2.50E+04
TL-208	Not Detected	-----	5.12E+03
U-235	Not Detected	-----	1.63E+03
TH-231	Not Detected	-----	2.74E+03
PA-231	Not Detected	-----	9.56E+03
AC-227	Not Detected	-----	1.46E+04
TH-227	Not Detected	-----	2.36E+03
RA-223	Not Detected	-----	1.00E+26
RN-219	Not Detected	-----	2.93E+03
PB-211	Not Detected	-----	8.98E+03
TL-207	Not Detected	-----	2.15E+05
AM-241	1.10E+05	1.75E+04	2.19E+03
PU-239	7.00E+05	5.05E+05	1.21E+06
NP-237	Not Detected	-----	1.84E+03
PA-233	Not Detected	-----	6.28E+02
TH-229	Not Detected	-----	1.58E+03

[Summary Report] - Sample ID: 50047906

Nuclide	Activity (pCi/Each)	2S Error	MDA
AG-110m	Not Detected	-----	1.62E+05
AR-41	Not Detected	-----	1.00E+26
BA-133	Not Detected	-----	5.58E+02
BA-140	Not Detected	-----	1.00E+26
CD-109	3.47E+05	7.37E+04	7.06E+04
CD-115	Not Detected	-----	1.00E+26
CE-139	Not Detected	-----	1.24E+06
CE-141	Not Detected	-----	1.98E+18
CE-144	Not Detected	-----	9.90E+04
CO-56	Not Detected	-----	1.65E+09
CO-57	1.28E+04	6.68E+03	1.07E+04
CO-58	Not Detected	-----	5.93E+09
CO-60	7.34E+04	9.53E+03	4.47E+02
CR-51	Not Detected	-----	6.77E+21
CS-134	Not Detected	-----	1.41E+03
CS-137	6.85E+04	8.83E+03	3.97E+02
CU-64	Not Detected	-----	1.00E+26
EU-152	Not Detected	-----	3.36E+03
EU-154	Not Detected	-----	2.21E+03
EU-155	Not Detected	-----	1.59E+03
FE-59	Not Detected	-----	2.65E+14
GD-153	Not Detected	-----	7.70E+04
HG-203	Not Detected	-----	2.58E+13
I-131	Not Detected	-----	1.00E+26
IN-115m	Not Detected	-----	1.00E+26
IR-192	Not Detected	-----	2.45E+09
K-40	Not Detected	-----	1.61E+03
LA-140	Not Detected	-----	1.00E+26
MN-54	Not Detected	-----	1.67E+04
MN-56	Not Detected	-----	1.00E+26
MO-99	Not Detected	-----	1.00E+26
NA-22	Not Detected	-----	8.08E+02
NA-24	Not Detected	-----	1.00E+26
NB-95	Not Detected	-----	1.00E+26
ND-147	Not Detected	-----	1.00E+26
NI-57	Not Detected	-----	1.00E+26
BE-7	Not Detected	-----	1.29E+13
RU-103	Not Detected	-----	3.61E+15
RU-106	Not Detected	-----	7.16E+04
SB-122	Not Detected	-----	1.00E+26
SB-124	Not Detected	-----	9.18E+10
SB-125	Not Detected	-----	3.53E+03
SC-46	Not Detected	-----	5.62E+08
SR-85	Not Detected	-----	2.74E+10
TA-182	Not Detected	-----	3.55E+07
TA-183	Not Detected	-----	1.00E+26
TE-132	Not Detected	-----	1.00E+26
TL-201	Not Detected	-----	1.00E+26
XE-133	Not Detected	-----	1.00E+26
Y-88	Not Detected	-----	1.22E+07
ZN-65	Not Detected	-----	1.16E+05
ZR-95	Not Detected	-----	5.80E+10

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program *
 * Quality Assurance Report *

Report Date : 6-26-95 2:39:35 PM
 QA File : C:\GENIEPC\CAMFILES\LCS1.QAF
 Analyst : MEC
 Sample ID : 50047906
 Sample Quantity : 1.00 Each
 Sample Date : 11-01-90 12:00:00 PM
 Measurement Date : 6-26-95 2:21:11 PM
 Elapsed Live Time : 600 seconds
 Elapsed Real Time : 608 seconds

Parameter	Mean	1S Error	New Value	<	LU	:	SD	:	UD	:	BS	>
AM-241 Activity	1.127E-01	4.846E-03	1.104E-01	<	:	:	Ac:	:	:	:	:	>
CS-137 Activity	6.832E-02	2.103E-03	6.848E-02	<	:	:	O.K.:	:	:	:	:	>
CO-60 Activity	7.665E-02	2.914E-03	7.293E-02	<	:	:	In:	:	:	:	:	>

Flags Key: LU = Boundary Test (Ab = Above, Be = Below)
 SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
 UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
 BS = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: Spencer Cole 6/26/95

SMO ANALYTICAL DATA ROUTING FORM

Project Name: TAT Phase I Case Number: 3626400

SNL Task Leader: Miller Org/Mail Stop: 7582/1347

SMO Project Coordinator: Puissant Sample Ship Date: 6/27/95

ARCOC Lab Lab ID
03731 SNL 7715 500491
03733 " 500495
03728 " 500488

Date Results Received:

Preliminary: _____ Final: 6/29, 6/29, 6/28/95

Corrections Requested From Laboratory: _____ Request _____

Date Corrections Received: _____

Date Assigned to SMO Reviewer: _____

Reviewer: _____

Date Review Complete: _____

Signature: _____

Date of Preliminary Notification: _____

Person Notified: _____

Date of Final Transmittal: 7/10/95

Transmitted To: Miller

Transmitted By: h/AM

Filed In Record Center: AM

Comments: _____

ORIGINAL FILED IN COPY RECORDS CENTER BY SMO [initials] 7/10/95



To be completed by Customer

Shaded areas are for RPSD use only

Customer: <u>D. Major / H. Flood</u>	Hazards/Special Instructions: <u>Please note SMO upon completion @ 845-0867</u>	Batch Log Number: <u>500495</u>
Organization: <u>7582</u>		Logged By: <u>JM</u>
Project Location: <u>1A-1</u>		Analysis Type: <input checked="" type="checkbox"/> Gamma Spec <input type="checkbox"/> H-3 <input type="checkbox"/> Alpha/Beta <input type="checkbox"/> Alpha Spec <input type="checkbox"/> Total U <input type="checkbox"/> Other
Phone: <u>645-0867</u>		
Date Results Needed: <u>6/30/95</u>		
Suspect Isotopes:		
Other Information: <u>03733</u>		
LIMS Login	Results Faxed	Sample Disposal

Customer Sample ID	Sample Type	Date/Time Collected	Sample Volume	Requested Analysis	RPSD Sample ID	Rad Scan CPM	Sample Weight	Remarks
<u>022953-05</u>	<u>S</u>	<u>6/20/95-10:30</u>	<u>500ml</u>	<u>Gamma spec.</u>	<u>01</u>	<u>2300</u>	<u>624g</u>	
<u>LCS</u>		<u>1/20/90</u>		<u>8 spec</u>	<u>02</u>	<u>NA</u>	<u>NA</u>	

Relinquished by <u>D. Major</u>	Date <u>6/20/95</u>	Time <u>13:19</u>	Received by <u>JM</u>	Date <u>6/28/95</u>	Time <u>1319</u>
Relinquished by <u>JM</u>	Date <u>6/29/95</u>	Time <u>1055</u>	Received by <u>JM</u>	Date <u>6-29-95</u>	Time <u>1055</u>
Relinquished by _____	Date _____	Time _____	Received by _____	Date _____	Time _____
Relinquished by _____	Date _____	Time _____	Received by _____	Date _____	Time _____

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-29-95 1:21:09 AM *

 * Analyzed by: *JR* 6/29/95 Reviewed by: *JR* 6/29/95 *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022953-05
 Lab Sample ID : 50049501

Sample Description : MARINELLI SOLID SAMPLE
 Sample Type : Solid
 Sample Geometry : 2SMAR
 Sample Quantity : 624.000 gram
 Sample Date/Time : 6-28-95 10:50:00 PM
 Acquire Start Date : 6-29-95 12:48:35 AM
 Detector Name : LAB02
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	6.88
TH-234	1.38	9.36E-01	1.34
U-234	Not Detected	-----	2.64E+01
RA-226	1.49	8.19E-01	1.20
PB-214	8.71E-01	1.92E-01	1.95E-01
BI-214	7.78E-01	1.57E-01	1.31E-01
PB-210	Not Detected	-----	4.29E+02
TH-232	5.56E-01	3.20E-01	4.71E-01
RA-228	7.17E-01	2.94E-01	3.76E-01
AC-228	6.64E-01	2.38E-01	2.97E-01
TH-228	8.73E-01	4.45E-01	9.33E-01
RA-224	2.27	6.22E-01	9.41E-01
PB-212	8.68E-01	1.88E-01	8.93E-02
BI-212	1.19	5.25E-01	6.76E-01
TL-208	6.87E-01	1.66E-01	1.52E-01
U-235	Not Detected	-----	5.10E-01
TH-231	Not Detected	-----	1.24
PA-231	Not Detected	-----	2.80
AC-227	Not Detected	-----	3.62
TH-227	Not Detected	-----	7.64E-01
RA-223	Not Detected	-----	3.84E-01
RN-219	Not Detected	-----	6.23E-01
PB-211	Not Detected	-----	1.47
TL-207	Not Detected	-----	3.06E+01
AM-241	Not Detected	-----	1.06
PU-239	Not Detected	-----	5.91E+02
NP-237	Not Detected	-----	6.01E-01
PA-233	Not Detected	-----	1.24E-01
TH-229	Not Detected	-----	6.41E-01

[Summary Report] - Sample ID: 50049501

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	6.04E-02
AR-41	Not Detected	-----	1.80E-01
BA-133	Not Detected	-----	1.36E-01
BA-140	Not Detected	-----	2.27E-01
CD-109	Not Detected	-----	2.06
CD-115	Not Detected	-----	1.35E-01
CE-139	Not Detected	-----	6.60E-02
CE-141	Not Detected	-----	1.13E-01
CE-144	Not Detected	-----	5.13E-01
CO-56	Not Detected	-----	7.18E-02
CO-57	Not Detected	-----	6.85E-02
CO-58	Not Detected	-----	6.57E-02
CO-60	Not Detected	-----	7.88E-02
CR-51	Not Detected	-----	4.81E-01
CS-134	Not Detected	-----	1.08E-01
CS-137	Not Detected	-----	7.59E-02
CU-64	Not Detected	-----	1.83E+01
EU-152	Not Detected	-----	5.09E-01
EU-154	Not Detected	-----	3.72E-01
EU-155	Not Detected	-----	3.07E-01
FE-59	Not Detected	-----	1.42E-01
GD-153	Not Detected	-----	2.51E-01
HG-203	Not Detected	-----	6.29E-02
I-131	Not Detected	-----	5.87E-02
IN-115m	Not Detected	-----	1.88E-01
IR-192	Not Detected	-----	5.69E-02
K-40	1.66E+01	2.53	6.07E-01
LA-140	Not Detected	-----	8.22E-02
MN-54	Not Detected	-----	6.80E-02
MN-56	Not Detected	-----	1.32E-01
MO-99	Not Detected	-----	5.10E-01
NA-22	Not Detected	-----	8.93E-02
NA-24	Not Detected	-----	8.07E-02
NB-95	Not Detected	-----	3.60E-01
ND-147	Not Detected	-----	4.39E-01
NI-57	Not Detected	-----	1.07E-01
BE-7	Not Detected	-----	4.96E-01
RU-103	Not Detected	-----	5.72E-02
RU-106	Not Detected	-----	6.35E-01
SB-122	Not Detected	-----	8.57E-02
SB-124	Not Detected	-----	6.63E-02
SB-125	Not Detected	-----	1.78E-01
SC-46	Not Detected	-----	1.15E-01
SR-85	Not Detected	-----	7.78E-02
TA-182	Not Detected	-----	3.40E-01
TA-183	Not Detected	-----	9.33E-01
TE-132	Not Detected	-----	6.05E-02
TL-201	Not Detected	-----	3.34E-01
XE-133	Not Detected	-----	2.91E-01
Y-88	Not Detected	-----	5.07E-02
ZN-65	Not Detected	-----	2.24E-01
ZR-95	Not Detected	-----	1.14E-01

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-29-95 7:28:33 AM *

 * Analyzed by: *JR 6/29/95* Reviewed by: *JR 6/29/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : LAB CONTROL SAMPLE ANALYSIS #CG134
 Lab Sample ID : 50049502

Sample Description : MIXED GAMMA_STANDARD
 Sample Type : Liquid
 Sample Geometry : WMAR
 Sample Quantity : 1.000 Each
 Sample Date/Time : 11-01-90 12:00:00 PM
 Acquire Start Date : 6-29-95 7:14:54 AM
 Detector Name : LAB02
 Elapsed Live Time : 600 seconds
 Elapsed Real Time : 606 seconds

Comments:

Nuclide	Activity (pCi/Each)	2S Error	MDA
U-238	Not Detected	-----	2.58E+04
TH-234	Not Detected	-----	5.36E+03
U-234	Not Detected	-----	1.25E+05
RA-226	Not Detected	-----	6.59E+03
PB-214	Not Detected	-----	7.43E+02
BI-214	Not Detected	-----	6.60E+02
PB-210	Not Detected	-----	6.75E+06
TH-232	Not Detected	-----	2.21E+03
RA-228	Not Detected	-----	3.06E+03
AC-228	Not Detected	-----	1.91E+03
TH-228	Not Detected	-----	4.08E+04
RA-224	Not Detected	-----	3.43E+04
PB-212	Not Detected	-----	3.13E+03
BI-212	Not Detected	-----	2.73E+04
TL-208	Not Detected	-----	5.46E+03
U-235	Not Detected	-----	1.98E+03
TH-231	Not Detected	-----	4.34E+03
PA-231	Not Detected	-----	1.05E+04
AC-227	Not Detected	-----	1.70E+04
TH-227	Not Detected	-----	2.60E+03
RA-223	Not Detected	-----	1.00E+26
RN-219	Not Detected	-----	3.21E+03
PB-211	Not Detected	-----	9.82E+03
TL-207	Not Detected	-----	2.39E+05
AM-241	9.85E+04	1.93E+04	7.53E+03
PU-239	Not Detected	-----	2.25E+06
NP-237	Not Detected	-----	2.98E+03
PA-233	Not Detected	-----	6.67E+02
TH-229	Not Detected	-----	2.43E+03

[Summary Report] - Sample ID: 50049502

Nuclide	Activity (pCi/Each)	2S Error	MDA
AG-110m	Not Detected	-----	1.83E+05
AR-41	Not Detected	-----	1.00E+26
BA-133	Not Detected	-----	5.79E+02
BA-140	Not Detected	-----	1.00E+26
CD-109	3.39E+05	1.13E+05	1.51E+05
CD-115	Not Detected	-----	1.00E+26
CE-139	Not Detected	-----	1.42E+06
CE-141	Not Detected	-----	2.52E+18
CE-144	Not Detected	-----	1.26E+05
CO-56	Not Detected	-----	1.82E+09
CO-57	1.35E+04	1.04E+04	1.63E+04
CO-58	Not Detected	-----	6.51E+09
CO-60	7.75E+04	1.01E+04	5.29E+02
CR-51	Not Detected	-----	7.73E+21
CS-134	Not Detected	-----	1.49E+03
CS-137	7.11E+04	9.18E+03	3.72E+02
CU-64	Not Detected	-----	1.00E+26
EU-152	Not Detected	-----	3.65E+03
EU-154	Not Detected	-----	2.44E+03
EU-155	Not Detected	-----	2.33E+03
FE-59	Not Detected	-----	2.98E+14
GD-153	Not Detected	-----	1.24E+05
HG-203	Not Detected	-----	3.00E+13
I-131	Not Detected	-----	1.00E+26
IN-115m	Not Detected	-----	1.00E+26
IR-192	Not Detected	-----	2.69E+09
K-40	Not Detected	-----	1.95E+03
LA-140	Not Detected	-----	1.00E+26
MN-54	Not Detected	-----	1.77E+04
MN-56	Not Detected	-----	1.00E+26
MO-99	Not Detected	-----	1.00E+26
NA-22	Not Detected	-----	8.96E+02
NA-24	Not Detected	-----	1.00E+26
NB-95	Not Detected	-----	1.00E+26
ND-147	Not Detected	-----	1.00E+26
NI-57	Not Detected	-----	1.00E+26
BE-7	Not Detected	-----	1.44E+13
RU-103	Not Detected	-----	3.86E+15
RU-106	Not Detected	-----	8.36E+04
SB-122	Not Detected	-----	1.00E+26
SB-124	Not Detected	-----	9.90E+10
SB-125	Not Detected	-----	3.86E+03
SC-46	Not Detected	-----	6.27E+08
SR-85	Not Detected	-----	3.07E+10
TA-182	Not Detected	-----	3.99E+07
TA-183	Not Detected	-----	1.00E+26
TE-132	Not Detected	-----	1.00E+26
TL-201	Not Detected	-----	1.00E+26
XE-133	Not Detected	-----	1.00E+26
Y-88	Not Detected	-----	1.23E+07
ZN-65	Not Detected	-----	1.28E+05
ZR-95	Not Detected	-----	6.40E+10

EK/1302

096 / DAT

10

SMO ANALYTICAL DATA ROUTING FORM

Project Name: TPI Phase I Case Number: 3626400

SNL Task Leader: Miller Org/Mail Stop: 7584 / 1148

SMO Project Coordinator: Puissant Sample Ship Date: 7/18/95

ARCOG Lab Lab ID 7/14/95
7/10/95

03795 7715 500560

03791 " 500547

03735 " 500525

Date Results Received:

Preliminary: _____ Final: 7/20/95, 7/17/95, 7/12/95

Corrections Requested From Laboratory: _____ Requestor: _____

Date Corrections Received: _____

Date Assigned to SMO Reviewer: _____ Reviewer: _____

Date Review Complete: _____ Signature: _____

Date of Preliminary Notification: _____ Person Notified: _____

Date of Final Transmittal: 8/16/95 Transmitted To: Miller

Transmitted By: [Signature] Filed In Record Center: [Signature]

Comments: _____

ANALYSIS REQUEST AND CHAIN OF CUSTODY

AR/COC-03735

RP 2001-COC (3-91)

500525

Dept. No./Mail Stop: 7582 / 1347 Project/Task Manager: D. Miller / H. Fleck Project Name: TA-1 Soil Sampling (Phase 1) Record Center Code: ADS 1302 ER Site 96 Logbook Ref No: 0133		Date Samples Shipped: 7/10/95 Carrier/Waybill No.: Hand Delivered Lab Contact: Amir M. Fleck Lab Destination: 7715 SMO Contact/Phone: D. MacLaughlin / 845-0967 Send Report to SMO: Deborah McLaughlin		Contract No.: N/A Case No.: 3626400 SMO Authorization: None Bill to: Sandia National Laboratories Supplier Services Department P.O. Box 5800 MS 0154 Albuquerque, NM 87185-0154		Parameter & Method Requested																																																																
SMO Reference No.: CF0089		Location: Tech Area outside TA-1 Building: 821, 884, 958 Room: outside		<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Sample No. - Fraction</th> <th rowspan="2">ER Sample ID or Sample Location Detail</th> <th rowspan="2">Beginning Depth in Ft.</th> <th rowspan="2">ER Site No.</th> <th rowspan="2">Date/Time Collected</th> <th colspan="2">Reference LOV (available at SMO)</th> <th rowspan="2">Preservative</th> <th rowspan="2">Sample Collection Method</th> <th rowspan="2">Sample Type</th> <th rowspan="2">Lab Sample ID</th> </tr> <tr> <th>Matrix</th> <th>Container (Type, Volume)</th> </tr> </thead> <tbody> <tr> <td>022956-05</td> <td>11076-GP-046-004-S</td> <td>8'</td> <td>76</td> <td>7/10/95 - 10:00</td> <td>S</td> <td>P 500ml</td> <td>None</td> <td>G</td> <td>SA</td> <td>X</td> </tr> <tr> <td>022957-05</td> <td>11096-GP-047-006-S</td> <td>9'</td> <td></td> <td>11:15</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>X</td> </tr> <tr> <td>022958-05</td> <td>11076-GP-048-007-S</td> <td>11'</td> <td></td> <td>13:15</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>X</td> </tr> <tr> <td>022959-05</td> <td>11096-GP-049-007-S</td> <td>11'</td> <td></td> <td>13:55</td> <td></td> <td></td> <td></td> <td></td> <td>PU</td> <td>X</td> </tr> </tbody> </table>										Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Reference LOV (available at SMO)		Preservative	Sample Collection Method	Sample Type	Lab Sample ID	Matrix	Container (Type, Volume)	022956-05	11076-GP-046-004-S	8'	76	7/10/95 - 10:00	S	P 500ml	None	G	SA	X	022957-05	11096-GP-047-006-S	9'		11:15						X	022958-05	11076-GP-048-007-S	11'		13:15						X	022959-05	11096-GP-049-007-S	11'		13:55					PU	X
Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth in Ft.	ER Site No.																Date/Time Collected	Reference LOV (available at SMO)					Preservative	Sample Collection Method	Sample Type	Lab Sample ID																																										
				Matrix	Container (Type, Volume)																																																																	
022956-05	11076-GP-046-004-S	8'	76	7/10/95 - 10:00	S	P 500ml	None	G	SA	X																																																												
022957-05	11096-GP-047-006-S	9'		11:15						X																																																												
022958-05	11076-GP-048-007-S	11'		13:15						X																																																												
022959-05	11096-GP-049-007-S	11'		13:55					PU	X																																																												
RMMA <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Ref. No. _____		Sample Tracking Date Entered (mm/dd/yy): 7/13/95 Entered by: [Signature]		Special Instructions/OC Requirements Please call Sand when complete.					Abnormal Conditions on Receipt																																																													
Sample Disposal <input checked="" type="checkbox"/> Return to Client <input type="checkbox"/> Disposal by lab		Turnaround Time <input checked="" type="checkbox"/> Normal <input type="checkbox"/> Rush Required Report Date _____		QC Inits: _____																																																																		
Sample Team Members Name: Matthew Shain Signature: [Signature] Init: MS Company/Organization: IT Corp / 7582																																																																						
1. Relinquished by [Signature] Org. 7582 Date 7/10/95 Time 15:00		1. Received by [Signature] Org. 7513/IC Date 7/10/95 Time 15:00		4. Relinquished by _____ Org. _____ Date _____ Time _____		4. Received by _____ Org. _____ Date _____ Time _____		2. Relinquished by [Signature] Org. 7513/IC Date 7/10/95 Time 15:30		2. Received by [Signature] Org. 7715 Date 7/10/95 Time 15:30		5. Relinquished by _____ Org. _____ Date _____ Time _____		5. Received by _____ Org. _____ Date _____ Time _____																																																								
3. Relinquished by [Signature] Org. SMU 7715 Date 7/12/95 Time 12:00		3. Received by [Signature] Org. SMU 75 Date 7-12-95 Time 12:00		6. Relinquished by _____ Org. _____ Date _____ Time _____		6. Received by _____ Org. _____ Date _____ Time _____																																																																

GAMMA. SAC

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 7-11-95 4:25:44 PM *

 * Analyzed by: *JR* 7/12/95 Reviewed by: *JR* 7/12/95 *

Customer : D.MILLER/D.BISWELL (7582/SMO)
 Customer Sample ID : 022956-05
 Lab Sample ID : 50052501

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 2SMAR
 Sample Quantity : 895.000 gram
 Sample Date/Time : 7-10-95 10:00:00 AM
 Acquire Start Date : 7-11-95 3:50:26 PM
 Detector Name : LAB02
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	4.77
TH-234	Not Detected	-----	1.11
U-234	Not Detected	-----	1.87E+01
RA-226	1.36	7.05E-01	1.03
PB-214	6.62E-01	1.35E-01	1.19E-01
BI-214	5.05E-01	1.00E-01	7.84E-02
PB-210	Not Detected	-----	4.49E+02
TH-232	6.50E-01	2.26E-01	2.79E-01
RA-228	4.80E-01	1.94E-01	2.45E-01
AC-228	6.65E-01	1.63E-01	1.42E-01
TH-228	Not Detected	-----	1.13
RA-224	Not Detected	-----	6.15E-01
PB-212	6.17E-01	1.34E-01	5.82E-02
BI-212	6.81E-01	3.78E-01	5.36E-01
TL-208	6.01E-01	1.26E-01	9.06E-02
U-235	Not Detected	-----	3.38E-01
TH-231	Not Detected	-----	8.38E-01
PA-231	Not Detected	-----	1.57
AC-227	Not Detected	-----	2.43
TH-227	Not Detected	-----	5.08E-01
RA-223	Not Detected	-----	2.87E-01
RN-219	Not Detected	-----	4.03E-01
PB-211	Not Detected	-----	8.99E-01
TL-207	Not Detected	-----	2.13E+01
AM-241	Not Detected	-----	7.95E-01
PU-239	Not Detected	-----	4.01E+02
NP-237	Not Detected	-----	5.35E-01
PA-233	Not Detected	-----	8.44E-02
TH-229	Not Detected	-----	4.00E-01

[Summary Report] - Sample ID: 50052501

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	4.31E-02
AR-41	Not Detected	-----	5.66E+03
BA-133	Not Detected	-----	9.06E-02
BA-140	Not Detected	-----	1.65E-01
CD-109	Not Detected	-----	1.85
CD-115	Not Detected	-----	1.44E-01
CE-139	Not Detected	-----	4.41E-02
CE-141	Not Detected	-----	8.07E-02
CE-144	Not Detected	-----	3.49E-01
CO-56	Not Detected	-----	5.27E-02
CO-57	Not Detected	-----	4.40E-02
CO-58	Not Detected	-----	4.43E-02
CO-60	Not Detected	-----	5.54E-02
CR-51	Not Detected	-----	3.27E-01
CS-134	Not Detected	-----	7.21E-02
CS-137	Not Detected	-----	4.95E-02
CU-64	Not Detected	-----	5.66E+01
EU-152	Not Detected	-----	3.75E-01
EU-154	Not Detected	-----	2.65E-01
EU-155	Not Detected	-----	2.06E-01
FE-59	Not Detected	-----	1.10E-01
GD-153	Not Detected	-----	1.58E-01
HG-203	Not Detected	-----	4.34E-02
I-131	Not Detected	-----	4.81E-02
IN-115m	Not Detected	-----	1.03E+01
IR-192	Not Detected	-----	4.08E-02
K-40	1.62E+01	2.37	4.61E-01
LA-140	Not Detected	-----	8.48E-02
MN-54	Not Detected	-----	4.95E-02
MN-56	Not Detected	-----	1.71E+02
MO-99	Not Detected	-----	4.95E-01
NA-22	Not Detected	-----	6.68E-02
NA-24	Not Detected	-----	1.97E-01
NB-95	Not Detected	-----	2.92E-01
ND-147	Not Detected	-----	3.18E-01
NI-57	Not Detected	-----	1.33E-01
BE-7	Not Detected	-----	3.61E-01
RU-103	Not Detected	-----	4.12E-02
RU-106	Not Detected	-----	4.03E-01
SB-122	Not Detected	-----	7.95E-02
SB-124	Not Detected	-----	4.51E-02
SB-125	Not Detected	-----	1.16E-01
SC-46	Not Detected	-----	8.03E-02
SR-85	Not Detected	-----	5.28E-02
TA-182	Not Detected	-----	2.38E-01
TA-183	Not Detected	-----	8.16E-01
TE-132	Not Detected	-----	5.26E-02
TL-201	Not Detected	-----	3.16E-01
XE-133	Not Detected	-----	2.78E-01
Y-88	Not Detected	-----	4.06E-02
ZN-65	Not Detected	-----	1.53E-01
ZR-95	Not Detected	-----	8.90E-02

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 7-11-95 5:39:37 PM *

 * Analyzed by: *DR 7/12/95* Reviewed by: *DR 7/12/95* *

Customer : D.MILLER/D.BISWELL (7582/SMO)
 Customer Sample ID : 022957-05
 Lab Sample ID : 50052502

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 2SMAR
 Sample Quantity : 822.000 gram
 Sample Date/Time : 7-10-95 11:15:00 AM
 Acquire Start Date : 7-11-95 5:06:41 PM
 Detector Name : LAB02
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	5.39
TH-234	6.64E-01	3.95E-01	7.90E-01
U-234	Not Detected	-----	1.98E+01
RA-226	1.47	7.11E-01	1.02
PB-214	7.21E-01	1.37E-01	9.93E-02
BI-214	6.24E-01	1.16E-01	7.82E-02
PB-210	Not Detected	-----	4.95E+02
TH-232	5.76E-01	2.53E-01	3.49E-01
RA-228	6.71E-01	2.58E-01	2.13E-01
AC-228	Not Detected	-----	3.13E-01
TH-228	6.07E-01	3.37E-01	7.31E-01
RA-224	Not Detected	-----	7.23E-01
PB-212	7.09E-01	1.46E-01	6.89E-02
BI-212	7.49E-01	4.43E-01	6.43E-01
TL-208	5.88E-01	1.32E-01	1.12E-01
U-235	Not Detected	-----	3.80E-01
TH-231	Not Detected	-----	9.60E-01
PA-231	Not Detected	-----	1.74
AC-227	Not Detected	-----	2.82
TH-227	Not Detected	-----	5.74E-01
RA-223	Not Detected	-----	3.25E-01
RN-219	Not Detected	-----	4.39E-01
PB-211	Not Detected	-----	9.95E-01
TL-207	Not Detected	-----	2.27E+01
AM-241	Not Detected	-----	9.45E-01
PU-239	Not Detected	-----	4.25E+02
NP-237	Not Detected	-----	6.08E-01
PA-233	Not Detected	-----	9.57E-02
TH-229	Not Detected	-----	4.49E-01

[Summary Report] - Sample ID: 50052502

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	5.09E-02
AR-41	Not Detected	-----	6.00E+03
BA-133	Not Detected	-----	9.84E-02
BA-140	Not Detected	-----	1.98E-01
CD-109	Not Detected	-----	2.00
CD-115	Not Detected	-----	1.56E-01
CE-139	Not Detected	-----	4.91E-02
CE-141	Not Detected	-----	8.91E-02
CE-144	Not Detected	-----	3.79E-01
CO-56	Not Detected	-----	5.70E-02
CO-57	Not Detected	-----	4.73E-02
CO-58	Not Detected	-----	5.43E-02
CO-60	Not Detected	-----	6.11E-02
CR-51	Not Detected	-----	3.86E-01
CS-134	Not Detected	-----	7.93E-02
CS-137	Not Detected	-----	5.96E-02
CU-64	Not Detected	-----	5.54E+01
EU-152	Not Detected	-----	3.85E-01
EU-154	Not Detected	-----	2.79E-01
EU-155	Not Detected	-----	2.23E-01
FE-59	Not Detected	-----	1.25E-01
GD-153	Not Detected	-----	1.76E-01
HG-203	Not Detected	-----	4.76E-02
I-131	Not Detected	-----	5.21E-02
IN-115m	Not Detected	-----	1.12E+01
IR-192	Not Detected	-----	4.48E-02
K-40	1.96E+01	2.83	4.45E-01
LA-140	Not Detected	-----	8.80E-02
MN-54	Not Detected	-----	5.85E-02
MN-56	Not Detected	-----	1.86E+02
MO-99	Not Detected	-----	5.50E-01
NA-22	Not Detected	-----	7.13E-02
NA-24	Not Detected	-----	2.18E-01
NB-95	Not Detected	-----	3.31E-01
ND-147	Not Detected	-----	3.51E-01
NI-57	Not Detected	-----	1.48E-01
BE-7	Not Detected	-----	4.04E-01
RU-103	Not Detected	-----	4.50E-02
RU-106	Not Detected	-----	4.80E-01
SB-122	Not Detected	-----	8.20E-02
SB-124	Not Detected	-----	4.71E-02
SB-125	Not Detected	-----	1.24E-01
SC-46	Not Detected	-----	8.55E-02
SR-85	Not Detected	-----	5.88E-02
TA-182	Not Detected	-----	2.52E-01
TA-183	Not Detected	-----	9.70E-01
TE-132	Not Detected	-----	5.53E-02
TL-201	Not Detected	-----	3.47E-01
XE-133	Not Detected	-----	2.99E-01
Y-88	Not Detected	-----	4.22E-02
ZN-65	Not Detected	-----	1.70E-01
ZR-95	Not Detected	-----	9.12E-02

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 7-12-95 6:15:51 AM *

 * Analyzed by: *JR 7/12/95* Reviewed by: *JR 7/12/95* *

Customer : D.MILLER/D.BISWELL (7582/SMO)
 Customer Sample ID : 022958-05
 Lab Sample ID : 50052503

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 2SMAR
 Sample Quantity : 835.000 gram
 Sample Date/Time : 7-10-95 1:15:00 PM
 Acquire Start Date : 7-12-95 5:43:25 AM
 Detector Name : LAB02
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	5.15
TH-234	Not Detected	-----	1.15
U-234	Not Detected	-----	1.86E+01
RA-226	1.70	8.58E-01	1.26
PB-214	7.39E-01	1.35E-01	8.02E-02
BI-214	5.39E-01	1.11E-01	9.68E-02
PB-210	Not Detected	-----	4.86E+02
TH-232	6.64E-01	2.16E-01	2.49E-01
RA-228	5.43E-01	3.34E-01	2.36E-01
AC-228	Not Detected	-----	3.08E-01
TH-228	6.16E-01	3.21E-01	7.01E-01
RA-224	Not Detected	-----	6.34E-01
PB-212	7.13E-01	1.44E-01	6.36E-02
BI-212	8.59E-01	3.63E-01	4.55E-01
TL-208	6.10E-01	1.47E-01	1.46E-01
U-235	Not Detected	-----	3.78E-01
TH-231	Not Detected	-----	9.08E-01
PA-231	Not Detected	-----	1.71
AC-227	Not Detected	-----	2.70
TH-227	Not Detected	-----	5.59E-01
RA-223	Not Detected	-----	3.26E-01
RN-219	Not Detected	-----	4.26E-01
PB-211	Not Detected	-----	8.87E-01
TL-207	Not Detected	-----	2.04E+01
AM-241	Not Detected	-----	8.36E-01
PU-239	Not Detected	-----	4.52E+02
NP-237	Not Detected	-----	5.56E-01
PA-233	Not Detected	-----	9.09E-02
TH-229	Not Detected	-----	4.02E-01

[Summary Report] - Sample ID: 50052503

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	4.76E-02
AR-41	Not Detected	-----	2.99E+05
BA-133	Not Detected	-----	1.00E-01
BA-140	Not Detected	-----	1.65E-01
CD-109	Not Detected	-----	1.83
CD-115	Not Detected	-----	1.66E-01
CE-139	Not Detected	-----	4.69E-02
CE-141	Not Detected	-----	8.64E-02
CE-144	Not Detected	-----	3.90E-01
CO-56	Not Detected	-----	5.44E-02
CO-57	Not Detected	-----	4.68E-02
CO-58	Not Detected	-----	4.69E-02
CO-60	Not Detected	-----	5.48E-02
CR-51	Not Detected	-----	3.66E-01
CS-134	Not Detected	-----	7.74E-02
CS-137	Not Detected	-----	5.15E-02
CU-64	Not Detected	-----	1.04E+02
EU-152	Not Detected	-----	4.14E-01
EU-154	Not Detected	-----	2.69E-01
EU-155	Not Detected	-----	2.20E-01
FE-59	Not Detected	-----	1.10E-01
GD-153	Not Detected	-----	1.64E-01
HG-203	Not Detected	-----	4.38E-02
I-131	Not Detected	-----	4.79E-02
IN-115m	Not Detected	-----	5.36E+01
IR-192	Not Detected	-----	4.30E-02
K-40	1.33E+01	2.00	4.47E-01
LA-140	Not Detected	-----	1.05E-01
MN-54	Not Detected	-----	5.69E-02
MN-56	Not Detected	-----	3.06E+03
MO-99	Not Detected	-----	5.63E-01
NA-22	Not Detected	-----	6.44E-02
NA-24	Not Detected	-----	3.01E-01
NB-95	Not Detected	-----	3.47E-01
ND-147	Not Detected	-----	2.90E-01
NI-57	Not Detected	-----	1.53E-01
BE-7	Not Detected	-----	3.61E-01
RU-103	Not Detected	-----	4.21E-02
RU-106	Not Detected	-----	4.35E-01
SB-122	Not Detected	-----	9.04E-02
SB-124	Not Detected	-----	4.87E-02
SB-125	Not Detected	-----	1.20E-01
SC-46	Not Detected	-----	7.98E-02
SR-85	Not Detected	-----	5.77E-02
TA-182	Not Detected	-----	2.35E-01
TA-183	Not Detected	-----	9.11E-01
TE-132	Not Detected	-----	5.85E-02
TL-201	Not Detected	-----	4.00E-01
XE-133	Not Detected	-----	3.45E-01
Y-88	Not Detected	-----	4.73E-02
ZN-65	Not Detected	-----	1.63E-01
ZR-95	Not Detected	-----	8.98E-02

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 7-12-95 6:52:53 AM *

 * Analyzed by: *JR 7/12/95* Reviewed by: *JR 7/12/95* *

Customer : D.MILLER/D.BISWELL (7582/SMO)
 Customer Sample ID : 022959-05
 Lab Sample ID : 50052504

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 2SMAR
 Sample Quantity : 861.000 gram
 Sample Date/Time : 7-10-95 1:55:00 PM
 Acquire Start Date : 7-12-95 6:20:21 AM
 Detector Name : LAB02
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	5.16
TH-234	1.36	7.40E-01	9.79E-01
U-234	Not Detected	-----	1.84E+01
RA-226	1.19	8.64E-01	1.34
PB-214	7.85E-01	1.54E-01	1.28E-01
BI-214	5.91E-01	1.17E-01	9.78E-02
PB-210	Not Detected	-----	4.59E+02
TH-232	5.70E-01	1.99E-01	2.40E-01
RA-228	5.87E-01	2.27E-01	2.00E-01
AC-228	8.95E-01	1.92E-01	1.27E-01
TH-228	7.12E-01	3.42E-01	7.53E-01
RA-224	1.89	4.66E-01	5.92E-01
PB-212	7.14E-01	1.42E-01	6.04E-02
BI-212	6.49E-01	3.90E-01	5.65E-01
TL-208	6.30E-01	1.43E-01	1.31E-01
U-235	Not Detected	-----	3.71E-01
TH-231	Not Detected	-----	8.95E-01
PA-231	Not Detected	-----	1.69
AC-227	Not Detected	-----	2.72
TH-227	Not Detected	-----	5.46E-01
RA-223	Not Detected	-----	3.10E-01
RN-219	Not Detected	-----	4.32E-01
PB-211	Not Detected	-----	9.96E-01
TL-207	Not Detected	-----	2.11E+01
AM-241	Not Detected	-----	8.35E-01
PU-239	Not Detected	-----	4.40E+02
NP-237	Not Detected	-----	5.69E-01
PA-233	Not Detected	-----	9.07E-02
TH-229	Not Detected	-----	4.22E-01

[Summary Report] - Sample ID: 50052504

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	4.19E-02
AR-41	Not Detected	-----	3.12E+05
BA-133	Not Detected	-----	9.80E-02
BA-140	Not Detected	-----	1.57E-01
CD-109	Not Detected	-----	1.91
CD-115	Not Detected	-----	1.64E-01
CE-139	Not Detected	-----	4.52E-02
CE-141	Not Detected	-----	8.55E-02
CE-144	Not Detected	-----	3.76E-01
CO-56	Not Detected	-----	5.11E-02
CO-57	Not Detected	-----	4.63E-02
CO-58	Not Detected	-----	4.71E-02
CO-60	Not Detected	-----	5.54E-02
CR-51	Not Detected	-----	3.57E-01
CS-134	Not Detected	-----	7.78E-02
CS-137	Not Detected	-----	4.85E-02
CU-64	Not Detected	-----	1.12E+02
EU-152	Not Detected	-----	3.68E-01
EU-154	Not Detected	-----	2.57E-01
EU-155	Not Detected	-----	2.14E-01
FE-59	Not Detected	-----	1.07E-01
GD-153	Not Detected	-----	1.60E-01
HG-203	Not Detected	-----	4.38E-02
I-131	Not Detected	-----	4.55E-02
IN-115m	Not Detected	-----	5.24E+01
IR-192	Not Detected	-----	4.30E-02
K-40	1.42E+01	2.11	4.57E-01
LA-140	Not Detected	-----	1.17E-01
MN-54	Not Detected	-----	5.26E-02
MN-56	Not Detected	-----	2.84E+03
MO-99	Not Detected	-----	5.62E-01
NA-22	Not Detected	-----	6.55E-02
NA-24	Not Detected	-----	3.41E-01
NB-95	Not Detected	-----	3.42E-01
ND-147	Not Detected	-----	3.08E-01
NI-57	Not Detected	-----	1.64E-01
BE-7	Not Detected	-----	3.58E-01
RU-103	Not Detected	-----	4.41E-02
RU-106	Not Detected	-----	3.92E-01
SB-122	Not Detected	-----	9.08E-02
SB-124	Not Detected	-----	4.88E-02
SB-125	Not Detected	-----	1.25E-01
SC-46	Not Detected	-----	8.34E-02
SR-85	Not Detected	-----	5.40E-02
TA-182	Not Detected	-----	2.44E-01
TA-183	Not Detected	-----	9.09E-01
TE-132	Not Detected	-----	5.94E-02
TL-201	Not Detected	-----	3.58E-01
XE-133	Not Detected	-----	3.38E-01
Y-88	Not Detected	-----	3.83E-02
ZN-65	Not Detected	-----	1.63E-01
ZR-95	Not Detected	-----	8.68E-02

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 7-12-95 8:44:27 AM *

 * Analyzed by: *[Signature]* 7/12/95 Reviewed by: *[Signature]* 7/12/95 *

Customer : D.MILLER/D.BISWELL (7582/SMO)
 Customer Sample ID : LAB CONTROL SAMPLE ANALYSIS #CG134
 Lab Sample ID : 50052505

Sample Description : MIXED GAMMA STANDARD
 Sample Type : Liquid
 Sample Geometry : WMAR
 Sample Quantity : 1.000 Each
 Sample Date/Time : 11-01-90 12:00:00 PM
 Acquire Start Date : 7-12-95 8:30:43 AM
 Detector Name : LAB02
 Elapsed Live Time : 600 seconds
 Elapsed Real Time : 606 seconds

Comments:

Nuclide	Activity (pCi/Each)	2S Error	MDA
U-238	Not Detected	-----	2.15E+04
TH-234	Not Detected	-----	4.71E+03
U-234	Not Detected	-----	1.16E+05
RA-226	Not Detected	-----	5.85E+03
PB-214	Not Detected	-----	6.97E+02
BI-214	Not Detected	-----	6.46E+02
PB-210	Not Detected	-----	1.08E+07
TH-232	Not Detected	-----	2.03E+03
RA-228	Not Detected	-----	2.79E+03
AC-228	Not Detected	-----	1.77E+03
TH-228	Not Detected	-----	3.61E+04
RA-224	Not Detected	-----	3.15E+04
PB-212	Not Detected	-----	2.87E+03
BI-212	Not Detected	-----	2.55E+04
TL-208	Not Detected	-----	5.41E+03
U-235	Not Detected	-----	1.85E+03
TH-231	Not Detected	-----	3.85E+03
PA-231	Not Detected	-----	9.18E+03
AC-227	Not Detected	-----	1.61E+04
TH-227	Not Detected	-----	2.28E+03
RA-223	Not Detected	-----	1.00E+26
RN-219	Not Detected	-----	2.88E+03
PB-211	Not Detected	-----	8.41E+03
TL-207	Not Detected	-----	2.14E+05
AM-241	9.49E+04	1.70E+04	6.60E+03
PU-239	Not Detected	-----	2.15E+06
NP-237	Not Detected	-----	2.73E+03
PA-233	Not Detected	-----	6.22E+02
TH-229	Not Detected	-----	2.03E+03

[Summary Report] - Sample ID: 50052505

Nuclide	Activity (pCi/Each)	2S Error	MDA
AG-110m	Not Detected	-----	1.80E+05
AR-41	Not Detected	-----	1.00E+26
BA-133	Not Detected	-----	5.47E+02
BA-140	Not Detected	-----	1.00E+26
CD-109	3.56E+05	9.87E+04	1.19E+05
CD-115	Not Detected	-----	1.00E+26
CE-139	Not Detected	-----	1.35E+06
CE-141	Not Detected	-----	3.14E+18
CE-144	Not Detected	-----	1.23E+05
CO-56	Not Detected	-----	1.92E+09
CO-57	8.21E+03	7.66E+03	1.21E+04
CO-58	Not Detected	-----	7.00E+09
CO-60	7.39E+04	9.62E+03	5.13E+02
CR-51	Not Detected	-----	9.87E+21
CS-134	Not Detected	-----	1.48E+03
CS-137	6.82E+04	8.81E+03	5.38E+02
CU-64	Not Detected	-----	1.00E+26
EU-152	Not Detected	-----	3.41E+03
EU-154	Not Detected	-----	2.24E+03
EU-155	Not Detected	-----	2.13E+03
FE-59	Not Detected	-----	3.62E+14
GD-153	Not Detected	-----	1.05E+05
HG-203	Not Detected	-----	3.17E+13
I-131	Not Detected	-----	1.00E+26
IN-115m	Not Detected	-----	1.00E+26
IR-192	Not Detected	-----	2.79E+09
K-40	Not Detected	-----	1.69E+03
LA-140	Not Detected	-----	1.00E+26
MN-54	Not Detected	-----	1.77E+04
MN-56	Not Detected	-----	1.00E+26
MO-99	Not Detected	-----	1.00E+26
NA-22	Not Detected	-----	8.06E+02
NA-24	Not Detected	-----	1.00E+26
NB-95	Not Detected	-----	1.00E+26
ND-147	Not Detected	-----	1.00E+26
NI-57	Not Detected	-----	1.00E+26
BE-7	Not Detected	-----	1.60E+13
RU-103	Not Detected	-----	4.68E+15
RU-106	Not Detected	-----	7.61E+04
SB-122	Not Detected	-----	1.00E+26
SB-124	Not Detected	-----	1.13E+11
SB-125	Not Detected	-----	3.39E+03
SC-46	Not Detected	-----	6.69E+08
SR-85	Not Detected	-----	3.17E+10
TA-182	Not Detected	-----	4.16E+07
TA-183	Not Detected	-----	1.00E+26
TE-132	Not Detected	-----	1.00E+26
TL-201	Not Detected	-----	1.00E+26
XE-133	Not Detected	-----	1.00E+26
Y-88	Not Detected	-----	1.34E+07
ZN-65	Not Detected	-----	1.23E+05
ZR-95	Not Detected	-----	7.06E+10

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program *
 * Quality Assurance Report *

Report Date : 7-12-95 8:49:38 AM
 QA File : C:\GENIEPC\CAMFILES\LCS2.QAF
 Analyst : FCD
 Sample ID : 50052505
 Sample Quantity : 1.00 Each
 Sample Date : 11-01-90 12:00:00 PM
 Measurement Date : 7-12-95 8:30:43 AM
 Elapsed Live Time : 600 seconds
 Elapsed Real Time : 606 seconds

Parameter	Mean	1S Error	New Value	< LU	: SD	: UD	: BS	:
AM-241 Activity	9.744E-02	3.746E-03	9.487E-02	<	:	:	:	>
CS-137 Activity	6.967E-02	2.428E-03	6.819E-02	<	:	:	:	>
CO-60 Activity	7.691E-02	2.535E-03	7.425E-02	<	(In)	:	:	>

OK 7/12/95

Flags Key: LU = Boundary Test (Ab = Above , Be = Below)
 SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
 UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
 ES = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: *JJ 7/12/95*

ER/1302

096/DAT
11

SMO ANALYTICAL DATA ROUTING FORM

Project Name: FAE Phase I Case Number: 3626400
 SNL Task Leader: Miller Org/Mail Stop: 7582-1148
 SMO Project Coordinator: Pissant Sample Ship Date: 7/14/95
7/11/95

ARCOG	Lab	Lab ID
<u>03789</u>	<u>7715</u>	<u>500548</u>
<u>03785</u>	<u>"</u>	<u>500533</u>
_____	_____	_____

Date Results Received:

Preliminary: _____ Final: 7/19/95 7/13/95

Corrections Requested From Laboratory: _____ Requestor: _____

Date Corrections Received: _____

Date Assigned to SMO Reviewer: _____

Reviewer: _____

Date Review Complete: _____

Signature: _____

Date of Preliminary Notification: _____

Person Notified: _____

Date of Final Transmittal: 8/16/95

Transmitted To: Miller

Transmitted By: [Signature]

Filed In Record Center: [Signature]

Comments: _____

ANALYSIS REQUEST AND CHAIN OF CUSTODY

001-COC (9-94) **506533**

AR/COC-03785

Dept. No./Mail Stop: **7582/1347**
 Object/Task Manager: **D. Miller / H. Fleck**
 Project Name: **TA-1 Soil Sampling (Amesl)**
 Record Center Code: **ADS 1302 ER Site 96**
 Logbook Ref No.: **0133**
 SMO Reference No.: **CF0089**

Date Samples Shipped: **7/11/95**
 Carrier/Waybill No.: **BC**
 Lab Contact: **Amir M.**
 Lab Destination: **7715**
 SMO Contact/Phone: **D. MacLaughlin/845-0857**
 Send Report to SMO: **Deborah McLaughlin**

Contract No.: **N/A**
 Case No.: **3626-400**
 SMO Authorization: **[Signature]**
 Bill to: Sandia National Laboratories
 Supplier Services Department
 P.O. Box 5800 MS 0154
 Albuquerque, NM 87185-0154

Parameter & Method Requested

Gamma Spec

Location		Tech Area		Reference LOV (available at SMO)										Lab Sample ID
Building 885, 807		Room Outside		Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Sample Matrix	Container		Preservative	Sample Collection Method	Sample Type		
Sample No. - Fraction		ER Sample ID or Sample Location Detail						Type	Volume					
22961	-05	T1096-6P-050-005-S	9'	96	7/11/95-8:20	S	P	500ml	None	G	SA	X		
22962	-05	T1096-6P-051-004-S	7'8"		10:15							X		
22963	-05	T1096-6P-052-004-S	7'8"		11:00							X		
22965	-05	T1096-6P-053-006-S	9'8"		12:40							X		
22966	-05	T1096-6P-054-007-S	11'		14:05							X		

MMA Yes No Ref. No. _____
 Sample Disposal: Return to Client Disposal by lab
 Turnaround Time: Normal Rush Required Report Date _____
 Sample Tracking: Date Entered (mm/dd/yy) **7/11/95**
 Entered By: **[Signature]**

Special Instructions/QC Requirements
 Abnormal Conditions on Receipt

Relinquished by **Matthew Rain** Org. **7582** Date **7/11/95** Time **1543**
 Received by **[Signature]** Org. **SMO 7513** Date **7-11-95** Time **1543**
 Relinquished by **[Signature]** Org. **SMO 2023** Date **7-11-95** Time **1657**
 Received by **[Signature]** Org. **SNL 7715** Date **7/11/95** Time **1657**
 Relinquished by **[Signature]** Org. **SNL 7715** Date **7/13/95** Time **1530**
 Received by **[Signature]** Org. **SMO 7513** Date **7-13-95** Time **1530**

Relinquished by Matthew Rain Org. 7582 Date 7/11/95 Time 1543	4. Relinquished by _____ Org. _____ Date _____ Time _____
Received by [Signature] Org. SMO 7513 Date 7-11-95 Time 1543	4. Received by _____ Org. _____ Date _____ Time _____
Relinquished by [Signature] Org. SMO 2023 Date 7-11-95 Time 1657	5. Relinquished by _____ Org. _____ Date _____ Time _____
Received by [Signature] Org. SNL 7715 Date 7/11/95 Time 1657	5. Received by _____ Org. _____ Date _____ Time _____
Relinquished by [Signature] Org. SNL 7715 Date 7/13/95 Time 1530	6. Relinquished by _____ Org. _____ Date _____ Time _____
Received by [Signature] Org. SMO 7513 Date 7-13-95 Time 1530	6. Received by _____ Org. _____ Date _____ Time _____

WHITE - To Accompany Samples, Laboratory Copy BLUE - To Accompany Samples, Return to SMO YELLOW - SMO Suspense Copy PINK - Field Copy

ANALYSIS REQUEST AND CHAIN OF CUSTODY

AR/COC- 03785

SF 2001-COC (0.94)

501533

Dept. No./Mail Stop: <u>4082/1347</u> Project/Task Manager: <u>D. Miller / H. Fleck</u> Project Name: <u>TA-1 Soil Sampling (Person)</u> Record Center Code: <u>ADG 1302 ER 5-18 96</u> Logbook Ref No: <u>0133</u> SMO Reference No.: <u>CF0059</u>	Date Samples Shipped: <u>7/11/95</u> Carrier/Waybill No.: <u>75C</u> Lab Contact: <u>Amir M.</u> Lab Destination: <u>7715</u> SMO Contact/Phone: <u>D. Mac McLaughlin/315-0567</u> Send Report to SMO: <u>Deborah McLaughlin</u>	Contract No.: <u>N/A</u> Case No.: <u>3626-400</u> SMO Authorization: <u>[Signature]</u> Bill to: Sandia National Laboratories Supplier Services Department P.O. Box 5800 MS 0154 Albuquerque, NM 87185-0154	Parameter & Method Requested
---	---	--	---

Location										Reference LOV (available at SMO)		Lab Sample ID								
Tech Area <u>Outside TA-1</u>										Sample Matrix	Type		Volume	Preservative	Sample Collection Method	Sample Type				
Building <u>585, 807</u>		Room <u>Outside</u>																		
Sample No. - Fraction		ER Sample ID or Sample Location Detail								Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Container	Sample Matrix	Type	Volume	Preservative	Sample Collection Method	Sample Type	
022961	-05	T1096-6P-050-005-S								9'	96	7/11/95-8:20	S	P	300ml	None	G	SA	X	
022962	-05	T1096-6P-051-004-S								7'8"		10:15								X
022963	-05	T1096-6P-052-004-S								7'8"		11:00								X
022965	-05	T1096-6P-053-006-S								7'8"		12:40								X
022966	-05	T1096-6P-054-007-S								11'		14:05								X

RMMA <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Ref. No. _____	Sample Tracking Date Entered (mm/dd/yy) <u>7/11/95</u> Entered by: <u>[Signature]</u>	Special Instructions/QC Requirements	Abnormal Conditions on Receipt												
Sample Disposal <input checked="" type="checkbox"/> Return to Client <input type="checkbox"/> Disposal by lab	Turnaround Time <input checked="" type="checkbox"/> Normal <input type="checkbox"/> Rush Required Report Date _____ QC inits. _____														
Sample Team Members	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>Name</th> <th>Signature</th> <th>Init</th> <th>Company/Organization</th> </tr> <tr> <td>Matthew Shein</td> <td>[Signature]</td> <td>MS</td> <td>IT Corp / 7532</td> </tr> <tr> <td>Celina Gohar</td> <td>[Signature]</td> <td>CG</td> <td>7532</td> </tr> </table>	Name	Signature	Init	Company/Organization	Matthew Shein	[Signature]	MS	IT Corp / 7532	Celina Gohar	[Signature]	CG	7532		
Name	Signature	Init	Company/Organization												
Matthew Shein	[Signature]	MS	IT Corp / 7532												
Celina Gohar	[Signature]	CG	7532												

1. Relinquished by <u>Matthew Shein</u> Org. <u>7532</u> Date <u>7/11/95</u> Time <u>1543</u>	4. Relinquished by _____ Org. _____ Date _____ Time _____
1. Received by _____ Org. <u>8007513</u> Date <u>7-11-95</u> Time <u>1543</u>	4. Received by _____ Org. _____ Date _____ Time _____
2. Relinquished by _____ Org. <u>51107513</u> Date <u>7-11-95</u> Time <u>1657</u>	5. Relinquished by _____ Org. _____ Date _____ Time _____
2. Received by _____ Org. <u>SNL7715</u> Date <u>7/11/95</u> Time <u>1657</u>	5. Received by _____ Org. _____ Date _____ Time _____
3. Relinquished by _____ Org. <u>SNL7715</u> Date <u>7/13/95</u> Time <u>1530</u>	6. Relinquished by _____ Org. _____ Date _____ Time _____
3. Received by _____ Org. <u>51107513</u> Date <u>7/12/95</u> Time <u>1530</u>	6. Received by _____ Org. _____ Date _____ Time _____

WHITE -- To Accompany Samples, Laboratory Copy
 BLUE- To Accompany Samples, Return to SMO
 YELLOW- SMO Suspense Copy
 PINK- Field Copy



To be completed by Customer

Shaded areas are for RPSD use only

Customer: <u>D. Miller/H. Fleck</u>	Hazards/Special Instructions:	Batch Log Number: <u>500533</u>
Organization: <u>7582</u>		Logged By: <u>700</u>
Project Location: <u>TA-1</u>		Analysis Type: <input checked="" type="checkbox"/> Gamma Spec
Phone: <u>845-0867</u>		<input type="checkbox"/> H-3
Date Results Needed: <u>7-13-95</u>		<input type="checkbox"/> Alpha/Beta
Suspect Isotopes:		<input type="checkbox"/> Alpha Spec
Other Information: <u>03785</u>	<input type="checkbox"/> Total U	
		<input type="checkbox"/> Other
	LIMS Login _____	
	Results Faxed _____	
	Sample Disposal _____	

Customer Sample ID	Sample Type	Date/Time Collected	Sample Volume	Requested Analysis	RPSD Sample ID	Rad Scan mR/hr	Sample Weight	Remarks
022961-05	S	7/11/95-8:20	500 ml	Gamma Spec.	01	2300	692	
022962-05	↓	-10:45	↓	↓	02	↓	628	
022963-05	↓	-11:00	↓	↓	03	↓	671	
022965-05	↓	-12:10	↓	↓	04	↓	910	
022966-05	↓	-14:05	↓	↓	05	2300	763	
LCS		1 Nov 90		Y Spec	06	NA	NA	

Relinquished by <u>[Signature]</u>	Date <u>7-11-95</u>	Time <u>1657</u>	Received by <u>[Signature]</u>	Date <u>7/11/95</u>	Time <u>1657</u>
Relinquished by <u>[Signature]</u>	Date <u>7/13/95</u>	Time <u>1530</u>	Received by <u>[Signature]</u>	Date <u>7-13-95</u>	Time <u>1530</u>
Relinquished by _____	Date _____	Time _____	Received by _____	Date _____	Time _____
Relinquished by _____	Date _____	Time _____	Received by _____	Date _____	Time _____



 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 7-12-95 2:49:45 PM *

 * Analyzed by: *Shamp Col 7/13/95* Reviewed by: *JK 7/13/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022961-05
 Lab Sample ID : 50053301

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 2SMAR
 Sample Quantity : 692.000 gram
 Sample Date/Time : 7-11-95 8:20:00 AM
 Acquire Start Date : 7-12-95 2:16:39 PM
 Detector Name : LAB02
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	5.91
TH-234	Not Detected	-----	1.01
U-234	Not Detected	-----	2.23E+01
RA-226	2.38	8.59E-01	1.13
PB-214	8.22E-01	1.60E-01	1.21E-01
BI-214	6.70E-01	1.34E-01	1.09E-01
PB-210	Not Detected	-----	5.37E+02
TH-232	6.75E-01	2.98E-01	4.11E-01
RA-228	7.31E-01	2.80E-01	2.39E-01
AC-228	7.96E-01	2.12E-01	2.10E-01
TH-228	Not Detected	-----	1.39
RA-224	Not Detected	-----	8.03E-01
PB-212	8.53E-01	1.77E-01	7.49E-02
BI-212	1.65	5.52E-01	6.32E-01
TL-208	7.07E-01	1.66E-01	1.55E-01
U-235	Not Detected	-----	4.17E-01
TH-231	Not Detected	-----	1.03
PA-231	Not Detected	-----	1.93
AC-227	Not Detected	-----	3.04
TH-227	Not Detected	-----	6.58E-01
RA-223	Not Detected	-----	3.51E-01
RN-219	Not Detected	-----	5.06E-01
PB-211	Not Detected	-----	1.12
TL-207	Not Detected	-----	2.51E+01
AM-241	Not Detected	-----	9.47E-01
PU-239	Not Detected	-----	5.16E+02
NP-237	6.07E-01	5.06E-01	7.89E-01
PA-233	Not Detected	-----	1.05E-01
TH-229	Not Detected	-----	5.09E-01

not detected JK 7/13/95

[Summary Report] - Sample ID: 50053301

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	5.07E-02
AR-41	Not Detected	-----	7.01E+03
BA-133	Not Detected	-----	1.14E-01
BA-140	Not Detected	-----	2.14E-01
CD-109	Not Detected	-----	2.41
CD-115	Not Detected	-----	1.78E-01
CE-139	Not Detected	-----	5.49E-02
CE-141	Not Detected	-----	9.64E-02
CE-144	Not Detected	-----	4.41E-01
CO-56	Not Detected	-----	5.76E-02
CO-57	Not Detected	-----	5.43E-02
CO-58	Not Detected	-----	5.84E-02
CO-60	Not Detected	-----	6.41E-02
CR-51	Not Detected	-----	4.31E-01
CS-134	Not Detected	-----	9.39E-02
CS-137	Not Detected	-----	5.86E-02
CU-64	Not Detected	-----	7.42E+01
EU-152	Not Detected	-----	4.29E-01
EU-154	Not Detected	-----	3.64E-01
EU-155	Not Detected	-----	2.43E-01
FE-59	Not Detected	-----	1.42E-01
GD-153	Not Detected	-----	2.06E-01
HG-203	Not Detected	-----	5.52E-02
I-131	Not Detected	-----	5.44E-02
IN-115m	Not Detected	-----	1.29E+01
IR-192	Not Detected	-----	5.04E-02
K-40	1.77E+01	2.61	4.52E-01
LA-140	Not Detected	-----	1.34E-01
MN-54	Not Detected	-----	6.28E-02
MN-56	Not Detected	-----	1.92E+02
MO-99	Not Detected	-----	6.16E-01
NA-22	Not Detected	-----	8.64E-02
NA-24	Not Detected	-----	2.68E-01
NB-95	Not Detected	-----	3.75E-01
ND-147	Not Detected	-----	3.89E-01
NI-57	Not Detected	-----	1.70E-01
BE-7	Not Detected	-----	4.62E-01
RU-103	Not Detected	-----	5.10E-02
RU-106	Not Detected	-----	5.54E-01
SB-122	Not Detected	-----	9.78E-02
SB-124	Not Detected	-----	5.79E-02
SB-125	Not Detected	-----	1.49E-01
SC-46	Not Detected	-----	9.41E-02
SR-85	Not Detected	-----	6.72E-02
TA-182	Not Detected	-----	2.77E-01
TA-183	Not Detected	-----	9.72E-01
TE-132	Not Detected	-----	6.46E-02
TL-201	Not Detected	-----	4.02E-01
XE-133	Not Detected	-----	3.42E-01
Y-88	Not Detected	-----	4.35E-02
ZN-65	Not Detected	-----	1.81E-01
ZR-95	Not Detected	-----	1.04E-01

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 7-12-95 3:28:57 PM *

 * Analyzed by: *Stephen Cole 7/13/95* Reviewed by: *W 7/13/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022962-05
 Lab Sample ID : 50053302

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 2SMAR
 Sample Quantity : 628.000 gram
 Sample Date/Time : 7-11-95 10:15:00 AM
 Acquire Start Date : 7-12-95 2:55:09 PM
 Detector Name : LAB02
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	5.84
TH-234	Not Detected	-----	1.38
U-234	Not Detected	-----	2.23E+01
RA-226	1.48	7.82E-01	1.14
PB-214	7.52E-01	1.52E-01	1.19E-01
BI-214	6.41E-01	1.29E-01	9.78E-02
PB-210	Not Detected	-----	5.54E+02
TH-232	5.53E-01	2.17E-01	2.71E-01
RA-228	5.87E-01	2.34E-01	2.82E-01
AC-228	Not Detected	-----	3.83E-01
TH-228	9.93E-01	4.37E-01	7.42E-01
RA-224	1.73	5.00E-01	7.53E-01
PB-212	7.20E-01	1.55E-01	7.28E-02
BI-212	6.42E-01	4.10E-01	5.87E-01
TL-208	5.38E-01	1.39E-01	1.31E-01
U-235	Not Detected	-----	4.40E-01
TH-231	Not Detected	-----	1.06
PA-231	Not Detected	-----	1.89
AC-227	Not Detected	-----	3.04
TH-227	Not Detected	-----	6.41E-01
RA-223	Not Detected	-----	3.53E-01
RN-219	Not Detected	-----	5.11E-01
PB-211	Not Detected	-----	1.08
TL-207	Not Detected	-----	2.50E+01
AM-241	Not Detected	-----	1.01
PU-239	Not Detected	-----	5.28E+02
NP-237	Not Detected	-----	6.58E-01
PA-233	Not Detected	-----	1.11E-01
TH-229	Not Detected	-----	4.78E-01

[Summary Report] - Sample ID: 50053302

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	5.19E-02
AR-41	Not Detected	-----	4.23E+03
BA-133	Not Detected	-----	1.17E-01
BA-140	Not Detected	-----	2.08E-01
CD-109	Not Detected	-----	2.16
CD-115	Not Detected	-----	1.67E-01
CE-139	Not Detected	-----	5.65E-02
CE-141	Not Detected	-----	1.01E-01
CE-144	Not Detected	-----	4.39E-01
CO-56	Not Detected	-----	6.93E-02
CO-57	Not Detected	-----	5.42E-02
CO-58	Not Detected	-----	5.65E-02
CO-60	Not Detected	-----	6.36E-02
CR-51	Not Detected	-----	4.40E-01
CS-134	Not Detected	-----	9.66E-02
CS-137	Not Detected	-----	6.48E-02
CU-64	Not Detected	-----	6.14E+01
EU-152	Not Detected	-----	5.09E-01
EU-154	Not Detected	-----	3.23E-01
EU-155	Not Detected	-----	2.48E-01
FE-59	Not Detected	-----	1.29E-01
GD-153	Not Detected	-----	1.91E-01
HG-203	Not Detected	-----	5.22E-02
I-131	Not Detected	-----	6.04E-02
IN-115m	Not Detected	-----	1.01E+01
IR-192	Not Detected	-----	5.20E-02
K-40	1.39E+01	2.14	4.45E-01
LA-140	Not Detected	-----	1.07E-01
MN-54	Not Detected	-----	7.00E-02
MN-56	Not Detected	-----	1.64E+02
MO-99	Not Detected	-----	6.47E-01
NA-22	Not Detected	-----	8.27E-02
NA-24	Not Detected	-----	2.44E-01
NB-95	Not Detected	-----	3.66E-01
ND-147	Not Detected	-----	3.90E-01
NI-57	Not Detected	-----	1.50E-01
BE-7	Not Detected	-----	4.46E-01
RU-103	Not Detected	-----	5.15E-02
RU-106	Not Detected	-----	5.37E-01
SB-122	Not Detected	-----	1.03E-01
SB-124	Not Detected	-----	5.79E-02
SB-125	Not Detected	-----	1.41E-01
SC-46	Not Detected	-----	9.87E-02
SR-85	Not Detected	-----	6.68E-02
TA-182	Not Detected	-----	2.86E-01
TA-183	Not Detected	-----	1.03
TE-132	Not Detected	-----	6.19E-02
TL-201	Not Detected	-----	3.96E-01
XE-133	Not Detected	-----	3.31E-01
Y-88	Not Detected	-----	5.24E-02
ZN-65	Not Detected	-----	1.86E-01
ZR-95	Not Detected	-----	1.02E-01

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 7-12-95 4:09:14 PM *

* Analyzed by: *Spencer Cole 7/13/95* Reviewed by: *JK 7/13/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022963-05
 Lab Sample ID : 50053303

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 2SMAR
 Sample Quantity : 671.000 gram
 Sample Date/Time : 7-11-95 11:00:00 AM
 Acquire Start Date : 7-12-95 3:35:22 PM
 Detector Name : LAB02
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	5.84
TH-234	Not Detected	-----	1.37
U-234	Not Detected	-----	2.32E+01
RA-226	1.51	7.15E-01	1.01
PB-214	7.52E-01	1.48E-01	1.09E-01
BI-214	5.87E-01	1.22E-01	1.01E-01
PB-210	Not Detected	-----	5.62E+02
TH-232	6.63E-01	2.30E-01	2.72E-01
RA-228	7.32E-01	-2.84E-01	2.12E-01
AC-228	Not Detected	-----	3.53E-01
TH-228	8.87E-01	4.07E-01	7.95E-01
RA-224	Not Detected	-----	7.39E-01
PB-212	7.28E-01	1.54E-01	7.18E-02
BI-212	8.90E-01	4.23E-01	5.53E-01
TL-208	6.77E-01	1.62E-01	1.53E-01
U-235	Not Detected	-----	4.32E-01
TH-231	Not Detected	-----	1.04
PA-231	Not Detected	-----	1.87
AC-227	Not Detected	-----	3.06
TH-227	Not Detected	-----	6.40E-01
RA-223	Not Detected	-----	3.49E-01
RN-219	Not Detected	-----	4.79E-01
PB-211	Not Detected	-----	1.19
TL-207	Not Detected	-----	2.60E+01
AM-241	Not Detected	-----	9.30E-01
PU-239	Not Detected	-----	5.00E+02
NP-237	Not Detected	-----	6.55E-01
PA-233	Not Detected	-----	1.03E-01
TH-229	Not Detected	-----	5.03E-01

[Summary Report] - Sample ID: 50053303

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	5.27E-02
AR-41	Not Detected	-----	3.97E+03
BA-133	Not Detected	-----	1.13E-01
BA-140	Not Detected	-----	1.95E-01
CD-109	Not Detected	-----	2.22
CD-115	Not Detected	-----	1.67E-01
CE-139	Not Detected	-----	5.27E-02
CE-141	Not Detected	-----	9.61E-02
CE-144	Not Detected	-----	4.19E-01
CO-56	Not Detected	-----	6.78E-02
CO-57	Not Detected	-----	5.56E-02
CO-58	Not Detected	-----	5.46E-02
CO-60	Not Detected	-----	7.40E-02
CR-51	Not Detected	-----	4.06E-01
CS-134	Not Detected	-----	9.22E-02
CS-137	Not Detected	-----	6.46E-02
CU-64	Not Detected	-----	6.51E+01
EU-152	Not Detected	-----	4.86E-01
EU-154	Not Detected	-----	3.39E-01
EU-155	Not Detected	-----	2.49E-01
FE-59	Not Detected	-----	1.32E-01
GD-153	Not Detected	-----	1.90E-01
HG-203	Not Detected	-----	5.25E-02
I-131	Not Detected	-----	5.29E-02
IN-115m	Not Detected	-----	1.00E+01
IR-192	Not Detected	-----	4.87E-02
K-40	1.58E+01	2.38	5.96E-01
LA-140	Not Detected	-----	1.19E-01
MN-54	Not Detected	-----	6.55E-02
MN-56	Not Detected	-----	1.57E+02
MO-99	Not Detected	-----	6.50E-01
NA-22	Not Detected	-----	8.06E-02
NA-24	Not Detected	-----	2.41E-01
NB-95	Not Detected	-----	3.64E-01
ND-147	Not Detected	-----	3.67E-01
NI-57	Not Detected	-----	1.57E-01
BE-7	Not Detected	-----	4.67E-01
RU-103	Not Detected	-----	5.27E-02
RU-106	Not Detected	-----	4.82E-01
SB-122	Not Detected	-----	9.56E-02
SB-124	Not Detected	-----	5.82E-02
SB-125	Not Detected	-----	1.34E-01
SC-46	Not Detected	-----	9.75E-02
SR-85	Not Detected	-----	6.63E-02
TA-182	Not Detected	-----	2.81E-01
TA-183	Not Detected	-----	9.47E-01
TE-132	Not Detected	-----	6.26E-02
TL-201	Not Detected	-----	3.63E-01
XE-133	Not Detected	-----	3.19E-01
Y-88	Not Detected	-----	5.29E-02
ZN-65	Not Detected	-----	1.95E-01
ZR-95	Not Detected	-----	1.06E-01

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 7-12-95 4:48:29 PM *

 * Analyzed by: *Spencer Cole 7/13/95* Reviewed by: *JK 7/13/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022965-05
 Lab Sample ID : 50053304

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 2SMAR
 Sample Quantity : 910.000 gram
 Sample Date/Time : 7-11-95 12:40:00 PM
 Acquire Start Date : 7-12-95 4:16:04 PM
 Detector Name : LAB02
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	4.88
TH-234	Not Detected	-----	1.11
U-234	Not Detected	-----	1.82E+01
RA-226	9.01E-01	6.87E-01	1.07
PB-214	5.65E-01	1.22E-01	1.17E-01
BI-214	4.35E-01	1.01E-01	1.04E-01
PB-210	Not Detected	-----	1.23
TH-232	4.55E-01	1.71E-01	2.13E-01
RA-228	3.48E-01	1.76E-01	2.41E-01
AC-228	Not Detected	-----	2.93E-01
TH-228	4.77E-01	3.16E-01	6.94E-01
RA-224	Not Detected	-----	1.50
PB-212	4.26E-01	1.02E-01	1.05E-01
BI-212	5.08E-01	3.24E-01	4.70E-01
TL-208	4.64E-01	1.22E-01	1.31E-01
U-235	Not Detected	-----	3.58E-01
TH-231	Not Detected	-----	8.43E-01
PA-231	Not Detected	-----	1.52
AC-227	Not Detected	-----	2.54
TH-227	Not Detected	-----	4.84E-01
RA-223	Not Detected	-----	2.86E-01
RN-219	Not Detected	-----	4.09E-01
PB-211	Not Detected	-----	9.26E-01
TL-207	Not Detected	-----	2.06E+01
AM-241	Not Detected	-----	8.08E-01
PU-239	Not Detected	-----	4.02E+02
NP-237	Not Detected	-----	5.30E-01
PA-233	Not Detected	-----	8.49E-02
TH-229	Not Detected	-----	4.19E-01

[Summary Report] - Sample ID: 50053304

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	4.71E-02
AR-41	Not Detected	-----	2.52E+03
BA-133	Not Detected	-----	8.50E-02
BA-140	Not Detected	-----	1.72E-01
CD-109	Not Detected	-----	1.78
CD-115	Not Detected	-----	1.25E-01
CE-139	Not Detected	-----	4.41E-02
CE-141	Not Detected	-----	8.18E-02
CE-144	Not Detected	-----	3.49E-01
CO-56	Not Detected	-----	5.13E-02
CO-57	Not Detected	-----	4.28E-02
CO-58	Not Detected	-----	4.91E-02
CO-60	Not Detected	-----	5.65E-02
CR-51	Not Detected	-----	3.62E-01
CS-134	Not Detected	-----	7.17E-02
CS-137	Not Detected	-----	5.71E-02
CU-64	Not Detected	-----	5.11E+01
EU-152	Not Detected	-----	3.66E-01
EU-154	Not Detected	-----	2.57E-01
EU-155	Not Detected	-----	2.06E-01
FE-59	Not Detected	-----	1.10E-01
GD-153	Not Detected	-----	1.66E-01
HG-203	Not Detected	-----	4.37E-02
I-131	Not Detected	-----	4.62E-02
IN-115m	Not Detected	-----	6.52
IR-192	Not Detected	-----	4.10E-02
K-40	2.20E+01	3.11	4.08E-01
LA-140	Not Detected	-----	8.47E-02
MN-54	Not Detected	-----	4.99E-02
MN-56	Not Detected	-----	9.13E+01
MO-99	Not Detected	-----	5.18E-01
NA-22	Not Detected	-----	6.77E-02
NA-24	Not Detected	-----	2.08E-01
NB-95	Not Detected	-----	2.74E-01
ND-147	Not Detected	-----	3.21E-01
NI-57	Not Detected	-----	1.32E-01
BE-7	Not Detected	-----	3.52E-01
RU-103	Not Detected	-----	4.01E-02
RU-106	Not Detected	-----	3.98E-01
SB-122	Not Detected	-----	8.21E-02
SB-124	Not Detected	-----	4.72E-02
SB-125	Not Detected	-----	1.13E-01
SC-46	Not Detected	-----	7.88E-02
SR-85	Not Detected	-----	5.31E-02
TA-182	Not Detected	-----	2.32E-01
TA-183	Not Detected	-----	8.19E-01
TE-132	Not Detected	-----	4.95E-02
TL-201	Not Detected	-----	3.12E-01
XE-133	Not Detected	-----	2.67E-01
Y-88	Not Detected	-----	3.99E-02
ZN-65	Not Detected	-----	1.50E-01
ZR-95	Not Detected	-----	9.17E-02

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 7-12-95 5:25:41 PM *

 * Analyzed by: *James Cole 7/13/95* Reviewed by: *JK 7/13/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022966-05
 Lab Sample ID : 50053305

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 2SMAR
 Sample Quantity : 763.000 gram
 Sample Date/Time : 7-11-95 2:05:00 PM
 Acquire Start Date : 7-12-95 4:52:59 PM
 Detector Name : LAB02
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	5.58
TH-234	1.05	5.65E-01	8.06E-01
U-234	Not Detected	-----	2.18E+01
RA-226	1.19	6.80E-01	1.01
PB-214	6.55E-01	1.40E-01	1.30E-01
BI-214	5.99E-01	1.18E-01	9.05E-02
PB-210	Not Detected	-----	1.27
TH-232	7.10E-01	2.43E-01	2.94E-01
RA-228	7.05E-01	2.67E-01	2.55E-01
AC-228	6.75E-01	1.89E-01	1.98E-01
TH-228	8.97E-01	4.03E-01	7.06E-01
RA-224	1.51	4.38E-01	7.26E-01
PB-212	7.71E-01	1.57E-01	6.93E-02
BI-212	1.09	5.31E-01	7.38E-01
TL-208	6.06E-01	1.47E-01	1.42E-01
U-235	Not Detected	-----	4.00E-01
TH-231	Not Detected	-----	9.44E-01
PA-231	Not Detected	-----	1.78
AC-227	Not Detected	-----	2.93
TH-227	Not Detected	-----	6.15E-01
RA-223	Not Detected	-----	3.28E-01
RN-219	Not Detected	-----	4.77E-01
PB-211	Not Detected	-----	1.04
TL-207	Not Detected	-----	2.35E+01
AM-241	Not Detected	-----	9.56E-01
PU-239	Not Detected	-----	4.79E+02
NP-237	Not Detected	-----	4.19E-01
PA-233	Not Detected	-----	1.02E-01
TH-229	Not Detected	-----	4.60E-01

[Summary Report] - Sample ID: 50053305

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	5.45E-02
AR-41	Not Detected	-----	1.98E+03
BA-133	Not Detected	-----	1.03E-01
BA-140	Not Detected	-----	2.04E-01
CD-109	Not Detected	-----	1.44
CD-115	Not Detected	-----	1.57E-01
CE-139	Not Detected	-----	5.06E-02
CE-141	Not Detected	-----	9.02E-02
CE-144	Not Detected	-----	4.04E-01
CO-56	Not Detected	-----	6.07E-02
CO-57	Not Detected	-----	5.32E-02
CO-58	Not Detected	-----	5.69E-02
CO-60	Not Detected	-----	7.20E-02
CR-51	Not Detected	-----	3.93E-01
CS-134	Not Detected	-----	8.21E-02
CS-137	Not Detected	-----	5.66E-02
CU-64	Not Detected	-----	5.99E+01
EU-152	Not Detected	-----	4.33E-01
EU-154	Not Detected	-----	3.26E-01
EU-155	Not Detected	-----	2.31E-01
FE-59	Not Detected	-----	1.34E-01
GD-153	Not Detected	-----	1.82E-01
HG-203	Not Detected	-----	5.00E-02
I-131	Not Detected	-----	5.54E-02
IN-115m	Not Detected	-----	7.32
IR-192	Not Detected	-----	4.72E-02
K-40	2.16E+01	3.11	6.20E-01
LA-140	Not Detected	-----	1.06E-01
MN-54	Not Detected	-----	5.72E-02
MN-56	Not Detected	-----	8.72E+01
MO-99	Not Detected	-----	5.54E-01
NA-22	Not Detected	-----	7.35E-02
NA-24	Not Detected	-----	2.20E-01
NB-95	Not Detected	-----	3.44E-01
ND-147	Not Detected	-----	3.81E-01
NI-57	Not Detected	-----	1.50E-01
BE-7	Not Detected	-----	4.18E-01
RU-103	Not Detected	-----	4.75E-02
RU-106	Not Detected	-----	5.05E-01
SB-122	Not Detected	-----	9.48E-02
SB-124	Not Detected	-----	5.13E-02
SB-125	Not Detected	-----	1.32E-01
SC-46	Not Detected	-----	9.20E-02
SR-85	Not Detected	-----	6.27E-02
TA-182	Not Detected	-----	2.72E-01
TA-183	Not Detected	-----	9.64E-01
TE-132	Not Detected	-----	5.83E-02
TL-201	Not Detected	-----	3.46E-01
XE-133	Not Detected	-----	3.09E-01
Y-88	Not Detected	-----	4.31E-02
ZN-65	Not Detected	-----	1.79E-01
ZR-95	Not Detected	-----	1.01E-01

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 7-12-95 5:45:17 PM *

 * Analyzed by: *James Cole* 7/13/95 Reviewed by: *JR* 7/13/95 *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : LAB CONTROL SAMPLE ANALYSIS #CG134
 Lab Sample ID : 50053306

Sample Description : MIXED GAMMA STANDARD
 Sample Type : Liquid
 Sample Geometry : WMAR
 Sample Quantity : 1.000 Each
 Sample Date/Time : 11-01-90 12:00:00 PM
 Acquire Start Date : 7-12-95 5:31:51 PM
 Detector Name : LAB02
 Elapsed Live Time : 600 seconds
 Elapsed Real Time : 606 seconds

Comments:

Nuclide	Activity (pCi/Each)	2S Error	MDA
U-238	Not Detected	-----	2.14E+04
TH-234	Not Detected	-----	4.71E+03
U-234	Not Detected	-----	1.17E+05
RA-226	Not Detected	-----	6.02E+03
PB-214	Not Detected	-----	7.06E+02
BI-214	Not Detected	-----	6.60E+02
PB-210	Not Detected	-----	4.46E+03
TH-232	Not Detected	-----	2.02E+03
RA-228	Not Detected	-----	2.79E+03
AC-228	Not Detected	-----	1.76E+03
TH-228	Not Detected	-----	3.73E+04
RA-224	Not Detected	-----	3.18E+04
PB-212	Not Detected	-----	2.90E+03
BI-212	Not Detected	-----	2.54E+04
TL-208	Not Detected	-----	5.28E+03
U-235	Not Detected	-----	1.84E+03
TH-231	Not Detected	-----	3.88E+03
PA-231	Not Detected	-----	9.48E+03
AC-227	Not Detected	-----	1.62E+04
TH-227	Not Detected	-----	2.29E+03
RA-223	Not Detected	-----	1.00E+26
RN-219	Not Detected	-----	2.88E+03
PB-211	Not Detected	-----	8.46E+03
TL-207	Not Detected	-----	2.22E+05
AM-241	9.29E+04	1.66E+04	6.36E+03
PU-239	Not Detected	-----	2.16E+06
NP-237	Not Detected	-----	2.67E+03
PA-233	Not Detected	-----	6.25E+02
TH-229	Not Detected	-----	2.08E+03

[Summary Report] - Sample ID: 50053306

Nuclide	Activity (pCi/Each)	2S Error	MDA
AG-110m	Not Detected	-----	1.80E+05
AR-41	Not Detected	-----	1.00E+26
BA-133	Not Detected	-----	5.60E+02
BA-140	Not Detected	-----	1.00E+26
CD-109	3.02E+05	8.68E+04	1.06E+05
CD-115	Not Detected	-----	1.00E+26
CE-139	Not Detected	-----	1.35E+06
CE-141	Not Detected	-----	3.16E+18
CE-144	Not Detected	-----	1.26E+05
CO-56	Not Detected	-----	1.99E+09
CO-57	Not Detected	-----	1.96E+04
CO-58	Not Detected	-----	7.16E+09
CO-60	7.56E+04	9.85E+03	5.91E+02
CR-51	Not Detected	-----	9.98E+21
CS-134	Not Detected	-----	1.48E+03
CS-137	6.80E+04	8.78E+03	4.04E+02
CU-64	Not Detected	-----	1.00E+26
EU-152	Not Detected	-----	3.51E+03
EU-154	Not Detected	-----	2.26E+03
EU-155	Not Detected	-----	2.18E+03
FE-59	Not Detected	-----	3.55E+14
GD-153	Not Detected	-----	1.09E+05
HG-203	Not Detected	-----	3.22E+13
I-131	Not Detected	-----	1.00E+26
IN-115m	Not Detected	-----	1.00E+26
IR-192	Not Detected	-----	2.82E+09
K-40	Not Detected	-----	1.62E+03
LA-140	Not Detected	-----	1.00E+26
MN-54	Not Detected	-----	1.81E+04
MN-56	Not Detected	-----	1.00E+26
MO-99	Not Detected	-----	1.00E+26
NA-22	Not Detected	-----	8.04E+02
NA-24	Not Detected	-----	1.00E+26
NB-95	Not Detected	-----	1.00E+26
ND-147	Not Detected	-----	1.00E+26
NI-57	Not Detected	-----	1.00E+26
BE-7	Not Detected	-----	1.57E+13
RU-103	Not Detected	-----	4.78E+15
RU-106	Not Detected	-----	7.86E+04
SB-122	Not Detected	-----	1.00E+26
SB-124	Not Detected	-----	1.12E+11
SB-125	Not Detected	-----	3.33E+03
SC-46	Not Detected	-----	6.53E+08
SR-85	Not Detected	-----	3.20E+10
TA-182	Not Detected	-----	3.98E+07
TA-183	Not Detected	-----	1.00E+26
TE-132	Not Detected	-----	1.00E+26
TL-201	Not Detected	-----	1.00E+26
XE-133	Not Detected	-----	1.00E+26
Y-88	Not Detected	-----	1.25E+07
ZN-65	Not Detected	-----	1.25E+05
ZR-95	Not Detected	-----	7.19E+10

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program *
 * Quality Assurance Report *

Report Date : 7-12-95 5:50:33 PM
 QA File : C:\GENIEPC\CAMFILES\LCS2.QAF
 Analyst : FCD
 Sample ID : 50053306
 Sample Quantity : 1.00 Each
 Sample Date : 11-01-90 12:00:00 PM
 Measurement Date : 7-12-95 5:31:51 PM
 Elapsed Live Time : 600 seconds
 Elapsed Real Time : 606 seconds

Parameter	Mean	1S Error	New Value	< LU	: SD	: UD	: BS	>
AM-241 Activity	9.741E-02	3.725E-03	9.294E-02	<	: In	: ^{O.K. 7/13/95}	:	>
CS-137 Activity	6.965E-02	2.423E-03	6.798E-02	<	:	:	:	>
CO-60 Activity	7.688E-02	2.540E-03	7.484E-02	<	:	:	:	>

Flags Key: LU = Boundary Test (Ab = Above, Be = Below)
 SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
 UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
 BS = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: _____

Shump Cole 7/13/95

EK/1302

096 / DAT

12

SMO ANALYTICAL DATA ROUTING FORM

Project Name: TAI Phase I Case Number: 3626400

SNL Task Leader: Miller Org/Mail Stop: 7584 / 1148

SMO Project Coordinator: Puisant Sample Ship Date: 7/18/95

ARCOG Lab Lab ID 7/14/95
7/10/95

03795 7715 500560

03791 " 500547

03735 " 500525

Date Results Received:

Preliminary: _____ Final: 7/20/95, 7/17/95, 7/12/95

Corrections Requested From Laboratory: _____ Requestor: _____

Date Corrections Received: _____

Date Assigned to SMO Reviewer: _____ Reviewer: _____

Date Review Complete: _____ Signature: _____

Date of Preliminary Notification: _____ Person Notified: _____

Date of Final Transmittal: 8/16/95 Transmitted To: Miller

Transmitted By: [Signature] Filed In Record Center: [Signature]

Comments: _____



To be completed by Customer

Shaded areas are for RPSD use only

Customer: <u>D. Miller/H. Fleck</u>	Hazards/Special Instructions: <u>Please Notify S10</u> <u>Up to Compliance @ 800-807</u>	Batch Log Number: <u>500560</u>
Organization: <u>7582</u>		Logged By: <u>JM</u>
Project Location: <u>TA-1</u>		Analysis Type: <input checked="" type="checkbox"/> Gamma Spec <input type="checkbox"/> H-3 <input type="checkbox"/> Alpha/Beta <input type="checkbox"/> Alpha Spec <input type="checkbox"/> Total U <input type="checkbox"/> Other
Phone: <u>845-0667</u>		
Date Results Needed: <u>7/20/95</u>		
Suspect Isotopes: _____		
Other Information: <u>03795</u>		
LIMS Login _____		Results Faxed _____
Sample Disposal _____		

Customer Sample ID	Sample Type	Date/Time Collected	Sample Volume	Requested Analysis	RPSD Sample	Rad Scan CPM	Sample Weight	Remarks
<u>022993-05</u>	<u>S</u>	<u>7/18/95^{5:30}</u>	<u>500ml</u>	<u>Gamma-Spec</u>	<u>10/1</u>	<u>2300</u>	<u>693</u>	
<u>LCS</u>		<u>1 NOV 95</u>		<u>γ Spec</u>	<u>0.2</u>	<u>N/A</u>	<u>N/A</u>	

Relinquished by <u>[Signature]</u>	Date <u>7/18/95</u>	Time <u>1650</u>	Received by <u>[Signature]</u>	Date <u>7/18/95</u>	Time <u>1050</u>
Relinquished by <u>[Signature]</u>	Date <u>7/20/95</u>	Time <u>1225</u>	Received by <u>[Signature]</u>	Date <u>7/20/95</u>	Time <u>1225</u>
Relinquished by <u>[Signature]</u>	Date _____	Time _____	Received by _____	Date _____	Time _____
Relinquished by _____	Date _____	Time _____	Received by _____	Date _____	Time _____

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 7-18-95 8:17:32 PM *

 * Analyzed by: *JR 7/19/95* Reviewed by: *JR 7/19/95* *

Customer : D.MILLER/D.McLAUGHLIN (7582/SMO)
 Customer Sample ID : 022993-05
 Lab Sample ID : 50056001

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 2SMAR
 Sample Quantity : 693.000 gram
 Sample Date/Time : 7-17-95 8:30:00 AM
 Acquire Start Date : 7-18-95 7:43:50 PM
 Detector Name : LAB02
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	5.74
TH-234	Not Detected	-----	1.28
U-234	Not Detected	-----	2.03E+01
RA-226	1.80	8.01E-01	1.13
PB-214	6.76E-01	1.34E-01	9.78E-02
BI-214	6.31E-01	1.33E-01	1.18E-01
PB-210	Not Detected	-----	1.38
TH-232	5.73E-01	2.36E-01	3.09E-01
RA-228	7.44E-01	2.58E-01	3.00E-01
AC-228	Not Detected	-----	3.31E-01
TH-228	Not Detected	-----	1.30
RA-224	Not Detected	-----	7.72E-01
PB-212	5.68E-01	1.28E-01	7.22E-02
BI-212	5.59E-01	3.73E-01	5.41E-01
TL-208	6.34E-01	1.63E-01	1.71E-01
U-235	Not Detected	-----	4.16E-01
TH-231	Not Detected	-----	9.78E-01
PA-231	Not Detected	-----	1.81
AC-227	Not Detected	-----	2.95
TH-227	Not Detected	-----	5.78E-01
RA-223	Not Detected	-----	3.36E-01
RN-219	Not Detected	-----	4.58E-01
PB-211	Not Detected	-----	1.04
TL-207	Not Detected	-----	2.41E+01
AM-241	Not Detected	-----	9.63E-01
PU-239	2.16E-02	2.07E-02	3.26E+02
NP-237	Not Detected	-----	6.22E-01
PA-233	Not Detected	-----	1.05E-01
TH-229	Not Detected	-----	4.55E-01

Not detected JR 7/19/95

[Summary Report] - Sample ID: 50056001

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	4.80E-02
AR-41	Not Detected	-----	4.90E+04
BA-133	Not Detected	-----	1.07E-01
BA-140	Not Detected	-----	1.92E-01
CD-109	Not Detected	-----	2.16
CD-115	Not Detected	-----	1.79E-01
CE-139	Not Detected	-----	5.30E-02
CE-141	Not Detected	-----	9.67E-02
CE-144	Not Detected	-----	4.01E-01
CO-56	Not Detected	-----	5.93E-02
CO-57	Not Detected	-----	5.31E-02
CO-58	Not Detected	-----	5.33E-02
CO-60	Not Detected	-----	6.30E-02
CR-51	Not Detected	-----	3.85E-01
CS-134	Not Detected	-----	8.91E-02
CS-137	Not Detected	-----	5.75E-02
CU-64	Not Detected	-----	8.81E+01
EU-152	Not Detected	-----	4.28E-01
EU-154	Not Detected	-----	3.02E-01
EU-155	Not Detected	-----	2.44E-01
FE-59	Not Detected	-----	1.26E-01
GD-153	Not Detected	-----	1.85E-01
HG-203	Not Detected	-----	5.03E-02
I-131	Not Detected	-----	5.12E-02
IN-115m	Not Detected	-----	2.75E+01
IR-192	Not Detected	-----	4.56E-02
K-40	1.49E+01	2.26	5.90E-01
LA-140	Not Detected	-----	1.14E-01
MN-54	Not Detected	-----	5.59E-02
MN-56	Not Detected	-----	8.18E+02
MO-99	Not Detected	-----	6.97E-01
NA-22	Not Detected	-----	7.57E-02
NA-24	Not Detected	-----	3.34E-01
NB-95	Not Detected	-----	3.48E-01
ND-147	Not Detected	-----	3.55E-01
NI-57	Not Detected	-----	1.63E-01
BE-7	Not Detected	-----	4.04E-01
RU-103	Not Detected	-----	5.18E-02
RU-106	Not Detected	-----	4.69E-01
SB-122	Not Detected	-----	1.03E-01
SB-124	Not Detected	-----	5.65E-02
SB-125	Not Detected	-----	1.33E-01
SC-46	Not Detected	-----	9.05E-02
SR-85	Not Detected	-----	6.66E-02
TA-182	Not Detected	-----	2.69E-01
TA-183	Not Detected	-----	1.02
TE-132	Not Detected	-----	6.31E-02
TL-201	Not Detected	-----	3.97E-01
XE-133	Not Detected	-----	3.41E-01
Y-88	Not Detected	-----	4.76E-02
ZN-65	Not Detected	-----	1.76E-01
ZR-95	Not Detected	-----	9.89E-02

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 7-19-95 8:37:36 AM *

 * Analyzed by: *JR 7/19/95* Reviewed by: *JR 7/19/95* *

Customer : D.MILLER/D.McLAUGHLIN (7582/SMO)
 Customer Sample ID : LAB CONTROL SAMPLE ANALYSIS #CG134
 Lab Sample ID : 50056002

Sample Description : MIXED GAMMA_STANDARD
 Sample Type : Liquid
 Sample Geometry : WMAR
 Sample Quantity : 1.000 Each
 Sample Date/Time : 11-01-90 12:00:00 PM
 Acquire Start Date : 7-19-95 8:25:16 AM
 Detector Name : LAB02
 Elapsed Live Time : 600 seconds
 Elapsed Real Time : 606 seconds

Comments:

Nuclide	Activity (pCi/Each)	2S Error	MDA
U-238	Not Detected	-----	2.17E+04
TH-234	Not Detected	-----	4.71E+03
U-234	Not Detected	-----	1.17E+05
RA-226	Not Detected	-----	5.77E+03
PB-214	Not Detected	-----	7.02E+02
BI-214	Not Detected	-----	6.40E+02
PB-210	Not Detected	-----	4.56E+03
TH-232	Not Detected	-----	2.03E+03
RA-228	Not Detected	-----	2.78E+03
AC-228	Not Detected	-----	1.74E+03
TH-228	Not Detected	-----	3.65E+04
RA-224	Not Detected	-----	3.15E+04
PB-212	Not Detected	-----	2.84E+03
BI-212	Not Detected	-----	2.58E+04
TL-208	Not Detected	-----	5.38E+03
U-235	Not Detected	-----	1.88E+03
TH-231	Not Detected	-----	3.87E+03
PA-231	Not Detected	-----	9.20E+03
AC-227	Not Detected	-----	1.62E+04
TH-227	Not Detected	-----	2.25E+03
RA-223	Not Detected	-----	1.00E+26
RN-219	Not Detected	-----	2.91E+03
PB-211	Not Detected	-----	8.48E+03
TL-207	Not Detected	-----	2.19E+05
AM-241	9.17E+04	1.64E+04	6.11E+03
PU-239	Not Detected	-----	2.13E+06
NP-237	Not Detected	-----	2.70E+03
PA-233	Not Detected	-----	6.24E+02
TH-229	Not Detected	-----	2.05E+03

[Summary Report] - Sample ID: 50056002

Nuclide	Activity (pCi/Each)	2S Error	MDA
AG-110m	Not Detected	-----	1.83E+05
AR-41	Not Detected	-----	1.00E+26
BA-133	Not Detected	-----	5.58E+02
BA-140	Not Detected	-----	1.00E+26
CD-109	3.32E+05	1.00E+05	1.27E+05
CD-115	Not Detected	-----	1.00E+26
CE-139	Not Detected	-----	1.42E+06
CE-141	Not Detected	-----	3.67E+18
CE-144	Not Detected	-----	1.27E+05
CO-56	Not Detected	-----	2.11E+09
CO-57	1.75E+04	1.69E+04	2.69E+04
CO-58	Not Detected	-----	7.53E+09
CO-60	7.47E+04	9.73E+03	4.99E+02
CR-51	Not Detected	-----	1.18E+22
CS-134	Not Detected	-----	1.48E+03
CS-137	6.80E+04	8.78E+03	4.50E+02
CU-64	Not Detected	-----	1.00E+26
EU-152	Not Detected	-----	3.42E+03
EU-154	Not Detected	-----	2.31E+03
EU-155	Not Detected	-----	2.13E+03
FE-59	Not Detected	-----	3.97E+14
GD-153	Not Detected	-----	1.11E+05
HG-203	Not Detected	-----	3.51E+13
I-131	Not Detected	-----	1.00E+26
IN-115m	Not Detected	-----	1.00E+26
IR-192	Not Detected	-----	3.03E+09
K-40	Not Detected	-----	1.65E+03
LA-140	Not Detected	-----	1.00E+26
MN-54	Not Detected	-----	1.77E+04
MN-56	Not Detected	-----	1.00E+26
MO-99	Not Detected	-----	1.00E+26
NA-22	Not Detected	-----	8.28E+02
NA-24	Not Detected	-----	1.00E+26
NB-95	Not Detected	-----	1.00E+26
ND-147	Not Detected	-----	1.00E+26
NI-57	Not Detected	-----	1.00E+26
BE-7	Not Detected	-----	1.76E+13
RU-103	Not Detected	-----	5.37E+15
RU-106	Not Detected	-----	7.91E+04
SB-122	Not Detected	-----	1.00E+26
SB-124	Not Detected	-----	1.23E+11
SB-125	Not Detected	-----	3.32E+03
SC-46	Not Detected	-----	7.17E+08
SR-85	Not Detected	-----	3.37E+10
TA-182	Not Detected	-----	4.30E+07
TA-183	Not Detected	-----	1.00E+26
TE-132	Not Detected	-----	1.00E+26
TL-201	Not Detected	-----	1.00E+26
XE-133	Not Detected	-----	1.00E+26
Y-88	Not Detected	-----	1.33E+07
ZN-65	Not Detected	-----	1.29E+05
ZR-95	Not Detected	-----	7.53E+10

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program *
 * Quality Assurance Report *

Report Date : 7-19-95 8:40:28 AM
 QA File : C:\GENIEPC\CAMFILES\LCS2.QAF
 Analyst : FCD
 Sample ID : 50056002
 Sample Quantity : 1.00 Each
 Sample Date : 11-01-90 12:00:00 PM
 Measurement Date : 7-19-95 8:25:16 AM
 Elapsed Live Time : 600 seconds
 Elapsed Real Time : 606 seconds

Parameter	Mean	1S Error	New Value	< LU : SD : UD : BS >
AM-241 Activity	9.695E-02	3.834E-03	9.173E-02	< <i>OK</i> In : <i>n</i> 7/19/95 >
CS-137 Activity	6.952E-02	2.390E-03	6.799E-02	< : : : >
CO-60 Activity	7.670E-02	2.547E-03	7.436E-02	< : : : >

Flags Key: LU = Boundary Test (Ab = Above, Be = Below)
 SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
 UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
 BS = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: *n* 7/19/95

ER/1302 096/DAT

13

SMO ANALYTICAL DATA ROUTING FORM

Project Name: TAT Phase I Case Number: 3626400

SNL Task Leader: Miller Org/Mail Stop: 7582/1347

SMO Project Coordinator: Puissant Sample Ship Date: 6/27/95

ARCOG Lab Lab ID
03731 SNL 7715 500491
03733 " 500495
03728 " 500488

Date Results Received:

Preliminary: _____ Final: 6/29, 6/29, 6/28/95

Corrections Requested From Laboratory: _____ Requestor: _____

Date Corrections Received: _____

Date Assigned to SMO Reviewer: _____

ORIGINAL FILED IN COPY
RECORDS CENTER BY
SMO [Signature]
(Initial) (Date) 7/10/95

Date Review Complete: _____

Signature: _____

Date of Preliminary Notification: _____

Person Notified: _____

Date of Final Transmittal: 7/10/95

Transmitted To: Miller

Transmitted By: [Signature]

Filed In Record Center: [Signature]

Comments: _____

500488

ANALYSIS REQUEST AND CHAIN OF CUSTODY

AR/COC-03728

Dept. No./Mail Stop: 7582 / 1347
 Project/Task Manager: D. Miller / H. Fleck
 Project Name: T-1 Soil Sampling (Phase 1)
 Record Center Code: ADS 1302 ER Site 96
 Logbook Ref No.: 0133
 SMO Reference No.: CF0089

Date Samples Shipped: 6/22/95
 Carrier/Waybill No.: 7582
 Lab Contact: AMIC M
 Lab Destination: 7715
 SMO Contact/Phone: D. "Mac" McLaughlin/845-0867
 Send Report to SMO: Deborah McLaughlin

Contract No.: N/A
 Case No.: 3626.400
 SMO Authorization: [Signature]
 Bill to: Sandia National Laboratories
 Supplier Services Department
 P.O. Box 5800 MS 0154
 Albuquerque, NM 87185-0154

Parameter & Method Requested

Gamma Spec.

Location		Tech Area		Reference LOV (available at SMO)										Lab Sample ID
Building		Room		Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Container		Preservative	Sample Collection Method	Sample Type	Gamma Spec.		
Sample No. - Fraction		ER Sample ID or Sample Location Detail					Sample Matrix	Type					Volume	
22915-05		T1096-SD-001-001-SS		1'	96	6/26/95/10:05	S	P	500ml	NONE	G SA	X		
22916-05		T1096-SD-002-001-SS				/10:30						X		
22917-05		T1096-SD-003-001-SS				/10:50						X		
22918-05		T1096-SD-004-001-SS				/11:05						X		
22919-05		T1096-SD-005-001-SS				/11:20						X		
22920-05		T1096-SD-006-001-SS				/13:00						X		
22921-05		T1096-SD-007-001-SS				/13:10						X		
22922-05		T1096-SD-008-001-SS				/13:15					Du	X		
22923-05		T1096-SD-009-001-SS				/13:40					SA	X		
22924-05		T1096-SD-010-001-SS				/14:00						X		

RMMA Yes No Ref. No. _____

Sample Tracking
 Date Entered (m/m/dd/yy): 6/30/95
 Entered by: [Signature]

Special Instructions/QC Requirements

Abnormal Conditions on Receipt

Sample Disposal Return to Client Disposal by lab

QC Inits: _____

Turnaround Time Normal Rush Required Report Date _____

Sample Team Members	Name	Signature	Unit	Company/Organization
	Matthew Shain	[Signature]	M2	IT Corp / 7582
	CATHIE GOHAR	[Signature]	CG	Sandia / 7582

1. Relinquished by <u>Matthew Shain</u> Org. <u>7582</u> Date <u>6/26/95</u> Time <u>1642</u>	4. Relinquished by _____ Org. _____ Date _____ Time _____
1. Received by <u>[Signature]</u> Org. <u>MO 07513</u> Date <u>6-26-95</u> Time <u>1642</u>	4. Received by _____ Org. _____ Date _____ Time _____
2. Relinquished by <u>[Signature]</u> Org. <u>SMO 7582</u> Date <u>6-27-95</u> Time <u>0944</u>	5. Relinquished by _____ Org. _____ Date _____ Time _____
2. Received by <u>[Signature]</u> Org. <u>SMV 7715</u> Date <u>6/27/95</u> Time <u>0944</u>	5. Received by _____ Org. _____ Date _____ Time _____
2. Relinquished by <u>[Signature]</u> Org. <u>SMV 7715</u> Date <u>6/28/95</u> Time <u>1505</u>	6. Relinquished by _____ Org. _____ Date _____ Time _____
3. Received by <u>[Signature]</u> Org. <u>MO 07513</u> Date <u>6-28-95</u> Time <u>1505</u>	6. Received by _____ Org. _____ Date _____ Time _____

ANALYSIS REQUEST AND CHAIN OF CUSTODY

SF 2001-COD (9-94)

AR/COC- 03728

(Phase I)														
Project Name: <u>TA-1 Soil Sampling</u> Project/Task Manager: <u>D. Miller / H. Fleck</u> Case No.: <u>3626.400</u>														
Location		Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Reference LOV (available at SMO)					Lab Sample ID				
Tech Area <u>NA</u>					Sample Matrix	Container		Preservative	Sample Collection Method		Sample Type			
Building <u>NA</u>	Room <u>Outside</u>					Type	Volume							
Sample No. - Fraction	ER Sample ID or Sample Location Detail													
022925-05	T1096-SD-011-001-SS	1'	96	6/26/95-14:30	S	P	500ml	NONE	G	SA	X			
022926-05	T1096-SD-012-001-SS	↓	↓	14:35	↓	↓	↓	↓	↓	↓	X			
022927-05	T1096-SD-013-001-SS	↓	↓	14:50	↓	↓	↓	↓	↓	↓	X			
022928-05	T1096-SD-014-001-SS	↓	↓	15:00	↓	↓	↓	↓	↓	↓	X			
022929-05	T1096-SD-015-001-SS	↓	↓	15:10	↓	↓	↓	↓	↓	↓	X			
022930-05	T1096-SD-016-001-SS	↓	↓	15:20	↓	↓	↓	↓	↓	↓	X			
022	CG 6/26/95													

Parameter & Method Requested

GAMMA SPEC

Abnormal Conditions on Receipt

Recipient Initials _____

WHITE - To Accompany Samples, Laboratory Copy BLUE - To Accompany Samples, Return to SMO YELLOW - SMO Response Copy PINK - Field Copy



To be completed by Customer

Shaded areas are for RPSD use only

Customer: <u>D. Miller/H. Fleck</u>	Hazards/Special Instructions: <u>Please notify SMO upon completion @ 845-0867</u>	Batch Log Number: <u>500488</u>
Organization: <u>7582</u>		Logged By: <u>JW</u>
Project Location: <u>1A-1</u>		Analysis Type: <input checked="" type="checkbox"/> Gamma Spec <input type="checkbox"/> H-3 <input type="checkbox"/> Alpha/Beta <input type="checkbox"/> Alpha Spec <input type="checkbox"/> Total U <input type="checkbox"/> Other
Phone: <u>845-0867</u>		LIMS Login: _____
Date Results Needed: <u>6-28-95</u>		Results Faxed _____
Suspect Isotopes: _____		Sample Disposal _____
Other Information: <u>03728</u>		

Customer Sample ID	Sample Type	Date/Time Collected	Sample Volume	Requested Analysis	RPSD Sample ID	Rad Scan CPM	Sample Weight	Remarks
022915-05	S	6/26/95-10:05	500ml	Gamma-Spec	01	2300	1051	
022916-05		10:30			02		1043	
022917-05		10:50			03		1057	
022918-05		11:05			04		927	
022919-05		11:20			05		692	
022920-05		13:00			06		844	
022921-05		13:10			07		960	
022922-05		13:15			08		903	
022923-05		13:40			09		902	
022924-05		14:00			10		956	
022925-05		14:10			11		766	
022926-05		14:35			12		792	
022927-05		14:50			13		804	
022928-05		15:00			14		825	

Relinquished by [Signature] Date 6/27/95 Time 0944

Received by [Signature] Date 6/27/95 Time 0944

Relinquished by [Signature] Date 6/28/95 Time 1505

Received by [Signature] Date 6-28-95 Time 1505

Relinquished by _____ Date _____ Time _____

Received by _____ Date _____ Time _____

Relinquished by _____ Date _____ Time _____

Received by _____ Date _____ Time _____



To be completed by Customer

Shaded areas are for RPSD use only

Customer: _____	Hazards/Special Instructions:	Batch Log Number: <u>500488</u>
Organization: _____		Logged By: _____
Project Location: _____		Analysis Type: <input checked="" type="checkbox"/> Gamma Spec
Phone: _____		<input type="checkbox"/> H-3
Date Results Needed: _____		<input type="checkbox"/> Alpha/Beta
Suspect Isotopes: _____		<input type="checkbox"/> Alpha Spec
Other Information: <u>03728</u>	LIMS Login: _____	<input type="checkbox"/> Total U
	Results Faxed: _____	<input type="checkbox"/> Other
	Sample Disposal: _____	

Customer Sample ID	Sample Type	Date/Time Collected	Sample Volume	Requested Analysis	RPSD Sample ID	Rad Scan CPM	Sample Weight	Remarks
022929-05	S	6/26/95 15:10	500ml	Gamma Spec	15	<300	822	
022930-05	↓	↓ 15:20	↓	↓	16	↓	746	
LCS		1-11-90			17			

Relinquished by [Signature] Date 6-27-95 Time 0944 Received by _____ Date _____ Time _____

Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____

Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____

Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-27-95 12:12:10 PM *

 * Analyzed by: *JW 6/28/95* Reviewed by: *JW 6/28/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022915-05
 Lab Sample ID : 50048801

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 2SMAR
 Sample Quantity : 1051.000 gram
 Sample Date/Time : 6-26-95 10:05:00 AM
 Acquire Start Date : 6-27-95 11:38:12 AM
 Detector Name : LAB02
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	4.24
TH-234	Not Detected	-----	9.71E-01
U-234	Not Detected	-----	1.46E+01
RA-226	1.05	7.92E-01	1.23
PB-214	4.47E-01	9.86E-02	9.73E-02
BI-214	3.41E-01	7.92E-02	7.73E-02
PB-210	Not Detected	-----	2.44E+02
TH-232	5.98E-01	2.44E-01	3.32E-01
RA-228	3.83E-01	1.61E-01	1.28E-01
AC-228	Not Detected	-----	2.38E-01
TH-228	4.57E-01	2.78E-01	5.94E-01
RA-224	Not Detected	-----	5.11E-01
PB-212	4.45E-01	1.18E-01	4.81E-02
BI-212	Not Detected	-----	6.71E-01
TL-208	3.69E-01	9.37E-02	8.99E-02
U-235	Not Detected	-----	3.23E-01
TH-231	Not Detected	-----	7.24E-01
PA-231	Not Detected	-----	1.56
AC-227	Not Detected	-----	2.26
TH-227	Not Detected	-----	4.28E-01
RA-223	Not Detected	-----	2.47E-01
RN-219	Not Detected	-----	3.65E-01
PB-211	Not Detected	-----	8.04E-01
TL-207	Not Detected	-----	1.58E+01
AM-241	Not Detected	-----	6.80E-01
PU-239	Not Detected	-----	3.66E+02
NP-237	Not Detected	-----	4.71E-01
PA-233	Not Detected	-----	7.58E-02
TH-229	Not Detected	-----	4.06E-01

[Summary Report] - Sample ID: 50048801

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	4.63E-02
AR-41	Not Detected	-----	9.79E+02
BA-133	Not Detected	-----	7.63E-02
BA-140	Not Detected	-----	1.46E-01
CD-109	Not Detected	-----	1.60
CD-115	Not Detected	-----	1.14E-01
CE-139	Not Detected	-----	3.85E-02
CE-141	Not Detected	-----	7.51E-02
CE-144	Not Detected	-----	3.09E-01
CO-56	Not Detected	-----	4.16E-02
CO-57	Not Detected	-----	4.22E-02
CO-58	Not Detected	-----	4.06E-02
CO-60	Not Detected	-----	4.51E-02
CR-51	Not Detected	-----	3.00E-01
CS-134	Not Detected	-----	5.87E-02
CS-137	4.13E-02	2.49E-02	3.62E-02
CU-64	Not Detected	-----	4.11E+01
EU-152	Not Detected	-----	3.05E-01
EU-154	Not Detected	-----	2.14E-01
EU-155	Not Detected	-----	1.89E-01
FE-59	Not Detected	-----	8.80E-02
GD-153	Not Detected	-----	1.54E-01
HG-203	Not Detected	-----	3.90E-02
I-131	Not Detected	-----	3.96E-02
IN-115m	Not Detected	-----	4.42
IR-192	Not Detected	-----	3.60E-02
K-40	1.24E+01	1.84	3.85E-01
LA-140	Not Detected	-----	7.08E-02
MN-54	Not Detected	-----	4.21E-02
MN-56	Not Detected	-----	4.28E+01
MO-99	Not Detected	-----	4.16E-01
NA-22	Not Detected	-----	5.74E-02
NA-24	Not Detected	-----	1.37E-01
NB-95	Not Detected	-----	2.43E-01
ND-147	Not Detected	-----	2.75E-01
NI-57	Not Detected	-----	9.20E-02
BE-7	3.25E-01	1.69E-01	2.32E-01
RU-103	Not Detected	-----	3.31E-02
RU-106	Not Detected	-----	3.35E-01
SB-122	Not Detected	-----	6.30E-02
SB-124	Not Detected	-----	4.10E-02
SB-125	Not Detected	-----	1.08E-01
SC-46	Not Detected	-----	6.84E-02
SR-85	Not Detected	-----	4.72E-02
TA-182	Not Detected	-----	2.02E-01
TA-183	Not Detected	-----	6.86E-01
TE-132	Not Detected	-----	4.44E-02
TL-201	Not Detected	-----	2.62E-01
XE-133	Not Detected	-----	2.36E-01
Y-88	Not Detected	-----	3.81E-02
ZN-65	Not Detected	-----	1.34E-01
ZR-95	Not Detected	-----	7.45E-02

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-27-95 12:51:15 PM *

 * Analyzed by: *JR 6/28/95* Reviewed by: *JR 6/28/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022916-05
 Lab Sample ID : 50048802

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 2SMAR
 Sample Quantity : 1043.000 gram
 Sample Date/Time : 6-26-95 10:30:00 AM
 Acquire Start Date : 6-27-95 12:17:36 PM
 Detector Name : LAB02
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	3.95
TH-234	Not Detected	-----	9.13E-01
U-234	Not Detected	-----	1.44E+01
RA-226	4.00E-01	4.12E-01	6.53E-01
PB-214	4.43E-01	9.15E-02	7.91E-02
BI-214	2.75E-01	6.91E-02	7.06E-02
PB-210	Not Detected	-----	2.36E+02
TH-232	2.27E-01	1.68E-01	2.56E-01
RA-228	4.05E-01	1.62E-01	1.24E-01
AC-228	Not Detected	-----	2.38E-01
TH-228	Not Detected	-----	1.05
RA-224	Not Detected	-----	1.24
PB-212	4.07E-01	1.14E-01	5.06E-02
BI-212	2.02E-01	2.55E-01	4.11E-01
TL-208	3.66E-01	9.86E-02	1.04E-01
U-235	Not Detected	-----	2.80E-01
TH-231	Not Detected	-----	7.14E-01
PA-231	Not Detected	-----	1.47
AC-227	Not Detected	-----	2.14
TH-227	Not Detected	-----	4.16E-01
RA-223	Not Detected	-----	2.43E-01
RN-219	Not Detected	-----	3.49E-01
PB-211	Not Detected	-----	8.12E-01
TL-207	Not Detected	-----	1.46E+01
AM-241	Not Detected	-----	6.32E-01
PU-239	Not Detected	-----	3.45E+02
NP-237	Not Detected	-----	4.47E-01
PA-233	Not Detected	-----	7.49E-02
TH-229	Not Detected	-----	3.71E-01

[Summary Report] - Sample ID: 50048802

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	4.81E-02
AR-41	Not Detected	-----	9.91E+02
BA-133	Not Detected	-----	7.54E-02
BA-140	Not Detected	-----	1.34E-01
CD-109	Not Detected	-----	6.85E-01
CD-115	Not Detected	-----	1.07E-01
CE-139	Not Detected	-----	3.78E-02
CE-141	Not Detected	-----	6.48E-02
CE-144	Not Detected	-----	2.84E-01
CO-56	Not Detected	-----	4.46E-02
CO-57	Not Detected	-----	3.88E-02
CO-58	Not Detected	-----	3.64E-02
CO-60	Not Detected	-----	4.91E-02
CR-51	Not Detected	-----	2.78E-01
CS-134	Not Detected	-----	5.59E-02
CS-137	8.18E-02	2.77E-02	3.27E-02
CU-64	Not Detected	-----	3.88E+01
EU-152	Not Detected	-----	2.97E-01
EU-154	Not Detected	-----	2.13E-01
EU-155	Not Detected	-----	1.83E-01
FE-59	Not Detected	-----	8.95E-02
GD-153	Not Detected	-----	1.40E-01
HG-203	Not Detected	-----	3.65E-02
I-131	Not Detected	-----	3.34E-02
IN-115m	Not Detected	-----	4.30
IR-192	Not Detected	-----	3.44E-02
K-40	1.03E+01	1.57	3.98E-01
LA-140	Not Detected	-----	6.47E-02
MN-54	Not Detected	-----	3.97E-02
MN-56	Not Detected	-----	4.89E+01
MO-99	Not Detected	-----	4.01E-01
NA-22	Not Detected	-----	4.74E-02
NA-24	Not Detected	-----	1.37E-01
NB-95	Not Detected	-----	2.36E-01
ND-147	Not Detected	-----	2.48E-01
NI-57	Not Detected	-----	9.47E-02
BE-7	Not Detected	-----	3.18E-01
RU-103	Not Detected	-----	3.47E-02
RU-106	Not Detected	-----	3.53E-01
SB-122	Not Detected	-----	6.04E-02
SB-124	Not Detected	-----	3.75E-02
SB-125	Not Detected	-----	1.03E-01
SC-46	Not Detected	-----	6.00E-02
SR-85	Not Detected	-----	4.65E-02
TA-182	Not Detected	-----	1.79E-01
TA-183	Not Detected	-----	6.35E-01
TE-132	Not Detected	-----	4.29E-02
TL-201	Not Detected	-----	2.20E-01
XE-133	Not Detected	-----	2.24E-01
Y-88	Not Detected	-----	3.05E-02
ZN-65	Not Detected	-----	1.16E-01
ZR-95	Not Detected	-----	6.91E-02

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-27-95 1:31:07 PM *

 * Analyzed by: *W 6/28/95* Reviewed by: *W 6/28/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022917-05
 Lab Sample ID : 50048803

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 2SMAR
 Sample Quantity : 1037.000 gram
 Sample Date/Time : 6-26-95 10:50:00 AM
 Acquire Start Date : 6-27-95 12:57:49 PM
 Detector Name : LAB02
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	4.00
TH-234	Not Detected	-----	8.90E-01
U-234	Not Detected	-----	1.41E+01
RA-226	8.41E-01	8.54E-01	1.36
PB-214	3.69E-01	8.30E-02	7.97E-02
BI-214	3.38E-01	7.76E-02	7.38E-02
PB-210	Not Detected	-----	2.41E+02
TH-232	3.26E-01	1.46E-01	1.97E-01
RA-228	3.38E-01	1.38E-01	1.65E-01
AC-228	Not Detected	-----	2.24E-01
TH-228	Not Detected	-----	1.08
RA-224	Not Detected	-----	1.22
PB-212	3.03E-01	8.20E-02	9.62E-02
BI-212	3.58E-01	2.77E-01	4.17E-01
TL-208	3.54E-01	8.93E-02	8.23E-02
U-235	Not Detected	-----	2.96E-01
TH-231	Not Detected	-----	6.92E-01
PA-231	Not Detected	-----	1.50
AC-227	Not Detected	-----	2.15
TH-227	Not Detected	-----	4.08E-01
RA-223	Not Detected	-----	2.33E-01
RN-219	Not Detected	-----	3.27E-01
PB-211	Not Detected	-----	7.72E-01
TL-207	Not Detected	-----	1.79E+01
AM-241	Not Detected	-----	6.54E-01
PU-239	Not Detected	-----	3.38E+02
NP-237	Not Detected	-----	4.37E-01
PA-233	Not Detected	-----	7.71E-02
TH-229	Not Detected	-----	3.67E-01

[Summary Report] - Sample ID: 50048803

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	4.25E-02
AR-41	Not Detected	-----	1.19E+03
BA-133	Not Detected	-----	7.02E-02
BA-140	Not Detected	-----	1.32E-01
CD-109	Not Detected	-----	1.46
CD-115	Not Detected	-----	1.01E-01
CE-139	Not Detected	-----	3.68E-02
CE-141	Not Detected	-----	6.69E-02
CE-144	Not Detected	-----	2.87E-01
CO-56	Not Detected	-----	4.18E-02
CO-57	Not Detected	-----	3.97E-02
CO-58	Not Detected	-----	3.60E-02
CO-60	Not Detected	-----	4.98E-02
CR-51	Not Detected	-----	2.84E-01
CS-134	Not Detected	-----	5.84E-02
CS-137	2.75E-02	2.09E-02	3.14E-02
CU-64	Not Detected	-----	3.94E+01
EU-152	Not Detected	-----	3.05E-01
EU-154	Not Detected	-----	2.22E-01
EU-155	Not Detected	-----	1.80E-01
FE-59	Not Detected	-----	8.76E-02
GD-153	Not Detected	-----	1.44E-01
HG-203	Not Detected	-----	3.54E-02
I-131	Not Detected	-----	3.70E-02
IN-115m	Not Detected	-----	4.28
IR-192	Not Detected	-----	3.56E-02
K-40	1.16E+01	1.73	2.84E-01
LA-140	Not Detected	-----	6.36E-02
MN-54	Not Detected	-----	4.23E-02
MN-56	Not Detected	-----	5.02E+01
MO-99	Not Detected	-----	3.90E-01
NA-22	Not Detected	-----	5.51E-02
NA-24	Not Detected	-----	1.40E-01
NB-95	Not Detected	-----	2.33E-01
ND-147	Not Detected	-----	2.53E-01
NI-57	Not Detected	-----	8.53E-02
BE-7	Not Detected	-----	2.82E-01
RU-103	Not Detected	-----	3.32E-02
RU-106	Not Detected	-----	3.29E-01
SB-122	Not Detected	-----	6.43E-02
SB-124	Not Detected	-----	3.71E-02
SB-125	Not Detected	-----	9.70E-02
SC-46	Not Detected	-----	6.25E-02
SR-85	Not Detected	-----	4.63E-02
TA-182	Not Detected	-----	1.84E-01
TA-183	Not Detected	-----	6.46E-01
TE-132	Not Detected	-----	4.29E-02
TL-201	Not Detected	-----	2.39E-01
XE-133	Not Detected	-----	2.24E-01
Y-88	Not Detected	-----	3.36E-02
ZN-65	Not Detected	-----	1.25E-01
ZR-95	Not Detected	-----	6.82E-02

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-27-95 2:11:04 PM *

 * Analyzed by: *JR 6/28/95* Reviewed by: *JR 6/28/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022918-05
 Lab Sample ID : 50048804

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 2SMAR
 Sample Quantity : 927.000 gram
 Sample Date/Time : 6-26-95 11:05:00 AM
 Acquire Start Date : 6-27-95 1:37:05 PM
 Detector Name : LAB02
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	4.09
TH-234	Not Detected	-----	1.01
U-234	Not Detected	-----	1.67E+01
RA-226	8.10E-01	4.82E-01	7.13E-01
PB-214	3.80E-01	8.94E-02	8.99E-02
BI-214	3.58E-01	7.93E-02	6.75E-02
PB-210	Not Detected	-----	2.60E+02
TH-232	4.80E-01	2.28E-01	3.21E-01
RA-228	2.15E-01	1.54E-01	2.29E-01
AC-228	Not Detected	-----	2.63E-01
TH-228	4.54E-01	3.04E-01	7.00E-01
RA-224	Not Detected	-----	6.04E-01
PB-212	4.13E-01	1.24E-01	5.61E-02
BI-212	5.72E-01	3.13E-01	4.31E-01
TL-208	3.94E-01	1.16E-01	1.33E-01
U-235	Not Detected	-----	3.32E-01
TH-231	Not Detected	-----	7.78E-01
PA-231	Not Detected	-----	1.77
AC-227	Not Detected	-----	2.32
TH-227	Not Detected	-----	4.63E-01
RA-223	Not Detected	-----	2.63E-01
RN-219	Not Detected	-----	3.71E-01
PB-211	Not Detected	-----	8.97E-01
TL-207	Not Detected	-----	1.87E+01
AM-241	Not Detected	-----	6.94E-01
PU-239	Not Detected	-----	3.91E+02
NP-237	Not Detected	-----	4.81E-01
PA-233	Not Detected	-----	7.79E-02
TH-229	Not Detected	-----	4.06E-01

[Summary Report] - Sample ID: 50048804

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	4.40E-02
AR-41	Not Detected	-----	1.48E+03
BA-133	Not Detected	-----	7.81E-02
BA-140	Not Detected	-----	1.43E-01
CD-109	Not Detected	-----	1.59
CD-115	Not Detected	-----	1.18E-01
CE-139	Not Detected	-----	4.36E-02
CE-141	Not Detected	-----	7.39E-02
CE-144	Not Detected	-----	3.21E-01
CO-56	Not Detected	-----	4.53E-02
CO-57	Not Detected	-----	4.22E-02
CO-58	Not Detected	-----	4.21E-02
CO-60	Not Detected	-----	5.20E-02
CR-51	Not Detected	-----	3.13E-01
CS-134	Not Detected	-----	6.51E-02
CS-137	2.52E-02	2.06E-02	3.12E-02
CU-64	Not Detected	-----	4.20E+01
EU-152	Not Detected	-----	3.27E-01
EU-154	Not Detected	-----	2.41E-01
EU-155	Not Detected	-----	2.00E-01
FE-59	Not Detected	-----	9.36E-02
GD-153	Not Detected	-----	1.59E-01
HG-203	Not Detected	-----	4.28E-02
I-131	Not Detected	-----	4.06E-02
IN-115m	Not Detected	-----	5.29
IR-192	Not Detected	-----	3.58E-02
K-40	1.30E+01	1.95	4.94E-01
LA-140	Not Detected	-----	8.26E-02
MN-54	Not Detected	-----	4.69E-02
MN-56	Not Detected	-----	6.06E+01
MO-99	Not Detected	-----	4.45E-01
NA-22	Not Detected	-----	5.99E-02
NA-24	Not Detected	-----	1.48E-01
NB-95	Not Detected	-----	2.67E-01
ND-147	Not Detected	-----	2.85E-01
NI-57	Not Detected	-----	1.09E-01
BE-7	Not Detected	-----	3.19E-01
RU-103	Not Detected	-----	3.70E-02
RU-106	Not Detected	-----	3.71E-01
SB-122	Not Detected	-----	7.22E-02
SB-124	Not Detected	-----	4.05E-02
SB-125	Not Detected	-----	1.16E-01
SC-46	Not Detected	-----	6.36E-02
SR-85	Not Detected	-----	5.00E-02
TA-182	Not Detected	-----	1.90E-01
TA-183	Not Detected	-----	6.94E-01
TE-132	Not Detected	-----	4.58E-02
TL-201	Not Detected	-----	2.76E-01
XE-133	Not Detected	-----	2.59E-01
Y-88	Not Detected	-----	3.86E-02
ZN-65	Not Detected	-----	1.30E-01
ZR-95	Not Detected	-----	7.59E-02

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-27-95 2:51:03 PM *

 * Analyzed by: *JR 6/28/95* Reviewed by: *JR 6/28/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022919-05
 Lab Sample ID : 50048805

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 2SMAR
 Sample Quantity : 692.000 gram
 Sample Date/Time : 6-26-95 11:20:00 AM
 Acquire Start Date : 6-27-95 2:17:35 PM
 Detector Name : LAB02
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	5.53
TH-234	Not Detected	-----	1.32
U-234	Not Detected	-----	2.20E+01
RA-226	9.84E-01	8.82E-01	1.39
PB-214	5.47E-01	1.24E-01	1.19E-01
BI-214	5.01E-01	1.15E-01	1.07E-01
PB-210	Not Detected	-----	3.63E+02
TH-232	4.42E-01	1.95E-01	2.57E-01
RA-228	6.52E-01	2.16E-01	2.18E-01
AC-228	Not Detected	-----	3.48E-01
TH-228	5.68E-01	3.73E-01	8.55E-01
RA-224	Not Detected	-----	1.84
PB-212	4.56E-01	1.05E-01	1.02E-01
BI-212	8.31E-01	5.12E-01	7.46E-01
TL-208	5.37E-01	1.54E-01	1.74E-01
U-235	Not Detected	-----	3.95E-01
TH-231	Not Detected	-----	9.94E-01
PA-231	Not Detected	-----	2.14
AC-227	Not Detected	-----	3.02
TH-227	Not Detected	-----	6.15E-01
RA-223	Not Detected	-----	3.42E-01
RN-219	Not Detected	-----	4.74E-01
PB-211	Not Detected	-----	1.18
TL-207	Not Detected	-----	2.45E+01
AM-241	Not Detected	-----	9.07E-01
PU-239	Not Detected	-----	4.81E+02
NP-237	Not Detected	-----	6.26E-01
PA-233	Not Detected	-----	1.01E-01
TH-229	Not Detected	-----	5.14E-01

[Summary Report] - Sample ID: 50048805

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	5.74E-02
AR-41	Not Detected	-----	2.30E+03
BA-133	Not Detected	-----	1.04E-01
BA-140	Not Detected	-----	2.17E-01
CD-109	Not Detected	-----	2.15
CD-115	Not Detected	-----	1.52E-01
CE-139	Not Detected	-----	5.43E-02
CE-141	Not Detected	-----	9.15E-02
CE-144	Not Detected	-----	4.19E-01
CO-56	Not Detected	-----	6.40E-02
CO-57	Not Detected	-----	5.55E-02
CO-58	Not Detected	-----	5.34E-02
CO-60	Not Detected	-----	6.64E-02
CR-51	Not Detected	-----	3.96E-01
CS-134	Not Detected	-----	8.24E-02
CS-137	Not Detected	-----	6.89E-02
CU-64	Not Detected	-----	5.46E+01
EU-152	Not Detected	-----	4.39E-01
EU-154	Not Detected	-----	3.30E-01
EU-155	Not Detected	-----	2.47E-01
FE-59	Not Detected	-----	1.36E-01
GD-153	Not Detected	-----	2.03E-01
HG-203	Not Detected	-----	5.11E-02
I-131	Not Detected	-----	5.45E-02
IN-115m	Not Detected	-----	7.21
IR-192	Not Detected	-----	4.98E-02
K-40	1.62E+01	2.45	6.61E-01
LA-140	Not Detected	-----	8.58E-02
MN-54	Not Detected	-----	6.36E-02
MN-56	Not Detected	-----	9.60E+01
MO-99	Not Detected	-----	5.27E-01
NA-22	Not Detected	-----	7.64E-02
NA-24	Not Detected	-----	2.26E-01
NB-95	Not Detected	-----	3.52E-01
ND-147	Not Detected	-----	3.91E-01
NI-57	Not Detected	-----	1.40E-01
BE-7	Not Detected	-----	4.27E-01
RU-103	Not Detected	-----	5.12E-02
RU-106	Not Detected	-----	5.17E-01
SB-122	Not Detected	-----	1.00E+01
SB-124	Not Detected	-----	5.24E-02
SB-125	Not Detected	-----	1.52E-01
SC-46	Not Detected	-----	8.61E-02
SR-85	Not Detected	-----	6.44E-02
TA-182	Not Detected	-----	2.47E-01
TA-183	Not Detected	-----	9.06E-01
TE-132	Not Detected	-----	5.83E-02
TL-201	Not Detected	-----	3.36E-01
XE-133	Not Detected	-----	3.37E-01
Y-88	Not Detected	-----	5.55E-02
ZN-65	Not Detected	-----	1.71E-01
ZR-95	Not Detected	-----	1.00E-01

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-27-95 3:30:52 PM *

 * Analyzed by: *JJ 6/28/95* Reviewed by: *JJ 6/28/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022920-05
 Lab Sample ID : 50048806

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 2SMAR
 Sample Quantity : 844.000 gram
 Sample Date/Time : 6-26-95 1:00:00 PM
 Acquire Start Date : 6-27-95 2:57:09 PM
 Detector Name : LAB02
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	5.05
TH-234	Not Detected	-----	1.18
U-234	Not Detected	-----	1.88E+01
RA-226	9.33E-01	7.03E-01	1.09
PB-214	4.77E-01	1.04E-01	9.64E-02
BI-214	5.03E-01	1.03E-01	8.09E-02
PB-210	Not Detected	-----	3.14E+02
TH-232	3.48E-01	2.08E-01	3.06E-01
RA-228	4.06E-01	2.23E-01	3.17E-01
AC-228	Not Detected	-----	3.19E-01
TH-228	7.64E-01	3.58E-01	6.73E-01
RA-224	1.42	4.05E-01	6.31E-01
PB-212	6.00E-01	1.25E-01	5.87E-02
BI-212	5.03E-01	3.42E-01	5.01E-01
TL-208	5.14E-01	1.25E-01	1.17E-01
U-235	Not Detected	-----	3.74E-01
TH-231	Not Detected	-----	8.72E-01
PA-231	Not Detected	-----	2.03
AC-227	Not Detected	-----	2.74
TH-227	Not Detected	-----	5.60E-01
RA-223	Not Detected	-----	2.98E-01
RN-219	Not Detected	-----	4.55E-01
PB-211	Not Detected	-----	1.03
TL-207	Not Detected	-----	1.99E+01
AM-241	Not Detected	-----	8.19E-01
PU-239	Not Detected	-----	4.35E+02
NP-237	Not Detected	-----	5.65E-01
PA-233	Not Detected	-----	9.16E-02
TH-229	Not Detected	-----	4.65E-01

[Summary Report] - Sample ID: 50048806

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	4.91E-02
AR-41	Not Detected	-----	1.33E+03
BA-133	Not Detected	-----	9.29E-02
BA-140	Not Detected	-----	1.90E-01
CD-109	Not Detected	-----	1.99
CD-115	Not Detected	-----	1.41E-01
CE-139	Not Detected	-----	5.03E-02
CE-141	Not Detected	-----	8.63E-02
CE-144	Not Detected	-----	3.90E-01
CO-56	Not Detected	-----	5.74E-02
CO-57	Not Detected	-----	5.10E-02
CO-58	Not Detected	-----	5.13E-02
CO-60	Not Detected	-----	6.67E-02
CR-51	Not Detected	-----	3.83E-01
CS-134	Not Detected	-----	7.42E-02
CS-137	Not Detected	-----	5.49E-02
CU-64	Not Detected	-----	5.55E+01
EU-152	Not Detected	-----	4.06E-01
EU-154	Not Detected	-----	2.73E-01
EU-155	Not Detected	-----	2.27E-01
FE-59	Not Detected	-----	1.15E-01
GD-153	Not Detected	-----	1.82E-01
HG-203	Not Detected	-----	4.78E-02
I-131	Not Detected	-----	4.74E-02
IN-115m	Not Detected	-----	5.81
IR-192	Not Detected	-----	4.47E-02
K-40	1.76E+01	2.57	3.65E-01
LA-140	Not Detected	-----	8.78E-02
MN-54	Not Detected	-----	5.45E-02
MN-56	Not Detected	-----	6.57E+01
MO-99	Not Detected	-----	5.28E-01
NA-22	Not Detected	-----	7.48E-02
NA-24	Not Detected	-----	1.71E-01
NB-95	Not Detected	-----	3.18E-01
ND-147	Not Detected	-----	3.37E-01
NI-57	Not Detected	-----	1.19E-01
BE-7	Not Detected	-----	3.87E-01
RU-103	Not Detected	-----	4.07E-02
RU-106	Not Detected	-----	4.51E-01
SB-122	Not Detected	-----	8.62E-02
SB-124	Not Detected	-----	4.64E-02
SB-125	Not Detected	-----	1.30E-01
SC-46	Not Detected	-----	9.09E-02
SR-85	Not Detected	-----	5.83E-02
TA-182	Not Detected	-----	2.65E-01
TA-183	Not Detected	-----	8.28E-01
TE-132	Not Detected	-----	5.48E-02
TL-201	Not Detected	-----	3.12E-01
XE-133	Not Detected	-----	3.01E-01
Y-88	Not Detected	-----	3.77E-02
ZN-65	Not Detected	-----	1.77E-01
ZR-95	Not Detected	-----	9.53E-02

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-27-95 6:03:05 PM *

 * Analyzed by: *JR 6/28/95* Reviewed by: *JR 6/28/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022921-05
 Lab Sample ID : 50048807

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 2SMAR
 Sample Quantity : 960.000 gram
 Sample Date/Time : 6-26-95 1:10:00 PM
 Acquire Start Date : 6-27-95 5:30:34 PM
 Detector Name : LAB02
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	4.77
TH-234	8.81E-01	6.45E-01	9.41E-01
U-234	Not Detected	-----	1.78E+01
RA-226	1.22	6.79E-01	1.01
PB-214	6.24E-01	1.20E-01	9.53E-02
BI-214	4.82E-01	9.85E-02	8.24E-02
PB-210	Not Detected	-----	3.01E+02
TH-232	4.16E-01	1.85E-01	2.53E-01
RA-228	5.29E-01	3.85E-01	2.17E-01
AC-228	Not Detected	-----	3.08E-01
TH-228	5.48E-01	3.22E-01	7.61E-01
RA-224	1.55	4.34E-01	6.33E-01
PB-212	6.26E-01	1.30E-01	5.98E-02
BI-212	7.74E-01	3.61E-01	4.82E-01
TL-208	5.58E-01	1.34E-01	1.34E-01
U-235	Not Detected	-----	3.62E-01
TH-231	Not Detected	-----	8.84E-01
PA-231	Not Detected	-----	1.85
AC-227	Not Detected	-----	2.54
TH-227	Not Detected	-----	5.25E-01
RA-223	Not Detected	-----	3.06E-01
RN-219	Not Detected	-----	4.30E-01
PB-211	Not Detected	-----	1.04
TL-207	Not Detected	-----	2.23E+01
AM-241	Not Detected	-----	7.95E-01
PU-239	Not Detected	-----	4.25E+02
NP-237	Not Detected	-----	5.59E-01
PA-233	Not Detected	-----	8.45E-02
TH-229	Not Detected	-----	4.59E-01

[Summary Report] - Sample ID: 50048807

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	4.89E-02
AR-41	Not Detected	-----	3.39E+03
BA-133	Not Detected	-----	9.13E-02
BA-140	Not Detected	-----	1.61E-01
CD-109	Not Detected	-----	1.87
CD-115	Not Detected	-----	1.32E-01
CE-139	Not Detected	-----	4.75E-02
CE-141	Not Detected	-----	8.38E-02
CE-144	Not Detected	-----	3.68E-01
CO-56	Not Detected	-----	5.30E-02
CO-57	Not Detected	-----	4.79E-02
CO-58	Not Detected	-----	4.91E-02
CO-60	Not Detected	-----	5.51E-02
CR-51	Not Detected	-----	3.69E-01
CS-134	Not Detected	-----	7.13E-02
CS-137	Not Detected	-----	5.77E-02
CU-64	Not Detected	-----	5.59E+01
EU-152	Not Detected	-----	3.79E-01
EU-154	Not Detected	-----	2.62E-01
EU-155	Not Detected	-----	2.30E-01
FE-59	Not Detected	-----	1.13E-01
GD-153	Not Detected	-----	1.81E-01
HG-203	Not Detected	-----	4.63E-02
I-131	Not Detected	-----	4.44E-02
IN-115m	Not Detected	-----	7.65
IR-192	Not Detected	-----	4.20E-02
K-40	1.99E+01	2.84	4.85E-01
LA-140	Not Detected	-----	8.32E-02
MN-54	Not Detected	-----	4.97E-02
MN-56	Not Detected	-----	1.15E+02
MO-99	Not Detected	-----	5.34E-01
NA-22	Not Detected	-----	7.34E-02
NA-24	Not Detected	-----	1.72E-01
NB-95	Not Detected	-----	3.05E-01
ND-147	Not Detected	-----	3.11E-01
NI-57	Not Detected	-----	1.23E-01
BE-7	Not Detected	-----	3.84E-01
RU-103	Not Detected	-----	3.74E-02
RU-106	Not Detected	-----	4.07E-01
SB-122	Not Detected	-----	8.09E-02
SB-124	Not Detected	-----	4.78E-02
SB-125	Not Detected	-----	1.31E-01
SC-46	Not Detected	-----	7.75E-02
SR-85	Not Detected	-----	5.56E-02
TA-182	Not Detected	-----	2.30E-01
TA-183	Not Detected	-----	7.99E-01
TE-132	Not Detected	-----	5.39E-02
TL-201	Not Detected	-----	3.06E-01
XE-133	Not Detected	-----	3.04E-01
Y-88	Not Detected	-----	3.63E-02
ZN-65	Not Detected	-----	1.52E-01
ZR-95	Not Detected	-----	9.04E-02

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-27-95 6:45:26 PM *

 * Analyzed by: *JW 6/28/95* Reviewed by: *JW 6/28/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022922-05
 Lab Sample ID : 50048808

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 2SMAR
 Sample Quantity : 903.000 gram
 Sample Date/Time : 6-26-95 1:15:00 PM
 Acquire Start Date : 6-27-95 6:07:51 PM
 Detector Name : LAB02
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	5.20
TH-234	Not Detected	-----	1.11
U-234	Not Detected	-----	1.79E+01
RA-226	1.38	6.56E-01	9.39E-01
PB-214	5.52E-01	1.21E-01	1.20E-01
BI-214	4.92E-01	1.04E-01	9.34E-02
PB-210	Not Detected	-----	2.88E+02
TH-232	5.69E-01	2.44E-01	3.35E-01
RA-228	6.13E-01	2.28E-01	2.83E-01
AC-228	Not Detected	-----	3.04E-01
TH-228	Not Detected	-----	1.45
RA-224	Not Detected	-----	1.67
PB-212	5.57E-01	1.14E-01	9.83E-02
BI-212	4.89E-01	4.15E-01	6.42E-01
TL-208	5.24E-01	1.26E-01	1.20E-01
U-235	Not Detected	-----	3.75E-01
TH-231	Not Detected	-----	9.31E-01
PA-231	Not Detected	-----	2.01
AC-227	Not Detected	-----	2.74
TH-227	Not Detected	-----	5.62E-01
RA-223	Not Detected	-----	3.19E-01
RN-219	Not Detected	-----	4.44E-01
PB-211	Not Detected	-----	1.01
TL-207	Not Detected	-----	2.28E+01
AM-241	Not Detected	-----	8.43E-01
PU-239	Not Detected	-----	4.45E+02
NP-237	Not Detected	-----	5.96E-01
PA-233	Not Detected	-----	9.55E-02
TH-229	Not Detected	-----	4.67E-01

[Summary Report] - Sample ID: 50048808

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	5.09E-02
AR-41	Not Detected	-----	4.29E+03
BA-133	Not Detected	-----	9.30E-02
BA-140	Not Detected	-----	1.74E-01
CD-109	Not Detected	-----	1.99
CD-115	Not Detected	-----	1.34E-01
CE-139	Not Detected	-----	4.90E-02
CE-141	Not Detected	-----	8.81E-02
CE-144	Not Detected	-----	3.89E-01
CO-56	Not Detected	-----	5.52E-02
CO-57	Not Detected	-----	5.05E-02
CO-58	Not Detected	-----	4.98E-02
CO-60	Not Detected	-----	6.00E-02
CR-51	Not Detected	-----	3.53E-01
CS-134	Not Detected	-----	7.58E-02
CS-137	Not Detected	-----	5.59E-02
CU-64	Not Detected	-----	5.69E+01
EU-152	Not Detected	-----	4.11E-01
EU-154	Not Detected	-----	2.72E-01
EU-155	Not Detected	-----	2.35E-01
FE-59	Not Detected	-----	1.25E-01
GD-153	Not Detected	-----	1.85E-01
HG-203	Not Detected	-----	4.85E-02
I-131	Not Detected	-----	4.75E-02
IN-115m	Not Detected	-----	8.39
IR-192	Not Detected	-----	4.30E-02
K-40	1.92E+01	2.77	5.58E-01
LA-140	Not Detected	-----	8.21E-02
MN-54	Not Detected	-----	5.70E-02
MN-56	Not Detected	-----	1.39E+02
MO-99	Not Detected	-----	5.25E-01
NA-22	Not Detected	-----	7.11E-02
NA-24	Not Detected	-----	2.08E-01
NB-95	Not Detected	-----	3.27E-01
ND-147	Not Detected	-----	3.31E-01
NI-57	Not Detected	-----	1.43E-01
BE-7	Not Detected	-----	3.86E-01
RU-103	Not Detected	-----	4.28E-02
RU-106	Not Detected	-----	4.44E-01
SB-122	Not Detected	-----	8.28E-02
SB-124	Not Detected	-----	4.87E-02
SB-125	Not Detected	-----	1.37E-01
SC-46	Not Detected	-----	8.30E-02
SR-85	Not Detected	-----	5.97E-02
TA-182	Not Detected	-----	2.40E-01
TA-183	Not Detected	-----	8.62E-01
TE-132	Not Detected	-----	5.67E-02
TL-201	Not Detected	-----	3.05E-01
XE-133	Not Detected	-----	3.00E-01
Y-88	Not Detected	-----	4.07E-02
ZN-65	Not Detected	-----	1.61E-01
ZR-95	Not Detected	-----	9.08E-02

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-27-95 7:27:37 PM *

 * Analyzed by: *JW 6/28/95* Reviewed by: *JW 6/28/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022923-05
 Lab Sample ID : 50048809

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 2SMAR
 Sample Quantity : 902.000 gram
 Sample Date/Time : 6-26-95 1:40:00 PM
 Acquire Start Date : 6-27-95 6:53:58 PM
 Detector Name : LAB02
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	4.97
TH-234	Not Detected	-----	1.18
U-234	Not Detected	-----	1.79E+01
RA-226	6.86E-01	5.81E-01	9.08E-01
PB-214	4.89E-01	1.03E-01	9.04E-02
BI-214	4.46E-01	9.48E-02	8.13E-02
PB-210	Not Detected	-----	2.95E+02
TH-232	4.33E-01	2.01E-01	2.79E-01
RA-228	5.56E-01	2.87E-01	2.34E-01
AC-228	Not Detected	-----	2.76E-01
TH-228	5.56E-01	3.39E-01	8.16E-01
RA-224	Not Detected	-----	6.16E-01
PB-212	5.33E-01	1.17E-01	5.65E-02
BI-212	6.29E-01	3.52E-01	4.94E-01
TL-208	4.55E-01	1.18E-01	1.20E-01
U-235	Not Detected	-----	3.59E-01
TH-231	Not Detected	-----	8.79E-01
PA-231	Not Detected	-----	1.97
AC-227	Not Detected	-----	2.58
TH-227	Not Detected	-----	5.09E-01
RA-223	Not Detected	-----	3.03E-01
RN-219	Not Detected	-----	4.28E-01
PB-211	Not Detected	-----	9.96E-01
TL-207	Not Detected	-----	2.01E+01
AM-241	Not Detected	-----	7.97E-01
PU-239	Not Detected	-----	4.18E+02
NP-237	Not Detected	-----	5.67E-01
PA-233	Not Detected	-----	9.16E-02
TH-229	Not Detected	-----	4.64E-01

[Summary Report] - Sample ID: 50048809

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	4.80E-02
AR-41	Not Detected	-----	4.70E+03
BA-133	Not Detected	-----	8.70E-02
BA-140	Not Detected	-----	1.56E-01
CD-109	Not Detected	-----	1.93
CD-115	Not Detected	-----	1.45E-01
CE-139	Not Detected	-----	4.74E-02
CE-141	Not Detected	-----	8.31E-02
CE-144	Not Detected	-----	3.65E-01
CO-56	Not Detected	-----	5.16E-02
CO-57	Not Detected	-----	4.72E-02
CO-58	Not Detected	-----	4.60E-02
CO-60	Not Detected	-----	5.83E-02
CR-51	Not Detected	-----	3.48E-01
CS-134	Not Detected	-----	6.99E-02
CS-137	Not Detected	-----	5.37E-02
CU-64	Not Detected	-----	5.85E+01
EU-152	Not Detected	-----	3.40E-01
EU-154	Not Detected	-----	2.61E-01
EU-155	Not Detected	-----	2.18E-01
FE-59	Not Detected	-----	1.12E-01
GD-153	Not Detected	-----	1.82E-01
HG-203	Not Detected	-----	4.64E-02
I-131	Not Detected	-----	4.78E-02
IN-115m	Not Detected	-----	9.52
IR-192	Not Detected	-----	4.18E-02
K-40	1.65E+01	2.41	4.10E-01
LA-140	Not Detected	-----	8.16E-02
MN-54	Not Detected	-----	4.78E-02
MN-56	Not Detected	-----	1.42E+02
MO-99	Not Detected	-----	5.08E-01
NA-22	Not Detected	-----	6.89E-02
NA-24	Not Detected	-----	1.89E-01
NB-95	Not Detected	-----	2.99E-01
ND-147	Not Detected	-----	3.03E-01
NI-57	Not Detected	-----	1.26E-01
BE-7	Not Detected	-----	3.65E-01
RU-103	Not Detected	-----	4.04E-02
RU-106	Not Detected	-----	4.40E-01
SB-122	Not Detected	-----	7.50E-02
SB-124	Not Detected	-----	4.41E-02
SB-125	Not Detected	-----	1.22E-01
SC-46	Not Detected	-----	7.59E-02
SR-85	Not Detected	-----	5.61E-02
TA-182	Not Detected	-----	2.29E-01
TA-183	Not Detected	-----	8.03E-01
TE-132	Not Detected	-----	5.39E-02
TL-201	Not Detected	-----	3.01E-01
XE-133	Not Detected	-----	2.92E-01
Y-88	Not Detected	-----	3.41E-02
ZN-65	Not Detected	-----	1.52E-01
ZR-95	Not Detected	-----	8.50E-02

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-27-95 8:07:47 PM *

* Analyzed by: *JW 6/28/95* Reviewed by: *JW 6/28/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022924-05
 Lab Sample ID : 50048810

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 2SMAR
 Sample Quantity : 956.000 gram
 Sample Date/Time : 6-26-95 2:00:00 PM
 Acquire Start Date : 6-27-95 7:34:30 PM
 Detector Name : LAB02
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	4.56
TH-234	1.01	5.44E-01	6.92E-01
U-234	Not Detected	-----	1.75E+01
RA-226	1.08	5.30E-01	7.08E-01
PB-214	5.39E-01	1.03E-01	7.61E-02
BI-214	4.43E-01	9.30E-02	7.94E-02
PB-210	Not Detected	-----	2.85E+02
TH-232	5.19E-01	2.13E-01	2.85E-01
RA-228	3.43E-01	1.90E-01	2.70E-01
AC-228	4.79E-01	1.44E-01	1.57E-01
TH-228	3.89E-01	7.16E-02	7.39E-01
RA-224	Not Detected	-----	5.93E-01
PB-212	5.40E-01	1.13E-01	5.67E-02
BI-212	5.15E-01	3.88E-01	5.89E-01
TL-208	4.83E-01	1.17E-01	1.10E-01
U-235	Not Detected	-----	3.52E-01
TH-231	Not Detected	-----	8.58E-01
PA-231	Not Detected	-----	1.78
AC-227	Not Detected	-----	2.51
TH-227	Not Detected	-----	5.07E-01
RA-223	Not Detected	-----	2.95E-01
RN-219	Not Detected	-----	4.05E-01
PB-211	Not Detected	-----	9.43E-01
TL-207	Not Detected	-----	2.04E+01
AM-241	Not Detected	-----	7.23E-01
PU-239	Not Detected	-----	3.96E+02
NP-237	Not Detected	-----	5.23E-01
PA-233	Not Detected	-----	8.27E-02
TH-229	Not Detected	-----	4.24E-01

[Summary Report] - Sample ID: 50048810

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	4.46E-02
AR-41	Not Detected	-----	4.87E+03
BA-133	Not Detected	-----	8.66E-02
BA-140	Not Detected	-----	1.62E-01
CD-109	Not Detected	-----	1.77
CD-115	Not Detected	-----	1.35E-01
CE-139	Not Detected	-----	4.59E-02
CE-141	Not Detected	-----	7.98E-02
CE-144	Not Detected	-----	3.43E-01
CO-56	Not Detected	-----	5.42E-02
CO-57	Not Detected	-----	4.59E-02
CO-58	Not Detected	-----	4.63E-02
CO-60	Not Detected	-----	4.96E-02
CR-51	Not Detected	-----	3.29E-01
CS-134	Not Detected	-----	6.81E-02
CS-137	Not Detected	-----	4.94E-02
CU-64	Not Detected	-----	5.74E+01
EU-152	Not Detected	-----	3.74E-01
EU-154	Not Detected	-----	2.53E-01
EU-155	Not Detected	-----	2.11E-01
FE-59	Not Detected	-----	1.03E-01
GD-153	Not Detected	-----	1.64E-01
HG-203	Not Detected	-----	4.31E-02
I-131	Not Detected	-----	4.36E-02
IN-115m	Not Detected	-----	9.29
IR-192	Not Detected	-----	3.90E-02
K-40	1.63E+01	2.37	4.22E-01
LA-140	Not Detected	-----	8.62E-02
MN-54	Not Detected	-----	4.79E-02
MN-56	Not Detected	-----	1.64E+02
MO-99	Not Detected	-----	4.96E-01
NA-22	Not Detected	-----	6.23E-02
NA-24	Not Detected	-----	1.95E-01
NE-95	Not Detected	-----	2.97E-01
ND-147	Not Detected	-----	2.90E-01
NI-57	Not Detected	-----	1.15E-01
BE-7	Not Detected	-----	3.68E-01
RU-103	Not Detected	-----	3.95E-02
RU-106	Not Detected	-----	4.21E-01
SB-122	Not Detected	-----	8.57E-02
SB-124	Not Detected	-----	4.25E-02
SB-125	Not Detected	-----	1.19E-01
SC-46	Not Detected	-----	7.75E-02
SR-85	Not Detected	-----	5.32E-02
TA-182	Not Detected	-----	2.27E-01
TA-183	Not Detected	-----	7.22E-01
TE-132	Not Detected	-----	5.26E-02
TL-201	Not Detected	-----	3.04E-01
XE-133	Not Detected	-----	2.88E-01
Y-88	Not Detected	-----	3.55E-02
ZN-65	Not Detected	-----	1.52E-01
ZR-95	Not Detected	-----	8.55E-02

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-27-95 8:47:35 PM *

 * Analyzed by: *JW 6/28/95* Reviewed by: *JW 6/28/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022925-05
 Lab Sample ID : 50048811

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 2SMAR
 Sample Quantity : 766.000 gram
 Sample Date/Time : 6-26-95 2:10:00 PM
 Acquire Start Date : 6-27-95 8:13:48 PM
 Detector Name : LAB02
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	5.26
TH-234	7.27E-01	7.43E-01	1.15
U-234	Not Detected	-----	2.01E+01
RA-226	1.27	6.96E-01	1.02
PB-214	6.72E-01	1.28E-01	8.98E-02
BI-214	5.77E-01	1.22E-01	1.07E-01
PB-210	Not Detected	-----	3.46E+02
TH-232	6.35E-01	2.20E-01	2.63E-01
RA-228	7.59E-01	2.81E-01	2.30E-01
AC-228	Not Detected	-----	3.53E-01
TH-228	5.54E-01	3.34E-01	7.46E-01
RA-224	Not Detected	-----	7.95E-01
PB-212	5.74E-01	1.27E-01	7.28E-02
BI-212	6.86E-01	4.11E-01	5.88E-01
TL-208	6.25E-01	1.51E-01	1.45E-01
U-235	Not Detected	-----	4.22E-01
TH-231	Not Detected	-----	9.81E-01
PA-231	Not Detected	-----	2.21
AC-227	Not Detected	-----	3.02
TH-227	Not Detected	-----	6.07E-01
RA-223	Not Detected	-----	3.36E-01
RN-219	Not Detected	-----	5.00E-01
PB-211	Not Detected	-----	1.11
TL-207	Not Detected	-----	2.44E+01
AM-241	Not Detected	-----	8.36E-01
PU-239	Not Detected	-----	4.52E+02
NP-237	Not Detected	-----	6.25E-01
PA-233	Not Detected	-----	1.03E-01
TH-229	Not Detected	-----	5.17E-01

[Summary Report] - Sample ID: 50048811

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	5.60E-02
AR-41	Not Detected	-----	7.13E+03
BA-133	Not Detected	-----	1.07E-01
BA-140	Not Detected	-----	1.97E-01
CD-109	Not Detected	-----	2.13
CD-115	Not Detected	-----	1.59E-01
CE-139	Not Detected	-----	5.28E-02
CE-141	Not Detected	-----	9.54E-02
CE-144	Not Detected	-----	4.10E-01
CO-56	Not Detected	-----	5.67E-02
CO-57	Not Detected	-----	5.38E-02
CO-58	Not Detected	-----	5.18E-02
CO-60	Not Detected	-----	6.65E-02
CR-51	Not Detected	-----	4.30E-01
CS-134	Not Detected	-----	8.67E-02
CS-137	Not Detected	-----	6.43E-02
CU-64	Not Detected	-----	7.26E+01
EU-152	Not Detected	-----	4.10E-01
EU-154	Not Detected	-----	3.24E-01
EU-155	Not Detected	-----	2.55E-01
FE-59	Not Detected	-----	1.35E-01
GD-153	Not Detected	-----	2.03E-01
HG-203	Not Detected	-----	5.44E-02
I-131	Not Detected	-----	5.14E-02
IN-115m	Not Detected	-----	1.18E+01
IR-192	Not Detected	-----	4.82E-02
K-40	1.78E+01	2.63	6.14E-01
LA-140	Not Detected	-----	9.21E-02
MN-54	Not Detected	-----	5.84E-02
MN-56	Not Detected	-----	1.95E+02
MO-99	Not Detected	-----	5.56E-01
NA-22	Not Detected	-----	7.57E-02
NA-24	Not Detected	-----	2.52E-01
NB-95	Not Detected	-----	3.57E-01
ND-147	Not Detected	-----	3.74E-01
NI-57	Not Detected	-----	1.67E-01
BE-7	Not Detected	-----	4.49E-01
RU-103	Not Detected	-----	4.82E-02
RU-106	Not Detected	-----	4.82E-01
SB-122	Not Detected	-----	1.00E-01
SB-124	Not Detected	-----	5.44E-02
SB-125	Not Detected	-----	1.40E-01
SC-46	Not Detected	-----	8.97E-02
SR-85	Not Detected	-----	6.61E-02
TA-182	Not Detected	-----	2.65E-01
TA-183	Not Detected	-----	8.52E-01
TE-132	Not Detected	-----	6.07E-02
TL-201	Not Detected	-----	3.57E-01
XE-133	Not Detected	-----	3.36E-01
Y-88	Not Detected	-----	4.02E-02
ZN-65	Not Detected	-----	1.72E-01
ZR-95	Not Detected	-----	1.02E-01

ER/1302 096/DAT

14

SMO ANALYTICAL DATA ROUTING FORM

Project Name: TAT Phase I Case Number: 3626400

SNL Task Leader: Miller Org/Mail Stop: 7582/1347

SMO Project Coordinator: Puissant Sample Ship Date: 6/27/95

ARCOG Lab Lab ID
03731 SNL 7715 500491

03733 " 500495

03728 " 500488

Date Results Received:

Preliminary: _____ Final: 6/29, 6/29, 6/29

Corrections Requested From Laboratory: _____ Requestor: _____

Date Corrections Received: _____

ORIGINAL COPY
FILED IN
RECORDS CENTER BY
SMO
JOM
7/10/95
(initials)

Date Assigned to SMO Reviewer: _____

Reviewer: _____

Date Review Complete: _____

Signature: _____

Date of Preliminary Notification: _____

Person Notified: _____

Date of Final Transmittal: 7/10/95

Transmitted To: Miller

Transmitted By: JOM

Filed In Record Center: JOM

Comments: _____

ANALYSIS REQUEST AND CHAIN OF CUSTODY

2001-COC (9-94)

500491

AR/COC- 03731

Dept. No./Mail Stop: CG 412495 7582/1347
 Project/Task Manager: D. Miller / H. Fleck (Phase)
 Project Name: TA-1 Soil Sampling
 Record Center Code: ADS 1302 ER Site 96
 Logbook Ref No.: 0133
 SMO Reference No.: CF0089

Date Samples Shipped: 6-27-95
 Carrier/Waybill No.: NYC
 Lab Contact: Amir M.
 Lab Destination: 7715
 SMO Contact/Phone: D. "Mac" McLaughlin / 845-0867
 Send Report to SMO: Deborah McLaughlin

Contract No.: NA
 Case No.: 3626-400
 SMO Authorization: [Signature]
 Bill to: Sandia National Laboratories
 Supplier Services Department
 P.O. Box 5800 MS 0154
 Albuquerque, NM 87185-0154

Parameter & Method Requested

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Location: Tech Area MA

Building MA Room Outside

Sample No. - Fraction ER Sample ID or Sample Location Detail

Beginning Depth in Ft.	ER Site No.	Date/Time Collected	Sample Matrix	Reference LOV (available at SMO)		Preservative	Sample Collection Method	Sample Type
				Container Type	Volume			
1'	96	6/27/95 8:35	S	P	500ml	NONE	G	SA
		8:55						
		9:15						
		9:30						
		9:50						
		10:40						
		10:55						
		↓						
		11:15						
		11:30						

GAMMA SPEC

Lab Sample ID

IMMA Yes No Ref. No. _____

Sample Disposal Return to Client Disposal by lab

Turnaround Time Normal Rush Required Report Date _____

Sample Tracking Date Entered (mm/dd/yy): 6/29/95

Entered by: [Signature]

Special Instructions/QC Requirements

Abnormal Conditions on Receipt

Sample Name	Name	Signature	Init	Company/Organization
Team	MATTHEW SHAIN	<u>[Signature]</u>	MS	TT / 7582
Members	CATHIE GOHAR	<u>[Signature]</u>	CG	SANDIA / 7582

Relinquished by <u>Matthew Shain</u> Org. <u>7582</u> Date <u>6/27/95</u> Time <u>1409</u>	4. Relinquished by _____ Org. _____ Date _____ Time _____
Received by <u>[Signature]</u> Org. <u>5007513</u> Date <u>6-27-95</u> Time <u>1409</u>	4. Received by _____ Org. _____ Date _____ Time _____
Relinquished by <u>[Signature]</u> Org. <u>5007513</u> Date <u>6-27-95</u> Time <u>1409</u>	5. Relinquished by _____ Org. _____ Date _____ Time _____
Received by <u>[Signature]</u> Org. <u>SN07715</u> Date <u>6/27/95</u> Time <u>1417</u>	5. Received by _____ Org. _____ Date _____ Time _____
Relinquished by <u>[Signature]</u> Org. <u>SN27715</u> Date <u>6/29/95</u> Time <u>1055</u>	6. Relinquished by _____ Org. _____ Date _____ Time _____
Received by <u>[Signature]</u> Org. <u>5007513</u> Date <u>6-29-95</u> Time <u>1055</u>	6. Received by _____ Org. _____ Date _____ Time _____



To be completed by Customer

Shaded areas are for RPSD use only

Customer: <u>D. Miller / H. Flood</u>	Hazards/Special Instructions: <u>Please Notify S-40</u> <u>upon completion</u> <u>@ 845-0807</u>	Batch Log Number: <u>500491</u>
Organization: <u>7582</u>		Logged By: <u>ema</u>
Project Location: <u>TA-1</u>		Analysis Type: <input checked="" type="checkbox"/> Gamma Spec
Phone: <u>845-0867</u>		<input type="checkbox"/> H-3
Date Results Needed: <u>6-29-95</u>		<input type="checkbox"/> Alpha/Beta
Suspect Isotopes: _____		<input type="checkbox"/> Alpha Spec
Other Information: <u>03731</u>	<input type="checkbox"/> Total U	
		<input type="checkbox"/> Other
LIMS Login: _____	Results Faxed: _____	Sample Disposal: _____

Customer Sample ID	Sample Type	Date/Time Collected	Sample Volume	Requested Analysis	RPSD Sample ID	Rad Scan CPM	Sample Weight	Remarks
<u>022936-05</u>	<u>soil</u>	<u>6-27-95 835</u>	<u>500</u>	<u>γ spec</u>	<u>01</u>	<u><300</u>	<u>818g</u>	
<u>022936</u>		<u>855</u>			<u>02</u>	<u>2300</u>	<u>825g</u>	
<u>022937</u>		<u>915</u>			<u>03</u>	<u><300</u>	<u>790g</u>	
<u>022938</u>		<u>930</u>			<u>04</u>	<u>2300</u>	<u>728g</u>	
<u>022939</u>		<u>950</u>			<u>05</u>	<u>2300</u>	<u>647g</u>	
<u>022940</u>		<u>1040</u>			<u>06</u>	<u><300</u>	<u>630g</u>	
<u>022941</u>		<u>1055</u>			<u>07</u>	<u><300</u>	<u>766g</u>	
<u>022942</u>		<u>↓</u>			<u>08</u>	<u><300</u>	<u>843g</u>	
<u>022943</u>		<u>1115</u>			<u>09</u>	<u><300</u>	<u>850g</u>	
<u>022944</u>		<u>± 1130</u>			<u>10</u>	<u><300</u>	<u>762g</u>	
<u>022945</u>		<u>1145</u>			<u>11</u>	<u><300</u>	<u>682g</u>	
<u>022946</u>		<u>1420</u>			<u>12</u>	<u><300</u>	<u>833g</u>	
<u>022947</u>	<u>↓</u>	<u>↓ 1510</u>	<u>↓</u>		<u>13</u>	<u><300</u>	<u>819g</u>	
<u>LCS</u>		<u>1-nov-90</u>		<u>γ spec</u>	<u>14</u>	<u>NA</u>	<u>NA</u>	

Relinquished by [Signature] Date 6-27-95 Time 1417 Received by [Signature] Date 6/27/95 Time 1417
 Relinquished by [Signature] Date 6/29/95 Time 1055 Received by [Signature] Date 6-29-95 Time 1055
 Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____
 Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-28-95 12:16:06 AM *

 * Analyzed by: *JW 6/28/95* Reviewed by: *JW 6/28/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022935-05
 Lab Sample ID : 50049101

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 1SMAR
 Sample Quantity : 818.000 gram
 Sample Date/Time : 6-27-95 8:35:00 AM
 Acquire Start Date : 6-27-95 11:43:37 PM
 Detector Name : LAB01
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	2.00
TH-234	6.11E-01	3.17E-01	4.76E-01
U-234	Not Detected	-----	1.66E+01
RA-226	1.13E-01	7.16E-01	1.09
PB-214	4.96E-01	1.01E-01	8.71E-02
BI-214	4.02E-01	9.14E-02	8.94E-02
PB-210	Not Detected	-----	4.50E+01
TH-232	4.45E-01	1.89E-01	2.55E-01
RA-228	4.19E-01	1.45E-01	1.69E-01
AC-228	Not Detected	-----	2.70E-01
TH-228	5.08E-01	3.03E-01	7.36E-01
RA-224	Not Detected	-----	6.02E-01
PB-212	5.36E-01	1.26E-01	5.59E-02
BI-212	6.51E-01	3.43E-01	4.74E-01
TL-208	4.64E-01	1.16E-01	1.16E-01
U-235	Not Detected	-----	3.09E-01
TH-231	Not Detected	-----	6.10E-01
PA-231	Not Detected	-----	1.82
AC-227	Not Detected	-----	2.38
TH-227	Not Detected	-----	4.74E-01
RA-223	Not Detected	-----	2.03E-01
RN-219	3.19E-01	2.21E-01	3.34E-01
PB-211	Not Detected	-----	9.59E-01
TL-207	Not Detected	-----	1.85E+01
AM-241	Not Detected	-----	2.55E-01
PU-239	Not Detected	-----	3.49E+02
NP-237	Not Detected	-----	2.37E-01
PA-233	Not Detected	-----	8.72E-02
TH-229	Not Detected	-----	3.18E-01

Not detected JW 6/28/95

[Summary Report] - Sample ID: 50049101

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	4.75E-02
AR-41	Not Detected	-----	2.17E+01
BA-133	Not Detected	-----	8.96E-02
BA-140	Not Detected	-----	1.49E-01
CD-109	Not Detected	-----	8.16E-01
CD-115	Not Detected	-----	1.12E-01
CE-139	Not Detected	-----	4.47E-02
CE-141	Not Detected	-----	6.98E-02
CE-144	Not Detected	-----	3.10E-01
CO-56	Not Detected	-----	4.98E-02
CO-57	Not Detected	-----	3.81E-02
CO-58	Not Detected	-----	4.80E-02
CO-60	Not Detected	-----	5.24E-02
CR-51	Not Detected	-----	3.40E-01
CS-134	Not Detected	-----	7.03E-02
CS-137	Not Detected	-----	5.46E-02
CU-64	Not Detected	-----	2.38E+01
EU-152	Not Detected	-----	3.49E-01
EU-154	Not Detected	-----	2.54E-01
EU-155	Not Detected	-----	1.65E-01
FE-59	Not Detected	-----	9.74E-02
GD-153	Not Detected	-----	1.34E-01
HG-203	Not Detected	-----	4.34E-02
I-131	Not Detected	-----	4.28E-02
IN-115m	Not Detected	-----	1.00
IR-192	Not Detected	-----	4.10E-02
K-40	1.65E+01	2.39	4.59E-01
LA-140	Not Detected	-----	6.07E-02
MN-54	Not Detected	-----	4.81E-02
MN-56	Not Detected	-----	3.13
MO-99	Not Detected	-----	4.21E-01
NA-22	Not Detected	-----	6.18E-02
NA-24	Not Detected	-----	9.65E-02
NB-95	Not Detected	-----	2.49E-01
ND-147	Not Detected	-----	2.98E-01
NI-57	Not Detected	-----	8.72E-02
BE-7	Not Detected	-----	3.73E-01
RU-103	Not Detected	-----	3.89E-02
RU-106	Not Detected	-----	4.06E-01
SB-122	Not Detected	-----	6.99E-02
SB-124	Not Detected	-----	5.03E-02
SB-125	Not Detected	-----	1.29E-01
SC-46	Not Detected	-----	7.43E-02
SR-85	Not Detected	-----	5.29E-02
TA-182	Not Detected	-----	2.17E-01
TA-183	Not Detected	-----	2.38E-01
TE-132	Not Detected	-----	4.49E-02
TL-201	Not Detected	-----	1.53E-01
XE-133	Not Detected	-----	1.79E-01
Y-88	Not Detected	-----	4.05E-02
ZN-65	Not Detected	-----	1.52E-01
ZR-95	Not Detected	-----	7.73E-02

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-28-95 12:53:37 AM *

 * Analyzed by: *JW* 6/28/95 Reviewed by: *JW* 6/28/95 *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022936-05
 Lab Sample ID : 50049102

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 1SMAR
 Sample Quantity : 825.000 gram
 Sample Date/Time : 6-27-95 8:55:00 AM
 Acquire Start Date : 6-28-95 12:21:06 AM
 Detector Name : LAB01
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	2.01
TH-234	5.63E-01	3.75E-01	5.34E-01
U-234	Not Detected	-----	1.54E+01
RA-226	8.76E-01	5.28E-01	7.93E-01
PB-214	4.94E-01	9.82E-02	8.02E-02
BI-214	3.84E-01	8.31E-02	7.23E-02
PB-210	Not Detected	-----	4.93E+01
TH-232	5.04E-01	1.86E-01	2.36E-01
RA-228	4.61E-01	1.98E-01	1.77E-01
AC-228	Not Detected	-----	2.67E-01
TH-228	Not Detected	-----	1.34
RA-224	1.31	3.61E-01	5.76E-01
PB-212	5.96E-01	1.20E-01	5.56E-02
BI-212	1.98E-01	2.87E-01	4.68E-01
TL-208	5.19E-01	1.26E-01	1.24E-01
U-235	Not Detected	-----	3.08E-01
TH-231	Not Detected	-----	2.65E-01
PA-231	Not Detected	-----	1.87
AC-227	Not Detected	-----	2.35
TH-227	Not Detected	-----	5.04E-01
RA-223	Not Detected	-----	1.99E-01
RN-219	Not Detected	-----	3.85E-01
PB-211	Not Detected	-----	9.23E-01
TL-207	Not Detected	-----	2.06E+01
AM-241	Not Detected	-----	2.67E-01
PU-239	Not Detected	-----	3.46E+02
NP-237	Not Detected	-----	3.82E-01
PA-233	Not Detected	-----	8.39E-02
TH-229	Not Detected	-----	3.22E-01

[Summary Report] - Sample ID: 50049102

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	5.03E-02
AR-41	Not Detected	-----	2.43E+01
BA-133	Not Detected	-----	8.45E-02
BA-140	Not Detected	-----	1.69E-01
CD-109	Not Detected	-----	1.32
CD-115	Not Detected	-----	1.14E-01
CE-139	Not Detected	-----	4.47E-02
CE-141	Not Detected	-----	7.13E-02
CE-144	Not Detected	-----	3.07E-01
CO-56	Not Detected	-----	5.14E-02
CO-57	Not Detected	-----	3.87E-02
CO-58	Not Detected	-----	4.87E-02
CO-60	Not Detected	-----	4.98E-02
CR-51	Not Detected	-----	3.22E-01
CS-134	Not Detected	-----	6.84E-02
CS-137	2.95E-02	2.26E-02	3.41E-02
CU-64	Not Detected	-----	2.69E+01
EU-152	Not Detected	-----	3.69E-01
EU-154	Not Detected	-----	2.29E-01
EU-155	Not Detected	-----	1.63E-01
FE-59	Not Detected	-----	1.06E-01
GD-153	Not Detected	-----	1.35E-01
HG-203	Not Detected	-----	4.16E-02
I-131	Not Detected	-----	4.42E-02
IN-115m	Not Detected	-----	1.06
IR-192	Not Detected	-----	3.97E-02
K-40	1.60E+01	2.33	4.60E-01
LA-140	Not Detected	-----	5.71E-02
MN-54	Not Detected	-----	4.97E-02
MN-56	Not Detected	-----	3.49
MO-99	Not Detected	-----	3.95E-01
NA-22	Not Detected	-----	5.87E-02
NA-24	Not Detected	-----	1.09E-01
NB-95	Not Detected	-----	2.65E-01
ND-147	Not Detected	-----	2.99E-01
NI-57	Not Detected	-----	9.19E-02
BE-7	Not Detected	-----	3.47E-01
RU-103	Not Detected	-----	4.19E-02
RU-106	Not Detected	-----	4.16E-01
SB-122	Not Detected	-----	6.97E-02
SB-124	Not Detected	-----	4.87E-02
SB-125	Not Detected	-----	1.20E-01
SC-46	Not Detected	-----	7.25E-02
SR-85	Not Detected	-----	5.40E-02
TA-182	Not Detected	-----	2.12E-01
TA-183	Not Detected	-----	2.50E-01
TE-132	Not Detected	-----	4.76E-02
TL-201	Not Detected	-----	1.52E-01
XE-133	Not Detected	-----	1.82E-01
Y-88	Not Detected	-----	3.64E-02
ZN-65	Not Detected	-----	1.45E-01
ZR-95	Not Detected	-----	7.95E-02

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-28-95 1:31:16 AM *

 * Analyzed by: *JW 6/28/95* Reviewed by: *JW 6/28/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022937-05
 Lab Sample ID : 50049103

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : LSMAR
 Sample Quantity : 790.000 gram
 Sample Date/Time : 6-27-95 9:15:00 AM
 Acquire Start Date : 6-28-95 12:58:48 AM
 Detector Name : LAB01
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	2.17
TH-234	4.57E-01	3.90E-01	5.89E-01
U-234	Not Detected	-----	1.73E+01
RA-226	7.78E-01	5.60E-01	8.61E-01
PB-214	4.98E-01	9.95E-02	8.09E-02
BI-214	4.46E-01	9.48E-02	8.33E-02
PB-210	Not Detected	-----	4.83E+01
TH-232	4.53E-01	1.82E-01	2.39E-01
RA-228	6.04E-01	2.17E-01	1.74E-01
AC-228	Not Detected	-----	2.89E-01
TH-228	Not Detected	-----	1.35
RA-224	Not Detected	-----	1.52
PB-212	4.51E-01	6.81E-02	7.43E-02
BI-212	9.04E-01	3.87E-01	5.01E-01
TL-208	5.45E-01	1.27E-01	1.17E-01
U-235	Not Detected	-----	3.30E-01
TH-231	Not Detected	-----	6.36E-01
PA-231	Not Detected	-----	1.87
AC-227	Not Detected	-----	2.52
TH-227	Not Detected	-----	5.01E-01
RA-223	Not Detected	-----	2.11E-01
RN-219	2.04E-01	2.18E-01	3.45E-01
PB-211	Not Detected	-----	9.89E-01
TL-207	Not Detected	-----	2.15E+01
AM-241	Not Detected	-----	2.76E-01
PU-239	Not Detected	-----	3.56E+02
NP-237	Not Detected	-----	2.29E-01
PA-233	Not Detected	-----	8.74E-02
TH-229	Not Detected	-----	3.29E-01

not detected JW 6/28/95

[Summary Report] - Sample ID: 50049103

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	5.03E-02
AR-41	Not Detected	-----	2.82E+01
BA-133	Not Detected	-----	8.88E-02
BA-140	Not Detected	-----	1.75E-01
CD-109	Not Detected	-----	7.87E-01
CD-115	Not Detected	-----	1.19E-01
CE-139	Not Detected	-----	4.66E-02
CE-141	Not Detected	-----	7.57E-02
CE-144	Not Detected	-----	3.26E-01
CO-56	Not Detected	-----	5.37E-02
CO-57	Not Detected	-----	3.89E-02
CO-58	Not Detected	-----	4.95E-02
CO-60	Not Detected	-----	6.12E-02
CR-51	Not Detected	-----	3.70E-01
CS-134	Not Detected	-----	7.40E-02
CS-137	Not Detected	-----	5.66E-02
CU-64	Not Detected	-----	2.98E+01
EU-152	Not Detected	-----	3.90E-01
EU-154	Not Detected	-----	2.71E-01
EU-155	Not Detected	-----	1.69E-01
FE-59	Not Detected	-----	1.11E-01
GD-153	Not Detected	-----	1.37E-01
HG-203	Not Detected	-----	4.49E-02
I-131	Not Detected	-----	4.74E-02
IN-115m	Not Detected	-----	1.15
IR-192	Not Detected	-----	4.31E-02
K-40	1.75E+01	2.53	4.15E-01
LA-140	Not Detected	-----	6.68E-02
MN-54	1.33E-02	1.93E-02	3.14E-02
MN-56	Not Detected	-----	3.95
MO-99	Not Detected	-----	4.18E-01
NA-22	Not Detected	-----	6.78E-02
NA-24	Not Detected	-----	1.10E-01
NB-95	Not Detected	-----	2.64E-01
ND-147	Not Detected	-----	3.11E-01
NI-57	Not Detected	-----	9.65E-02
BE-7	Not Detected	-----	3.64E-01
RU-103	Not Detected	-----	4.31E-02
RU-106	Not Detected	-----	4.41E-01
SB-122	Not Detected	-----	7.22E-02
SB-124	Not Detected	-----	5.25E-02
SB-125	Not Detected	-----	1.28E-01
SC-46	Not Detected	-----	7.80E-02
SR-85	Not Detected	-----	5.33E-02
TA-182	Not Detected	-----	2.25E-01
TA-183	Not Detected	-----	2.58E-01
TE-132	Not Detected	-----	4.70E-02
TL-201	Not Detected	-----	1.62E-01
XE-133	Not Detected	-----	1.91E-01
Y-88	Not Detected	-----	3.90E-02
ZN-65	Not Detected	-----	1.55E-01
ZR-95	Not Detected	-----	8.30E-02

not detected 7/1/28/75

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-28-95 2:08:46 AM *

 * Analyzed by: *JR 6/28/95* Reviewed by: *JR 6/28/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022938-05
 Lab Sample ID : 50049104

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 1SMAR
 Sample Quantity : 728.000 gram
 Sample Date/Time : 6-27-95 9:30:00 AM
 Acquire Start Date : 6-28-95 1:36:13 AM
 Detector Name : LAB01
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	2.30
TH-234	Not Detected	-----	5.52E-01
U-234	Not Detected	-----	1.87E+01
RA-226	1.83	7.11E-01	9.72E-01
PB-214	5.82E-01	1.23E-01	1.18E-01
BI-214	5.42E-01	1.10E-01	9.09E-02
PB-210	Not Detected	-----	3.10E+01
TH-232	5.64E-01	1.83E-01	2.08E-01
RA-228	5.56E-01	2.34E-01	2.33E-01
AC-228	7.36E-01	1.90E-01	1.85E-01
TH-228	Not Detected	-----	1.53
RA-224	Not Detected	-----	6.36E-01
PB-212	6.98E-01	1.36E-01	5.94E-02
BI-212	7.52E-01	3.71E-01	4.99E-01
TL-208	5.82E-01	1.35E-01	1.22E-01
U-235	Not Detected	-----	3.58E-01
TH-231	Not Detected	-----	6.62E-01
PA-231	Not Detected	-----	2.13
AC-227	Not Detected	-----	2.58
TH-227	Not Detected	-----	5.63E-01
RA-223	Not Detected	-----	2.18E-01
RN-219	Not Detected	-----	4.35E-01
PB-211	Not Detected	-----	1.06
TL-207	Not Detected	-----	2.19E+01
AM-241	Not Detected	-----	3.02E-01
PU-239	Not Detected	-----	4.00E+02
NP-237	Not Detected	-----	4.32E-01
PA-233	Not Detected	-----	1.03E-01
TH-229	Not Detected	-----	3.54E-01

[Summary Report] - Sample ID: 50049104

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	5.71E-02
AR-41	Not Detected	-----	3.31E+01
BA-133	Not Detected	-----	9.77E-02
BA-140	Not Detected	-----	1.82E-01
CD-109	Not Detected	-----	8.91E-01
CD-115	Not Detected	-----	1.28E-01
CE-139	Not Detected	-----	4.75E-02
CE-141	Not Detected	-----	7.95E-02
CE-144	Not Detected	-----	3.53E-01
CO-56	Not Detected	-----	5.71E-02
CO-57	Not Detected	-----	4.48E-02
CO-58	Not Detected	-----	5.15E-02
CO-60	Not Detected	-----	6.01E-02
CR-51	Not Detected	-----	4.04E-01
CS-134	Not Detected	-----	8.49E-02
CS-137	Not Detected	-----	6.49E-02
CU-64	Not Detected	-----	2.87E+01
EU-152	Not Detected	-----	4.14E-01
EU-154	Not Detected	-----	2.71E-01
EU-155	Not Detected	-----	1.82E-01
FE-59	Not Detected	-----	1.14E-01
GD-153	Not Detected	-----	1.51E-01
HG-203	Not Detected	-----	3.79E-02
I-131	Not Detected	-----	5.10E-02
IN-115m	Not Detected	-----	1.31
IR-192	Not Detected	-----	4.78E-02
K-40	1.78E+01	2.60	6.29E-01
LA-140	Not Detected	-----	8.20E-02
MN-54	Not Detected	-----	5.71E-02
MN-56	Not Detected	-----	4.65
MO-99	Not Detected	-----	4.78E-01
NA-22	Not Detected	-----	6.59E-02
NA-24	Not Detected	-----	1.03E-01
NB-95	Not Detected	-----	2.98E-01
ND-147	Not Detected	-----	3.48E-01
NI-57	Not Detected	-----	9.75E-02
BE-7	Not Detected	-----	3.77E-01
RU-103	Not Detected	-----	4.73E-02
RU-106	Not Detected	-----	4.53E-01
SB-122	Not Detected	-----	8.00E-02
SB-124	Not Detected	-----	5.88E-02
SB-125	Not Detected	-----	1.41E-01
SC-46	Not Detected	-----	8.10E-02
SR-85	Not Detected	-----	6.05E-02
TA-182	Not Detected	-----	2.40E-01
TA-183	Not Detected	-----	2.83E-01
TE-132	Not Detected	-----	4.93E-02
TL-201	Not Detected	-----	1.72E-01
XE-133	Not Detected	-----	2.07E-01
Y-88	Not Detected	-----	4.75E-02
ZN-65	Not Detected	-----	1.65E-01
ZR-95	Not Detected	-----	9.25E-02

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-28-95 2:46:35 AM *

 * Analyzed by: *W 1/28/95* Reviewed by: *W 8/28/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022939-05
 Lab Sample ID : 50049105

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 1SMAR
 Sample Quantity : 647.000 gram
 Sample Date/Time : 6-27-95 9:50:00 AM
 Acquire Start Date : 6-28-95 2:13:59 AM
 Detector Name : LAB01
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	2.51
TH-234	1.02	4.69E-01	5.90E-01
U-234	Not Detected	-----	2.14E+01
RA-226	1.32	5.76E-01	7.97E-01
PB-214	6.60E-01	1.28E-01	9.86E-02
BI-214	6.65E-01	1.25E-01	8.57E-02
PB-210	Not Detected	-----	5.89E+01
TH-232	6.39E-01	2.19E-01	2.63E-01
RA-228	6.16E-01	2.89E-01	2.33E-01
AC-228	8.08E-01	1.95E-01	1.60E-01
TH-228	Not Detected	-----	1.69
RA-224	2.04	5.30E-01	7.15E-01
PB-212	8.20E-01	1.73E-01	7.12E-02
BI-212	1.02	4.54E-01	5.96E-01
TL-208	6.00E-01	1.54E-01	1.62E-01
U-235	Not Detected	-----	4.01E-01
TH-231	Not Detected	-----	7.62E-01
PA-231	Not Detected	-----	2.36
AC-227	Not Detected	-----	2.91
TH-227	Not Detected	-----	6.36E-01
RA-223	Not Detected	-----	2.52E-01
RN-219	Not Detected	-----	3.83E-01
PB-211	Not Detected	-----	1.19
TL-207	Not Detected	-----	2.28E+01
AM-241	Not Detected	-----	3.34E-01
PU-239	Not Detected	-----	4.18E+02
NP-237	Not Detected	-----	4.89E-01
PA-233	Not Detected	-----	1.04E-01
TH-229	Not Detected	-----	3.81E-01

[Summary Report] - Sample ID: 50049105

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	6.99E-02
AR-41	Not Detected	-----	3.93E+01
BA-133	Not Detected	-----	1.13E-01
BA-140	Not Detected	-----	1.91E-01
CD-109	Not Detected	-----	1.06
CD-115	Not Detected	-----	1.38E-01
CE-139	Not Detected	-----	5.10E-02
CE-141	Not Detected	-----	9.10E-02
CE-144	Not Detected	-----	3.76E-01
CO-56	Not Detected	-----	6.36E-02
CO-57	Not Detected	-----	4.69E-02
CO-58	Not Detected	-----	6.05E-02
CO-60	Not Detected	-----	6.30E-02
CR-51	Not Detected	-----	4.07E-01
CS-134	Not Detected	-----	9.08E-02
CS-137	1.17E-01	3.64E-02	3.97E-02
CU-64	Not Detected	-----	2.95E+01
EU-152	Not Detected	-----	4.55E-01
EU-154	Not Detected	-----	3.11E-01
EU-155	Not Detected	-----	1.98E-01
FE-59	Not Detected	-----	1.26E-01
GD-153	Not Detected	-----	1.64E-01
HG-203	Not Detected	-----	5.11E-02
I-131	Not Detected	-----	5.33E-02
IN-115m	Not Detected	-----	1.47
IR-192	Not Detected	-----	4.78E-02
K-40	1.45E+01	2.20	5.72E-01
LA-140	Not Detected	-----	8.64E-02
MN-54	Not Detected	-----	6.28E-02
MN-56	Not Detected	-----	5.60
MO-99	Not Detected	-----	5.09E-01
NA-22	Not Detected	-----	6.76E-02
NA-24	Not Detected	-----	1.24E-01
NB-95	Not Detected	-----	3.38E-01
ND-147	Not Detected	-----	3.86E-01
NI-57	Not Detected	-----	1.19E-01
BE-7	Not Detected	-----	4.47E-01
RU-103	Not Detected	-----	4.95E-02
RU-106	Not Detected	-----	5.17E-01
SB-122	Not Detected	-----	9.21E-02
SB-124	Not Detected	-----	6.16E-02
SB-125	Not Detected	-----	1.51E-01
SC-46	Not Detected	-----	8.67E-02
SR-85	Not Detected	-----	6.50E-02
TA-182	Not Detected	-----	2.55E-01
TA-183	Not Detected	-----	3.14E-01
TE-132	Not Detected	-----	5.53E-02
TL-201	Not Detected	-----	1.94E-01
XE-133	Not Detected	-----	2.28E-01
Y-88	Not Detected	-----	4.89E-02
ZN-65	Not Detected	-----	1.73E-01
ZR-95	Not Detected	-----	9.62E-02

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-28-95 3:23:58 AM *

 * Analyzed by: *JN 6/28/95* Reviewed by: *JN 6/28/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022940-05
 Lab Sample ID : 50049106

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 1SMAR
 Sample Quantity : 630.000 gram
 Sample Date/Time : 6-27-95 10:40:00 AM
 Acquire Start Date : 6-28-95 2:51:28 AM
 Detector Name : LAB01
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	2.39
TH-234	5.57E-01	4.79E-01	7.23E-01
U-234	Not Detected	-----	2.12E+01
RA-226	1.60	7.01E-01	9.83E-01
PB-214	6.57E-01	1.33E-01	1.13E-01
BI-214	5.55E-01	1.18E-01	1.05E-01
PB-210	Not Detected	-----	5.88E+01
TH-232	5.29E-01	2.13E-01	2.12E-01
RA-228	6.63E-01	2.38E-01	2.78E-01
AC-228	Not Detected	-----	3.35E-01
TH-228	5.63E-01	3.56E-01	8.40E-01
RA-224	1.65	4.86E-01	7.56E-01
PB-212	6.63E-01	1.72E-01	6.83E-02
BI-212	Not Detected	-----	9.54E-01
TL-208	5.72E-01	2.16E-01	1.20E-01
U-235	Not Detected	-----	3.70E-01
TH-231	Not Detected	-----	7.52E-01
PA-231	Not Detected	-----	2.32
AC-227	Not Detected	-----	2.84
TH-227	Not Detected	-----	5.97E-01
RA-223	Not Detected	-----	2.48E-01
RN-219	Not Detected	-----	4.73E-01
PB-211	Not Detected	-----	1.12
TL-207	Not Detected	-----	2.59E+01
AM-241	Not Detected	-----	3.29E-01
PU-239	Not Detected	-----	4.36E+02
NP-237	Not Detected	-----	2.97E-01
PA-233	Not Detected	-----	1.13E-01
TH-229	Not Detected	-----	3.86E-01

[Summary Report] - Sample ID: 50049106

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	5.29E-02
AR-41	Not Detected	-----	3.55E+01
BA-133	Not Detected	-----	1.07E-01
BA-140	Not Detected	-----	1.98E-01
CD-109	Not Detected	-----	1.02
CD-115	Not Detected	-----	1.37E-01
CE-139	Not Detected	-----	5.12E-02
CE-141	Not Detected	-----	8.41E-02
CE-144	Not Detected	-----	3.81E-01
CO-56	Not Detected	-----	6.46E-02
CO-57	Not Detected	-----	4.90E-02
CO-58	Not Detected	-----	5.98E-02
CO-60	Not Detected	-----	6.81E-02
CR-51	Not Detected	-----	4.39E-01
CS-134	Not Detected	-----	8.92E-02
CS-137	Not Detected	-----	5.75E-02
CU-64	Not Detected	-----	3.28E+01
EU-152	Not Detected	-----	4.54E-01
EU-154	Not Detected	-----	3.16E-01
EU-155	Not Detected	-----	2.09E-01
FE-59	Not Detected	-----	1.24E-01
GD-153	Not Detected	-----	1.60E-01
HG-203	Not Detected	-----	4.96E-02
I-131	Not Detected	-----	5.43E-02
IN-115m	Not Detected	-----	1.42
IR-192	Not Detected	-----	5.20E-02
K-40	1.83E+01	2.69	4.40E-01
LA-140	Not Detected	-----	8.13E-02
MN-54	Not Detected	-----	5.89E-02
MN-56	Not Detected	-----	5.38
MO-99	Not Detected	-----	5.18E-01
NA-22	Not Detected	-----	7.84E-02
NA-24	Not Detected	-----	1.40E-01
NB-95	Not Detected	-----	3.16E-01
ND-147	Not Detected	-----	3.58E-01
NI-57	Not Detected	-----	1.16E-01
BE-7	Not Detected	-----	4.42E-01
RU-103	Not Detected	-----	5.21E-02
RU-106	Not Detected	-----	5.20E-01
SB-122	Not Detected	-----	8.78E-02
SB-124	Not Detected	-----	6.09E-02
SB-125	Not Detected	-----	1.54E-01
SC-46	Not Detected	-----	8.87E-02
SR-85	Not Detected	-----	6.77E-02
TA-182	Not Detected	-----	2.64E-01
TA-183	Not Detected	-----	3.08E-01
TE-132	Not Detected	-----	5.59E-02
TL-201	Not Detected	-----	1.84E-01
XE-133	Not Detected	-----	2.22E-01
Y-88	Not Detected	-----	5.26E-02
ZN-65	Not Detected	-----	1.79E-01
ZR-95	Not Detected	-----	1.10E-01

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-28-95 4:01:55 AM *

* Analyzed by: *JR 6/28/95* Reviewed by: *JR 6/28/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022941-05
 Lab Sample ID : 50049107

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 1SMAR
 Sample Quantity : 766.000 gram
 Sample Date/Time : 6-27-95 10:55:00 AM
 Acquire Start Date : 6-28-95 3:29:26 AM
 Detector Name : LAB01
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	2.17
TH-234	7.72E-01	5.14E-01	7.38E-01
U-234	Not Detected	-----	1.91E+01
RA-226	1.22E-01	5.54E-01	7.83E-01
PB-214	6.46E-01	1.21E-01	9.03E-02
BI-214	4.50E-01	9.94E-02	9.39E-02
PB-210	Not Detected	-----	4.98E+01
TH-232	4.94E-01	1.87E-01	2.39E-01
RA-228	4.80E-01	1.96E-01	2.47E-01
AC-228	Not Detected	-----	2.94E-01
TH-228	Not Detected	-----	1.46
RA-224	1.40	3.76E-01	5.31E-01
PB-212	5.90E-01	1.18E-01	5.37E-02
BI-212	8.45E-01	4.34E-01	6.08E-01
TL-208	4.90E-01	1.28E-01	1.35E-01
U-235	Not Detected	-----	3.35E-01
TH-231	Not Detected	-----	6.41E-01
PA-231	Not Detected	-----	2.04
AC-227	Not Detected	-----	2.50
TH-227	Not Detected	-----	5.12E-01
RA-223	Not Detected	-----	2.13E-01
RN-219	2.12E-01	1.71E-01	2.61E-01
PB-211	Not Detected	-----	1.02
TL-207	Not Detected	-----	2.19E+01
AM-241	Not Detected	-----	2.90E-01
PU-239	Not Detected	-----	3.74E+02
NP-237	Not Detected	-----	2.09E-01
PA-233	Not Detected	-----	8.84E-02
TH-229	Not Detected	-----	3.45E-01

[Summary Report] - Sample ID: 50049107

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	4.32E-02
AR-41	Not Detected	-----	3.92E+01
BA-133	Not Detected	-----	9.81E-02
BA-140	Not Detected	-----	1.74E-01
CD-109	Not Detected	-----	7.18E-01
CD-115	Not Detected	-----	1.20E-01
CE-139	Not Detected	-----	4.68E-02
CE-141	Not Detected	-----	7.54E-02
CE-144	Not Detected	-----	3.36E-01
CO-56	Not Detected	-----	5.64E-02
CO-57	Not Detected	-----	4.07E-02
CO-58	Not Detected	-----	4.82E-02
CO-60	Not Detected	-----	5.56E-02
CR-51	Not Detected	-----	3.60E-01
CS-134	Not Detected	-----	7.62E-02
CS-137	Not Detected	-----	5.16E-02
CU-64	Not Detected	-----	2.88E+01
EU-152	Not Detected	-----	3.82E-01
EU-154	Not Detected	-----	2.72E-01
EU-155	Not Detected	-----	1.78E-01
FE-59	Not Detected	-----	1.10E-01
GD-153	Not Detected	-----	1.45E-01
HG-203	Not Detected	-----	4.40E-02
I-131	Not Detected	-----	4.46E-02
IN-115m	Not Detected	-----	1.31
IR-192	Not Detected	-----	4.11E-02
K-40	1.56E+01	2.30	5.78E-01
LA-140	Not Detected	-----	7.63E-02
MN-54	Not Detected	-----	5.08E-02
MN-56	Not Detected	-----	5.21
MO-99	Not Detected	-----	4.31E-01
NA-22	Not Detected	-----	6.39E-02
NA-24	Not Detected	-----	1.13E-01
NB-95	Not Detected	-----	2.72E-01
ND-147	Not Detected	-----	3.08E-01
NI-57	Not Detected	-----	9.57E-02
BE-7	Not Detected	-----	3.72E-01
RU-103	Not Detected	-----	4.09E-02
RU-106	Not Detected	-----	4.40E-01
SB-122	Not Detected	-----	7.14E-02
SB-124	Not Detected	-----	5.44E-02
SB-125	Not Detected	-----	1.31E-01
SC-46	Not Detected	-----	7.45E-02
SR-85	Not Detected	-----	5.45E-02
TA-182	Not Detected	-----	2.18E-01
TA-183	Not Detected	-----	2.73E-01
TE-132	Not Detected	-----	4.63E-02
TL-201	Not Detected	-----	1.69E-01
XE-133	Not Detected	-----	2.01E-01
Y-88	Not Detected	-----	4.42E-02
ZN-65	Not Detected	-----	1.47E-01
ZR-95	Not Detected	-----	9.32E-02

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-28-95 4:39:12 AM *

 * Analyzed by: *JR* 6/28/95 Reviewed by: *JR* 6/28/95 *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022942-05
 Lab Sample ID : 50049108

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 1SMAR
 Sample Quantity : 843.000 gram
 Sample Date/Time : 6-27-95 10:55:00 AM
 Acquire Start Date : 6-28-95 4:06:42 AM
 Detector Name : LAB01
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	2.04
TH-234	Not Detected	-----	6.61E-01
U-234	Not Detected	-----	1.68E+01
RA-226	1.03	5.05E-01	7.28E-01
PB-214	5.32E-01	1.02E-01	7.82E-02
BI-214	4.92E-01	1.10E-01	1.13E-01
PB-210	Not Detected	-----	4.78E+01
TH-232	4.57E-01	1.69E-01	2.13E-01
RA-228	5.44E-01	2.10E-01	1.79E-01
AC-228	6.29E-01	1.53E-01	1.31E-01
TH-228	4.56E-01	2.79E-01	6.52E-01
RA-224	1.50	3.93E-01	5.94E-01
PB-212	5.71E-01	1.13E-01	5.59E-02
BI-212	5.98E-01	3.41E-01	4.86E-01
TL-208	5.67E-01	1.28E-01	1.17E-01
U-235	Not Detected	-----	3.16E-01
TH-231	Not Detected	-----	6.12E-01
PA-231	Not Detected	-----	1.85
AC-227	Not Detected	-----	2.35
TH-227	Not Detected	-----	4.97E-01
RA-223	Not Detected	-----	2.04E-01
RN-219	Not Detected	-----	4.07E-01
PB-211	Not Detected	-----	9.83E-01
TL-207	Not Detected	-----	2.01E+01
AM-241	Not Detected	-----	2.71E-01
PU-239	Not Detected	-----	3.42E+02
NP-237	Not Detected	-----	2.21E-01
PA-233	Not Detected	-----	8.47E-02
TH-229	Not Detected	-----	3.20E-01

[Summary Report] - Sample ID: 50049108

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	4.45E-02
AR-41	Not Detected	-----	4.57E+01
BA-133	Not Detected	-----	8.48E-02
BA-140	Not Detected	-----	1.55E-01
CD-109	Not Detected	-----	7.61E-01
CD-115	Not Detected	-----	1.10E-01
CE-139	Not Detected	-----	4.31E-02
CE-141	Not Detected	-----	7.12E-02
CE-144	Not Detected	-----	3.15E-01
CO-56	Not Detected	-----	5.25E-02
CO-57	Not Detected	-----	3.90E-02
CO-58	Not Detected	-----	4.52E-02
CO-60	Not Detected	-----	5.32E-02
CR-51	Not Detected	-----	3.29E-01
CS-134	Not Detected	-----	7.44E-02
CS-137	Not Detected	-----	5.24E-02
CU-64	Not Detected	-----	2.99E+01
EU-152	Not Detected	-----	3.41E-01
EU-154	Not Detected	-----	2.50E-01
EU-155	Not Detected	-----	1.66E-01
FE-59	Not Detected	-----	9.59E-02
GD-153	Not Detected	-----	1.34E-01
HG-203	Not Detected	-----	4.12E-02
I-131	Not Detected	-----	4.33E-02
IN-115m	Not Detected	-----	1.31
IR-192	Not Detected	-----	4.02E-02
K-40	1.49E+01	2.18	4.53E-01
LA-140	Not Detected	-----	6.42E-02
MN-54	Not Detected	-----	4.85E-02
MN-56	Not Detected	-----	5.73
MO-99	Not Detected	-----	4.24E-01
NA-22	Not Detected	-----	5.69E-02
NA-24	Not Detected	-----	1.16E-01
NB-95	Not Detected	-----	2.65E-01
ND-147	Not Detected	-----	3.08E-01
NI-57	Not Detected	-----	9.96E-02
BE-7	Not Detected	-----	3.30E-01
RU-103	Not Detected	-----	4.05E-02
RU-106	Not Detected	-----	3.99E-01
SB-122	Not Detected	-----	6.95E-02
SB-124	Not Detected	-----	5.35E-02
SB-125	Not Detected	-----	1.18E-01
SC-46	Not Detected	-----	6.69E-02
SR-85	Not Detected	-----	5.16E-02
TA-182	Not Detected	-----	2.00E-01
TA-183	Not Detected	-----	2.56E-01
TE-132	Not Detected	-----	4.66E-02
TL-201	Not Detected	-----	1.55E-01
XE-133	Not Detected	-----	1.88E-01
Y-88	Not Detected	-----	3.15E-02
ZN-65	Not Detected	-----	1.33E-01
ZR-95	Not Detected	-----	7.87E-02

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-28-95 5:17:07 AM *

 * Analyzed by: *JN 6/28/95* Reviewed by: *JN 6/28/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022943-05
 Lab Sample ID : 50049109

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : LSMAR
 Sample Quantity : 850.000 gram
 Sample Date/Time : 6-27-95 11:15:00 AM
 Acquire Start Date : 6-28-95 4:44:37 AM
 Detector Name : LAB01
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	6.63E-01	8.81E-01	1.42
TH-234	Not Detected	-----	6.81E-01
U-234	Not Detected	-----	1.69E+01
RA-226	1.18	5.30E-01	7.50E-01
PB-214	4.94E-01	9.35E-02	6.54E-02
BI-214	4.40E-01	8.97E-02	7.36E-02
PB-210	Not Detected	-----	4.70E+01
TH-232	4.12E-01	2.07E-01	2.97E-01
RA-228	4.63E-01	1.57E-01	1.95E-01
AC-228	5.92E-01	1.44E-01	1.18E-01
TH-228	Not Detected	-----	1.32
RA-224	1.61	3.53E-01	5.64E-01
PB-212	5.75E-01	1.02E-01	5.14E-02
BI-212	4.47E-01	3.67E-01	5.64E-01
TL-208	4.83E-01	1.21E-01	1.26E-01
U-235	Not Detected	-----	3.05E-01
TH-231	Not Detected	-----	5.92E-01
PA-231	Not Detected	-----	1.83
AC-227	Not Detected	-----	2.33
TH-227	Not Detected	-----	4.76E-01
RA-223	Not Detected	-----	1.97E-01
RN-219	Not Detected	-----	4.02E-01
PB-211	Not Detected	-----	9.32E-01
TL-207	Not Detected	-----	1.84E+01
AM-241	Not Detected	-----	2.59E-01
PU-239	Not Detected	-----	3.42E+02
NP-237	Not Detected	-----	3.75E-01
PA-233	Not Detected	-----	8.18E-02
TH-229	Not Detected	-----	3.16E-01

[Summary Report] - Sample ID: 50049109

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	3.88E-02
AR-41	Not Detected	-----	4.32E+01
BA-133	Not Detected	-----	8.47E-02
BA-140	Not Detected	-----	1.65E-01
CD-109	Not Detected	-----	1.29
CD-115	Not Detected	-----	1.04E-01
CE-139	Not Detected	-----	4.31E-02
CE-141	Not Detected	-----	6.84E-02
CE-144	Not Detected	-----	3.11E-01
CO-56	Not Detected	-----	5.09E-02
CO-57	Not Detected	-----	3.80E-02
CO-58	Not Detected	-----	4.40E-02
CO-60	Not Detected	-----	5.37E-02
CR-51	Not Detected	-----	3.27E-01
CS-134	Not Detected	-----	7.08E-02
CS-137	Not Detected	-----	4.53E-02
CU-64	Not Detected	-----	2.94E+01
EU-152	Not Detected	-----	3.53E-01
EU-154	Not Detected	-----	2.38E-01
EU-155	Not Detected	-----	1.63E-01
FE-59	Not Detected	-----	9.68E-02
GD-153	Not Detected	-----	1.30E-01
HG-203	Not Detected	-----	4.34E-02
I-131	Not Detected	-----	4.24E-02
IN-115m	Not Detected	-----	1.30
IR-192	Not Detected	-----	3.88E-02
K-40	1.37E+01	2.02	4.01E-01
LA-140	Not Detected	-----	6.84E-02
MN-54	Not Detected	-----	4.83E-02
MN-56	Not Detected	-----	6.01
MO-99	Not Detected	-----	3.91E-01
NA-22	Not Detected	-----	5.87E-02
NA-24	Not Detected	-----	1.16E-01
NB-95	Not Detected	-----	2.55E-01
ND-147	Not Detected	-----	2.91E-01
NI-57	Not Detected	-----	9.47E-02
BE-7	Not Detected	-----	3.33E-01
RU-103	Not Detected	-----	4.11E-02
RU-106	Not Detected	-----	4.12E-01
SB-122	Not Detected	-----	6.82E-02
SB-124	Not Detected	-----	4.99E-02
SB-125	Not Detected	-----	1.12E-01
SC-46	Not Detected	-----	6.81E-02
SR-85	Not Detected	-----	5.12E-02
TA-182	Not Detected	-----	1.97E-01
TA-183	Not Detected	-----	2.45E-01
TE-132	Not Detected	-----	4.53E-02
TL-201	Not Detected	-----	1.58E-01
XE-133	Not Detected	-----	1.82E-01
Y-88	Not Detected	-----	3.12E-02
ZN-65	Not Detected	-----	1.37E-01
ZR-95	Not Detected	-----	7.78E-02

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-28-95 9:34:49 AM *

 * Analyzed by: *JR 6/28/95* Reviewed by: *JR 6/28/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022944-05
 Lab Sample ID : 50049110

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 1SMAR
 Sample Quantity : 762.000 gram
 Sample Date/Time : 6-27-95 11:30:00 AM
 Acquire Start Date : 6-28-95 8:56:37 AM
 Detector Name : LAB01
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	2.05
TH-234	Not Detected	-----	4.66E-01
U-234	Not Detected	-----	1.70E+01
RA-226	1.11	5.35E-01	7.65E-01
PB-214	6.24E-01	1.15E-01	7.91E-02
BI-214	4.98E-01	1.01E-01	8.37E-02
PB-210	Not Detected	-----	4.63E+01
TH-232	5.46E-01	2.56E-01	3.63E-01
RA-228	4.52E-01	2.42E-01	3.47E-01
AC-228	5.69E-01	1.51E-01	1.41E-01
TH-228	5.72E-01	2.29E-01	7.33E-01
RA-224	1.46	3.92E-01	5.80E-01
PB-212	5.43E-01	1.11E-01	5.54E-02
BI-212	6.92E-01	3.41E-01	4.57E-01
TL-208	4.62E-01	1.28E-01	1.43E-01
U-235	Not Detected	-----	3.17E-01
TH-231	Not Detected	-----	6.25E-01
PA-231	Not Detected	-----	1.98
AC-227	Not Detected	-----	2.39
TH-227	Not Detected	-----	4.99E-01
RA-223	Not Detected	-----	2.09E-01
RN-219	Not Detected	-----	2.97E-01
PB-211	Not Detected	-----	9.85E-01
TL-207	Not Detected	-----	2.10E+01
AM-241	Not Detected	-----	2.74E-01
PU-239	Not Detected	-----	3.51E+02
NP-237	Not Detected	-----	2.33E-01
PA-233	Not Detected	-----	9.26E-02
TH-229	Not Detected	-----	3.33E-01

[Summary Report] - Sample ID: 50049110

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	4.26E-02
AR-41	Not Detected	-----	2.00E+02
BA-133	Not Detected	-----	9.64E-02
BA-140	Not Detected	-----	1.57E-01
CD-109	Not Detected	-----	8.01E-01
CD-115	Not Detected	-----	1.22E-01
CE-139	Not Detected	-----	4.47E-02
CE-141	Not Detected	-----	7.32E-02
CE-144	Not Detected	-----	3.24E-01
CO-56	Not Detected	-----	5.39E-02
CO-57	Not Detected	-----	3.84E-02
CO-58	Not Detected	-----	4.55E-02
CO-60	Not Detected	-----	4.89E-02
CR-51	Not Detected	-----	3.47E-01
CS-134	Not Detected	-----	7.60E-02
CS-137	Not Detected	-----	4.93E-02
CU-64	Not Detected	-----	3.55E+01
EU-152	Not Detected	-----	3.84E-01
EU-154	Not Detected	-----	2.56E-01
EU-155	Not Detected	-----	1.65E-01
FE-59	Not Detected	-----	1.03E-01
GD-153	Not Detected	-----	1.36E-01
HG-203	Not Detected	-----	4.34E-02
I-131	Not Detected	-----	4.54E-02
IN-115m	Not Detected	-----	2.65
IR-192	Not Detected	-----	4.19E-02
K-40	1.09E+01	1.67	3.54E-01
LA-140	Not Detected	-----	8.34E-02
MN-54	Not Detected	-----	5.37E-02
MN-56	Not Detected	-----	1.84E+01
MO-99	Not Detected	-----	4.31E-01
NA-22	Not Detected	-----	5.19E-02
NA-24	Not Detected	-----	1.20E-01
NB-95	Not Detected	-----	2.76E-01
ND-147	Not Detected	-----	3.03E-01
NI-57	Not Detected	-----	1.08E-01
BE-7	Not Detected	-----	3.46E-01
RU-103	Not Detected	-----	4.12E-02
RU-106	Not Detected	-----	3.97E-01
SB-122	Not Detected	-----	7.92E-02
SB-124	Not Detected	-----	5.22E-02
SB-125	Not Detected	-----	1.19E-01
SC-46	Not Detected	-----	7.29E-02
SR-85	Not Detected	-----	5.59E-02
TA-182	Not Detected	-----	2.12E-01
TA-183	Not Detected	-----	2.65E-01
TE-132	Not Detected	-----	4.81E-02
TL-201	Not Detected	-----	1.69E-01
XE-133	Not Detected	-----	2.04E-01
Y-88	Not Detected	-----	5.30E-02
ZN-65	Not Detected	-----	1.39E-01
ZR-95	Not Detected	-----	7.57E-02

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-28-95 11:49:10 AM *

 * Analyzed by: *JW* 6/28/95 Reviewed by: *JW* 6/28/95 *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022945-05
 Lab Sample ID : 50049111

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 1SMAR
 Sample Quantity : 682.000 gram
 Sample Date/Time : 6-27-95 11:45:00 AM
 Acquire Start Date : 6-28-95 11:16:07 AM
 Detector Name : LAB01
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	2.20
TH-234	Not Detected	-----	9.43E-01
U-234	Not Detected	-----	1.84E+01
RA-226	1.08	5.46E-01	7.85E-01
PB-214	6.00E-01	1.20E-01	1.00E-01
BI-214	4.93E-01	1.06E-01	9.39E-02
PB-210	Not Detected	-----	5.08E+01
TH-232	3.26E-01	1.86E-01	2.70E-01
RA-228	3.96E-01	1.85E-01	2.41E-01
AC-228	Not Detected	-----	2.93E-01
TH-228	8.83E-01	4.63E-01	8.14E-01
RA-224	1.41	4.21E-01	6.77E-01
PB-212	5.38E-01	1.14E-01	6.40E-02
BI-212	5.35E-01	3.43E-01	4.93E-01
TL-208	4.66E-01	1.20E-01	1.19E-01
U-235	Not Detected	-----	3.27E-01
TH-231	Not Detected	-----	6.57E-01
PA-231	Not Detected	-----	2.13
AC-227	Not Detected	-----	2.54
TH-227	Not Detected	-----	5.39E-01
RA-223	Not Detected	-----	2.22E-01
RN-219	Not Detected	-----	4.36E-01
PB-211	Not Detected	-----	1.00E+01
TL-207	Not Detected	-----	2.18E+01
AM-241	Not Detected	-----	2.93E-01
PU-239	Not Detected	-----	3.81E+02
NP-237	Not Detected	-----	4.23E-01
PA-233	Not Detected	-----	9.75E-02
TH-229	Not Detected	-----	3.41E-01

[Summary Report] - Sample ID: 50049111

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	4.85E-02
AR-41	Not Detected	-----	5.26E+02
BA-133	Not Detected	-----	1.02E-01
BA-140	Not Detected	-----	1.83E-01
CD-109	Not Detected	-----	8.68E-01
CD-115	Not Detected	-----	1.41E-01
CE-139	Not Detected	-----	4.87E-02
CE-141	Not Detected	-----	7.59E-02
CE-144	Not Detected	-----	3.43E-01
CO-56	Not Detected	-----	5.88E-02
CO-57	Not Detected	-----	4.16E-02
CO-58	Not Detected	-----	5.02E-02
CO-60	Not Detected	-----	5.98E-02
CR-51	Not Detected	-----	3.76E-01
CS-134	Not Detected	-----	8.20E-02
CS-137	Not Detected	-----	5.63E-02
CU-64	Not Detected	-----	4.51E+01
EU-152	Not Detected	-----	4.00E-01
EU-154	Not Detected	-----	2.68E-01
EU-155	Not Detected	-----	1.74E-01
FE-59	Not Detected	-----	1.06E-01
GD-153	Not Detected	-----	1.45E-01
HG-203	Not Detected	-----	4.63E-02
I-131	Not Detected	-----	4.97E-02
IN-115m	Not Detected	-----	4.12
IR-192	Not Detected	-----	4.47E-02
K-40	1.21E+01	1.86	4.75E-01
LA-140	Not Detected	-----	8.06E-02
MN-54	Not Detected	-----	5.47E-02
MN-56	Not Detected	-----	3.50E+01
MO-99	Not Detected	-----	5.01E-01
NA-22	Not Detected	-----	6.06E-02
NA-24	Not Detected	-----	1.66E-01
NB-95	Not Detected	-----	3.02E-01
ND-147	Not Detected	-----	3.49E-01
NI-57	Not Detected	-----	1.16E-01
BE-7	Not Detected	-----	4.00E-01
RU-103	Not Detected	-----	4.51E-02
RU-106	Not Detected	-----	4.36E-01
SB-122	1.55E-02	1.70E-02	3.26E-02
SB-124	Not Detected	-----	5.95E-02
SB-125	Not Detected	-----	1.32E-01
SC-46	Not Detected	-----	7.87E-02
SR-85	Not Detected	-----	5.93E-02
TA-182	Not Detected	-----	2.33E-01
TA-183	Not Detected	-----	2.86E-01
TE-132	Not Detected	-----	5.33E-02
TL-201	Not Detected	-----	1.75E-01
XE-133	Not Detected	-----	2.16E-01
Y-88	Not Detected	-----	4.76E-02
ZN-65	Not Detected	-----	1.59E-01
ZR-95	Not Detected	-----	8.34E-02

Not detected *W*
6/22/9

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-28-95 12:28:36 PM *

 * Analyzed by: *JW 6/28/95* Reviewed by: *JW 8/28/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022946-05
 Lab Sample ID : 50049112

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : LSMAR
 Sample Quantity : 833.000 gram
 Sample Date/Time : 6-27-95 2:20:00 PM
 Acquire Start Date : 6-28-95 11:50:46 AM
 Detector Name : LAB01
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	Not Detected	-----	2.25
TH-234	8.82E-01	3.97E-01	5.03E-01
U-234	Not Detected	-----	1.74E+01
RA-226	1.48	7.72E-01	1.15
PB-214	6.64E-01	1.22E-01	8.97E-02
BI-214	5.91E-01	1.13E-01	8.85E-02
PB-210	Not Detected	-----	5.03E+01
TH-232	6.28E-01	2.03E-01	2.41E-01
RA-228	6.03E-01	2.00E-01	2.28E-01
AC-228	7.38E-01	1.71E-01	1.40E-01
TH-228	8.49E-01	3.49E-01	6.78E-01
RA-224	Not Detected	-----	6.91E-01
PB-212	7.04E-01	1.56E-01	6.23E-02
BI-212	8.01E-01	3.40E-01	4.33E-01
TL-208	5.85E-01	1.32E-01	1.22E-01
U-235	Not Detected	-----	3.31E-01
TH-231	Not Detected	-----	6.68E-01
PA-231	Not Detected	-----	2.07
AC-227	Not Detected	-----	2.55
TH-227	Not Detected	-----	5.33E-01
RA-223	Not Detected	-----	2.25E-01
RN-219	Not Detected	-----	2.71E-01
PB-211	Not Detected	-----	1.03
TL-207	Not Detected	-----	2.05E+01
AM-241	Not Detected	-----	2.95E-01
PU-239	Not Detected	-----	3.66E+02
NP-237	Not Detected	-----	2.60E-01
PA-233	Not Detected	-----	8.80E-02
TH-229	Not Detected	-----	3.38E-01

[Summary Report] - Sample ID: 50049112

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	4.30E-02
AR-41	Not Detected	-----	2.30E+02
BA-133	Not Detected	-----	9.54E-02
BA-140	Not Detected	-----	1.67E-01
CD-109	Not Detected	-----	8.93E-01
CD-115	Not Detected	-----	1.29E-01
CE-139	Not Detected	-----	4.80E-02
CE-141	Not Detected	-----	7.58E-02
CE-144	Not Detected	-----	3.25E-01
CO-56	Not Detected	-----	4.97E-02
CO-57	Not Detected	-----	4.15E-02
CO-58	Not Detected	-----	4.44E-02
CO-60	Not Detected	-----	5.86E-02
CR-51	Not Detected	-----	3.62E-01
CS-134	Not Detected	-----	7.87E-02
CS-137	Not Detected	-----	5.26E-02
CU-64	Not Detected	-----	3.74E+01
EU-152	Not Detected	-----	3.73E-01
EU-154	Not Detected	-----	2.71E-01
EU-155	Not Detected	-----	1.69E-01
FE-59	Not Detected	-----	1.09E-01
GD-153	Not Detected	-----	1.45E-01
HG-203	Not Detected	-----	4.43E-02
I-131	Not Detected	-----	4.63E-02
IN-115m	Not Detected	-----	2.83
IR-192	Not Detected	-----	4.21E-02
K-40	1.44E+01	2.12	4.68E-01
LA-140	Not Detected	-----	7.48E-02
MN-54	Not Detected	-----	5.19E-02
MN-56	Not Detected	-----	1.73E+01
MO-99	Not Detected	-----	4.63E-01
NA-22	Not Detected	-----	6.28E-02
NA-24	Not Detected	-----	1.28E-01
NB-95	Not Detected	-----	2.94E-01
ND-147	Not Detected	-----	3.08E-01
NI-57	Not Detected	-----	1.15E-01
BE-7	Not Detected	-----	3.55E-01
RU-103	Not Detected	-----	4.12E-02
RU-106	Not Detected	-----	4.45E-01
SB-122	Not Detected	-----	7.76E-02
SB-124	Not Detected	-----	5.60E-02
SB-125	Not Detected	-----	1.25E-01
SC-46	Not Detected	-----	7.13E-02
SR-85	Not Detected	-----	5.54E-02
TA-182	Not Detected	-----	2.12E-01
TA-183	Not Detected	-----	2.85E-01
TE-132	Not Detected	-----	4.97E-02
TL-201	Not Detected	-----	1.76E-01
XE-133	Not Detected	-----	2.20E-01
Y-88	Not Detected	-----	4.32E-02
ZN-65	Not Detected	-----	1.41E-01
ZR-95	Not Detected	-----	8.36E-02

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-28-95 1:01:20 PM *

 * Analyzed by: *JN 6/28/95* Reviewed by: *JN 6/28/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : 022947-05
 Lab Sample ID : 50049113

Sample Description : MARINELLI SOIL SAMPLE
 Sample Type : Solid
 Sample Geometry : 1SMAR
 Sample Quantity : 819.000 gram
 Sample Date/Time : 6-27-95 3:10:00 PM
 Acquire Start Date : 6-28-95 12:26:58 PM
 Detector Name : LAB01
 Elapsed Live Time : 1800 seconds
 Elapsed Real Time : 1801 seconds

Comments:

Nuclide	Activity (pCi/gram)	2S Error	MDA
U-238	7.75E-01	7.01E-01	1.09
TH-234	1.07	4.51E-01	5.92E-01
U-234	Not Detected	-----	1.85E+01
RA-226	1.32	5.47E-01	7.56E-01
PB-214	7.12E-01	1.35E-01	1.12E-01
BI-214	6.86E-01	1.24E-01	8.92E-02
PB-210	Not Detected	-----	5.15E+01
TH-232	6.41E-01	2.68E-01	3.70E-01
RA-228	7.45E-01	2.63E-01	2.11E-01
AC-228	Not Detected	-----	3.16E-01
TH-228	7.14E-01	3.34E-01	7.00E-01
RA-224	1.50	2.08E-01	7.31E-01
PB-212	8.50E-01	1.28E-01	6.73E-02
BI-212	9.07E-01	4.25E-01	5.83E-01
TL-208	7.80E-01	1.70E-01	1.59E-01
U-235	Not Detected	-----	3.53E-01
TH-231	Not Detected	-----	6.87E-01
PA-231	Not Detected	-----	2.14
AC-227	Not Detected	-----	2.72
TH-227	Not Detected	-----	5.77E-01
RA-223	Not Detected	-----	2.30E-01
RN-219	Not Detected	-----	4.42E-01
PB-211	Not Detected	-----	1.04
TL-207	Not Detected	-----	2.23E+01
AM-241	Not Detected	-----	3.05E-01
PU-239	Not Detected	-----	3.99E+02
NP-237	Not Detected	-----	2.52E-01
PA-233	Not Detected	-----	9.46E-02
TH-229	Not Detected	-----	3.56E-01

[Summary Report] - Sample ID: 50049113

Nuclide	Activity (pCi/gram)	2S Error	MDA
AG-110m	Not Detected	-----	6.58E-02
AR-41	Not Detected	-----	2.51E+02
BA-133	Not Detected	-----	1.02E-01
BA-140	Not Detected	-----	1.90E-01
CD-109	Not Detected	-----	8.66E-01
CD-115	Not Detected	-----	1.37E-01
CE-139	Not Detected	-----	4.81E-02
CE-141	Not Detected	-----	8.02E-02
CE-144	Not Detected	-----	3.50E-01
CO-56	Not Detected	-----	5.56E-02
CO-57	Not Detected	-----	4.47E-02
CO-58	Not Detected	-----	5.05E-02
CO-60	Not Detected	-----	6.08E-02
CR-51	Not Detected	-----	3.80E-01
CS-134	Not Detected	-----	8.20E-02
CS-137	1.21E-01	3.89E-02	4.73E-02
CU-64	Not Detected	-----	4.14E+01
EU-152	Not Detected	-----	4.00E-01
EU-154	Not Detected	-----	3.00E-01
EU-155	Not Detected	-----	1.79E-01
FE-59	Not Detected	-----	1.16E-01
GD-153	Not Detected	-----	1.52E-01
HG-203	Not Detected	-----	3.93E-02
I-131	Not Detected	-----	4.99E-02
IN-115m	Not Detected	-----	2.93
IR-192	Not Detected	-----	4.55E-02
K-40	1.75E+01	2.53	5.36E-01
LA-140	Not Detected	-----	8.47E-02
MN-54	1.43E-02	2.07E-02	3.38E-02
MN-56	Not Detected	-----	1.82E+01
MO-99	Not Detected	-----	4.79E-01
NA-22	Not Detected	-----	6.39E-02
NA-24	Not Detected	-----	1.41E-01
NB-95	Not Detected	-----	3.18E-01
ND-147	Not Detected	-----	3.44E-01
NI-57	Not Detected	-----	1.13E-01
BE-7	Not Detected	-----	4.01E-01
RU-103	Not Detected	-----	4.50E-02
RU-106	Not Detected	-----	4.49E-01
SB-122	Not Detected	-----	8.62E-02
SB-124	Not Detected	-----	5.69E-02
SB-125	Not Detected	-----	1.36E-01
SC-46	Not Detected	-----	8.41E-02
SR-85	Not Detected	-----	5.84E-02
TA-182	Not Detected	-----	2.41E-01
TA-183	Not Detected	-----	2.94E-01
TE-132	Not Detected	-----	5.19E-02
TL-201	Not Detected	-----	1.83E-01
XE-133	Not Detected	-----	2.26E-01
Y-88	Not Detected	-----	3.87E-02
ZN-65	Not Detected	-----	1.69E-01
ZR-95	Not Detected	-----	9.06E-02

not detected *W*
6/28/95

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program [881 Laboratory] *
 * 6-28-95 1:55:42 PM *

 * Analyzed by: *JR 6/28/95* Reviewed by: *JR 6/28/95* *

Customer : D.MILLER/E.RANKIN (7582/SMO)
 Customer Sample ID : LAB CONTROL SAMPLE ANALYSIS #CG134
 Lab Sample ID : 50049114

Sample Description : MIXED GAMMA_STANDARD
 Sample Type : Liquid
 Sample Geometry : WMAR
 Sample Quantity : 1.000 Each
 Sample Date/Time : 11-01-90 12:00:00 PM
 Acquire Start Date : 6-28-95 1:39:06 PM
 Detector Name : LAB01
 Elapsed Live Time : 600 seconds
 Elapsed Real Time : 608 seconds

Comments:

Nuclide	Activity (pCi/Each)	2S Error	MDA
U-238	Not Detected	-----	2.55E+04
TH-234	Not Detected	-----	3.93E+03
U-234	Not Detected	-----	1.12E+05
RA-226	Not Detected	-----	5.97E+03
PB-214	Not Detected	-----	7.09E+02
BI-214	Not Detected	-----	6.11E+02
PB-210	Not Detected	-----	1.26E+06
TH-232	Not Detected	-----	2.05E+03
RA-228	Not Detected	-----	2.74E+03
AC-228	Not Detected	-----	1.75E+03
TH-228	Not Detected	-----	3.63E+04
RA-224	Not Detected	-----	3.16E+04
PB-212	Not Detected	-----	2.88E+03
BI-212	Not Detected	-----	2.48E+04
TL-208	Not Detected	-----	5.15E+03
U-235	Not Detected	-----	1.59E+03
TH-231	Not Detected	-----	2.74E+03
PA-231	Not Detected	-----	9.36E+03
AC-227	Not Detected	-----	1.44E+04
TH-227	Not Detected	-----	2.39E+03
RA-223	Not Detected	-----	1.00E+26
RN-219	Not Detected	-----	2.92E+03
PB-211	Not Detected	-----	8.74E+03
TL-207	Not Detected	-----	2.14E+05
AM-241	1.10E+05	1.75E+04	1.84E+03
PU-239	Not Detected	-----	1.80E+06
NP-237	Not Detected	-----	1.82E+03
PA-233	Not Detected	-----	6.30E+02
TH-229	Not Detected	-----	1.56E+03

[Summary Report] - Sample ID: 50049114

Nuclide	Activity (pCi/Each)	2S Error	MDA
AG-110m	Not Detected	-----	1.64E+05
AR-41	Not Detected	-----	1.00E+26
BA-133	Not Detected	-----	5.59E+02
BA-140	Not Detected	-----	1.00E+26
CD-109	3.08E+05	6.70E+04	6.60E+04
CD-115	Not Detected	-----	1.00E+26
CE-139	Not Detected	-----	1.25E+06
CE-141	Not Detected	-----	2.02E+18
CE-144	Not Detected	-----	1.01E+05
CO-56	Not Detected	-----	1.72E+09
CO-57	1.38E+04	6.19E+03	9.04E+03
CO-58	Not Detected	-----	6.03E+09
CO-60	7.38E+04	9.57E+03	6.07E+02
CR-51	Not Detected	-----	7.12E+21
CS-134	Not Detected	-----	1.39E+03
CS-137	6.83E+04	8.80E+03	4.16E+02
CU-64	Not Detected	-----	1.00E+26
EU-152	Not Detected	-----	3.42E+03
EU-154	Not Detected	-----	2.20E+03
EU-155	Not Detected	-----	1.59E+03
FE-59	Not Detected	-----	2.75E+14
GD-153	Not Detected	-----	7.73E+04
HG-203	Not Detected	-----	2.63E+13
I-131	Not Detected	-----	1.00E+26
IN-115m	Not Detected	-----	1.00E+26
IR-192	Not Detected	-----	2.52E+09
K-40	Not Detected	-----	1.69E+03
LA-140	Not Detected	-----	1.00E+26
MN-54	Not Detected	-----	1.64E+04
MN-56	Not Detected	-----	1.00E+26
MO-99	Not Detected	-----	1.00E+26
NA-22	Not Detected	-----	7.90E+02
NA-24	Not Detected	-----	1.00E+26
NB-95	Not Detected	-----	1.00E+26
ND-147	Not Detected	-----	1.00E+26
NI-57	Not Detected	-----	1.00E+26
BE-7	Not Detected	-----	1.33E+13
RU-103	Not Detected	-----	3.71E+15
RU-106	Not Detected	-----	7.11E+04
SB-122	Not Detected	-----	1.00E+26
SB-124	Not Detected	-----	9.15E+10
SB-125	Not Detected	-----	3.58E+03
SC-46	Not Detected	-----	5.69E+08
SR-85	Not Detected	-----	2.81E+10
TA-182	Not Detected	-----	3.59E+07
TA-183	Not Detected	-----	1.00E+26
TE-132	Not Detected	-----	1.00E+26
TL-201	Not Detected	-----	1.00E+26
XE-133	Not Detected	-----	1.00E+26
Y-88	Not Detected	-----	1.14E+07
ZN-65	Not Detected	-----	1.17E+05
ZR-95	Not Detected	-----	5.83E+10

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program *
 * Quality Assurance Report *

Report Date : 6-28-95 2:04:54 PM
 QA File : C:\GENIEPC\CAMFILES\LCS1.QAF
 Analyst : FCD
 Sample ID : 50049114
 Sample Quantity : 1.00 Each
 Sample Date : 11-01-90 12:00:00 PM
 Measurement Date : 6-28-95 1:39:06 PM
 Elapsed Live Time : 600 seconds
 Elapsed Real Time : 608 seconds

Parameter	Mean	1S Error	New Value	< LU	: SD	: UD	: BS
AM-241 Activity	1.127E-01	4.548E-03	1.104E-01	<	:	:	AC ^{6/28/95} >
CS-137 Activity	6.832E-02	2.030E-03	6.829E-02	<	:	:	:
CO-60 Activity	7.649E-02	2.935E-03	7.362E-02	<	:	:	:

Flags Key: LU = Boundary Test (Ab = Above, Be = Below)
 SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
 UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
 BS = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: *JJ* 6/28/95

Technical Comments



National Nuclear Security Administration

Sandia Site Office
P.O. Box 5400
Albuquerque, New Mexico 87185-5400



DEC 9 2003

cc. Records Center

CERTIFIED MAIL-RETURN RECEIPT REQUESTED

Mr. John E. Kieling, Manager
Permits Management Program
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Rd., Building E
Santa Fe, NM 87505

Dear Mr. Kieling,

Enclosed is one of two NMED copies of the "Expanded Responses to NMED's 1998 Technical Comments on No Further Action (NFA) Proposals for Solid Waste Management Units (SWMUs) 96, 187 and 226." Per our verbal agreement, the second NMED copy is being sent directly to the Albuquerque Group Manager.

This submittal includes descriptions and results of recent site sampling work that was conducted in response to NMED/HWB's request. With a minor, approved exception, the sampling completed was that documented in the December 2001 document, "Sampling and Analysis Plan for Supplemental Investigations at Solid Waste Management Units 96, 187 and 226." Revised risk assessments are also included.

The risk assessments conclude that for these sites (1) there is no significant risk to human health under both the industrial and residential land-use scenarios, and (2) that there are no ecological risks associated with these sites.

The Department of Energy and Sandia National Laboratories/New Mexico are requesting a determination that these sites are acceptable for No Further Action.

If you have any questions, please contact John Gould at (505) 845-6089.

Sincerely,

Karen L. Boardman
Manager

Enclosure



J. Kieling

(2)

DEC 9 2000

cc w/enclosure:

L. King, EPA, Region 6 (2 copies Via Certified Mail)
W. Moats, NMED-HWB (Via Certified Mail)
M. Gardipe, ERD
C. Voorhess, NMED-OB
D. Bierley, NMED-OB

cc w/o enclosure:

K. Thomas, EPA, Region 6
S. Martin, NMED-HWB
F. Nimick, SNL, MS 1089
D. Stockham, SNL, MS 1087
P. Freshour, SNL, MS 87
B. Langkopf, SNL, MS 1087
M. Skelly, SNL, MS 1087
D. Fate, SNL, MS 1089
M.J. Davis, SNL, MS 1089
A. Blumberg, SNL, MS 0141



Sandia National Laboratories Albuquerque, New Mexico November 2003

Environmental Restoration Project Expanded Responses to NMED's 1998 Technical Comments on No Further Action Proposals for Solid Waste Management Units 96, 187, and 226 Dated May 1997

INTRODUCTION

Sandia National Laboratories/New Mexico (SNL/NM) is submitting this expanded response to technical comments for Solid Waste Management Units (SWMUs) 96, 187, and 226, which are managed by the Technical Area (TA)-I, Operable Unit (OU) 1302. This document expands on responses to technical comments received in a letter from the New Mexico Environment Department (NMED) to the U.S. Department of Energy (DOE) (Dinwiddie March 1998) documenting the review of three SWMUs submitted with the seventh round of Proposals for No Further Action (NFA) in May 1997 (SNL/NM May 1997a, 1997b, and 1997c). The original NFA proposals refer to these potentially contaminated sites as "Environmental Restoration (ER) Sites." Even though the terms are equivalent, "SWMU," which is the current terminology, will be used in this document. The three SWMUs discussed in this expanded response include:

- SWMU 96—Storm Drain System
- SWMU 187—Sanitary Sewer System
- SWMU 226—Old Acid Waste Line

During the past ten years, these three SWMUs have been subjected to numerous investigations and have been discussed on numerous occasions with the NMED. The breadth of work completed at these SWMUs is shown in Table 1. This is the second response submitted by SNL/NM to technical comments for SWMUs 96, 187, and 226. In June 1998, an original response to NMED's Technical Comments was submitted by SNL/NM and DOE to NMED (SNL/NM June 1998). However, this response was not complete, but resulted in a need for more discussions with NMED, and identified more investigations to resolve outstanding issues. This expanded response includes the results of soil and sediment sampling completed after the

submittal of the NFA proposals in May 1997; it also addresses the NMED request for organizing the analytical data into an approved table format. Revised human health and ecological risk assessments that use the analytical results from numerous soil sampling events conducted by the ER Project at each site are also provided in this response. In addition, relevant information from the Tijeras Arroyo Groundwater (TAG) Investigation (SNL/NM November 2002) is included.

Table 1
Historical Timeline for Events Related to SWMUs 96, 187, and 226
NFA Proposals

Month	Year	Event	Reference
May	1997	SNL/NM submits NFA Proposals for SWMUs 96, 187, and 226.	SNL/NM May 1997a, 1997b, and 1997c
March	1998	NMED submits Technical Comments on the NFA Proposals.	Dinwiddie March 1998
June	1998	SNL/NM submits original response to NMED's Request for Supplemental Information/Technical Comments. The response was incomplete, called for more discussions with the NMED, and identified supplemental investigations required to resolve issues.	SNL/NM June 1998
August-September	1998	Due to impending construction activities in the TA-I Storm Water System, SNL/NM performs additional sampling at SWMU 96.	SNL/NM March 2003
March	1999	NMED and SNL/NM meet to discuss deficiencies in SNL/NM's Response to NMED's Request for Supplemental Information/Technical Comments.	Fleck March 1999
July	1999	SNL/NM collects several soil samples at SWMU 98 (Building 863 TCA and photochemical release) that pertain to SWMU 226.	SNL/NM September 2000 Skelly March 2003
September	2001	SNL/NM and NMED meet to discuss requirements for a SAP to complete characterization of the three SWMUs.	Lyon September 2001
December	2001	SNL/NM submits the SAP for Supplemental Sampling at the three SWMUs.	SNL/NM December 2001
February	2002	NMED approves the SAP for Supplemental Sampling at the three SWMUs.	Moats February 2002a
January-June	2002	SNL/NM implements the SAP for Supplemental Sampling.	SNL/NM June 2002 SNL/NM April 2003

- NFA = No Further Action.
- NMED = New Mexico Environment Department.
- SAP = Sampling and Analysis Plan.
- SNL/NM = Sandia National Laboratories/New Mexico.
- SWMU = Solid Waste Management Unit.
- TA = Technical Area.
- TCA = Trichloroethane.

This expanded response addresses the most current correspondence from the NMED by providing the requested information for the general and site-specific comments (discussed in numerical order). Each section provides NMED technical comments repeated in **bold** and arranged by comment number in the original order. The DOE and SNL/NM response is written in normal font style on a separate line under "Response." For clarity, the original responses (SNL/NM June 1998) are restated in this document and identified as "Original Response." Additional language added since the June 1998 document (such as presentation of additional data and further explanations of the conclusions) are identified as "Expanded Response." In a few instances, the original response sufficiently addressed the technical comment, and no expanded response was deemed necessary. Responses to general technical comments begin on page 8, and responses to site-specific technical comments begin on page 14.

Additional supporting information for the general and site-specific comments is appended to this document. The original response included eleven attachments comprised of documentation that supported SNL/NM's responses to NMED's technical comments. In order to keep this expanded response document to a manageable size, the original attachments are not included with this submittal. The supporting documentation to the original response was referred to as "Attachments," and the supporting documentation to the NFA proposal was referred to as "Appendices." To prevent confusion, the supporting documentation to the expanded response is referred to as "Addenda." The list of addenda for the expanded response is presented in Table 2; the list of attachments to the original response is presented in Table 3.

Table 2
List of Addenda to the Expanded Response

Addendum A	SWMU 96 Human Health and Ecological Risk Assessment
Addendum B	SWMU 187 Human Health and Ecological Risk Assessment
Addendum C	SWMU 226 Human Health and Ecological Risk Assessment
Addendum D	"Field Report for Supplemental Investigations at Solid Waste Management Units 96, 187, and 226 Completed June 2002" (SNL/NM April 2003)
Addendum E	Results of Investigations Conducted at Miscellaneous Buildings in TA-I and Surrounding Areas
Addendum F	Plates Showing the Storm Water Drain System and the Sanitary Sewer System
Addendum G	"Solid Waste Management Unit 96—TA-I Storm Drain System, August/September 1998 Supplemental Investigation—Field Report" (SNL/NM March 2003)
Addendum H	Analytical Data Tables for SWMU 96—Method Detection Limit Tables for all SWMUs
Addendum I	Analytical Data Tables for SWMU 187
Addendum J	Figure Showing the Relationship of SWMU 226 to SWMU 46 and other Tijeras Arroyo Operable Unit 1309 SWMUs
Addendum K	Summary of SWMU 226 Confirmatory Soil Sampling Data Collected from Below Building 863 (SWMU 98), July 1999
Addendum L	Analytical Data Tables for SWMU 226

SWMU = Solid Waste Management Unit.
TA = Technical Area.

Table 3
List of Attachments to the Original Response (SNL/NM June 1998)

Attachment A	Approval Letter for Sandia North GIP and Transmittal Letter for Sandia North GIP Annual Report, Fiscal Year 1997
Attachment B	List of VOCs, SVOCs, and Radionuclides Analyzed for at ER Site 96
Attachment C	Equipment Blank Metals Data for ER Site 96
Attachment D	Gamma Spectroscopy Data for ER Site 96
Attachment E	Gamma Spectroscopy Data for ER Site 187
Attachment F	List of VOCs, SVOCs, and PCBs Analyzed for at ER Site 187
Attachment G	Equipment Blank Metals Data for ER Site 187
Attachment H	Gamma Spectroscopy Data for ER Site 226
Attachment I	List of VOCs, SVOCs, and PCBs Analyzed for at ER Site 226
Attachment J	Equipment Blank Metals Data for ER Site 226
Attachment K	EPA Guidance on Laboratory Data Validation

EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
GIP = Groundwater Investigation Plan.
PCB = Polychlorinated biphenyl.
SVOC = Semivolatile organic compound.
VOC = Volatile organic compound.

TABLE OF CONTENTS

	Page
LIST OF TABLES	6
GENERAL COMMENTS	8
SITE-SPECIFIC COMMENTS	14
OU 1302.....	14
ER Site 96	14
ER Site 187	29
ER Site 226	37
REFERENCES	44

LIST OF TABLES

Table 1	Historical Timeline for Events Related to SWMUs 96, 187, and 226 NFA Proposals	2
Table 2	List of Addenda to the Expanded Response.....	3
Table 3	List of Attachments to the Original Response (SNL/NM June 1998)	4
Table 4	Status of DSS Sites Identified by the NMED.....	31

Addendum Tables

Table H1-1	SWMUs 96, 187, and 226 Summary of Metals Analytical Detection Limits, 1998 and 2002 Supplemental Investigations	H-1
Table H1-2	SWMUs 96, 187, and 226 Summary of PCB Analytical Detection Limits, 1998 and 2002 Supplemental Investigations.....	H-2
Table H1-3	SWMUs 96, 187, and 226 Summary of SVOC Analytical Detection Limits, 1998 and 2002 Supplemental Investigations	H-3
Table H1-4	SWMUs 96, 187, and 226 Summary of VOC Analytical Detection Limits, 1998 and 2002 Supplemental Investigations.....	H-5
Table H2-1	SWMU 96, Summary of Metals Analytical Results, Soil Samples Collected 1998	H-6
Table H2-2	SWMU 96, Summary of PCB Analytical Results—Detections Only, Soil Samples Collected 1998.....	H-19
Table H2-3	SWMU 96, Summary of SVOC Analytical Results—Detections Only, Soil Samples Collected 1998.....	H-20
Table H2-4	SWMU 96, Summary of VOC Analytical Results—Detections Only, Soil Samples Collected 1998.....	H-21
Table H2-5a-f	SWMU 96, Summary of Radiochemistry Analytical Results, 1998 Supplemental Investigation	H-30
Table H3-1	SWMU 96, Summary of Metals Analytical Results, 2002 Supplemental Investigation	H-45

LIST OF TABLES (Concluded)

Table H3-2	SWMU 96, Summary of PCB Analytical Results—Detections Only, 2002 Supplemental Investigation	H-47
Table H3-3	SWMU 96, Summary of SVOC Analytical Results—Detections Only, 2002 Supplemental Investigation	H-48
Table H3-4	SWMU 96, Summary of VOC Analytical Results—Detections Only, 2002 Supplemental Investigation	H-50
Table H3-5	SWMU 96, Summary of Radiochemistry Analytical Results, 2002 Supplemental Investigation	H-51
Table I-1	SWMU 187, Summary of VOC Analytical Results—Detections Only, 2002 Supplemental Investigation	I-1
Table I-2	SWMU 187, Summary of SVOC Analytical Results—Detections Only, 2002 Supplemental Investigation	I-2
Table I-3	SWMU 187, Summary of Metals Analytical Results, 2002 Supplemental Investigation	I-3
Table I-4	SWMU 187, Summary of Radiochemistry Analytical Results, 2002 Supplemental Investigation	I-4
Table L-1	SWMU 226, Summary of SVOC Analytical Results—Detections Only, 2002 Supplemental Investigation	L-1
Table L-2	SWMU 226, Summary of Radiochemistry Analytical Results, 2002 Supplemental Investigation	L-2

General Comments

RESPONSES TO NMED TECHNICAL COMMENTS ON NO FURTHER ACTION PROPOSALS DATED OCTOBER 3, 1996 (7th ROUND)

GENERAL COMMENTS

1. **Drafts of maps, supporting documents, appendices, and data tables are unfinished products. For the purpose of a NFA proposal, final versions of these and any other types of information must be submitted.**

Original Response: To Sandia National Laboratories/Department of Energy's (SNL/DOE's) knowledge, no draft maps or documents were transmitted with the No Further Action (NFA) proposals for Sites 96, 187, and 226. As noted in previous responses to comments on other NFA proposals, some historical reference documents have never been finalized, and only the draft version is available for use (e.g., Comprehensive Environmental Assessment and Response Program [CEARP] Phase I, Preliminary Draft, May 1987).

Expanded Response: Maps, supporting documents, addenda, and data tables included with this submittal are final versions.

2. **It is helpful to include analytical results for field and equipment blanks, and duplicates in data tables. QA/QC data should not be mixed with environmental data in the same tables. If applicable, the QA/QC data tables should also include comparisons of offsite and onsite laboratory results (e.g., RPD's).**

Original Response: The quality assurance/quality control (QA/QC) data mentioned in this comment (field and equipment blanks) were included in the subject NFA proposals at the end of the relevant data tables. Thus, although they were included in the same tables as the environmental data, they were not intermingled. For these sites, comparisons of on-site and off-site data are not applicable because all data were measured off site.

Expanded Response: Data tables included with this submittal contain the results of quality assurance (QA)/quality control (QC) samples.

3. **Data tables for volatile organic compounds (VOC's), semi-volatile organic compounds (SVOC's), and radionuclides list only the constituents that were detected. While summary tables like these are acceptable (and preferred for review purposes), they provide only part of the information needed to fully evaluate a NFA proposal. To complete the data package, additional tables must be submitted listing *all* of the various constituents that were analyzed for and their method detection limits/minimum detectable activities.**

Please also note that "J-coded" data must be reported as detected constituents.

General Comments

Original Response: The requested tables are included with this package. For the purpose of this set of responses, detailed information is provided later in this package in the responses to Site-Specific Comments.

Please note that, in the subject NFA proposals, J-coded data were reported as detected constituents.

Expanded Response: For all data acquired since the original response to NMED's technical comments, tables are included that list all of the constituents for which samples were analyzed and the corresponding method detection limits (MDLs)/minimum detectable activity values. Also in this submittal, all "J-coded" data from recent sampling efforts are reported as detected constituents.

- 4. As presented, sample locations and depths must be inferred from the sample identification numbers in the data tables. Notes describing how such information is encoded in the sample identification numbers must be added to the tables.**

Original Response: SNL/DOE agree that information about encoding of sample location and depth within sample identification numbers must be available to the New Mexico Environment Department (NMED) and any other potential users of resulting data. Notes pertaining to this topic have been added to tables in later NFA proposals. For the purpose of this set of responses, detailed information is provided later in this package in the responses to Site-Specific Comments.

Expanded Response: For the data tables included with this submittal, all sample location and depth information is provided.

- 5. The NFA proposals contain redundant information, making it more time-consuming than necessary to review. Sections of the TA-1 RFI Work Plan are included with the NFA proposals. The NMED is more interested in what was actually done than what was planned. There is generally no need to include sections of the RFI Work Plans with the NFA proposals; relevant information (such as site history) can be summarized or restated in the text of the NFA proposal.**

Original Response: The comment is noted. SNL/DOE will try to balance omitting redundant information with the need to make NFA proposals stand-alone documents (per General Comment 10).

- 6. HRMB will not review the risk assessments for ER Sites 96, 187, and 226 until the sites have been adequately characterized. Risk assessments must be based on the protocols being developed by the DOE/SNL and the NMED.**

Original Response: SNL/DOE recognize that NMED has the prerogative of deciding when review of risk assessments is appropriate. In this case, the timing clearly hinges on

General Comments

"adequate characterization," which is the subject of many of the specific comments. Please note that, although additional sampling may delineate concentrations between "hits" (results that were found to be above background but below risk-based action levels) and background, there is no reason to anticipate discovery of values higher than those already found during the Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) sampling. Thus, the existing risk assessments are likely to be the most conservative (in terms of showing highest risk), and it may be worth NMED's time to review them at this stage.

Expanded Response: Based upon the implementation of the NMED-approved Sampling and Analysis Plan (SAP) (SNL/NM December 2001), SNL/NM believes that SWMUs 96, 187, and 226 have been adequately characterized. Risk assessments developed using the most recent (2003) assessment guidance, NMED-approved protocols, and recent characterization data are included in Addenda A through C.

7. **QA/QC -- At a meeting held in Santa Fe on December 3, 1996, HRMB staff members expressed concern about SNL's recurring problem regarding the frequent detection of "common laboratory contaminants" (such as acetone and methylene chloride) in various types of blanks. These organic compounds have been and still are widely used at SNL, and in some cases, historically were disposed of onto and into the ground. Thus, the presence of these chemicals in QC samples (such as field and trip blanks) can not be automatically discounted as laboratory contamination.**

Additionally, in this December meeting, HRMB personnel suggested that SNL review its contract laboratory's QA/QC program; and, if it is found deficient, remedy the problem or find other laboratory.

Repeated detections in equipment blanks may indicate improper decontamination practices and/or contaminated wash/rinse water and/or containers or other equipment. SNL should ensure that wash/rinse water, containers, and other equipment is not contaminated prior to their use.

Consistent QC failures are considered by HRMB to be an indication that laboratory data are not reliable. The HRMB will require sampling to be repeated at ER sites where such problems are evident.

Original Response: The comment is noted by SNL/DOE. SNL's Sample Management Office has an ongoing audit program to evaluate the adequacy of QA/QC problems at the off-site contract laboratories; this program is supplemented by a similar program overseen by DOE's Albuquerque Operations Office. When specific QA/QC concerns arise, the affected laboratory is contacted and corrective actions are defined and implemented. However, laboratory contamination is a sporadic problem at any major commercial laboratory and is a problem that defies universal and permanent correction because several common laboratory contaminants are necessary compounds in sample analytical procedures. This has been recognized by the U.S. Environmental Protection Agency

General Comments

(EPA) and, as NMED is aware, guidance has been available for some time on how to evaluate and use environmental data, despite the presence of laboratory contamination. For completeness, the guidance is included in this package as Attachment A to these general comments.

Because the comment indicates that the Hazardous and Radioactive Materials Bureau (HRMB) may be inclined to require resampling of sites in the event of "consistent QC failures," it is requested that a discussion be held between HRMB and SNL/DOE staff to reach a common understanding on what extent of laboratory contamination is considered to constitute "consistent QC failure."

Expanded Response: Based upon the implementation of the NMED-approved SAP (SNL/NM December 2001), specific locations have been resampled to alleviate concerns about VOC detections in QA/QC samples. All QA/QC sample analytical data are provided in the tables included with this submittal. SNL/NM believes that the current contract laboratory QA/QC program is sufficiently rigorous to provide quality analytical data.

8. Breaks/cracks/cross-connections in pipes that are downstream of those determined to have appreciable levels of contamination must be investigated.

Original Response: The comment is noted by SNL/DOE. Although there is agreement among the parties on this approach, it is a critical prerequisite to reach consensus on what constitutes "appreciable contamination."

Expanded Response: Additional site characterization requested by the NMED was completed in June 2002. The activities were performed in accordance with the "Sampling and Analysis Plan for Supplemental Investigations at Solid Waste Management Units 96, 187, and 226" (SNL/NM December 2001) as approved by the NMED (Moats February 2002a). The sampling event is documented in a field report included as Addendum D, and data are provided in tables in various addenda as cited in the expanded responses for the site-specific comments. The significance of the analytical results is discussed by individual SWMU.

9. HRMB will not support NFA proposals for active sites. DOE/SNL must investigate active sites within 2 years of decommissioning.

Original Response: SNL/DOE understand that the HRMB will not support NFA proposals for active sites; however, the comment is only partially germane to the three sites addressed here. Site 187, the sanitary sewer lines, is not an active site because the site is defined as the soils outside the pipe, from the midpoint of the pipe downward. Although water continues to flow within the pipes, modern waste-handling processes prevent the introduction of potential contaminants to that water; therefore, leakage from cracks in the line does not result in active contamination of the site as defined. For the same reasons, Site 226 is not an active site.

General Comments

Parts of Site 96, the storm-drain system, may need to be considered as active. The enclosed, engineered portions are inactive for the same reasons expressed in the preceding paragraph. However, the unlined surface channels obviously continue to receive flow originating from runoff from streets, parking lots, and miscellaneous exterior surfaces in Technical Area (TA)-I, processes for which environmental controls are less certain than for processes occurring within buildings. It would probably be fruitful to discuss approaches to these portions of Site 96 to ensure a common understanding of future status and timing.

Expanded Response: Currently these three SWMUs are not on the "active" site list. Only sites that currently conduct tests or implement procedures that may introduce potential contaminants into the environment are considered active. In a letter dated April 26, 2001, from William Moats (NMED Hazardous Waste Bureau [HWB]) to Michael Zamorski (DOE Kirtland Area Office) and Peter Davies (SNL/NM), the Permits Management Program of the NMED HWB had determined that sites that were at one time considered to be active could be petitioned for NFA on a case-by-case basis (Moats April 2001).

As with other SWMUs that were at one time considered to be active, the processes that led to contamination of the environment at SWMUs 96, 187, and 226 are no longer employed. In accordance with the requirements of the SNL/NM Environmental, Safety, and Health Program (which, in turn, are based on numerous state and federal requirements), SNL/NM no longer allows for the disposal of hazardous materials to these systems. The sanitary sewer and storm water effluent is monitored by the Water Quality Program as part of SNL/NM's Environmental Management Group (Department 3121). Although pollution prevention is the emphasis of the Water Quality Program, if an incident should result in the release of contaminants to the environment, the program procedures are designed to mitigate the spread of contamination. If required, the program procedures would require an investigation of the nature and extent of the release and implementation of any necessary removal action and remediation.

- 10. NFA proposals must be self-contained documents. The NFA criteria for a site must be specified in the NFA proposal. It is not adequate to only refer to the list of NFA criteria in the Document of Understanding.**

Original Response: NFA Criterion 5 was specified in the proposal. See Sections 1.0 and 1.2, page 1-1.

- 11. Buildings 810, 814, 824, 838, 839, and 870 are not considered by HRMB to be included in ER Sites 96, 187, or 226. Results of the investigations conducted at and near these buildings by DOE/SNL will be reviewed later by HRMB to determine whether these areas are new solid waste management units. However, DOE/SNL must provide any information from the investigations of these areas that may also be relevant to ER Sites 96, 187, and 226.**

General Comments

Original Response: The buildings listed in the NMED comment are not considered by SNL/DOE to be part of the Environmental Restoration (ER) sites. Furthermore, SNL buildings are addressed under a separately funded program (Decontamination and Decommissioning [D&D]) and are not candidates for inclusion as new Solid Waste Management Units. The D&D and ER Projects coordinate activities so that any investigation of soil or piping exterior to a building's slab or basement is conducted with ER goals and requirements in mind. As required by regulation, if contamination is discovered during such an investigation, regulatory authorities are notified. This has been, and will continue to be, SNL/DOE practice.

Results of the above-mentioned investigations will be provided for NMED's review. For the purpose of this set of responses, detailed information is provided later in this package in the responses to Site-Specific Comments. This information is included in this response because it details the results of work specifically conducted at the storm, sanitary, and acid waste lines that were connected to these buildings and investigated prior to building D&D actions.

Expanded Response: Results of sampling at or in the vicinity of these buildings are included in Addendum E. When applicable, the significance of the analytical results is discussed by individual SWMU (primarily in the expanded response to Site-Specific Technical Comment Number 3 for SWMU 187). The data are provided in tables in various addenda as cited in the expanded responses for the site-specific comments.

Site-Specific Comments

SITE-SPECIFIC COMMENTS

OU1302

ER Site 96, The Storm Drain System

1. **Appendix A, Plate 1-1, Soil-Boring Location Map --**
 - A. **The inlets/outlets need to be shown clearly on the map.**
 - B. **The open ditches need to be shown clearly on the map.**
 - C. **The various drainage systems (watersheds) should be shown in different colors so that they can be readily distinguished from one another.**
 - D. **Any surface impoundments need to be shown clearly on the map.**
 - E. **The direction of flow should be indicated on each main, trunk, and feeder line.**
 - F. **Connections to the storm system outside the study area should be shown, or indicated in some way on the map.**
 - G. **See general comment 1.**
 - H. **The locations of cracks, breaks, and any cross-connections should be shown on the map.**

Original Response 1A: The inlets/outfalls will be added to Plate 1-1. SNL Facilities plans to upgrade the storm drain system inside TA-I. Based on this latest information, ER/Geographic Information System (GIS) is in the process of upgrading our database. The new plate cannot be upgraded in time for this submittal, but will be provided upon completion of the GIS upgrade.

Expanded Response 1A: The storm-water inlets and outlets are shown on Plate F-1 (Addendum F). This plate also includes the recent SNL/NM Facilities upgrades to the storm drain system inside TA-I. Plate F-1 should be compared to Plate 1-1 of the SWMU 96 NFA Proposal (SNL/NM May 1997a).

Original Response 1B: The open-ditches will be added to Plate 1-1. SNL Facilities plans to upgrade the storm drain system inside TA-I. Based on this latest information, ER/GIS is in the process of upgrading our database. The new plate cannot be upgraded in time for this submittal, but will be provided upon completion of the GIS upgrade.

Expanded Response 1B: The open ditches are shown on Plate F-1 (Addendum F).

Original Response 1C: TA-I is part of the overall Tijeras Arroyo Watershed Area. The underground storm drains are shown on Plate 1-1. The open ditches will be added to Plate 1-1 (see Response 1B). SNL/NM ER does not know of any additional drainage systems (watersheds) within the TA-I project area.

Expanded Response 1C: Four distinct storm-water drainage systems are shown on Plate F-1 (Addendum F).

Site-Specific Comments

Original Response 1D: SNL/NM ER has no information showing surface impoundments within the TA-I project area.

Expanded Response 1D: A recently installed surface impoundment on the north side of TA-I and south of Building 831 has been added to Plate F-1 (Addendum F). No other surface impoundments exist in TA-I.

Original Response 1E: Flow arrows will be added to Plate 1-1. SNL Facilities plans to upgrade the storm drain system inside TA-I. Based on this latest information, ER/GIS is in the process of upgrading our database. The new plate cannot be upgraded in time for this submittal, but will be provided upon completion of the GIS upgrade.

Expanded Response 1E: The flow direction is shown on Plate F-1 (Addendum F).

Original Response 1E: The outside connections will be added to Plate 1-1. SNL Facilities plans to upgrade the storm drain system inside TA-I. Based on this latest information, ER/GIS is in the process of upgrading our database. The new plate cannot be upgraded in time for this submittal, but will be provided upon completion of the GIS upgrade.

Expanded Response 1E: The connections to the storm drain system outside the study area are shown on Plate F-1 (Addendum F).

Original Response 1G: See response to General Comment 1.

Original Response 1H: The cracks, breaks, and cross-connections have been provided on Plates 5-1 through 5-6 of the "Technical Area I (ADS 1302) RFI Work Plan," Volume 2, Plates 5-1 through 5-11.

2. **According to the RFI Work Plan, ground-water monitor wells were to be installed around the perimeter of Technical Area 1 (TA-1). One purpose of these wells from the HRMB's perspective was to allow for the monitoring of any contamination that may have originated from leaks from the sanitary-sewer and storm-drain systems.**

To HRMB's knowledge, not all of the proposed wells in the RFI Work Plan have been installed. Furthermore, no ground-water data were provided for review. The monitor wells that were proposed in the TA-1 RFI Work Plan must be installed. Analytical results of ground-water samples from wells in the TA-1 area must be submitted for HRMB's review.

Original Response: The TA-I groundwater monitoring program was incorporated into the Sandia North groundwater program. This project change was approved by HRMB upon approval of the Sandia North Groundwater Investigation Plan (GIP). The HRMB GIP approval letter is provided in Attachment A. To date, four monitor wells have been

Site-Specific Comments

installed: regional well TAI-W-01 is located at ER Site 190 (southwest corner of TA-I), regional well TA-I-W-03 is located close to the Eubank-1 well (southeast corner of TA-I), and regional well TAI-W-02 and shallow-water bearing well TAI-W-06 are located in the parking lot south of Building 825 (southern boundary of TA-I). The Sandia North groundwater program plans to drill an additional three to five monitor wells at three locations within the TA-I area. The final number of wells installed will depend on whether the shallow-water bearing zone extends into the TA-I area.

Analytical results for fiscal year 1997 have been reported in "Sandia North Groundwater Investigation Annual Report Fiscal Year 1997." Copies of this report have been provided to NMED/HRMB and NMED/DOE Oversight Bureau (OB). The transmittal letter is provided in Attachment A.

Expanded Response: Groundwater monitoring for TA-I and the surrounding area are conducted as part of the TAG Investigation. The first comprehensive groundwater document was the "Sandia North Groundwater Investigation Plan" (SNL/NM March 1996). A pair of Sandia North status reports were prepared in 1998 (SNL/NM March 1998) and 2000 (SNL/NM June 2000). In late 2000, "Tijeras Arroyo" replaced the term "Sandia North." In mid-2002, the comprehensive "Tijeras Arroyo Groundwater Continuing Investigation Report" (SNL/NM November 2002) was prepared. In June 2003, the "Tijeras Arroyo Groundwater Investigation Work Plan" (SNL/NM June 2003) was prepared in order to identify data gaps and present a comprehensive approach for completing the characterization of groundwater contamination. All Sandia North/Tijeras Arroyo Groundwater reports have been provided to the NMED/HWB under separate cover.

3. Appendix C, Table 2 -- See general comments 2, 3, and 4.

With regard to the analytical results of samples from locations GP-01, GP-04, GP-05, GP-07, and GP-11, the laboratory reporting limit (LRL) for methylene chloride (200 ug/kg) is too high, and suggests that samples were diluted prior to analysis. New samples must be collected and analyzed for VOC's at these locations.

Additionally, SNL/DOE must return to each location where VOC's were detected and determine the extent of contamination. The source (or sources) of contamination must be determined.

Original Response: See responses to General Comments 2, 3, and 4. The field blank, equipment blank, duplicate sample, and trip blank data were clearly identified in Appendix C, Table 2. An off-site laboratory analyzed the samples. Therefore, a comparison of off-site and on-site laboratory data could not be conducted at this site.

A table showing the list of volatile organic compounds (VOCs) analyzed for is provided in Attachment B. This list includes the method detection limit (MDL) for each compound.

Site-Specific Comments

The sample identification number T1096-GP-001-010-S (example) represents the following: T1 = Technical Area 1, 096 = ER Site 96, GP = geoprobe, 001 = soil boring location one, 010 = depth of sample collected (in feet), and S = soil sample.

The DOE has forwarded a letter to NMED requesting that the response due date be extended an additional 60 days. The letter also stated the following: "... identified several issues in the Request for Supplemental Information (RSI) with potential programmatic implications that may require extensive discussions with the NMED technical staff." The nature and extent of VOC contamination is one of the issues that will impact the program. A response on the nature and extent of contamination will not be addressed at this time. The SNL ER Project requests a meeting with the NMED technical staff to resolve this issue.

Expanded Response: Since the submittal of the NFA proposal, two sampling events were conducted that included an August/September 1998 sampling event and a June 2002 sampling event. In August/September 1998, supplemental soil sampling was completed at five SWMU 96 outfall locations. These August/September 1998 locations were determined to be necessary for further sampling based upon the following:

- The results of the original RFI surface soil sampling (SNL/NM May 1997a)
- The technical comments from the NMED on the SNL/NM SWMU 96 Proposal for NFA (Dinwiddie March 1998 and SNL/NM June 1998)
- Discussions in meetings with personnel from NMED
- Impending construction activities (by SNL/NM Facilities) within or near SWMU 96 outfall areas

The August/September 1998 characterization was performed according to the RFI Work Plan (SNL/NM February 1995), with the sampling activities documented in a field report (Addendum G). The analytical data tables are presented in Addendum H. Table H2-4 presents the 1998 VOC analytical results. Nine VOCs were detected, mostly at concentrations near the MDLs. The maximum concentration detected was 20 micrograms (μg)/kilogram (kg) for toluene.

Additional site characterization requested by the NMED was completed in June 2002. The characterization was performed according to the SAP (SNL/NM December 2001), with the sampling activities documented in a field report (Addendum D). The analytical data tables are presented in Addendum H. Table H3-4 presents the 2002 VOC analytical results. Two VOCs (acetone and methylene chloride) were detected, all at concentrations below the MDL and all were B qualified.

Site-Specific Comments

Based upon the data acquired from the supplemental investigations, SNL/NM has determined the extent of contamination at each of the locations requested by NMED. These investigations have confirmed that the sources of contamination (if any) are the original locations of the underground pipe break and deficiencies that were specified for characterization sampling in the RFI Work Plan (SNL/NM February 1995).

4. Appendix C, Table 3 -- See general comments 2, 3, and 4.

With regard to the analytical results of samples from locations SD-001 through SD-005, SD-10, and SD-15, the laboratory reporting limits (LRL's) for the various detected SVOC's are too high, suggesting that samples were diluted prior to analysis. New samples must be collected and analyzed for SVOC's at these locations.

Additionally, SNL/DOE must return to each location where SVOC's were detected and determine the extent of contamination. The source (or sources) of contamination must be determined.

Original Response: See responses to General Comments 2, 3, and 4. The field blank, equipment blank, and duplicate sample data were clearly identified in Appendix C, Table 3. An off-site laboratory analyzed the samples. Therefore, a comparison of off-site and on-site laboratory data could not be conducted at this site.

A table showing the list of semivolatile organic compounds (SVOCs) analyzed for is provided in Attachment B (see response to Comment 3). The list includes the MDL for each compound.

The sample identification number T1096-GP-001-010-S (example) represents the following: T1 = Technical Area 1, 096 = ER Site 96, GP = geoprobe, 001 = soil boring location one, 010 = depth of sample collected (in feet), and S = soil sample.

The DOE has forwarded a letter to NMED requesting that the response due date be extended an additional 60 days. The letter also stated the following: "... identified several issues in the RSI with potential programmatic implications that may require extensive discussions with the NMED technical staff." The nature and extent of SVOC contamination is one of the issues that will impact the program. A response on the nature and extent of contamination will not be addressed at this time. The SNL ER Project requests a meeting with the NMED technical staff to resolve this issue.

Expanded Response: Since the submittal of the NFA proposal, two sampling events were conducted that included an August/September 1998 sampling event and a June 2002 sampling event. In August/September 1998, supplemental soil sampling was completed at five SWMU 96 outfall locations. These August/September 1998 locations were determined to be necessary for further sampling based upon the following:

Site-Specific Comments

- The results of the original RFI surface soil sampling (SNL/NM May 1997a)
- The technical comments from the NMED on the SNL/NM SWMU 96 Proposal for NFA (Dinwiddie March 1998 and SNL/NM June 1998)
- Discussions in meetings with personnel from NMED
- Impending construction activities (by SNL/NM Facilities) within or near SWMU 96 outfall areas

The August/September 1998 characterization was performed according to the Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Work Plan (SNL/NM February 1995), with the sampling activities documented in a field report (Addendum G). The analytical data tables are presented in Addendum H. Table H2-3 presents the 1998 SVOC analytical results. Nine SVOCs were detected, mostly at concentrations below the MDL. The highest concentration for an SVOC was 1,700 µg/kg of fluoranthene in two samples.

Additional site characterization requested by the NMED was completed in June 2002. The characterization was performed according to the SAP (SNL/NM December 2001), with the sampling activities documented in a field report (Addendum D). The analytical data tables are presented in Addendum H. Table H3-3 presents the 2002 SVOC analytical results. Eleven SVOCs were detected, mostly at concentrations below the MDL. The highest concentration of an SVOC was 67.4 µg/kg for bis(2-ethylhexyl) phthalate.

Based upon the data acquired from the supplemental investigations, SNL/NM has determined the extent of contamination at each of the locations requested by NMED. These investigations have confirmed that the sources of contamination (if any) are the original locations of the underground pipe break and deficiencies that were specified for characterization sampling in the RFI Work Plan (SNL/NM February 1995).

5. **Appendix C, Table 4 -- SNL/DOE must return to the locations where the PCB detections occurred and determine the extent of contamination. The source (or sources) of PCB contamination must be determined.**

See general comment 4.

Original Response: The DOE has forwarded a letter to NMED requesting that the response due date be extended an additional 60 days. The letter also stated the following: "... identified several issues in the RSI with potential programmatic implications that may require extensive discussions with the NMED technical staff." The nature and extent of polychlorinated biphenyl (PCB) contamination is one of the issues that will impact the program. A response on the nature and extent of contamination will not be

Site-Specific Comments

addressed at this time. The SNL ER Project requests a meeting with the NMED technical staff to resolve this issue.

See response to General Comment 4. The sample identification number T1096-GP-001-010-S (example) represents the following: T1 = Technical Area 1, 096 = ER Site 96, GP = geoprobe, 001 = soil boring location one, 010 = depth of sample collected (in feet), and S = soil sample.

Expanded Response: Since the submittal of the NFA proposal, two sampling events were conducted that included an August/September 1998 sampling event and a June 2002 sampling event. In August/September 1998, supplemental soil sampling was completed at five SWMU 96 outfall locations. These August/September 1998 locations were determined to be necessary for further sampling based on the following:

- The results of the original RFI surface soil sampling (SNL/NM May 1997a)
- The technical comments from the NMED on the SNL/NM SWMU 96 Proposal for NFA (Dinwiddie March 1998 and SNL/NM June 1998)
- Discussions in meetings with personnel from NMED
- Impending construction activities (by SNL/NM Facilities) within or near SWMU 96 outfall areas

The August/September 1998 characterization was performed according to the RFI Work Plan (SNL/NM February 1995), with the sampling activities documented in a field report (Addendum G). The analytical data tables are presented in Addendum H. Table H2-2 presents the 1998 polychlorinated biphenyl (PCB) analytical results. Three PCB Aroclors were detected. The highest concentration for a PCB was 160 µg/kg of Aroclor-1260.

Additional site characterization requested by the NMED was completed in June 2002. The characterization was performed according to the SAP (SNL/NM December 2001), with the sampling activities documented in a field report (Addendum D). The analytical data tables are presented in Addendum H. Table H3-2 presents the 2002 PCB analytical results. One PCB Aroclor was detected. The highest concentration for a PCB was 76 µg/kg of Aroclor-1260.

Based upon the data acquired from the supplemental investigations, SNL/NM has determined the extent of contamination at each of the locations requested by NMED. These investigations have confirmed that the sources of contamination (if any) are the original locations of the underground pipe break and deficiencies that were specified for characterization sampling in the RFI Work Plan (SNL/NM February 1995).

Site-Specific Comments

6. Appendix C, Table 5 -- Analytical results for some samples exceed the approved background concentrations for certain metals:

<u>Metal</u>	<u>Borehole (GP) Location</u>
Ag	011,
As	022, 031, 033, 034, 041, 043, 044, 046,
Ba	013, 031, 034, 036, 046, 050
Co	001, 003, 010,
Ni	003, 008, 010, 029,
Tl	001, 002, 003, 007, 010, 011, 029, 030, 033, 034, 035, 036, 039, 040, 041, 043
V	030, 031, 033, 036, 039, 040, 041, 042, 043, 044, 045, 046, 047, 050

SNL/DOE must return to each location and determine the extent of contamination. The source (or sources) of each contaminant must be determined.

See general comments 2 and 4.

Original Response: The DOE has forwarded a letter to NMED requesting that the response due date be extended an additional 60 days. The letter also stated the following: "... identified several issues in the RSI with potential programmatic implications that may require extensive discussions with the NMED technical staff." The nature and extent of metal contamination and the approved background values are two of the issues that will impact the program. A response on the nature and extent of contamination and background concentrations will not be addressed at this time. The SNL ER Project requests a meeting with the NMED technical staff to resolve these issues.

See responses to General Comments 2 and 4. The metals equipment blank sample data have been added to Appendix C, Table 5 (Attachment C). An off-site laboratory analyzed the samples. Therefore, a comparison of off-site and on-site laboratory data could not be conducted at this site.

The sample identification number T1096-GP-001-010-S (example) represents the following: T1 = Technical Area 1, 096 = ER Site 96, GP = geoprobe, 001 = soil boring location one, 010 = depth of sample collected (in feet), and S = soil sample.

Expanded Response: Since the submittal of the NFA proposal, two sampling events were conducted that included an August/September 1998 sampling event and a June 2002 sampling event. In August/September 1998, supplemental soil sampling was completed at five SWMU 96 outfall locations. These August/September 1998 locations were determined to be necessary for further sampling based upon the following:

Site-Specific Comments

- The results of the original RFI surface soil sampling (SNL/NM May 1997a)
- The technical comments from the NMED on the SNL/NM SWMU 96 Proposal for NFA (Dinwiddie March 1998 and SNL/NM June 1998)
- Discussions in meetings with personnel from NMED
- Impending construction activities (by SNL/NM Facilities) within or near SWMU 96 outfall areas

The August/September 1998 characterization was performed according to the RFI Work Plan (SNL/NM February 1995), with the sampling activities documented in a field report (Addendum G). The analytical data tables are presented in Addendum H. Table H2-1 presents the 1998 metal analytical results. Many of the metals exceed approved background concentrations.

Additional site characterization requested by the NMED was completed in June 2002. The characterization was performed according to the SAP (SNL/NM December 2001), with the sampling activities documented in a field report (Addendum D). The analytical data tables are presented in Addendum H. Table H3-1 presents the 2002 metal analytical results. Four metals exceeded the approved background concentrations. The highest concentration exceedence was barium at 314 milligrams (mg)/kg.

Based upon the data acquired from the supplemental investigations, SNL/NM has determined the extent of contamination at each of the locations requested by NMED. These investigations have confirmed that the sources of contamination (if any) are the original locations of the underground pipe break and deficiencies that were specified for characterization sampling in the RFI Work Plan (SNL/NM February 1995).

7. Appendix C, Table 6 -- See general comments 3 and 4.

Analytical results for some samples demonstrate that radioactive contamination is present:

Radionuclide	Borehole (GP) Locations
Plutonium	006, 052
Tritium	006, 007, 008, 009, 010, 018, 044

Plutonium was also detected at 0.439 pCi/g in sediment sample SD-017.

SNL/DOE must return to each of these locations and determine the extent of contamination. The source (or sources) of each contaminant must be determined.

Site-Specific Comments

Surface-soil samples must also be collected and analyzed for plutonium throughout the TA-1 area. A sampling and analysis plan must be submitted to HRMB for approval prior to conducting this work.

Original Response: See responses to General Comments 3 and 4. The field blank, equipment blank, and duplicate sample data were clearly identified in Appendix C, Table 6. An off-site laboratory analyzed the samples. Therefore, a comparison of off-site and on-site laboratory data could not be conducted at this site.

A table showing the list of radionuclides analyzed for is provided in Attachment B (see response to Comment 3). This list includes the MDL for each compound.

The sample identification number T1096-GP-001-010-S (example) represents the following: T1 = Technical Area 1, 096 = ER Site 96, GP = geoprobe, 001 = soil boring location one, 010 = depth of sample collected (in feet), and S = soil sample.

The DOE has forwarded a letter to NMED requesting that the response due date be extended an additional 60 days. The letter also stated the following: "... identified several issues in the RSI with potential programmatic implications that may require extensive discussions with the NMED technical staff." The nature and extent of radionuclide contamination and radiological characterization (i.e., new sample and analysis plan) are two of the issues that will impact the program. A response on these two issues will not be addressed at this time. The SNL ER Project requests a meeting with the NMED technical staff to resolve these issues.

The plutonium result was transcribed incorrectly by SNL ER in Appendix C, Table 6. The correct value should read "0.0439 pCi/g." The value was stated correctly in the NFA text (Section 3.6.2.2).

Expanded Response: Since the submittal of the NFA proposal, two sampling events were conducted that included an August/September 1998 sampling event and a June 2002 sampling event. In August/September 1998, supplemental soil sampling was completed at five SWMU 96 outfall locations. These August/September 1998 locations were determined to be necessary for further sampling based on the following:

- The results of the original RFI surface soil sampling (SNL/NM May 1997a)
- The technical comments from the NMED on the SNL/NM SWMU 96 Proposal for NFA (Dinwiddie March 1998 and SNL/NM June 1998)
- Discussions in meetings with personnel from NMED
- Impending construction activities (by SNL/NM Facilities) within or near SWMU 96 outfall areas

Site-Specific Comments

The August/September 1998 characterization was performed according to the RFI Work Plan (SNL/NM February 1995), with the sampling activities documented in a field report (Addendum G). The analytical data tables are presented in Addendum H. Table H2-5 presents the 1998 radiochemistry results.

Additional site characterization requested by the NMED was completed in June 2002. The characterization was performed according to the SAP (SNL/NM December 2001), with the sampling activities documented in a field report (Addendum D). The analytical data tables are presented in Addendum H. Table H3-5 presents the 2002 radiochemistry analytical results. All the radiochemistry analytical results were nondetections.

Based upon the data acquired from the supplemental investigations, SNL/NM has determined the extent of contamination at each of the locations requested by NMED. These investigations have confirmed that the sources of contamination (if any) are the original locations of the underground pipe break and deficiencies that were specified for characterization sampling in the RFI Work Plan (SNL/NM February 1995).

8. **Appendix C, Table 7 -- Analytical results for some samples exceed the approved background concentrations for certain metals:**

<u>Metal</u>	<u>Sediment Sample (SD) Locations</u>
Ba	002, 003, 010, 013, 014, 016, 021, 027
Cd	001, 002, 003, 004
Cr	002, 003
Cu	001, 002, 003, 004, 007, 011, 014, 015
Pb	002, 003, 007
Hg	023
Ag	001, 002, 003, 004, 005
Zn	001, 002, 003, 004, 007, 014

SNL/DOE must return to each of these locations and determine the extent of contamination. The source (or sources) of each contaminant must be determined.

See general comments 2 and 4.

Original Response: The DOE has forwarded a letter to NMED requesting that the response due date be extended an additional 60 days. The letter also stated the following: "... identified several issues in the RSI with potential programmatic implications that may require extensive discussions with the NMED technical staff." The nature and extent of metal contamination and the approved background values are two of the issues that will impact the program. A response on the nature and extent of contamination and background concentrations will not be addressed at this time. The SNL ER Project requests a meeting with the NMED technical staff to resolve these issues.

Site-Specific Comments

See responses to General Comments 2 and 4. The metals equipment blank sample data have been added to Appendix C, Table 7 (Attachment C) (see response to Comment 6). An off-site laboratory analyzed the samples. Therefore, a comparison of off-site and on-site laboratory data could not be conducted at this site.

The sample identification number T1096-GP-001-010-S (example) represents the following: T1 = Technical Area 1, 096 = ER Site 96, GP = geoprobe, 001 = soil boring location one, 010 = depth of sample collected (in feet), and S = soil sample.

Expanded Response: Since the submittal of the NFA proposal, two sampling events were conducted that included an August/September 1998 sampling event and a June 2002 sampling event. In August/September 1998, supplemental soil sampling was completed at five SWMU 96 outfall locations. These August/September 1998 locations were determined to be necessary for further sampling based on the following:

- The results of the original RFI surface soil sampling (SNL/NM May 1997a)
- The technical comments from the NMED on the SNL/NM SWMU 96 Proposal for NFA (Dinwiddie March 1998 and SNL/NM June 1998)
- Discussions in meetings with personnel from NMED
- Impending construction activities (by SNL/NM Facilities) within or near SWMU 96 outfall areas

The August/September 1998 characterization was performed according to the RFI Work Plan (SNL/NM February 1995), with the sampling activities documented in a field report (Addendum G). The analytical data tables are presented in Addendum H. Table H2-1 presents the 1998 metal analytical results. Many of the metals exceed approved background concentrations.

Additional site characterization requested by the NMED was completed in June 2002. The characterization was performed according to the SAP (SNL/NM December 2001), with the sampling activities documented in a field report (Addendum D). The analytical data tables are presented in Addendum H. Table H3-1 presents the 2002 metal analytical results. Four metals exceeded the approved background concentration. The highest concentration exceedance was barium at 314 mg/kg.

Based upon the data acquired from the supplemental investigations, SNL/NM has determined the extent of contamination at each of the locations requested by NMED. These investigations have confirmed that the sources of contamination (if any) are the original locations of the underground pipe break and deficiencies that were specified for characterization sampling in the RFI Work Plan (SNL/NM February 1995).

Site-Specific Comments

9. **Page 1-1, section 1.3, 2nd sentence -- Why wasn't an investigation done for the drain systems in Technical Areas 2 and 4?**

Original Response: TAs II and IV are not part of ADS 1302. In addition, these two technical areas are downgradient of the TA-I storm drain system and have no impact on TA-I.

Expanded Response: Investigations of SWMUs within TA-II are covered by OU 1303 activities. Numerous NFA proposals and Notice of Deficiency (NOD) responses with data on TA-II SWMUs have been provided to NMED under separate cover. Historically, no engineered storm-water structures existed in TA-II aside from very localized culverts. During storm events, precipitation either infiltrated the soil or traveled via sheetflow towards Tijeras Arroyo along the natural contour of the mesa.

TA-IV does not contain any SWMUs. Because research operations began in 1980, TA-IV is the newest SNL/NM technical area and has always operated in compliance with current environmental, safety, and health procedures and considerations.

During storm events, surface water from TA-II and TA-IV flows over the mesa edge into Tijeras Arroyo. Six storm-water outfalls are located along the steep northern rim of Tijeras Arroyo at the eastern and southern edges of TA-II and TA-IV, which have been identified as SWMUs 230, 231, 232-1, 232-2, 233, and 234. Investigations of these six SWMUs are covered by OU 1309 activities. Numerous NFA proposals and NOD responses with data on these SWMUs have been provided to NMED under separate cover.

10. **Page 3-1, section 3.4 -- Results relevant to ER Site 96 must be summarized for the earlier investigations:**

- a. **the cross-connection study,**
- b. **sampling done in the discharge channel areas west of TA-2, and**
- c. **the sampling done during the removal of the local storm-drain system of Building 870.**

Data should be summarized in tables for each of the three different investigations. Sample locations should be shown on maps.

Original Response: These earlier investigations were presented/summarized in the TA-I Work Plan (in Appendix B of the NFA). SNL/DOE believe it would be redundant to further summarize these data.

Expanded Response 10a: Data from the cross-connection study are provided in Addendum E in the section labeled "Cross-Connect."

Site-Specific Comments

Expanded Response 10b: The sampling results for the discharge channel areas west of TA-II are provided in Addendum E in the section labeled "SDDA/OAWDL."

Expanded Response 10c: The sampling results for the investigation associated with the removal of the local storm-drain system of Building 870 is provided in Addendum E in the section labeled "Bldg. 870."

11. **Page 3-6, section 3.6.1.2, 1st paragraph, last sentence -- the gamma spectroscopy results must be provided.**

Original Response: The gamma spectroscopy data are provided in Attachment D.

12. **Page 3-7, section 3.6.1.2, bullet 5 -- What was the minimum detectable activity for U-235?**

Original Response: The detection limit is 0.0112 picocuries per gram (pCi/g) and the reporting limit is 0.0900 pCi/g. A copy of the laboratory report for radiological compounds is provided in Attachment B (see response to Comment 3).

13. **Appendix B -- See general comment 5.**

Original Response: See response to General Comment 5.

14. **Appendix D -- See general comment 6.**

Original Response: See response to General Comment 6.

Expanded Response: Based upon implementation of the NMED-approved SAP (SNL/NM December 2001), SNL/NM believes that SWMU 96 has been adequately characterized. A risk assessment developed for SWMU 96 using the most recent assessment guidance, NMED-approved protocols, and recent characterization data is included in Addendum A.

15. **Appendix C, Table 9 -- The background levels in this table for As, Cd, Cr, Cr⁺⁶, Co, Cu, Pb, Hg, Ag, V, and Zn are not the approved background concentrations for these constituents. The background values reported for the TA-1 study have not been approved by the HRMB.**

Original Response: The DOE has forwarded a letter to NMED requesting that the response due date be extended an additional 60 days. The letter also stated the following: "... identified several issues in the RSI with potential programmatic implications that may require extensive discussions with the NMED technical staff." The TA-I background study is one of the issues that will impact the program. A response on the TA-I background study will not be addressed at this time. The SNL ER Project requests a meeting with the NMED technical staff to resolve this issue.

Site-Specific Comments

Please note that the TA-I values were evaluated against the approved site-wide background values.

Expanded Response: All tables in Addendum H containing metals analytical data include NMED-approved background concentrations (Dinwiddie September 1997) for comparison.

16. Appendix C, Table 11 -- See specific comment 15.

Original Response: See response to Specific Comment 15.

Expanded Response: All tables in Addendum H containing metals analytical data include NMED-approved background concentrations (Dinwiddie September 1997) for comparison.

Addendum A

ADDENDUM A

SWMU 96 HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT



TABLE OF CONTENTS

I.	Site Description and History	A-1
II.	Data Quality Objectives.....	A-3
III.	Determination of Nature, Rate, and Extent of Contamination.....	A-7
III.1	Introduction	A-7
III.2	Nature of Contamination	A-7
III.3	Rate of Contaminant Migration.....	A-7
III.4	Extent of Contamination.....	A-7
IV.	Comparison of COCs to Background Screening Levels.....	A-8
V.	Fate and Transport	A-8
VI.	Human Health Risk Assessment.....	A-17
VI.1	Introduction	A-17
VI.2	Step 1. Site Data.....	A-17
VI.3	Step 2. Pathway Identification	A-18
VI.4	Step 3. Background Screening Procedure	A-18
VI.4.1	Methodology	A-18
VI.4.2	Results.....	A-21
VI.5	Step 4. Identification of Toxicological Parameters.....	A-21
VI.6	Step 5. Exposure Assessment and Risk Characterization.....	A-25
VI.6.1	Exposure Assessment	A-25
VI.6.2	Risk Characterization.....	A-26
VI.7	Step 6. Comparison of Risk Values to Numerical Guidelines	A-29
VI.8	Step 7. Uncertainty Discussion.....	A-30
VI.9	Summary.....	A-32
VII.	Ecological Risk Assessment	A-34
VII.1	Introduction.....	A-34
VII.2	Scoping Assessment.....	A-35
VII.2.1	Data Assessment.....	A-35
VII.2.2	Bioaccumulation.....	A-36
VII.2.3	Fate and Transport Potential.....	A-37
VII.2.4	Scoping Risk-Management Decision.....	A-37
VII.3	Risk Assessment	A-38
VII.3.1	Problem Formulation.....	A-38
VII.3.2	Exposure Estimation	A-39
VII.3.3	Ecological Effects Evaluation	A-41
VII.3.4	Risk Characterization	A-41
VII.3.5	Uncertainty Assessment.....	A-52
VII.3.6	Risk Interpretation.....	A-56
VII.3.7	Risk Assessment Scientific/Management Decision Point	A-56
VIII.	References.....	A-56
	Appendix 1	A-63
	Appendix 2.....	A-75

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LIST OF TABLES

Table	Page
1	Summary of Sampling Performed to Meet DQOs A-4
2	Number of Characterization Soil Samples Collected During the SWMU 96 RFI..... A-5
3	Summary of Data Quality Requirements..... A-6
4	Nonradiological COCs for Human Health Risk Assessment at SWMU 96 with Comparison to the Associated SNL/NM Background Screening Value, BCF, and Log K_{ow} A-9
5	Nonradiological COCs for Ecological Risk Assessment at SWMU 96 with Comparison to the Associated SNL/NM Background Screening Value, BCF, and Log K_{ow} A-12
6	Radiological COCs for Human Health Risk Assessment at SWMU 96 with Comparison to the Associated SNL/NM Background Screening Value and BCF A-14
7	Radiological COCs for Ecological Risk Assessment at SWMU 96 with Comparison to the Associated SNL/NM Background Screening Value and BCF A-15
8	Summary of Fate and Transport at SWMU 96..... A-17
9	Toxicological Parameter Values for SWMU 96 Nonradiological COCs A-22
10	Radiological Toxicological Parameter Values for SWMU 96 COCs Obtained from RESRAD Risk Coefficients..... A-25
11	Risk Assessment Values for SWMU 96 Nonradiological COCs A-27
12	Risk Assessment Values for SWMU 96 Nonradiological Background Constituents..... A-29
13	Summation of Radiological and Nonradiological Risks from Site Carcinogens A-34
14	Exposure Factors for Ecological Receptors at SWMU 96 A-42
15	Transfer Factors Used in Exposure Models for COPECs at SWMU 96 A-43
16	Media Concentrations for COPECs at SWMU 96 A-45

LIST OF TABLES (Concluded)

Table		Page
17	Toxicity Benchmarks for Ecological Receptors at SWMU 96	A-47
18	HQs for Ecological Receptors at SWMU 96.....	A-50
19	Total Dose Rates for Deer Mice Exposed to Radionuclides at SWMU 96.....	A-53
20	Total Dose Rates for Burrowing Owls Exposed to Radionuclides at SWMU 96.....	A-53
21	HQs for Ecological Receptors Exposed to Background Concentrations at SWMU 96.....	A-55

LIST OF FIGURES

Figure		Page
1	Conceptual Site Model Flow Diagram for SWMU 96.....	A-19

SWMU 96: RISK ASSESSMENT REPORT

I. Site Description and History

Solid Waste Management Unit (SWMU) 96, the Storm Drain System, was listed as an Environmental Restoration (ER) Site based upon information obtained during the Comprehensive Environmental Assessment and Response Program (CEARP) Phase I interviews. The original SWMU name was the Storm Drain System (Active), but was later changed to the Storm Drain System during the development of the Technical Area (TA)-I Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Work Plan (SNL/NM February 1995).

The original storm drain system was constructed between 1948 and 1950. The system collects stormwater runoff from TA-I, TA-II, and TA-IV. The majority of the storm water flows from east to west with the terrain across Sandia National Laboratories/New Mexico (SNL/NM). For TA-I, the majority of the water is conveyed through a series of open channels and underground lines from the north to Tijeras Arroyo in the south. The system was developed in four watersheds and is described in a drainage system analysis.

SWMU 96 comprises only the storm drain system in and around TA-I. The site boundaries are assumed to be the limits of areas where potential constituents of concern (COCs) have been detected near breaks in the lines or at the outfall locations. Any storm water flowing within the system is not addressed as part of SWMU 96. Storm water flow within the storm drain system is regulated under the National Pollution Discharge Elimination System (NPDES) amendments to the Clean Water Act.

During the CEARP Phase I interviews, the storm drain system was reported to have received contaminants from various activities. System discharges were reported to include nonpoint source surface runoff from TA-I, blowdown from an incinerator scrubbing system, and cooling tower blowdown water (possibly containing chromates and other antifoulants). There were several specific releases to the storm drains recorded in the CEARP report:

- An estimated 200 gallons of a 20 percent sodium hydroxide solution spilled from an aboveground tank at SWMU 42, Acid Spill Water Treatment Facility for discharges from Building 870, in 1984.
- An estimated 1,000 gallons of a 30 percent hydrochloric acid solution was released from an aboveground tank at the Acid Spill Water Treatment Facility near Building 870, SWMU 42, in 1983.
- A cooling tower on the roof of Building 806 caught fire in 1983, burning wood slats that were believed to have been contaminated with chromium. Much of the debris was reported to have been washed down the drain.
- An estimated 500 gallons of Number 2 fuel oil was released to the storm drain system due to a tank overflow; the location of the tank was not reported.

An RFI Work Plan for TA-I was delivered to U.S. Environmental Protection Agency (EPA) for review in February 1995. Site characterization and field sampling activities began in June 1995. The surface (0-2 feet below ground surface [bgs]) and near-surface (2-10 feet bgs) field investigations were completed in July 1995. Sampling data indicated that there were detectable amounts of polychlorinated biphenyl (PCB) and semivolatile organic compound (SVOC) contamination in the open storm drain channels. Final analysis indicates no detectable levels of contamination for radionuclides and metals.

Based upon the results of data collected in the Storm Drain System in 1995, a proposal for no further action (NFA) with risk assessment justification was prepared and submitted to the New Mexico Environment Department (NMED) for review in May 1997 (SNL/NM May 1997). The NMED reviewed the NFA and returned technical comments to SNL/NM in March 1998 (NMED March 1998); SNL/NM responded to these comments in June 1998 (SNL/NM June 1998). The NMED requested that additional sampling be done to further determine the nature and extent of contamination. Due to impending construction activities, supplemental soil sampling was completed at select outfalls in SWMU 96 in late 1998.

The NMED's technical comments also required additional sampling at SWMUs 187 and 226. Due to the proximity of these SWMUs to SWMU 96 (as well as similarities in the nature of contamination), SNL/NM decided to investigate these sites together. In September 2001, SNL/NM met with the NMED to define specifically what additional sampling was required to fully characterize SWMUs 96, 187, and 226. Based upon these discussions, a Sampling and Analysis Plan (SAP) was completed in December 2001 that specified locations and discussed strategies for each SWMU. The analytical suite included volatile organic compounds (VOCs), SVOCs, PCBs, metals, and radionuclides. The soil samples required by the SAP were collected in January through June 2002. In the SAP, SNL/NM agreed to resample 4 original (1995) locations, as well as collect soil samples from 22 locations in the vicinity of 9 original (1995) sample locations and 18 locations offset from the original (1995) sample location.

SWMU 96 rests on a partially dissected bajada formed by coalescing multiple alluvial fan complexes that originate in the mountain ranges to the east. The Holocene and Pleistocene deposits on the surface are composed of alluvial fan deposits shed from the eastern uplifts that interfinger with valley alluvium west of the site. The thickness of these Holocene and Pleistocene deposits is thought to be less than 10 feet. Surficial deposits derived from the Tijeras Arroyo drainage contain granitic and sedimentary lithologies from the Sandia Mountains and sedimentary and metamorphic lithologies from the Manzanita Mountains. The surficial deposits are underlain by the upper unit of the Tertiary Santa Fe Group, which consists of coarse- to fine-grained alluvial fan/piedmont veneer facies that extend westward from the Sandia and Manzanita Mountains. The upper Santa Fe unit is approximately 1,200 feet in thickness in the vicinity of the site.

The soil at the site is part of the Embudo-Tijeras complex, which consists of deep, well-drained, moderately alkaline soil (pH of 7.9 to 8.4) that formed in decomposed granitic alluvium on old alluvial fans. Permeability of this soil is moderate (0.6 to 2.0 inches per hour).

Groundwater monitoring for the area surrounding SWMU 96 is conducted as part of the Tijeras Arroyo (formerly Sandia North) Groundwater (TAG) Investigation. Two water-bearing zones, the perched groundwater system and the regional aquifer, underlie SWMU 96. There are 26 groundwater monitoring wells located around the TAG Investigation study area. The perched groundwater system is not used for water supply. The depth to the perched groundwater

system is approximately 275 feet bgs and the depth to the regional aquifer is approximately 535 feet bgs. Both the City of Albuquerque and Kirtland Air Force Base (KAFB) use the regional aquifer as a water supply source, and pumping of city wells has created a cone of depression in the northern portion of SNL/NM that affects groundwater flow in the vicinity of the site. The nearest water supply well is KAFB-1, located approximately 0.5 mile west of the site.

The climatic conditions are those normally associated with the high desert plateau: low precipitation, sunny days, and wide temperature ranges. Precipitation for the SNL/NM and KAFB area averages 8.1 inches per year (NOAA 1990). The weather is typically sunny and clear, with an average of 169 sunny days per year. The average diurnal temperature range is 28 degrees Fahrenheit (°F). Winter daily low temperatures normally fall to 23 to 27°F, and normal high temperature during the summer months range from 82 to 91°F. Winds are typically out of the east with an average speed of 9 miles per hour. Evapotranspiration has been estimated at 95 percent of the annual rainfall. (Thomson and Smith 1985, SNL/NM March 1996).

The site has been heavily disturbed by human activity for more than 50 years, and plants are not currently allowed to grow within the site boundaries. Generally, the diversity and abundance of animal species in areas in and around TA-I varies at given locations, depending upon the quantity and quality of necessary habitats. Given the amount of known human intrusion at the site, a large diversity or abundance of animal species is unlikely, although the site-specific species have not been quantified. No long-term, suitable habitat remains within the site boundaries to sustain a viable ecological system.

Natural areas outside the site boundaries are dominated by grassland vegetation; black grama, blue grama, and western cheatgrass compose 30 to 40 percent of the vegetative mass. Indigenous wildlife includes amphibians, reptiles, birds, and small mammals. Thirteen species of concern have been identified at SNL/NM and KAFB locations; however, no threatened or endangered species and no species of concern have been identified within TA-I. There are no permanent wetlands identified in TA-I.

II. Data Quality Objectives

The Data Quality Objectives (DQOs) presented in the TA-I RFI Plan and the subsequent SAP for SWMU 96 (SNL/NM December 2001) identified the site-specific characterization sample locations, sample depths, sampling procedures, and analytical requirements. The DQOs outlined the Quality Assurance (QA)/Quality Control (QC) requirements necessary for producing defensible analytical data suitable for risk-assessment purposes. The characterization sampling conducted at SWMU 96 was designed to:

- Determine whether any VOCs, SVOCs, metals, PCBs, and/or radionuclides have been released to the soil near the identified line breaks in the storm drain system and/or at system outfalls.
- Produce data of adequate quality (Level III) for all subsurface samples at each break location under investigation so that risk calculations may be performed.

- Characterize the vertical extent of any COCs detected above action levels near the storm drain lines and outfalls by collecting samples from deep soil borings for analysis (Level II and Level III).
- Produce data of adequate quality (Level III) for 20 percent of deep borehole samples so that risk calculations may be performed and corrective measures may be evaluated.

The characterization samples were collected at 220 locations across SWMU 96 (Table 1). The sample numbers, sample dates, and chain of custody form numbers are identified in the data tables presented in the associated expanded response to the NMED's technical comments. Surface soil samples were collected using a hand auger or Geoprobe™ from a depth of 0 to 2 feet bgs; subsurface samples were collected to a maximum depth of 20 feet bgs. The soil samples were collected using the sampling procedures detailed in the TA-I Work Plan and subsequent SAP (SNL/NM December 2001).

Table 1
Summary of Sampling Performed to Meet DQOs

SWMU 96 Sampling	Potential COC Source	Number of Sampling Locations	Sampling Location Rationale
All locations	Releases to the storm drain system	220	Confirm that no significant levels of COCs are contained in the soils beneath the storm drain system.

COC = Constituent of concern.

DQO = Data quality objective.

SWMU = Solid Waste Management Unit.

The number of characterization samples by analyte are shown in Table 2. The soil samples were collected using the sampling procedures detailed in the TA-I RFI Work Plan and the SAP. Samples were collected at 220 locations across SWMU 96 analyzed for: metals, VOCs, SVOCs, radionuclides, and PCBs. The samples were analyzed by General Engineering Laboratories, Inc. (GEL)/Environmental Physics, Inc. (EPI) and the on-site SNL/NM Radiation Protection Sample Diagnostics (RPSD) Laboratory. Table 3 summarizes the analytical methods and some of the data quality requirements from the SWMU 96.

A total of 62 QA/QC samples were collected during the characterization sampling effort according to the ER Project Quality Assurance Project Plan. The QA/QC samples consisted of 10 duplicates, 33 trip blanks, 12 equipment blanks, and 7 field blanks. Trip blanks accompanied the soil samples requiring VOC analyses. No significant QA/QC problems were identified in the QA/QC samples.

The characterization sample results from 1998 through 2002 were verified/validated by SNL/NM. The off-site laboratory results from GEL/EPI were reviewed according to SNL/NM ER Project Laboratory Data Review Guidelines (SNL/NM July 1996) and Data Validation Procedure for Chemical and Radiochemical Data, AOP [Administrative Operating Procedure] 00-03, Rev. 0 (SNL/NM December 1999). The gamma spectroscopy data from the RPSD

Table 2
Number of Characterization Soil Samples Collected During the SWMU 96 RFI^a

Sample Type	Number of Samples	Radionuclides	Radionuclides	Metals	VOCs	SVOCs	PCBs
Characterization	210	194	22	194	200	196	197
Duplicates	10	8	-	8	10	8	8
VOC TBs	33	-	-	-	33	-	-
EBs	12	12	-	12	12	12	12
FBs	7	-	-	-	7	-	-
Total Samples	272	214	22	214	262	216	217
Analytical Laboratory		GEL/EPI	RPSD Laboratory	GEL/EPI	GEL/EPI	GEL/EPI	GEL/EPI

Note: Samples from chain of custody forms 3703, 3713, 3716, 3718, 3719, 3721, 3723, 3726, 3729, 3730, 3732, 3734, 3736, 3794, 600829, 600830, 600831, 600832, 600838, 600840, 600842, 600843, 600845, 600846, 601096, 605198, 605533.

^aSampling dates: June 13, 1995 through June 18, 2002.

- EB = Equipment blank.
- EPI = Environmental Physics, Inc.
- FB = Field blank.
- GEL = General Engineering Laboratories, Inc.
- PCB = Polychlorinated biphenyl.
- RCRA = Resource Conservation and Recovery Act.
- RFI = RCRA Facility Investigation.
- RPSD = Radiation Protection Sample Diagnostics.
- SVOC = Semivolatile organic compound.
- SWMU = Solid Waste Management Unit.
- TB = Trip blank.
- VOC = Volatile organic compound.
- = Information not available.

Table 3
Summary of Data Quality Requirements

Analytical Method	Data Quality Level	GEL/EPI	RPSD Laboratory
Gamma Spectroscopy EPA Method 901.1 ^a	Defensible	38 samples	na
Gamma Spectroscopy EPA Method 901.1 ^a	Defensible	NA	22 samples
Isotopic Plutonium EPI Methods A-012 and A-012B	Defensible	194 samples	na
Isotopic Uranium EPI Methods A-011 and A-011B	Defensible	194 samples	na
Metals EPA Methods 6000/7000 Series ^a	Defensible	194 samples	na
PCBs EPA Methods 8080 and 8082 ^a	Defensible	197 samples	na
SVOCs EPA Methods 8270 and 8270C ^a	Defensible	196 samples	na
H-3 LAL Methods -0066 and -0067	Defensible	194 samples	na
VOCs EPA Methods 8240, 8260, 8260A, and 8260B ^a	Defensible	200 samples	na

^aEPA November 1986.

Note: The number of samples does not include QA/QC samples such as duplicates, trip blanks, and equipment blanks.

EPA = U.S. Environmental Protection Agency
 EPI = Environmental Physics, Inc.
 GEL = General Engineering Laboratories, Inc.
 LAL = Lockheed Analytical Laboratories.
 na = Not analyzed.
 NA = Not applicable.
 PCB = Polychlorinated biphenyl.
 QA = Quality assurance.
 QC = Quality control.
 RPSD = Radiation Protection Sample Diagnostics.
 SVOC = Semivolatile organic compound.
 VOC = Volatile organic compound.

Laboratory were reviewed according to "Laboratory Data Review Guidelines," Procedure No. RPSD-02-11, Issue No. 02 (SNL/NM July 1996). The RPSD gamma-spectroscopy results were provided in the original technical comment response. The reviews confirmed that the analytical data are defensible and therefore acceptable for use in the risk assessment. Therefore, the DQOs have been fulfilled.

III. Determination of Nature, Rate, and Extent of Contamination

III.1 Introduction

The determination of the nature, migration rate, and extent of contamination at SWMU 96 was based upon an initial conceptual model validated with sampling at the site. The initial conceptual model was developed from archival research, video camera survey results, and soil sampling. The DQOs contained in the TA-I RFI Work Plan and subsequent SAP identified the sample locations, sample density, sample depth, and analytical requirements. The sample data were then used to develop the final conceptual model for SWMU 96. The quality of the data specifically used to determine the nature, migration rate, and extent of contamination are described below.

III.2 Nature of Contamination

Both the nature of contamination and the potential for the degradation of COCs at SWMU 96 were evaluated using laboratory analyses of the soil samples. The analytical requirements included analyses for radionuclides, metals, VOCs, SVOCs, and PCBs. The analytes and methods listed in Tables 2 and 3 are appropriate to characterize the COCs and any potential degradation products at SWMU 96.

III.3 Rate of Contaminant Migration

SWMU 96 is a site where all primary sources of COCs have been eliminated by compliance with the NPDES amendments to the Clean Water Act, RCRA requirements, and SNL/NM best management practices. As a result, only secondary sources of COCs potentially remain in soil in the form of adsorbed COCs (radionuclides, metals, VOCs, SVOCs, and PCBs). Therefore, the rate of COC migration from surface soil is dependent predominantly upon precipitation and occasional surface-water flow. Data available from the TAG Investigation; numerous SNL/NM monitoring programs for air, water, and radionuclides; various biological surveys; and meteorological monitoring are adequate to characterize the rate of COC migration at SWMU 96.

III.4 Extent of Contamination

Surface and subsurface characterization soil samples were collected from SWMU 96 to assess the extent of contamination. The soil samples were collected from the ground surface to a maximum depth of 20 feet bgs. The soil samples are considered to be representative of the soil potentially contaminated with the COCs and sufficient to determine any vertical extent of COCs. In summary, the design of the characterization sampling was appropriate and adequate to determine the nature, migration rate, and extent of residual COCs in surface and subsurface soils at SWMU 96.

IV. Comparison of COCs to Background Screening Levels

Site history and characterization activities are used to identify potential COCs. The SWMU 96 NFA proposal describes the identification of COCs and the sampling that was conducted in order to determine the concentration levels of those COCs across the site. Generally, COCs that were evaluated in this risk assessment included all detected organic compounds and all inorganic and radiological COCs for which samples were analyzed. If the detection limit of an organic compound was too high (i.e., could possibly cause an adverse effect to human health or the environment), the compound was retained. Nondetected organic compounds not included in this assessment were determined to have detection limits low enough to ensure protection of human health and the environment. In order to provide conservatism in this risk assessment, the calculation used only the maximum concentration value of each COC found for the entire site. The SNL/NM maximum background concentration (Dinwiddie September 1997) was selected to provide the background screening value listed in Tables 4 through 7.

Nonradiological inorganic compounds that are essential nutrients such as iron, magnesium, calcium, potassium, and sodium were not included in this risk assessment (EPA 1989). Both radiological and nonradiological COCs were evaluated. The nonradiological COCs evaluated included inorganic and organic compounds.

Tables 4 and 5 list the nonradiological COCs for the human health and ecological risk assessments at SWMU 96, respectively. Tables 6 and 7 list radiological COCs for the human health and ecological risk assessments, respectively. All tables show the associated SNL/NM maximum background concentration values (Dinwiddie September 1997). Section VI.4 provides discussion of Tables 4 and 6 while Sections VII.2 and VII.3 provide discussion of Tables 5 and 7.

V. Fate and Transport

The primary releases of COCs at SWMU 96 were to the surface and subsurface soil, resulting from the flow of stormwater runoff from TA-I, TA-II, and TA-IV through the open channels and underground lines of the storm drain system to Tijeras Arroyo. Wind, water, and biota are natural mechanisms of COC transport from the primary release point. Wind is expected to be of low significance as a transport mechanism for COCs at SWMU 96 because the soil associated with this site is located in a topographic depression, and only exposed to wind within the open channel portions of the storm drain system, which shelters soil from strong surface winds.

Water at SWMU 96 is received directly as precipitation (approximately 8.1 inches annually, as recorded at nearby Albuquerque International Sunport [NOAA 1990]). Infiltration of precipitation into the soil is enhanced by the sandy texture of the soil at this site. The soil in the area of the site is primarily fine sandy loams of the Embudo-Tijeras Complex (USDA 1977). Although the percolation of water through the soil may leach COCs deeper into the subsurface soil, evapotranspiration accounts for approximately 95 percent of the annual precipitation in this area (SNL/NM March 1996). Therefore, the potential for significant downward movement of COCs through leaching is very limited. Because perched groundwater at this site is located at a depth of greater than 275 feet bgs, the potential for COCs to reach groundwater through the unsaturated zone above the water table is extremely small. Surface water is also received

Table 4
Nonradiological COCs for Human Health Risk Assessment at SWMU 96 with
Comparison to the Associated SNL/NM Background Screening Value, BCF, and Log K_{ow}

COC	Maximum Concentration (mg/kg)	SNL/NM Background Concentration (mg/kg) ^a	Is Maximum COC Concentration Less Than or Equal to the Applicable SNL/NM Background Screening Value?	BCF (maximum aquatic)	Log K _{ow} (for organic COCs)	Bioaccumulator? ^b (BCF>40, Log K _{ow} >4)
Inorganic						
Aluminum	12,800	69,957 ^c	Yes	1,305 ^d	NA	Yes
Antimony	0.898 J	3.9	Yes	16,000 ^e	NA	Yes
Arsenic	7.51	4.4	No	44 ^f	NA	Yes
Barium	509	200	No	170 ^g	NA	Yes
Beryllium	0.676	0.80	Yes	19 ^f	NA	No
Cadmium	14	<1	No	64 ^f	NA	Yes
Chromium, total	80.8	12.8	No	16 ^f	NA	No
Chromium VI	0.7	NC	Unknown	16 ^f	NA	No
Cobalt	11.7	7.1	No	10,000 ^h	NA	Yes
Copper	41.7	17	No	6 ^f	NA	No
Lead	97	11.2	No	49 ^f	NA	Yes
Manganese	485	831 ^c	Yes	100,000 ^h	NA	Yes
Mercury	0.347	<0.1	No	5500 ^f	NA	Yes
Nickel	94.2	25.4	No	47 ^f	NA	Yes
Selenium	0.818	<1	Unknown	800 ^e	NA	Yes
Silver	76.4	<1	No	0.5 ^f	NA	No
Thallium	2.03	<1.1	No	119 ^f	NA	Yes
Vanadium	50.2	33	No	3,000 ^g	NA	Yes
Zinc	168	76	No	47 ^f	NA	Yes
Organic						
Acenaphthene	0.303 J	NA	NA	389 ⁱ	3.92 ⁱ	Yes
Acetone	0.0476	NA	NA	0.69 ^j	-0.24 ^j	No
Anthracene	1.71 J	NA	NA	917 ^f	4.45 ^f	Yes
Benzo(a)anthracene	7.9	NA	NA	10,000 ⁱ	5.61 ⁱ	Yes
Benzo(a)pyrene	2.73 J	NA	NA	3,000 ^f	6.04 ^f	Yes
Benzo(b)fluoranthene	12.4	NA	NA	-	6.124 ⁱ	Yes
Benzo(g,h,i)perylene	4.24	NA	NA	58,884 ⁱ	6.58 ⁱ	Yes

Refer to footnotes at end of table.

Table 4 (Continued)
Nonradiological COCs for Human Health Risk Assessment at SWMU 96 with
Comparison to the Associated SNL/NM Background Screening Value, BCF, and Log K_{ow}

COC	Maximum Concentration (mg/kg)	SNL/NM Background Concentration (mg/kg) ^a	Is Maximum COC Concentration Less Than or Equal to the Applicable SNL/NM Background Screening Value?	BCF (maximum aquatic)	Log K _{ow} (for organic COCs)	Bioaccumulator? ^b (BCF>40, Log K _{ow} >4)
Benzo(k)fluoranthene	3.88	NA	NA	93,325 ⁱ	6.84 ⁱ	Yes
2-Butanone	0.01 B	NA	NA	1 ^j	0.29 ^j	No
Butyl benzyl phthalate	0.0522 J	NA	NA	663 ^j	4.77 ⁱ	Yes
Carbon disulfide	0.00064 JB	NA	NA	7.9 ^j	-	No
Chloroform	0.0028 B	NA	NA	10.35 ^j	1.92 ⁱ	No
Chloromethane	0.00339 J	NA	NA	1.8 ^k	0.91 ^k	No
Chrysene	11.5	NA	NA	18,000 ⁱ	5.91 ⁱ	Yes
Dibenzofuran	0.196 J	NA	NA	2,800 ⁱ	4.12 ⁱ	Yes
Dichloroethene, cis-1,2	0.0015	NA	NA	22 ^j	2.06 ^j	No
Diethylphthalate	0.0395 JB	NA	NA	117 ⁱ	2.47 ⁱ	Yes
bis(2-Ethylhexyl)phthalate	12.8	NA	NA	851 ⁱ	7.6 ⁱ	Yes
Fluoranthene	14.5	NA	NA	12,302 ⁱ	4.90 ⁱ	Yes
Fluorene	0.339	NA	NA	2,239 ⁱ	4.18 ⁱ	Yes
Indeno(1,2,3-cd)pyrene	3.97	NA	NA	59,407 ⁱ	6.58 ⁱ	Yes
Methylene chloride	0.101 J	NA	NA	5 ^j	1.25 ^j	No
Naphthalene	0.292 J	NA	NA	1,000 ⁱ	3.30 ⁱ	Yes
Phenanthrene	8.01	NA	NA	23,800 ^f	4.63 ^f	Yes
Pyrene	18.8	NA	NA	36,300 ^f	5.32 ⁱ	Yes
Tetrachloroethene	0.015	NA	NA	49 ^j	2.67 ⁱ	Yes
Toluene	0.0393	NA	NA	10.7 ⁱ	2.69 ^f	No
Trichloroethene	0.0057	NA	NA	10.6 ^f	2.29 ^f	No
Xylene	0.0139 J	NA	NA	23.4 ^j	1.5 ⁱ	No
PCBs, total	0.36	NA	NA	31,200 ^f	6.72 ^f	Yes

Note: **Bold** indicates COCs that exceed background values and/or are bioaccumulators.

^aDinwiddie September 1997, North Supergroup Soils.

^bNMED March 1998.

^cNURE Data Program (USGS 1994).

^dWren and Stephenson 1991.

^eCallahan et al. 1979.

Table 4 (Concluded)
Nonradiological COCs for Human Health Risk Assessment at SWMU 96 with
Comparison to the Associated SNL/NM Background Screening Value, BCF, and Log K_{ow}

^fYanicak March 1997.

^gNeumann 1976.

^hVanderploeg et al 1975.

ⁱMicromedex 1998.

^jHoward 1989.

^kLyman.

^lHoward 1990.

B = Analyte detected in associated blank.

BCF = Bioconcentration factor.

COC = Constituent of concern.

J = Estimated value.

K_{ow} = Octanol-water partition coefficient.

Log = Logarithm (base 10).

mg/kg = Milligram(s) per kilogram.

NA = Not applicable.

NC = Not calculated.

NMED = New Mexico Environment Department.

NURE = National Uranium Resource Evaluation.

PCB = Polychlorinated biphenyl.

SNL/NM = Sandia National Laboratories/New Mexico.

SWMU = Solid Waste Management Unit.

- = Information not available.

Table 5
Nonradiological COCs for Ecological Risk Assessment at SWMU 96 with
Comparison to the Associated SNL/NM Background Screening Value, BCF, and Log K_{ow}

COC	Maximum Concentration (mg/kg)	SNL/NM Background Concentration (mg/kg) ^a	Is Maximum COC Concentration Less Than or Equal to the Applicable SNL/NM Background Screening Value?	BCF (maximum aquatic)	Log K _{ow} (for organic COCs)	Bioaccumulator? ^b (BCF>40, Log K _{ow} >4)
Inorganic						
Aluminum	11,900	69,957 ^c	Yes	1,305 ^d	NA	Yes
Antimony	0.898 J	3.9	Yes	16,000 ^e	NA	Yes
Arsenic	7.51	4.4	No	44 ^f	NA	Yes
Barium	509	200	No	170 ^g	NA	Yes
Beryllium	0.58	0.80	Yes	19 ^f	NA	No
Cadmium	1.78	<1	No	64 ^f	NA	Yes
Chromium, total	80.8	12.8	No	16 ^f	NA	No
Chromium VI	0.68	NC	Unknown	16 ^f	NA	No
Cobalt	6.83	7.1	Yes	10,000 ^h	NA	Yes
Copper	41.7	17	No	6 ^f	NA	No
Lead	97	11.2	No	49 ^f	NA	Yes
Manganese	331	831 ^c	Yes	100,000 ^h	NA	Yes
Mercury	0.254	<0.1	No	5,500 ⁱ	NA	Yes
Nickel	26.1	25.4	No	47 ^f	NA	Yes
Selenium	0.818	<1	Unknown	800 ^e	NA	Yes
Silver	76.4	<1	No	0.5 ^f	NA	No
Thallium	1.64	<1.1	No	119 ^f	NA	Yes
Vanadium	50.2	33	No	3,000 ^g	NA	Yes
Zinc	168	76	No	47 ^f	NA	Yes
Organic						
Acenaphthene	0.303 J	NA	NA	389 ^j	3.92 ^l	Yes
Acetone	0.0437	NA	NA	0.69 ^j	-0.24 ^l	No
Anthracene	1.71 J	NA	NA	917 ^f	4.45 ^f	Yes
Benzo(a)anthracene	7.9	NA	NA	10,000 ⁱ	5.61 ⁱ	Yes
Benzo(a)pyrene	2.73 J	NA	NA	3,000 ^f	6.04 ^f	Yes
Benzo(b)fluoranthene	12.4	NA	NA	-	6.124 ^l	Yes
Benzo(g,h,i)perylene	4.24	NA	NA	58,884 ⁱ	6.58 ^l	Yes

Refer to footnotes at end of table.

Table 5 (Concluded)
Nonradiological COCs for Ecological Risk Assessment at SWMU 96 with
Comparison to the Associated SNL/NM Background Screening Value, BCF, and Log K_{ow}

COC	Maximum Concentration (mg/kg)	SNL/NM Background Concentration (mg/kg) ^a	Is Maximum COC Concentration Less Than or Equal to the Applicable SNL/NM Background Screening Value?	BCF (maximum aquatic)	Log K _{ow} (for organic COCs)	Bioaccumulator? ^b (BCF>40, Log K _{ow} >4)
Benzo(k)fluoranthene	3.88	NA	NA	93,325 ⁱ	6.84 ⁱ	Yes
Chloroform	0.0027 B	NA	NA	10.35 ^j	1.92 ^j	No
Chrysene	11.5	NA	NA	18,000 ^j	5.91 ⁱ	Yes
Dibenzofuran	0.196 J	NA	NA	2,800 ^j	4.12 ^j	Yes
Diethylphthalate	0.0395 JB	NA	NA	117 ^k	2.47 ^k	Yes
bis(2-Ethylhexyl)phthalate	12.8	NA	NA	851 ^k	7.6 ⁱ	Yes
Fluoranthene	14.5	NA	NA	12,302 ^j	4.90 ^j	Yes
Fluorene	0.339	NA	NA	2,239 ^j	4.18 ^j	Yes
Indeno(1,2,3-cd)pyrene	3.97	NA	NA	59,407 ^j	6.58 ^j	Yes
Methylene chloride	0.0119 B	NA	NA	5 ^j	1.25 ^j	No
Naphthalene	0.292 J	NA	NA	1,000 ^j	3.30 ^j	Yes
PCBs, total	0.36	NA	NA	31,200 ^f	6.72 ^f	Yes
Phenanthrene	8.01	NA	NA	23,800 ^f	4.63 ^f	Yes
Pyrene	18.8	NA	NA	36,300 ^f	5.32 ^j	Yes
Tetrachloroethene	0.0031	NA	NA	49 ^j	2.67 ^j	Yes
Toluene	0.0393	NA	NA	10.7 ^f	2.69 ^f	No
Trichloroethene	0.0021	NA	NA	10.6 ^f	2.29 ^f	No
Xylene	0.0139 J	NA	NA	23.4 ^j	1.5 ⁱ	No

Note: **Bold** indicates COCs that exceed background values and/or are bioaccumulators.

^aDinwiddie September 1997, North Supergroup Soils.

^bNMED March 1998.

^cNURE Data Program (USGS 1994).

^dWren and Stephenson 1991.

^eCallahan et al. 1979.

^fYanicak March 1997.

^gNeumann 1976.

^hVanderploeg et al 1975.

ⁱMicromedex 1998.

^jHoward 1990.

^kHoward 1989.

B = Analyte detected in associated blank.

BCF = Bioconcentration factor.

COC = Constituent of concern.

J = Estimated value.

K_{ow} = Octanol-water partition coefficient.

Log = Logarithm (base 10).

mg/kg = Milligram(s) per kilogram.

NA = Not applicable.

NC = Not calculated.

NMED = New Mexico Environment Department.

NURE = National Uranium Resource Evaluation.

SNL/NM = Sandia National Laboratories/New Mexico.

SWMU = Solid Waste Management Unit.

- = Information not available.

Table 6
Radiological COCs for Human Health Risk Assessment at SWMU 96 with
Comparison to the Associated SNL/NM Background Screening Value and BCF

COC	Maximum Activity (pCi/g)	SNL/NM Background Activity (pCi/g) ^a	Is Maximum COC Activity Less Than or Equal to the Applicable SNL/NM Background Screening Value?	BCF (maximum aquatic)	Is COC a Bioaccumulator? ^b (BCF >40)
H-3	0.81	0.021 ^c	No	NA	NA
Pu-238	0.934	NA	No	2,000 ^d	Yes
Pu-239	0.213	NA	No	2,000 ^d	Yes
U-235	0.11	0.18	Yes	900 ^e	Yes
U-238	1.41	1.3	No	900 ^e	Yes

Note: **Bold** indicates COCs that exceed background screening values and/or are bioaccumulators.

^aDinwiddie September 1997, North Supergroup.

^bNMED March 1998.

^cTharp 1999.

^dYanicak 1997.

^eBaker and Soldat 1992.

BCF = Bioconcentration factor.

COC = Constituent of concern.

NA = Not applicable.

NMED = New Mexico Environment Department.

pCi/g = Picocurie(s) per gram.

SNL/NM = Sandia National Laboratories/New Mexico.

SWMU = Solid Waste Management Unit.

Table 7
Radiological COCs for Ecological Risk Assessment at SWMU 96 with
Comparison to the Associated SNL/NM Background Screening Value and BCF

COC	Maximum Activity (pCi/g)	SNL/NM Background Activity (pCi/g) ^a	Is Maximum COC Activity Less Than or Equal to the Applicable SNL/NM Background Screening Value?	BCF (maximum aquatic)	Is COC a Bioaccumulator? ^b (BCF >40)
H-3	0.175	0.021 ^c	No	NA	NA
Pu-238	0.934	NA	No	2,000 ^d	Yes
Pu-239	0.18	NA	No	2,000 ^d	Yes
U-235	0.10	0.18	Yes	900 ^e	Yes
U-238	1.38	1.3	No	900 ^e	Yes

Note: **Bold** indicates COCs that exceed background screening values and/or are bioaccumulators.

^aDinwiddie September 1997, North Supergroup.

^bNMED March 1998.

^cTharp 1999.

^dYanicak 1997.

^eBaker and Soldat 1992.

BCF = Bioconcentration factor.

COC = Constituent of concern.

NA = Not applicable.

NMED = New Mexico Environment Department.

pCi/g = Picocurie(s) per gram.

SNL/NM = Sandia National Laboratories/New Mexico.

SWMU = Solid Waste Management Unit.

periodically as storm water runoff from TA-I, TA-II, and TA-IV. Surface-water flows may transport COCs in soils near the surface of the channels, but this is unlikely to significantly affect COCs in the subsurface soils. Therefore, the significance of these surface-water flows is expected to be moderate.

COCs can enter the food chain through uptake by plant roots. COCs taken up by plant roots can be transported to aboveground tissues where they can be consumed by herbivores, which can in turn be eaten by predators. Once in the food web, COCs can be transported from the site by the movements of these organisms or by other surficial transport mechanisms. However, because SWMU 96 is small in total area (approximately 4.5 acres) and contains only limited areas of significant vegetative cover, food chain transport is expected to be of low significance at this site.

The COCs at SWMU 96 include both inorganic and organic analytes. The nonradiological inorganic COCs are elemental in form, and are not considered to be degradable. Transformations of these inorganic COCs could include changes in valence (oxidation/reduction reactions) or incorporation into organic forms (e.g., the conversion of selenite or selenate from soil to seleno-amino acids in plants). Radiological COCs will undergo decay to stable isotopes or radioactive daughter elements. However, because of the long half-lives of the radionuclides (with the exception of tritium), the aridity of the environment at this site, and the lack of potential contact with biota, none of these mechanisms is expected to result in significant losses or transformations of the inorganic COCs.

The organic COCs at SWMU 96 may be degraded through photolysis, hydrolysis, and biotransformation. Photolysis requires light, and therefore takes place in the air, at the ground surface, or in surface water. Hydrolysis includes chemical transformations in water, and may occur in the soil solution. Biotransformation (i.e., transformation due to plants, animals, and microorganisms) may occur; however, biological activity may be limited by the aridity of the environment at this site. Some organic COCs (e.g., acetone, 2-butanone, chloroform, chloromethane, cis-1,2-dichloroethene, methylene chloride, tetrachloroethene, trichloroethene, toluene, and xylenes) may be lost through volatilization, with subsequent degradation in the air.

Table 8 summarizes the fate and transport processes that can occur at SWMU 96. COCs at this site include organic analytes and radiological and nonradiological inorganic analytes. For the reasons detailed above, wind and biota are considered to be of low significance as potential transport mechanisms at this site. Surface water may be moderate significance within the open channels of the storm drain system. Because of the low precipitation and high evapotranspiration rates of the area, significant leaching of COCs into the subsurface soil is unlikely and leaching into the groundwater at this site is highly unlikely. The potential for transformation of inorganic compounds is low and loss through decay of radiological COCs is insignificant because of their long half-lives. Tritium has a shorter half-life and therefore, the loss due to decay may be significant. For some organic compounds, loss through volatilization and eventual degradation may be of moderate to low significance.

Table 8
Summary of Fate and Transport at SWMU 96

Transport and Fate Mechanism	Existence at Site	Significance
Wind	Yes	Low
Surface runoff	Yes	Moderate
Migration to groundwater	No	None
Food chain uptake	Yes	Low
Transformation/degradation	Yes	Moderate to low

SWMU = Solid Waste Management Unit.

VI. Human Health Risk Assessment

VI.1 Introduction

The human health risk assessment of this site includes a number of steps that culminate in a quantitative evaluation of the potential adverse human health effects caused by constituents located at the site. The steps to be discussed include the following:

Step 1.	Site data are described that provide information on the potential COCs, as well as the relevant physical characteristics and properties of the site.
Step 2.	Potential pathways are identified by which a representative population might be exposed to the COCs.
Step 3.	The potential intake of these COCs by the representative population is calculated using a tiered approach. The first component of the tiered approach is a screening procedure that compares the maximum concentration of the COC to an SNL/NM maximum background screening value. COCs that are not eliminated during the first screening procedure are carried forward in the risk assessment process.
Step 4.	Toxicological parameters are identified and referenced for COCs that were not eliminated during the screening procedure.
Step 5.	Potential toxicity effects (specified as a hazard index [HI]) and estimated excess cancer risks are calculated for nonradiological COCs and background. For radiological COCs, the incremental total effective dose equivalent (TEDE) and incremental estimated cancer risk are calculated by subtracting applicable background concentrations directly from maximum on-site contaminant values. This background subtraction applies only when a radiological COC occurs as contamination and exists as a natural background radionuclide.
Step 6.	These values are compared with guidelines established by the EPA, NMED and U.S. Department of Energy (DOE) to determine whether further evaluation and potential site cleanup are required. Nonradiological COC risk values also are compared to background risk so that an incremental risk can be calculated.
Step 7.	Uncertainties of the above steps are addressed.

VI.2 Step 1. Site Data

Section I of this risk assessment provides the site description and history of SWMU 96. Section II presents a comparison of results to DQOs. Section III discusses the nature, rate, and extent of contamination.

VI.3 Step 2. Pathway Identification

SWMU 96 has been designated with a future land use scenario of industrial (DOE et al. September 1995) (see Appendix 1 for default exposure pathways and parameters). However, the residential land use scenario is also considered within the pathway analysis. Because of the location and the characteristics of the potential contaminants, the primary pathway for human exposure is considered to be soil ingestion for the nonradiological COCs and direct gamma exposure for the radiological COCs. The inhalation pathway for both nonradiological and radiological COCs is included because of the potential for inhalation of dust and volatiles. Soil ingestion is included for the radiological COCs as well. The dermal pathway is included for the nonradiological COCs because of the potential for the receptor to be exposed to contaminated soil. No water pathways to groundwater are considered. Depth to perched groundwater at SWMU 96 is approximately 275 feet bgs. No intake routes through plant, meat, or milk ingestion are considered appropriate for either the industrial or residential land use scenario. Figure 1 shows the conceptual site model flow diagram for SWMU 96.

Pathway Identification

Nonradiological Constituents	Radiological Constituents
Soil ingestion	Soil ingestion
Inhalation (dust and volatiles)	Inhalation (dust and volatiles)
Dermal contact	Direct gamma

VI.4 Step 3. Background Screening Procedure

This section discusses Step 3, the background screening procedure, which compares the maximum COC concentration to the background screening level. The methodology and results are described below.

VI.4.1 Methodology

Maximum concentrations of nonradiological COCs were compared to the approved SNL/NM maximum screening level for this area (Dinwiddie September 1997). The SNL/NM maximum background concentration was selected to provide the background screen in Table 4 and was used to calculate risk attributable to background in Section VI.6.2. Only the COCs that were detected above their respective SNL/NM maximum background screening levels or do not have either a quantifiable or a calculated background screening level were considered in further risk assessment analyses.

For radiological COCs that exceeded the SNL/NM background screening levels, background values were subtracted from the individual maximum radionuclide concentrations. Those that did not exceed these background levels were not carried any further in the risk assessment. This approach is consistent with DOE Order 5400.5, "Radiation Protection of the Public and the Environment" (DOE 1993). Radiological COCs that do not have a background value and were detected above the analytical minimum detectable activity (MDA) were carried through the risk assessment at their maximum levels. The resultant radiological COCs remaining after this step are referred to as background-adjusted radiological COCs.

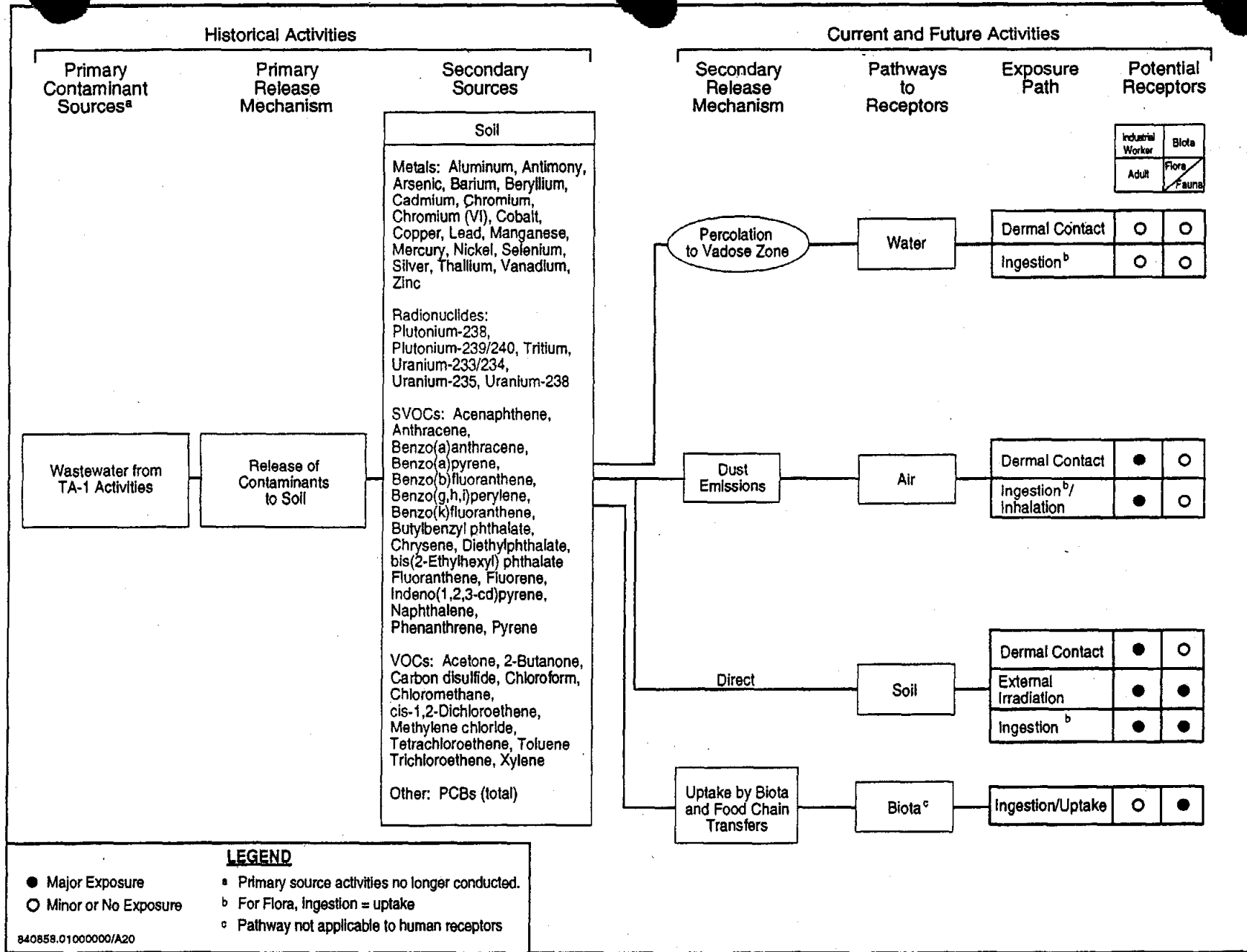


Figure 1
Conceptual Site Model Flow Diagram for SWMU 96



VI.4.2 Results

Tables 4 and 6 show the SWMU 96 maximum COC concentrations that were compared to the SNL/NM maximum background values (Dinwiddie September 1997) for the human health risk assessment. For the nonradiological COCs, 13 constituents were measured at concentrations greater than their respective background screening values. Two constituents did not have quantified background screening concentrations; therefore, it is unknown if these COCs exceeded background values. Thirty nonradiological COCs were organic compounds and did not have corresponding background screening values.

The maximum concentration value for lead is 97 milligrams (mg)/kilogram (kg). The EPA intentionally does not provide any human health toxicological data on lead; therefore, no risk parameter values could be calculated. However, the NMED guidance for lead screening concentrations for construction and industrial land use scenarios are 750 and 1,500 mg/kg, respectively (Olson and Moats March 2000). The EPA screening guidance value for a residential land use scenario is 400 mg/kg (Laws July 1994). The maximum concentration value for lead at this site is lower than all the screening values; therefore, lead is eliminated from further consideration in the human health risk assessment.

The maximum concentration value for total PCBs is 0.36 mg/kg. This concentration is lower than the EPA screening level of 1 mg/kg (40 CFR 761). Since the maximum concentration for PCBs at this site is lower than the screening value, PCBs are eliminated from further consideration in the human health risk assessment.

For the radiological COCs, four constituents had MDA values greater than their respective backgrounds (H-3, Pu-238, Pu-239 and U-238).

VI.5 Step 4. Identification of Toxicological Parameters

Tables 9 and 10 list the COCs retained in the risk assessment and the values for the available toxicological information. The toxicological values used for nonradiological COCs in Table 9 are from the Integrated Risk Information System (IRIS) (EPA 2003), the Health Effects Assessment Summary Tables (HEAST) (EPA 1997a), the Technical Background Document for Development of Soil Screening Levels (NMED December 2000), and the EPA Region 6 (EPA 2002a), EPA Region 9 (EPA 2002b) and Risk Assessment Information System (ORNL 2003) electronic databases. Dose conversion factors (DCFs) used in determining the excess TEDE values for radiological COCs for the individual pathways were the default values provided in the RESRAD computer code (Yu et al. 1993a) as developed in the following documents:

- DCFs for ingestion and inhalation were taken from "Federal Guidance Report No. 11, Limiting Values of Radionuclide Intake and Air Concentration and Dose Conversion Factors for Inhalation, Submersion, and Ingestion" (EPA 1988).
- DCFs for surface contamination were taken from DOE/EH-0070, "External Dose-Rate Conversion Factors for Calculation of Dose to the Public" (DOE 1988).

Table 9
Toxicological Parameter Values for SWMU 96 Nonradiological COCs

COC	RfD _o (mg/kg-d)	Confidence ^a	RfD _{inh} (mg/kg-d)	Confidence ^a	SF _o (mg/kg-day) ⁻¹	SF _{inh} (mg/kg-day) ⁻¹	Cancer Class ^b	ABS
Inorganic								
Arsenic	3E-4 ^c	M	-	-	1.5E+0 ^c	1.5E+1 ^c	A	0.03 ^d
Barium	7E-2 ^c	M	1.4E-4 ^e	-	-	-	D	0.01 ^d
Cadmium	5E-4 ^c	H	5.7E-5 ^f	-	-	6.3E+0 ^c	B1	0.001 ^d
Chromium, total	1.5E+0 ^c	L	-	-	-	-	D	0.01 ^d
Chromium VI	3E-3 ^c	L	2.3E-6 ^c	L	-	4.2E+1 ^c	A	0.01 ^d
Cobalt	2E-2 ^g	-	5.7E-6 ^g	-	-	9.8E+0 ^f	-	0.01 ^d
Copper	3.7E-2 ^f	-	-	-	-	-	D	0.01 ^d
Mercury	3E-4 ^e	-	8.6E-5 ^c	M	-	-	D	0.01 ^d
Nickel	2E-2 ^c	M	-	-	-	-	-	0.01 ^d
Selenium	5E-3 ^c	H	-	-	-	-	D	0.01 ^d
Silver	5E-3 ^c	L	-	-	-	-	D	0.01 ^d
Thallium	6.6E-5 ^g	-	-	-	-	-	-	0.01 ^d
Vanadium	7E-3 ^e	-	-	-	-	-	-	0.01 ^d
Zinc	3E-1 ^c	M	-	-	-	-	D	0.01 ^d
Organic								
Acenaphthene	6E-2 ^c	L	6E-2 ^f	-	-	-	-	0.13 ^d
Acetone	1E-1 ^c	L	1E-1 ^f	-	-	-	D	0.01 ^h
Anthracene	3E-1 ^c	L	3E-1 ^f	-	-	-	D	0.13 ^d
Benzo(a)anthracene	-	-	-	-	7.3E-1 ^f	3.1E-1 ^f	B2	0.13 ^d
Benzo(a)pyrene	-	-	-	-	7.3E+0 ^c	3.1E+0 ^f	B2	0.13 ^d
Benzo(b)fluoranthene	-	-	-	-	7.3E-1 ^f	3.1E-1 ^f	B2	0.13 ^d
Benzo(g,h,i)perylene ⁱ	-	-	-	-	7.3E+0 ^f	3.1E+0 ^f	B2	0.13 ^d
Benzo(k)fluoranthene	-	-	-	-	7.3E-2 ^f	3.1E-2 ^f	B2	0.13 ^d
2-Butanone	6E-1 ^c	L	2.9E-1 ^c	L	-	-	D	0.1 ^d
Butyl benzyl phthalate	2E-1 ^c	L	2E-1 ^f	-	-	-	C	0.01 ^h
Carbon disulfide	1E-1 ^c	M	2E-1 ^c	M	-	-	-	0.25 ^h
Chloroform	1E-2 ^c	M	8.6E-5 ^f	-	6.1E-3 ^f	8.1E-2 ^c	B2	0.1 ^d
Chloromethane	-	-	2.6E-2 ^c	M	1.3E-2 ^e	6.3E-3 ^e	C	0.1 ^d
Chrysene	-	-	-	-	7.3E-3 ^f	3.1E-3 ^f	B2	0.13 ^d
Dibenzofuran	4E-3 ^f	-	4E-3 ^f	-	-	-	D	0.01 ^h
Dichloroethene, cis-1,2	1E-2 ^e	-	1E-2 ^f	-	-	-	D	0.1 ^d

Refer to footnotes at end of table.

Table 9.(Continued)
Toxicological Parameter Values for SWMU 96 Nonradiological COCs

COC	RfD _o (mg/kg-d)	Confidence ^a	RfD _{inh} (mg/kg-d)	Confidence ^a	SF _o (mg/kg-day) ⁻¹	SF _{inh} (mg/kg-day) ⁻¹	Cancer Class ^b	ABS
Diethylphthalate	8E-1 ^c	L	8E-1 ^f	-	-	-	D	0.1 ^d
bis(2-Ethylhexyl)phthalate	2E-2 ^f	-	2E-2 ^f	-	1.4E-2 ^f	1.4E-2 ^f	-	0.01 ^h
Fluoranthene	4E-2 ^c	L	4E-2 ^f	-	-	-	D	0.13 ^d
Fluorene	4E-2 ^c	L	4E-2 ^f	-	-	-	D	0.1 ^d
Indeno(1,2,3-cd)pyrene	-	-	-	-	7.3E-1 ^f	3.1E-1 ^f	B2	0.13 ^d
Methylene chloride	6E-2 ^c	M	8.6E-1 ^e	-	7.5E-3 ^c	1.6E-3 ^c	B2	0.1 ^d
Naphthalene	2E-2 ^c	L	8.6E-4 ^c	M	-	-	C	0.1 ^d
Phenanthrene ⁱ	3E-1 ^c	L	3E-1 ^f	-	-	-	D	0.1 ^d
Pyrene	3E-2 ^c	L	3E-2 ^f	-	-	-	D	0.1 ^d
Tetrachloroethene	1E-2 ^c	M	1.1E-1 ^f	-	5.2E-2 ^f	1.2E-2 ^f	-	0.1 ^d
Toluene	2E-1 ^c	M	1.1E-1 ^c	M	-	-	D	0.1 ^d
Trichloroethene	3E-4 ^f	-	1.1E-2 ^f	-	4E-1 ^f	4E-1 ^f	-	0.1 ^d
Xylene	2E+0 ^c	M	2E-1 ^f	-	-	-	D	0.1 ^d

^aConfidence associated with IRIS (EPA 2003) database values. Confidence: L = low, M = medium, H = high.

^bEPA weight-of-evidence classification system for carcinogenicity (EPA 1989) taken from IRIS (EPA 2003):

- A = Human carcinogen.
- B1 = Probable human carcinogen. Limited human data are available.
- B2 = Probable human carcinogen. Sufficient evidence in animals and inadequate or no evidence in humans.
- C = Possible human carcinogen.
- D = Not classifiable as to human carcinogenicity.

^cToxicological parameter values from IRIS electronic database (EPA 2003).

^dToxicological parameter values from NMED December 2000.

^eToxicological parameter values from HEAST (EPA 1997a).

^fToxicological parameter values from EPA Region 6 electronic database (EPA 2002a).

^gToxicological parameter values from EPA Region 9 electronic database (EPA 2002b).

^hToxicological parameter values from ORNL (2003).

ⁱToxicological parameter values for benzo(g,h,i)perylene could not be found. Dibenz(a,h)anthracene was used as a surrogate.

^jToxicological parameter values for phenanthrene could not be found. Anthracene was used as a surrogate.

- ABS = Gastrointestinal adsorption coefficient.
- COC = Constituent of concern.
- EPA = U.S. Environmental Protection Agency.
- HEAST = Health Effects Assessment Summary Tables.

Table 9 (Concluded)
Toxicological Parameter Values for SWMU 96 Nonradiological COCs

IRIS	= Integrated Risk Information System.
mg/kg-d	= Milligram(s) per kilogram per day.
(mg/kg-day) ⁻¹	= Per milligram per kilogram per day.
NMED	= New Mexico Environment Department.
ORNL	= Oak Ridge National Laboratory.
RfD _{inh}	= Inhalation chronic reference dose.
RfD _o	= Oral chronic reference dose.
SF _{inh}	= Inhalation slope factor.
SF _o	= Oral slope factor.
SWMU	= Solid Waste Management Unit.
-	= Information not available.

Table 10
Radiological Toxicological Parameter Values for SWMU 96 COCs
Obtained from RESRAD Risk Coefficients^a

COC	SF _o (1/pCi)	SF _{inh} (1/pCi)	SF _{ev} (g/pCi-yr)	Cancer Class ^b
H-3	7.20E-14	9.60E-14	0	A
Pu-238	1.30E-10	4.40E-8	4.53E-11	A
Pu-239	1.34E-10	4.66E-8	1.34E-10	A
U-238	6.20E-11	1.20E-08	6.60E-08	A

^aYu et al. 1993a.

^bEPA weight-of-evidence classification system for carcinogenicity (EPA 1989): A = Human carcinogen for high dose and high dose rate (i.e., greater than 50 rem per year). For low-level environmental exposures, the carcinogenic effect has not been observed and documented.

1/pCi = One per picocurie.

COC = Constituent of concern.

EPA = U.S. Environmental Protection Agency.

g/pCi-yr = Gram(s) per picocurie per year.

SF_{ev} = External volume exposure slope factor.

SF_{inh} = Inhalation slope factor.

SF_o = Oral (ingestion) slope factor.

SWMU = Solid Waste Management Unit.

- DCFs for volume contamination (exposure to contamination deeper than the immediate surface of the site) were calculated using the methods discussed in "Dose-Rate Conversion Factors for External Exposure to Photon Emitters in Soil" (Kocher 1983) and in ANL/EAIS-8, "Data Collection Handbook to Support Modeling the Impacts of Radioactive Material in Soil" (Yu et al. 1993b).

VI.6 Step 5. Exposure Assessment and Risk Characterization

Section VI.6.1 describes the exposure assessment for this risk assessment. Section VI.6.2 provides the risk characterization, including the HI and excess cancer risk for both the potential nonradiological COCs and associated background for industrial and residential land use scenarios. The incremental TEDE and incremental estimated cancer risk are provided for the background-adjusted radiological COCs for both industrial and residential land use scenarios.

VI.6.1 Exposure Assessment

Appendix 1 provides the equations and parameter input values used in calculating intake values and subsequent HI and excess cancer risk values for the individual exposure pathways. The appendix shows parameters for both industrial and residential land use scenarios. The equations for nonradiological COCs are based upon the Risk Assessment Guidance for Superfund (RAGS) (EPA 1989). Parameters are based upon information from the RAGS (EPA 1989), the Technical Background Document for Development of Soil Screening Levels (NMED December 2000), and other EPA and NMED guidance documents and reflect the reasonable maximum exposure (RME) approach advocated by the RAGS (EPA 1989). For radiological

COCs, the coded equations provided in RESRAD computer code are used to estimate the incremental TEDE and cancer risk for individual exposure pathways. Further discussion of this process is provided in the "Manual for Implementing Residual Radioactive Material Guidelines Using RESRAD" (Yu et al. 1993a).

Although the designated land use scenario for this site is industrial, risk and TEDE values for a residential land use scenario are also presented.

VI.6.2 Risk Characterization

Table 11 shows an HI of 3.05 for the SWMU 96 nonradiological COCs and an estimated excess cancer risk of $5E-5$ for the designated industrial land use scenario. The numbers presented include exposure from soil ingestion, dermal contact, and dust and volatile inhalation for nonradiological COCs. Table 12 shows an HI of 0.02 and an estimated excess cancer risk of $3E-6$ for the SWMU 96 associated background constituents under the designated industrial land use scenario.

For the radiological COCs, contribution from the direct gamma exposure pathway is included. For the industrial land use scenario, a TEDE was calculated that resulted in an incremental TEDE of $3.4E-2$ millirem (mrem)/year (yr). In accordance with EPA guidance found in Office of Solid Waste and Emergency Response (OSWER) Directive No. 9200.4-18 (EPA 1997b), an incremental TEDE of 15 mrem/yr is used as the cleanup level for the probable land use scenario (industrial in this case); the calculated dose value for SWMU 96 for the industrial land use is well below this guideline. The estimated excess cancer risk is $2.3E-8$.

For the nonradiological COCs under the residential land use scenario, the HI is 11.19 and the estimated excess cancer risk is $2E-4$ (Table 11). The numbers in the table included exposure from soil ingestion, dermal contact, and dust and volatile inhalation. Although the EPA (1991) generally recommends that inhalation not be included in a residential land use scenario, this pathway is included because of the potential for soil in Albuquerque, New Mexico, to be eroded and, subsequently, for dust to be present in predominantly residential areas. Because of the nature of the local soil, other exposure pathways are not considered (see Appendix 1). Table 12 shows that for the SWMU 96 associated background constituents, the HI is 0.34 and the estimated excess cancer risk is $1E-5$.

For the radiological COCs, the incremental TEDE under the residential land use scenario is $1.2E-1$ mrem/yr. The guideline being used is an excess TEDE of 75 mrem/yr (SNL/NM February 1998) for a complete loss of institutional controls (residential land use in this case); the calculated dose value for SWMU 96 for the residential land use scenario is well below this guideline. Consequently, SWMU 96 is eligible for unrestricted radiological release as the residential land use scenario resulted in an incremental TEDE of less than 75 mrem/yr to the on-site receptor. The estimated excess cancer risk is $9.4E-8$. The excess cancer risk from the nonradiological COCs and the radiological COCs should be summed to provide risk estimates for persons exposed to both types of carcinogenic contaminants, as noted in OSWER Directive No. 9200-4-18, "Establishment of Cleanup Levels for CERCLA [Comprehensive Environmental Response, Compensation, and Liability Act] Sites with Radioactive Contamination," (EPA 1997b). This summation is tabulated in Section VI.9, "Summary."

Table 11
Risk Assessment Values for SWMU 96 Nonradiological COCs

COC	Maximum Concentration (mg/kg)	Industrial Land Use Scenario ^a		Residential Land Use Scenario ^a	
		Hazard Index	Cancer Risk	Hazard Index	Cancer Risk
Inorganic					
Arsenic	7.51	0.03	5E-6	0.35	2E-5
Barium	509	0.01	—	0.10	—
Cadmium	14	0.03	5E-9	0.36	1E-8
Chromium, total	80.8	0.00	—	0.00	—
Chromium VI	0.7	0.00	2E-9	0.00	3E-9
Cobalt	11.7	0.00	6E-9	0.01	1E-8
Copper	41.7	0.00	—	0.01	—
Mercury	0.347	0.00	—	0.02	—
Nickel	94.2	0.00	—	0.06	—
Selenium	0.818	0.00	—	0.00	—
Silver	76.4	0.02	—	0.20	—
Thallium	2.03	0.03	—	0.40	—
Vanadium	50.2	0.01	—	0.09	—
Zinc	168	0.00	—	0.01	—
Organic					
Acenaphthene	0.303 J	0.00	—	0.00	—
Acetone	0.0476	0.00	—	0.00	—
Anthracene	1.71 J	0.00	—	0.00	—
Benzo(a)anthracene	7.9	0.00	4E-6	0.00	1E-5
Benzo(a)pyrene	2.73 J	0.00	1E-5	0.00	4E-5
Benzo(b)fluoranthene	12.4	0.00	6E-6	0.00	2E-5
Benzo(g,h,i)perylene	4.24	0.00	2E-5	0.00	7E-5
Benzo(k)fluoranthene	3.88	0.00	2E-7	0.00	6E-7
2-Butanone	0.01 B	0.00	—	0.00	—
Butyl benzyl phthalate	0.0522 J	0.00	—	0.00	—
Carbon disulfide	0.00064 JB	0.00	—	0.00	—
Chloroform	0.0028 B	0.00	5E-9	0.01	1E-8
Chloromethane	0.00339 J	0.00	1E-9	0.00	3E-9
Chrysene	11.5	0.00	5E-8	0.00	2E-7
Dibenzofuran	0.196 J	0.00	—	0.00	—
Dichloroethene, cis-1,2	0.0015	0.00	—	0.00	—
Diethylphthalate	0.0395 JB	0.00	—	0.00	—
bis(2-Ethylhexyl)phthalate	12.8	0.00	7E-8	0.01	3E-7
Fluoranthene	14.5	0.00	—	0.01	—
Fluorene	0.339	0.00	—	0.00	—
Indeno(1,2,3-cd) pyrene	3.97	0.00	2E-6	0.00	6E-6
Methylene chloride	0.101 J	0.00	7E-7	0.00	1E-6
Naphthalene	0.292 J	0.00	—	0.01	—
Phenanathrene	8.01	2.92	—	9.53	—
Pyrene	18.8	0.00	—	0.01	—
Tetrachloroethene	0.015	0.00	4E-9	0.00	1E-8
Toluene	0.0393	0.00	—	0.00	—

Refer to footnotes at end of table.

Table 11 (Concluded)
Risk Assessment Values for SWMU 96 Nonradiological COCs

COC	Maximum Concentration (mg/kg)	Industrial Land Use Scenario ^a		Residential Land Use Scenario ^a	
		Hazard Index	Cancer Risk	Hazard Index	Cancer Risk
Trichloroethene	0.0057	0.00	6E-8	0.00	1E-7
Xylene	0.0139 J	0.00	-	0.00	-
Total		3.05	5E-5	11.19	2E-4

^aEPA 1989.

B = Analyte detected in associated blank.

COC = Constituent of concern.

EPA = U.S. Environmental Protection Agency.

J = Estimated concentration.

mg/kg = Milligram(s) per kilogram.

SWMU = Solid Waste Management Unit.

- = Information not available.

Table 12
Risk Assessment Values for SWMU 96 Nonradiological Background Constituents

COC	Background Concentration ^a (mg/kg)	Industrial Land Use Scenario ^b		Residential Land Use Scenario ^b	
		Hazard Index	Cancer Risk	Hazard Index	Cancer Risk
Arsenic	4.4	0.02	3E-6	0.20	1E-5
Barium	200	0.00	—	0.04	—
Cadmium	<1	—	—	—	—
Chromium, total	12.8	0.00	—	0.00	—
Chromium VI	NC	—	—	—	—
Cobalt	7.1	0.00	4E-9	0.01	8E-9
Copper	17	0.00	—	0.01	—
Mercury	<0.1	—	—	—	—
Nickel	25.4	0.00	—	0.02	—
Selenium	<1	—	—	—	—
Silver	<1	—	—	—	—
Thallium	<1.1	—	—	—	—
Vanadium	33	0.00	—	0.06	—
Zinc	76	0.00	—	0.00	—
Total		0.02	3E-6	0.34	1E-5

^aDinwiddie September 1997, North Supergroup.

^bEPA 1989.

COC = Constituent of concern.

EPA = U.S. Environmental Protection Agency.

mg/kg = Milligram(s) per kilogram.

NC = Not calculated.

SWMU = Solid Waste Management Unit.

— = Information not available.

VI.7 Step 6. Comparison of Risk Values to Numerical Guidelines

The human health risk assessment analysis evaluated the potential for adverse health effects for both the industrial land use scenario (the designated land use scenario for this site) and the residential land use scenario.

For the nonradiological COCs under the industrial land use scenario, the HI is 3.05; which is greater than the numerical guideline of 1 suggested in the RAGS (EPA 1989). Excess cancer risk was estimated at 5E-5. NMED guidance states that cumulative excess lifetime cancer risk must be less than 1E-5 (Bearzi January 2001); thus, the excess cancer risk for this site is above the suggested acceptable risk value. This assessment also determined risks considering background concentrations of the potential nonradiological COCs for both the industrial and the residential land use scenarios. Assuming the industrial land use scenario, the HI is 0.02 and the excess cancer risk is 3E-6 for nonradiological background COCs. Incremental risk is determined by subtracting risk associated with background from potential COC risk. These numbers are not rounded before the difference is determined and may therefore appear to be inconsistent with numbers presented in tables and within the text. For conservatism, the background constituents that do not have quantified background screening concentrations are assumed to have a hazard quotient (HQ) of 0.00. Incremental HI is 3.03 and the estimated

incremental cancer risk is $4.51E-5$ for the industrial land use scenario. These incremental risk calculations are above NMED guidelines considering an industrial land use scenario.

For radiological COCs under the industrial land use scenario, incremental TEDE is $3.4E-2$ mrem/yr, which is significantly lower than EPA's numerical guideline of 15 mrem/yr. Incremental estimated cancer risk is $2.3E-8$.

The calculated HI for nonradiological COCs under the residential land use scenario is 11.19, which is above numerical guidance. The excess cancer risk is estimated to be $2E-4$. NMED guidance states that cumulative excess lifetime cancer risk must be less than $1E-5$ (Bearzi January 2001), thus the excess cancer risk for this site is above the suggested acceptable risk value. The HI for associated background for the residential land use scenario is 0.34; the estimated excess cancer risk is $1E-5$. The incremental HI is 10.85 and the estimated incremental cancer risk is $1.58E-4$ for the residential land use scenario. The incremental excess cancer risk calculation are above NMED guidelines considering a residential land use scenario.

The incremental TEDE for a residential land use scenario from the radiological components is $1.2E-1$ mrem/yr, which is significantly lower than the numerical guideline of 75 mrem/yr suggested in the SNL/NM RESRAD Input Parameter Assumptions and Justification (SNL/NM February 1998). The incremental estimated cancer risk is $9.4E-8$.

VI.8 Step 7. Uncertainty Discussion

The determination of the nature, rate, and extent of contamination at SWMU 96 is based upon an initial conceptual model that was validated with sampling conducted across the site. The sampling was implemented in accordance with the TA-I RFI Work Plan (SNL/NM February 1995) and the SAP for Supplemental Investigation at SWMU 96 (SNL/NM December 2001). The DQOs contained in the work plan and the SAP are appropriate for use in risk assessments. The data collected are representative of the site based upon sample location, density, and depth. The analytical requirements and results satisfy the DQOs. Data quality was verified/validated in accordance with SNL/NM procedures (SNL/NM January 2000, SNL/NM July 1996). Therefore, there is no uncertainty associated with the data quality used to perform the risk assessment at SWMU 96.

Because of the location, history of the site, and future land use (DOE et al. September 1995), there is low uncertainty in the land use scenario and the potentially affected populations that were considered in performing the risk assessment analysis. Because the COCs are found in surface and near-surface soil; and because of the location and physical characteristics of the site, there is little uncertainty in the exposure pathways relevant to the analysis.

An RME approach was used to calculate the risk assessment values. This means that the parameter values in the calculations are conservative and that calculated intakes are probably overestimated. Maximum measured values of COC concentrations are used to provide conservative results.

Table 9 shows the uncertainties in nonradiological toxicological parameter values. There is a combination of estimated values and values from the IRIS (EPA 2003); HEAST (EPA 1997a); Technical Background Document for Development of Soil Screening Levels (NMED

December 2000); and Risk Assessment Information System (ORNL 2003), EPA Region 9 (EPA 2002b) and EPA Region 6 (EPA 2002a) electronic databases. Where values are not provided, information is not available from the HEAST (EPA 1997a), IRIS (EPA 2003), Technical Background Document for Development of Soil Screening Levels (NMED December 2000), Risk Assessment Information System (ORNL 2003); or EPA regions (EPA 2002a, EPA 2002b, EPA 2002c). Because of the conservative nature of the RME approach, uncertainties in toxicological values are not expected to change the conclusion from the risk assessment analysis.

Though both the HI and estimated excess cancer risk are above NMED guidelines for the industrial land use scenario, maximum concentrations were used in the risk calculation. The site has been adequately characterized; therefore, average concentrations are more representative of actual site conditions. The main contributors to excess cancer risk and their average concentrations are:

- Arsenic (2.95 mg/kg) (below background and therefore removed from further evaluation)
- Barium (195 mg/kg) (below background and therefore removed from further evaluation)
- Benzo(a)anthracene (0.44 mg/kg)
- Benzo(a)pyrene (0.16 mg/kg)
- Benzo(b)fluoranthene (0.9 mg/kg)
- Benzo(g,h,i)perylene (0.25 mg/kg)
- Benzo(k)fluoranthene (0.24 mg/kg)
- Cadmium (0.45 mg/kg)
- Indeno(1,2,3-cd) pyrene (0.23 mg/kg)
- Methylene chloride (0.007 mg/kg)
- Phenanthrene (0.48 mg/kg)
- Silver (5.4 mg/kg)
- Thallium (0.63 mg/kg)

Using the 95% upper confidence limit (UCL) (provided in Appendix 2) of the average concentrations for these COCs, the total HI and estimated excess cancer risk are reduced to 0.19 and 2.8E-6, respectively; the incremental HI and excess cancer risk are reduced to 0.19 and 2.75E-6, respectively. Thus, using more realistic concentrations in the risk calculations that more accurately depict actual site conditions, both the total and incremental HI and estimated excess cancer risks are below NMED guidelines.

The HI and estimated excess cancer risk for the residential land use scenario are also above NMED guidelines. However, the risk calculation was based upon maximum concentrations. The site has been adequately characterized; therefore, average concentrations are more representative of actual site conditions. The main contributors to excess cancer risk are identical to the main contributors for the industrial land use scenario.

Using the 95% UCL of the average concentrations for these COCs, the total HI and estimated excess cancer risk are reduced to 0.97 and 9.9E-6, respectively. The incremental HI and excess cancer risk are reduced to 0.87 and 9.87E-6, respectively. Thus, using more realistic concentrations in the risk calculations that more accurately depict actual site conditions, both the total and incremental HI and estimated excess cancer risks are below NMED guidelines.

For radiological COCs, the conclusion of the risk assessment is that potential effects on human health for both industrial and residential land use scenarios are within guidelines and represent only a small fraction of the estimated 360 mrem/yr received by the average U.S. population (NCRP 1987).

The overall uncertainty in all of the steps in the risk assessment process is not considered to be significant with respect to the conclusion reached.

VI.9 Summary

SWMU 96 contains identified COCs consisting of some inorganic, organic, and radiological compounds. Because of the location of the site, the designated industrial land use scenario, and the nature of contamination, potential exposure pathways identified for this site include soil ingestion, dermal contact, and dust and volatile inhalation for chemical COCs, and soil ingestion, dust inhalation, and direct gamma exposure for radionuclides. The same exposure pathways were applied to the residential land use scenario.

Using conservative assumptions and an RME approach to risk assessment, calculations for nonradiological COCs show that the HI under the industrial land use scenario (3.05) is above the accepted numerical guidance from the EPA. Estimated excess cancer risk is 5E-5; thus, excess cancer risk is also above the acceptable risk value provided by the NMED for an industrial land use scenario (Bearzi January 2001). The incremental HI is 3.03, and the incremental excess cancer risk is 4.51E-5 for the industrial land use scenario. Incremental risk calculations are above NMED guidelines for the industrial land use scenario.

Though both the HI and estimated excess cancer risk are above NMED guidelines for the industrial land use scenario, maximum concentrations were used in the risk calculation. The site has been adequately characterized; therefore, average concentrations are more representative of actual site conditions. The main contributors to excess cancer risk and their average concentrations are:

- Arsenic (2.95 mg/kg) (below background and therefore removed from further evaluation)
- Barium (195 mg/kg) (below background and therefore removed from further evaluation)

- Benzo(a)anthracene (0.44 mg/kg)
- Benzo(a)pyrene (0.16 mg/kg)
- Benzo(b)fluoranthene (0.9 mg/kg)
- Benzo(g,h,i)perylene (0.25 mg/kg)
- Benzo(k)fluoranthene (0.24 mg/kg)
- Cadmium (0.45 mg/kg)
- Indeno(1,2,3-cd)pyrene (0.23 mg/kg)
- Methylene chloride (0.007 mg/kg)
- Phenanthrene (0.48 mg/kg)
- Silver (5.4 mg/kg)
- Thallium (0.63 mg/kg)

Using the 95% UCL of the average concentrations for these COCs, the total HI and estimated excess cancer risk are reduced to 0.19 and 2.8E-6, respectively. The incremental HI and excess cancer risk are reduced to 0.19 and 2.75E-6, respectively. Thus, using more realistic concentrations in the risk calculations that more accurately depict actual site conditions, both the total and incremental HI and estimated excess cancer risks are below NMED guidelines.

Using conservative assumptions and an RME approach to risk assessment, calculations for nonradiological COCs show that the HI under the residential land use scenario (11.19) is above the accepted numerical guideline from the EPA. Estimated excess cancer risk is 2E-4. Thus, excess cancer risk is above the acceptable risk value provided by the NMED for a residential land use scenario (Bearzi January 2001). The incremental HI is 10.85, and the incremental excess cancer risk is 1.58E-4 for the residential land use scenario.

The HI and estimated excess cancer risk for the residential land use scenario are also above NMED guidelines. However, maximum concentrations were used in the risk calculation. The site has been adequately characterized; therefore, average concentrations are more representative of actual site conditions. The main contributors to excess cancer risk are identical to the main contributors for the industrial land use scenario.

Using the 95% UCL of the average concentrations for these COCs, the total HI and estimated excess cancer risk are reduced to 0.97 and 9.9E-6, respectively. The incremental HI and excess cancer risk are reduced to 0.87 and 9.87E-6, respectively. Thus, using more realistic concentrations in the risk calculations that more accurately depict actual site conditions, both the total and incremental HI and estimated excess cancer risks are below NMED guidelines.

Incremental TEDE and corresponding estimated cancer risk from radiological COCs are much lower than EPA guidance values. The estimated TEDE is 3.4E-2 mrem/yr for the industrial land use scenario; this value is much lower than the EPA's numerical guidance of 15 mrem/yr in EPA guidance (EPA 1997b). The corresponding incremental estimated cancer risk value is 2.3E-8 for the industrial land use scenario. The incremental TEDE for the residential land use scenario that results from a complete loss of institutional controls is 1.2E-1 mrem/yr, with an associated cancer risk of 9.4E-8. The guideline for this scenario is 75 mrem/yr (SNL/NM February 1998). Therefore, SWMU 96 is eligible for unrestricted radiological release.

The summation of the nonradiological and radiological carcinogenic risks are tabulated in Table 13.

Table 13
Summation of Radiological and Nonradiological Risks from Site Carcinogens

Scenario	Nonradiological Risk	Radiological Risk	Total Risk
Industrial	2.8E-6	2.3E-8	2.8E-6
Residential	9.9E-6	9.4E-8	9.9E-6

Uncertainties associated with the calculations are considered small relative to the conservatism of risk assessment analysis. Therefore, it is concluded that this site poses insignificant risk to human health under both the industrial and residential land use scenarios.

VII. Ecological Risk Assessment

VII.1 Introduction

This section addresses the ecological risks associated with exposure to constituents of potential ecological concern (COPECs) in soils at SWMU 96. A component of the NMED Risk-Based Decision Tree (NMED March 1998) is to conduct an ecological risk assessment that corresponds with that presented in the EPA's Ecological RAGS (EPA 1997c). The current methodology is tiered and contains an initial scoping assessment followed by a more detailed risk assessment. Initial components of the NMED's decision tree (a discussion of DQOs, a data assessment, and evaluations of bioaccumulation as well as fate and transport potential) are addressed in previous sections of this report. Following the completion of the scoping assessment, a determination is made as to whether a more detailed examination of potential ecological risk is necessary. If deemed necessary, the scoping assessment proceeds to a risk assessment, whereby a more quantitative estimation of ecological risk is conducted. Although this assessment incorporates conservatisms in the estimation of ecological risks, ecological relevance and professional judgment are also used as recommended by the EPA (1998) to ensure that predicted exposures of selected ecological receptors reflect those reasonably expected to occur at the site.

VII.2 Scoping Assessment

The scoping assessment focuses primarily on the likelihood of biota at or adjacent to the site being exposed to constituents associated with site activities. Included in this section are an evaluation of existing data and a comparison of maximum detected concentrations to background concentrations, examination of bioaccumulation potential, and fate and transport potential. A scoping risk-management decision (Section VII.2.4) involves summarizing the scoping results and determining whether further examination of potential ecological impacts is necessary.

VII.2.1 Data Assessment

As indicated in Section IV (Tables 5 and 7), inorganic constituents in soil within the 0- to 5-foot depth interval that were determined not to be within background concentrations were as follows:

- Arsenic
- Barium
- Cadmium
- Chromium (total)
- Copper
- H-3
- Lead
- Mercury
- Nickel
- Pu-238
- Pu-239
- Silver
- Thallium
- U-238
- Vanadium
- Zinc

For two inorganic constituents (chromium VI and selenium) comparisons to background screening values could not be made. In the case of chromium VI, no background screening level has been determined. For selenium, the maximum detected concentration was lower than the upper limit of the background screening value; however, because the screening value is expressed as being fewer than an upper limit (i.e., <1 mg/kg), it cannot be determined whether this constituent exceeds background. For these reasons, neither chromium VI nor selenium were screened out based upon the comparison to background.

Organic analytes that were detected in soil samples from the upper 5 feet of soil at this site were as follows:

- Acenaphthene
- Acetone
- Anthracene
- Benzo(a)anthracene

- Benzo(a)pyrene
- Benzo(b)fluoranthene
- Benzo(g,h,i)perylene
- Benzo(k)fluoranthene
- Chloroform
- Chrysene
- Dibenzofuran
- Diethylphthalate
- bis(2-Ethylhexyl)phthalate
- Fluoranthene
- Fluorene
- Indeno(1,2,3-cd)pyrene
- Methylene chloride
- Naphthalene
- PCBs (total)
- Phenanthrene
- Pyrene
- Tetrachloroethene
- Toluene
- Trichloroethene
- Xylenes

VII.2.2 Bioaccumulation

Among the COPECs listed in Section VII.2.1, the following are considered to have bioaccumulation potential in aquatic environments (Section IV, Tables 5 and 7):

- Acenaphthene
- Aluminum
- Anthracene
- Antimony
- Arsenic
- Barium
- Benzo(a)anthracene
- Benzo(a)pyrene
- Benzo(b)fluoranthene
- Benzo(g,h,i)perylene
- Benzo(k)fluoranthene
- Cadmium
- Chrysene
- Cobalt
- Dibenzofuran
- Diethylphthalate
- bis(2-Ethylhexyl)phthalate

- Fluoranthene
- Fluorene
- Indeno(1,2,3-cd)pyrene
- Lead
- Manganese
- Mercury
- Naphthalene
- Nickel
- PCBs (total)
- Phenanthrene
- Pu-238
- Pu-239
- Pyrene
- Selenium
- Tetrachloroethene
- Thallium
- U-238
- Vanadium
- Zinc

However, it should be noted that, as directed by the NMED (March 1998), bioaccumulation for inorganic compounds is assessed exclusively based upon maximum reported bioconcentration factors (BCF) for aquatic species. Because only aquatic BCFs are used to evaluate the bioaccumulation potential for metals, bioaccumulation in terrestrial species is likely to be overpredicted.

VII.2.3 Fate and Transport Potential

The potential for the COPECs to move from the source of contamination to other media or biota is discussed in Section V. As noted in Table 8 (Section V), wind and food chain uptake are expected to be of low significance as transport mechanisms for COPECs at this site and migration to groundwater is not anticipated. However, the function of this site as a storm-water drainage system implies that periodic flows of storm-water runoff may be of moderate importance as a transport mechanism. Degradation and/or transformation for the inorganic COPECs and radionuclides is expected to be of low significance.

VII.2.4 Scoping Risk-Management Decision

Based upon information gathered through the scoping assessment, it was concluded that complete ecological pathways may be associated with SWMU 96 and that COPECs exist at the site. As a consequence, a risk assessment was deemed necessary to predict the potential level of ecological risk associated with the site.

VII.3 Risk Assessment

As concluded in Section VII.2.4, complete ecological pathways and COPECs are associated with SWMU 96. The risk assessment performed for the site involves a quantitative estimation of current ecological risks using exposure models in association with exposure parameters and toxicity information obtained from the literature. The estimation of potential ecological risks is conservative in order to ensure that ecological risks are not underpredicted.

Components within the risk assessment include the following:

- Problem Formulation—sets the stage for the evaluation of potential exposure and risk.
- Exposure Estimation—provides a quantitative estimate of potential exposure.
- Ecological Effects Evaluation—presents benchmarks used to gauge the toxicity of COPECs to specific receptors.
- Risk Characterization—characterizes the ecological risk associated with exposure of the receptors to environmental media at the site.
- Uncertainty Assessment—discusses uncertainties associated with the estimation of exposure and risk.
- Risk Interpretation—evaluates ecological risk in terms of HQs and ecological significance.
- Risk Assessment Scientific/Management Decision Point—presents the decision to risk managers based upon the results of the screening assessment.

VII.3.1 Problem Formulation

Problem formulation is the initial stage of the risk assessment that provides the introduction to the risk evaluation process. Components that are addressed in this section include a discussion of ecological pathways and the ecological setting, identification of COPECs, and selection of ecological receptors. The conceptual model, ecological food webs, and ecological endpoints (other components commonly addressed in a risk assessment) are presented in the "Predictive Ecological Risk Assessment Methodology for Environmental Restoration Program, Sandia National Laboratories, New Mexico" (IT July 1998) and are not duplicated here.

VII.3.1.1 *Ecological Pathways and Setting*

SWMU 96 is approximately 4.5 acres in size. The original habitat of this site was grassland; however, much of the natural vegetation at SWMU 96 has been disturbed and the original habitat has been altered to accommodate the storm-water drainage system as well as the development of facilities at TA-I, TA-II, and TA-IV. Usable habitat is limited to outfalls and open channels. Wildlife use the area, but the limited vegetative cover and disturbed nature of the site

make significant transfers of COPECs through the food chain unlikely. No sensitive species are known to occur in the area of the site.

Complete ecological pathways may exist at this site through the exposure of plants and wildlife to COPECs in soil. It is assumed that direct uptake of COPECs from soil is the major route of exposure for plants and that exposure of plants to wind-blown soil is minor. Exposure modeling for the wildlife receptors is limited to the food and soil ingestion pathways and external radiation. Because the presence of surface water at this site is ephemeral, principally limited to brief storm runoff events, exposure to COPECs through the ingestion of surface water is considered to be of low significance. Inhalation and dermal contact are also considered pathways of low significance with respect to ingestion (Sample and Suter 1994). Groundwater is not expected to be affected by COCs at this site.

VII.3.1.2 COPECs

COPECs for SWMU 96 are listed in Section VII.2.1. These COPECs include both inorganic and organic constituents. Inorganic constituents include both radiological and nonradiological analytes. The concentrations of inorganic analytes detected at this site were screened against background concentrations (see Section IV) and those that exceeded the approved SNL/NM background screening levels (Dinwiddie September 1997) for the area were considered to be COPECs. All organic analytes that were detected within the upper 5 feet of soil were identified as COPECs. Nonradiological inorganic compounds that are essential nutrients, such as iron, magnesium, calcium, potassium, and sodium, were not included in this risk assessment as set forth by the EPA (1989). In order to provide conservatism, this ecological risk assessment was based upon the maximum soil concentrations of the COPECs measured in the surface soil. Tables 5 and 7 present maximum concentrations for the COPECs.

VII.3.1.3 Ecological Receptors

A nonspecific perennial plant was selected as the receptor to represent plant species at the site (IT July 1998). Vascular plants are the principal primary producers at the site and are key to the diversity and productivity of the wildlife community associated with the site. The deer mouse (*Peromyscus maniculatus*) and the burrowing owl (*Speotyto cunicularia*) were used to represent wildlife use. Because of its opportunistic food habits, the deer mouse was used to represent a mammalian herbivore, omnivore, and insectivore; the burrowing owl was selected to represent a top predator at this site. The burrowing owl is present at SNL/NM and is designated a species of management concern by the U.S. Fish and Wildlife Service in Region 2, which includes the state of New Mexico (USFWS September 1995).

VII.3.2 Exposure Estimation

For nonradiological COPECs, direct uptake from the soil was considered the only significant route of exposure for terrestrial plants. Exposure modeling for the wildlife receptors was limited to food and soil ingestion pathways. Inhalation and dermal contact are considered insignificant pathways with respect to ingestion (Sample and Suter 1994). Drinking water is also considered a low significance pathway because of the ephemeral nature of surface water at this site. The deer mouse was modeled under three dietary regimes: as an herbivore

(100 percent of its diet as plant material), as an omnivore (50 percent of its diet as plants and 50 percent as soil invertebrates), and as an insectivore (100 percent of its diet as soil invertebrates). The burrowing owl was modeled as a strict predator on small mammals (100 percent of its diet as deer mice). Because the exposure in the burrowing owl from a diet consisting of equal parts of herbivorous, omnivorous, and insectivorous mice would be equivalent to the exposure from a diet consisting of only omnivorous mice, the diet of the burrowing owl was modeled with intake of omnivorous mice only. Both species were modeled with soil ingestion comprising 2 percent of total dietary intake. Table 14 presents the species-specific factors used in modeling exposures in the wildlife receptors. Justification for use of the factors presented in this table is described in the ecological risk assessment methodology document (IT July 1998).

Although home range is also included in Table 14, exposures for this risk assessment were modeled using an area use factor of 1, implying that all food items and soil ingested are from the site being investigated. The maximum measured COPEC concentrations from surface soil samples were used to conservatively estimate potential exposures and risks to plants and wildlife at this site.

For the radiological dose-rate calculations, the deer mouse was modeled as an herbivore (100 percent of its diet as plants) and the burrowing owl was modeled as a strict predator on small mammals (100 percent of its diet as deer mice). Both were modeled with soil ingestion comprising 2 percent of total dietary intake. Receptors are exposed to radiation both internally and externally from H-3, Pu-238, Pu-239 and U-238. Internal and external dose rates to the deer mouse and the burrowing owl are approximated using modified dose-rate models from the DOE (1995), as presented in the ecological risk assessment methodology document for the SNL/NM ER Project (IT July 1998). Radionuclide-dependent data for the dose-rate calculations were obtained from Baker and Soldat (1992). The external dose-rate model examines the total-body dose-rate to a receptor residing in soil exposed to radionuclides. The soil surrounding the receptor is assumed to be an infinite medium uniformly contaminated with gamma-emitting radionuclides. The external dose-rate model is the same for both the deer mouse and the burrowing owl. The internal total-body dose-rate model assumes that a fraction of the radionuclide concentration ingested by a receptor is absorbed by the body and concentrated at the center of a spherical body shape. This provides a conservative estimate for absorbed dose. This concentrated radiation source at the center of the body of the receptor is assumed to be a "point" source. Radiation emitted from this point source is absorbed by the body tissues to contribute to the absorbed dose. Alpha and beta emitters are assumed to transfer 100 percent of their energy to the receptor as they pass through tissues. Gamma-emitting radionuclides only transfer a fraction of their energy to the tissues because gamma rays interact less with matter than alpha or beta emitters do. The external and internal dose-rate results are summed to calculate a total dose rate from exposure to H-3, Pu-238, Pu-239 and U-238 in soil.

Table 15 presents the transfer factors used to model the concentrations of COPECs through the food chain. Table 16 presents maximum concentrations in soil and derived concentrations in tissues of the various food chain elements that are used to model dietary exposures for each of the wildlife receptors.

VII.3.3 Ecological Effects Evaluation

Table 17 shows benchmark toxicity values for the plant and wildlife receptors. For plants, the benchmark soil concentrations are based upon the lowest-observed-adverse-effect level. For wildlife, the toxicity benchmarks are based upon the no-observed-adverse-effect level (NOAEL) for chronic oral exposure in a taxonomically similar test species. For the wildlife receptors, toxicity benchmarks for total PCBs were based upon toxicity of Aroclor-1254. Sufficient plant toxicity information was not available to estimate the plant toxicity benchmarks for acetone, chloroform, dibenzofuran, diethylphthalate, bis(2-ethylhexyl)phthalate, methylene chloride, tetrachloroethene, trichloroethene, and xylenes. For the deer mice, sufficient toxicity information was not available to estimate the NOAELs for dibenzofuran. For the burrowing owl, sufficient toxicity information was not available to estimate the NOAELs for chromium VI, silver, thallium, and all organic compounds except bis(2-ethylhexyl)phthalate and total PCBs.

The benchmark used for exposure of terrestrial receptors to radiation was 0.1 rad/day. This value has been recommended by the International Atomic Energy Agency (IAEA 1992) for the protection of terrestrial populations. Because plants and insects are less sensitive to radiation than vertebrates (Whicker and Schultz 1982), the dose of 0.1 rad/day should also offer sufficient protection to other components within the terrestrial habitat of SWMU 96.

VII.3.4 Risk Characterization

For nonradiological COPECs, maximum concentrations in soil and estimated dietary exposures were compared to plant and wildlife benchmark values, respectively. Table 18 presents results of these comparisons. HQs are used to quantify the comparison with benchmarks for plants and wildlife exposure.

For plants, HQs greater than unity were found for total chromium, lead, silver, thallium, vanadium, and zinc. Due to insufficient toxicity information, HQs for plants could not be determined for acetone, chloroform, dibenzofuran, diethylphthalate, bis(2-ethylhexyl)phthalate, methylene chloride, tetrachloroethene, trichloroethene, and xylenes. HQs greater than unity were found for all three dietary regimes of the deer mouse from exposure to barium, and for the omnivorous and insectivorous deer mice for arsenic, thallium, vanadium, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, bis(2-ethylhexyl)phthalate, fluoranthene, indeno(1,2,3-cd)pyrene, total PCBs, phenanthrene, and pyrene. For the burrowing owl, HQs greater than unity were limited to bis(2-ethylhexyl)phthalate and mercury, when all mercury at the site was assumed to be in organic form. However, HQs for the burrowing owl could not be determined for chromium VI, silver, thallium, and all organic compounds except bis(2-ethylhexyl)phthalate and total PCBs. As directed by the NMED, HIs were calculated for each of the receptors (the HI is the sum of chemical-specific HQs for all pathways for a given receptor). All HIs exceeded unity; the maximum HI is 310 for the insectivorous deer mouse.

Table 14
Exposure Factors for Ecological Receptors at SWMU 96

Receptor Species	Class/Order	Trophic Level	Body Weight (kg) ^a	Food Intake Rate (kg/day) ^b	Dietary Composition ^c	Home Range (acres)
Deer Mouse (<i>Peromyscus maniculatus</i>)	Mammalia/ Rodentia	Herbivore	2.39E-2 ^d	3.72E-3	Plants: 100% (+ Soil at 2% of intake)	2.7E-1 ^e
Deer Mouse (<i>Peromyscus maniculatus</i>)	Mammalia/ Rodentia	Omnivore	2.39E-2 ^d	3.72E-3	Plants: 50% Invertebrates: 50% (+ Soil at 2% of intake)	2.7E-1 ^e
Deer Mouse (<i>Peromyscus maniculatus</i>)	Mammalia/ Rodentia	Insectivore	2.39E-2 ^d	3.72E-3	Invertebrates: 100% (+ Soil at 2% of intake)	2.7E-1 ^e
Burrowing owl (<i>Speotyto cunicularia</i>)	Aves/ Strigiformes	Carnivore	1.55E-1 ^f	1.73E-2	Rodents: 100% (+ Soil at 2% of intake)	3.5E+1 ^g

^aBody weights are in kg wet weight.

^bFood intake rates are estimated from the allometric equations presented in Nagy (1987). Units are kg dry weight per day.

^cDietary compositions are generalized for modeling purposes. Default soil intake value of 2% of food intake.

^dSilva and Downing 1995.

^eEPA 1993, based upon the average home range measured in semiarid shrubland in Idaho.

^fDunning 1993.

^gHaug et al. 1993.

EPA = U.S. Environmental Protection Agency.

kg = Kilogram(s).

SWMU = Solid Waste Management Unit.

Table 15
Transfer Factors Used in Exposure Models for COPECs at SWMU 96

COPEC	Soil-to-Plant Transfer Factor	Soil-to-Invertebrate Transfer Factor	Food-to-Muscle Transfer Factor
Inorganic			
Arsenic	4.0E-2 ^a	1.0E+0 ^b	2.0E-3 ^a
Barium	1.5E-1 ^a	1.0E+0 ^b	2.0E-4 ^c
Cadmium	5.5E-1 ^a	6.0E-1 ^d	5.5E-4 ^a
Chromium (total)	4.0E-2 ^c	1.3E-1 ^e	3.0E-2 ^c
Chromium VI	4.0E-2 ^c	1.3E-1 ^e	3.0E-2 ^c
Copper	8.0E-1 ^f	2.5E-1 ^d	1.0E-2 ^a
Lead	9.0E-2 ^c	4.0E-2 ^d	8.0E-4 ^c
Mercury	1.0E+0 ^c	1.0E+0 ^b	2.5E-1 ^a
Nickel	2.0E-1 ^c	3.8E-1 ^e	6.0E-3 ^a
Selenium	5.0E-1 ^c	1.0E+0 ^b	1.0E-1 ^c
Silver	1.0E+0 ^c	2.5E-1 ^d	5.0E-3 ^c
Thallium	4.0E-3 ^a	1.0E+0 ^b	4.0E-2 ^a
Vanadium	5.5E-3 ^a	1.0E+0 ^b	2.5E-3 ^a
Zinc	1.5E+0 ^a	3.0E-1 ^d	1.0E-1 ^a
Organic^g			
Acenaphthene	2.1E-1	2.1E+1	2.1E-4
Acetone	5.3E+1	1.3E+1	1.0E-8
Anthracene	1.0E-1	2.2E+1	7.3E-4
Benzo(a)anthracene	2.2E-2	2.5E+1	1.1E-2
Benzo(a)pyrene	1.1E-2	2.7E+1	3.8E-2
Benzo(b)fluoranthene	6.2E-3	2.8E+1	1.1E-1
Benzo(g,h,i)perylene	6.1E-3	2.8E+1	1.2E-1
Benzo(k)fluoranthene	4.3E-3	2.9E+1	2.1E-1
Chloroform	3.0E+0	1.6E+1	1.8E-6
Chrysene	1.5E-2	2.6E+1	2.3E-2
Dibenzofuran	1.6E-1	2.1E+1	3.3E-4
Diethylphthalate	1.4E+0	1.7E+1	6.6E-6
bis(2-Ethylhexyl)phthalate	1.6E-3	3.2E+1	1.3E+0
Fluoranthene	5.7E-2	2.3E+1	2.1E-3
Fluorene	1.5E-1	2.1E+1	3.8E-4
Indeno(1,2,3-cd)pyrene	6.1E-3	2.8E+1	1.2E-1
Methylene chloride	7.3E+0	1.5E+1	3.6E-7
Naphthalene	4.8E-1	1.9E+1	4.7E-5
PCBs (total)	1.2E-2	2.6E+1	3.2E-2
Phenanthrene	8.9E-2	2.2E+1	9.6E-4
Pyrene	3.3E-2	2.4E+1	5.8E-3
Tetrachloroethene	1.1E+0	1.8E+1	1.1E-5
Toluene	1.0E+0	1.8E+1	1.3E-5
Trichloroethene	1.1E+0	1.8E+1	1.2E-5
Xylenes	5.5E-1	1.9E+1	3.7E-5

^aBaes et al. 1984.

^bDefault value.

^cNCRP January 1989.

^eStafford et al. 1991.

^fMa 1982.

Table 15 (Concluded)
Transfer Factors Used in Exposure Models for COPECs at SWMU 96

[†]IAEA 1994.

⁹Soil-to-plant and food-to-muscle transfer factors from equations developed in Travis and Arms (1988).
Soil-to-invertebrate transfer factors from equations developed in Connell and Markwell (1990). All three equations based upon relationship of the transfer factor to the Log K_{ow} value of compound.

COPEC = Constituent of potential ecological concern.

IAEA = International Atomic Energy Agency.

K_{ow} = Octanol-water partition coefficient.

Log = Logarithm (base 10).

NCRP = National Council on Radiation Protection and Measurements.

PCB = Polychlorinated biphenyl.

SWMU = Solid Waste Management Unit.

Table 16
Media Concentrations^a for COPECs at SWMU 96

COPEC	Soil (maximum) ^a	Plant Foliage ^b	Soil Invertebrate ^b	Deer Mouse Tissues ^c
Inorganic				
Arsenic	7.5E+0	3.0E-1	7.5E+0	2.5E-2
Barium	5.1E+2	7.6E+1	5.1E+2	1.9E-1
Cadmium	1.8E+0	9.8E-1	1.1E+0	1.8E-3
Chromium (total)	8.1E+1	3.2E+0	1.1E+1	8.0E-1
Chromium VI	6.8E-1	2.7E-2	8.8E-2	6.7E-3
Copper	4.2E+1	3.3E+1	1.0E+1	7.1E-1
Lead	9.7E+1	8.7E+0	3.9E+0	2.1E-2
Mercury	2.5E-1	2.5E-1	2.5E-1	2.0E-1
Nickel	2.6E+1	5.2E+0	9.9E+0	1.5E-1
Selenium	8.2E-1	4.1E-1	8.2E-1	2.0E-1
Silver	7.6E+1	7.6E+1	1.9E+1	7.7E-1
Thallium	1.6E+0	6.6E-3	1.6E+0	1.1E-1
Vanadium	5.0E+1	2.8E-1	5.0E+1	2.1E-1
Zinc	1.7E+2	2.5E+2	5.0E+1	4.8E+1
Organic				
Acenaphthene	3.0E-1 ^d	6.4E-2	6.3E+0	2.0E-3
Acetone	4.4E-2	2.3E+0	5.6E-1	4.7E-8
Anthracene	1.7E+0 ^d	1.8E-1	3.8E+1	4.3E-2
Benzo(a)anthracene	7.9E+0	1.8E-1	2.0E+2	3.6E+0
Benzo(a)pyrene	2.7E+0 ^d	3.1E-2	7.3E+1	4.3E+0
Benzo(b)fluoranthene	1.2E+1	7.7E-2	3.5E+2	6.1E+1
Benzo(g,h,i)perylene	4.2E+0	2.6E-2	1.2E+2	2.1E+1
Benzo(k)fluoranthene	3.9E+0	1.7E-2	1.1E+2	3.8E+1
Chloroform	2.7E-3	8.1E-3	4.4E-2	1.5E-7
Chrysene	1.2E+1	1.7E-1	3.0E+2	1.1E+1
Dibenzofuran	2.0E-1 ^d	3.2E-2	4.1E+0	2.2E-3
Diethylphthalate	4.0E-2 ^d	5.7E-2	6.9E-1	7.7E-6
bis(2-Ethylhexyl)phthalate	1.3E+1	2.0E-2	4.0E+2	8.2E+2
Fluoranthene	1.5E+1	8.3E-1	3.4E+2	1.1E+0
Fluorene	3.4E-1	5.0E-2	7.2E+0	4.4E-3
Indeno(1,2,3-cd)pyrene	4.0E+0	2.4E-2	1.1E+2	2.0E+1
Methylene chloride	1.2E-2	8.7E-2	1.8E-1	1.5E-7
Naphthalene	2.9E-1 ^d	1.4E-1	5.6E+0	4.3E-4
PCBs (total)	3.6E-1	4.5E-3	9.5E+0	4.7E-1
Phenanthrene	8.0E+0	7.1E-1	1.8E+2	2.7E-1
Pyrene	1.9E+1	6.1E-1	4.6E+2	4.1E+0
Tetrachloroethene	3.1E-3	3.4E-3	5.5E-2	9.7E-7
Toluene	3.9E-2	3.9E-2	7.1E-1	1.5E-5
Trichloroethene	2.1E-3	2.2E-3	3.8E-2	7.3E-7
Xylenes	1.4E-2 ^d	7.6E-3	2.6E-1	1.6E-5

^aIn mg/kg. All biotic media are based upon dry weight of the media. Soil concentration measurements are assumed to have been based upon dry weight. Values have been rounded to two significant digits after calculation.

^bProduct of the soil concentration and the corresponding transfer factor.

Table 16 (Concluded)
Media Concentrations^a for COPECs at SWMU 96

^aBased upon the deer mouse with an omnivorous diet. Product of the average concentration ingested in food and soil times the food-to-muscle transfer factor times a wet weight-dry weight conversion factor of 3.125 (EPA 1993).

^dEstimated value.

COPEC = Constituent of potential ecological concern.

mg/kg = Milligram(s) per kilogram.

PCB = Polychlorinated biphenyl.

SWMU = Solid Waste Management Unit.

Table 17
Toxicity Benchmarks for Ecological Receptors at SWMU 96

COPEC	Plant Benchmark ^{a,b}	Mammalian NOAELs			Avian NOAELs		
		Mammalian Test Species ^{c,d}	Test Species NOAEL ^{d,e}	Deer Mouse NOAEL ^{e,f}	Avian Test Species ^d	Test Species NOAEL ^{d,e}	Burrowing Owl NOAEL ^{e,g}
Inorganic							
Arsenic	10	mouse	0.126	0.133	mallard	5.14	5.14
Barium	500	rat ^h	5.1	10.5	chicken	20.8	20.8
Cadmium	3	rat ⁱ	1.0	1.89	mallard	1.45	1.45
Chromium (total)	1	rat	2,737	5,354	black duck	1.0	1.0
Chromium VI	1	rat	3.28	6.42	-	-	-
Copper	100	mink	11.7	29.8	chicken	47	47
Lead	50	rat	8.0	15.7	American kestrel	3.85	3.85
Mercury (organic)	0.3	rat	0.03	0.06	mallard	0.0064	0.0064
Mercury (inorganic)	0.3	mouse	13.2	14.0	Japanese quail	0.45	0.45
Nickel	30	rat	40	78	mallard	77.4	77.4
Selenium	1	rat	0.2	0.391	screech owl	0.44	0.44
Silver	2	rat	17.8 ^j	34.8	-	-	-
Thallium	1	rat ^k	0.0074	0.015	-	-	-
Vanadium	2	rat	0.21	0.38	mallard	11.4	11.4
Zinc	50	rat	160	313	chicken	14.5	14.5
Organic							
Acenaphthene	18 ^l	mouse	17.5 ^m	18.5	-	-	-
Acetone	-	rat	10	19.6	-	-	-
Anthracene	18 ^l	mouse	100 ⁿ	106	-	-	-
Benzo(a)anthracene	18 ^l	mouse	1 ^o	1.06	-	-	-
Benzo(a)pyrene	18 ^l	mouse	1	1.06	-	-	-
Benzo(b)fluoranthene	18 ^l	mouse	1 ^o	1.06	-	-	-
Benzo(g,h,i)perylene	18 ^l	mouse	1 ^o	1.06	-	-	-
Benzo(k)fluoranthene	18 ^l	mouse	1 ^o	1.06	-	-	-
Chloroform	-	rat	15	29.3	-	-	-
Chrysene	18 ^l	mouse	1 ^o	1.06	-	-	-
Dibenzofuran	-	-	-	-	-	-	-
Diethylphthalate	-	mouse	75.3 ^p	79.7	-	-	-
bis(2-Ethylhexyl)phthalate	-	mouse	18.3	19.4	ringed dove	1.1	1.1
Fluoranthene	18 ^l	mouse	12.5 ^q	13.2	-	-	-
Fluorene	18 ^l	mouse	12.5 ^q	13.2	-	-	-
Indeno(1,2,3-cd)pyrene	18 ^l	mouse	1 ^o	1.06	-	-	-

Refer to footnotes at end of table.

Table 17 (Continued)
Toxicity Benchmarks for Ecological Receptors at SWMU 96

COPEC	Plant Benchmark ^{a,b}	Mammalian NOAELs			Avian NOAELs		
		Mammalian Test Species ^{c,d}	Test Species NOAEL ^{d,e}	Deer Mouse NOAEL ^{e,f}	Avian Test Species ^d	Test Species NOAEL ^{d,e}	Burrowing Owl NOAEL ^{e,g}
Methylene chloride	–	rat	5.85	11.4	–	–	–
Naphthalene	18 ^l	mouse	5 ^r	5.29	–	–	–
PCBs (based upon Aroclor-1254)	40	oldfield mouse	0.068	0.059	ring-necked pheasant	0.18	0.18
Phenanthrene	18 ^l	mouse	1 ^o	1.06	–	–	–
Pyrene	18 ^l	mouse	7.5 ^s	7.94	–	–	–
Tetrachloroethene	–	mouse	1.4	1.48	–	–	–
Toluene	200	mouse	26	27.5	–	–	–
Trichloroethene	–	mouse	0.7	0.74	–	–	–
Xylenes	–	mouse	2.1	2.2	–	–	–

^aIn mg/kg soil dry weight.

^bEfroymsen et al. 1997.

^cBody weights (in kg) for the NOAEL conversion are as follows: lab mouse, 0.030; lab rat, 0.350; mink, 1.0; oldfield mouse, 0.014 (except where noted).

^dSample et al. 1996.

^eIn mg/kg body weight per day.

^fBased upon NOAEL conversion methodology presented in Sample et al. (1996), using a deer mouse body weight of 0.0239 kg and a mammalian scaling factor of 0.25.

^gBased upon NOAEL conversion methodology presented in Sample et al. (1996). The avian scaling factor of 0.0 was used, making the NOAEL independent of body weight.

^hBody weight: 0.435 kg.

ⁱBody weight: 0.303 kg.

^jBased upon a rat LOAEL of 89 mg/kg body weight per day (EPA 2003) and an uncertainty factor of 0.2.

^kBody weight: 0.365 kg.

^lSims and Overcash 1983.

^mBased upon a subchronic NOAEL of 175 mg/kg/d (EPA 2003) and an uncertainty factor of 0.1.

ⁿBased upon a subchronic NOAEL of 1,000 mg/kg/d (EPA 2003) and an uncertainty factor of 0.1.

^oNo data available. Toxicity value based upon NOAEL for benzo(a)pyrene.

^pBased upon NOAEL for bis(2-ethylhexyl)phthalate and the ratio of LD₅₀ values for diethylphthalate and bis(2-ethylhexyl)phthalate (Micromedex 1998).

^qBased upon a subchronic NOAEL of 125 mg/kg/d (EPA 2003) and an uncertainty factor of 0.1.

^rBased upon NOAEL for pyrene and the ratio of LD₅₀ values for naphthalene and pyrene (Micromedex 1998).

^sEPA 2003.

Table 17 (Concluded)
Toxicity Benchmarks for Ecological Receptors at SWMU 96

COPEC = Constituent of potential ecological concern.
kg = Kilogram(s).
LD₅₀ = Acute lethal dose to 50 percent of the test population.
LOAEL = Lowest-observed-adverse-effect level
mg/kg = Milligram(s) per kilogram.
mg/kg/d = Milligram(s) per kilogram per day.
NOAEL = No-observed-adverse-effect level.
PCB = Polychlorinated biphenyl.
SWMU = Solid Waste Management Unit.
- = Insufficient toxicity data.

Table 18
 HQs for Ecological Receptors at SWMU 96

COPEC	Plant HQ	Deer Mouse HQ (Herbivorous)	Deer Mouse HQ (Omnivorous)	Deer Mouse HQ (Insectivorous)	Burrowing Owl HQ
Inorganic					
Arsenic	7.5E-1	5.3E-1	4.7E+0	8.9E+0	3.8E-3
Barium	1.0E+0	1.3E+0	4.5E+0	7.7E+0	5.6E-2
Cadmium	5.9E-1	8.4E-2	8.7E-2	9.1E-2	2.9E-3
Chromium (total)	8.1E+1	1.4E-4	2.5E-4	3.5E-4	2.7E-1
Chromium VI	6.8E-1	9.9E-4	1.7E-3	2.5E-3	-
Copper	4.2E-1	1.8E-1	1.2E-1	5.9E-2	3.7E-3
Lead	1.9E+0	1.1E-1	8.2E-2	5.8E-2	5.7E-2
Mercury (organic)	8.5E-1	6.4E-1	6.4E-1	6.4E-1	3.6E+0
Mercury (inorganic)	8.5E-1	2.9E-3	2.9E-3	2.9E-3	5.1E-2
Nickel	8.7E-1	1.1E-2	1.6E-2	2.1E-2	9.7E-4
Selenium	8.2E-1	1.7E-1	2.5E-1	3.3E-1	5.4E-2
Silver	3.8E+1	3.5E-1	2.2E-1	9.2E-2	-
Thallium	1.6E+0	4.2E-1	9.1E+0	1.8E+1	-
Vanadium	2.5E+1	5.2E-1	1.1E+1	2.1E+1	1.2E-2
Zinc	3.4E+0	1.3E-1	7.7E-2	2.7E-2	4.0E-1
Organic					
Acenaphthene	1.7E-2	5.9E-4	2.7E-2	5.3E-2	-
Acetone	-	1.9E-2	1.1E-2	4.5E-3	-
Anthracene	9.5E-2	3.1E-4	2.8E-2	5.5E-2	-
Benzo(a)anthracene	4.4E-1	4.9E-2	1.5E+1	2.9E+1	-
Benzo(a)pyrene	1.5E-1	1.3E-2	5.3E+0	1.1E+1	-
Benzo(b)fluoranthene	6.9E-1	4.8E-2	2.6E+1	5.1E+1	-
Benzo(g,h,i)perylene	2.4E-1	1.6E-2	8.8E+0	1.8E+1	-
Benzo(k)fluoranthene	2.2E-1	1.4E-2	8.3E+0	1.7E+1	-
Chloroform	-	4.3E-5	1.4E-4	2.4E-4	-
Chrysene	6.4E-1	5.9E-2	2.2E+1	4.4E+1	-
Dibenzofuran	-	-	-	-	-
Diethylphthalate	-	1.1E-4	7.3E-4	1.3E-3	-
bis(2-Ethylhexyl)phthalate	-	2.2E-3	1.6E+0	3.2E+0	8.4E+1

Refer to footnotes at end of table.

Table 18 (Concluded)
 HQs for Ecological Receptors at SWMU 96

COPEC	Plant HQ	Deer Mouse HQ (Herbivorous)	Deer Mouse HQ (Omnivorous)	Deer Mouse HQ (Insectivorous)	Burrowing Owl HQ
Fluoranthene	8.1E-1	1.3E-2	2.0E+0	3.9E+0	-
Fluorene	1.9E-2	6.7E-4	4.3E-2	8.5E-2	-
Indeno(1,2,3-cd)pyrene	2.2E-1	1.5E-2	8.2E+0	1.6E+1	-
Methylene chloride	-	1.2E-3	1.8E-3	2.5E-3	-
Naphthalene	1.6E-2	4.3E-3	8.5E-2	1.7E-1	-
Total PCBs (based upon Aroclor-1254)	9.0E-3	3.1E-2	1.2E+1	2.5E+1	3.0E-1
Phenanthrene	4.5E-1	1.3E-1	1.3E+1	2.6E+1	-
Pyrene	1.0E+0	1.9E-2	4.5E+0	9.0E+0	-
Tetrachloroethene	-	3.7E-4	3.1E-3	5.8E-3	-
Toluene	2.0E-4	2.3E-4	2.1E-3	4.0E-3	-
Trichloroethene	-	4.7E-4	4.2E-3	7.9E-3	-
Xylenes	-	5.5E-4	9.5E-3	1.9E-2	-
HI ^a	1.6E+2	4.8E+0	1.6E+2	3.1E+2	8.8E+1

Note: **Bold** text indicates HQ or HI exceeds unity.

^aThe HI is the sum of individual HQs.

HI = Hazard index.

HQ = Hazard quotient.

PCB = Polychlorinated biphenyl.

SWMU = Solid Waste Management Unit.

- = Insufficient toxicity data available for risk estimation purposes.

Tables 19 and 20 summarize the total of internal and external dose-rate model results for H-3, Pu-238, Pu-239 and U-238. The total radiation dose rate to both the deer mouse and burrowing owl is predicted to be $2.2E-4$ rad/day. The dose rate for the deer mouse and the burrowing owl is considerably lower than the benchmark of 0.1 rad/day.

VII.3.5 Uncertainty Assessment

Many uncertainties are associated with the characterization of ecological risks at SWMU 96. These uncertainties result from assumptions used in calculating risk that could overestimate or underestimate true risk presented at a site. For this risk assessment, assumptions are made that are more likely to overestimate exposures and risk than to underestimate them. These conservative assumptions are used to be more protective of the ecological resources potentially affected by the site. Conservatisms incorporated into this risk assessment include the use of maximum measured analyte concentrations in soil to evaluate risk, the use of wildlife toxicity benchmarks based upon NOAEL values, the incorporation of strict herbivorous and strict insectivorous diets for predicting the extreme HQ values for the deer mouse, and the use of 1.0 as the area use factor for wildlife receptors regardless of seasonal use or home range size. These uncertainties, which are consistent among each of the SWMU-specific ecological risk assessments, are discussed in greater detail in the uncertainty section of the ecological risk assessment methodology document for the SNL/NM ER Program (IT July 1998).

Uncertainties associated with the estimation of risk to ecological receptors following exposure to H-3, Pu-238, Pu-239, and U-238 are primarily related to those inherent in the radionuclide-specific data. Radionuclide-dependent data are measured values that have associated errors. The dose-rate models used for these calculations are based upon conservative estimates on receptor shape, radiation absorption by body tissues, and intake parameters. The goal is to provide a realistic but conservative estimate of a receptor's internal and external exposure to radionuclides in soil.

In the estimation of ecological risk, background concentrations are included as a component of maximum on-site concentrations. For some inorganic COPECs, conservatisms in the modeling of exposure and risk result in the prediction of risk to ecological receptors when exposed at background concentrations. As shown in Table 21, the HQs for plants associated with exposure to background concentrations of chromium, vanadium, and zinc are greater than unity, as are the HQs for the omnivorous and insectivorous deer mice from exposures to background levels of arsenic, barium, thallium, and vanadium. These results indicate that the conservative nature of the exposure models and toxicity benchmarks overpredict potential risk to these receptors, at least for these COPECs.

The assumption of an area use factor of 1.0 is a source of uncertainty for the burrowing owl at this site. Because SWMU 96 is approximately 4.5 acres in size and the home range of the burrowing owl is 35 acres, an area use factor of approximately 0.13 would be justified for this receptor. This is sufficient to reduce the burrowing owl HQ for mercury (organic) from 3.6 to 0.47 and the HQ for bis(2-ethylhexyl)phthalate from 84 to 10.9.

Another significant source of uncertainty associated with the prediction of ecological risk at this site is the use of the maximum measured concentrations as the exposure point concentrations. This results in a conservative exposure scenario that does not necessarily reflect actual site conditions. The mean soil concentration of each COPEC, for example, is more likely to be

Table 19
Total Dose Rates for Deer Mice
Exposed to Radionuclides at SWMU 96

Radionuclide	Maximum Concentration (pCi/g)	Total Dose (rad/day)
H-3	0.175	5.6E-7
Pu-238	0.934	8.6E-7
Pu-239	0.18	1.4E-7
U-238	1.38	2.2E-4
Total Dose		2.2E-4

pCi/g = Picocurie(s) per gram.
 SWMU = Solid Waste Management Unit.

Table 20
Total Dose Rates for Burrowing Owls
Exposed to Radionuclides at SWMU 96

Radionuclide	Maximum Concentration (pCi/g)	Total Dose (rad/day)
H-3	0.175	2.0E-7
Pu-238	0.934	2.0E-6
Pu-239	0.18	3.6E-7
U-238	1.38	2.2E-4
Total Dose		2.2E-4

pCi/g = Picocurie(s) per gram.
 SWMU = Solid Waste Management Unit.

representative of the average exposure experienced by receptors at this site. It should be noted that the 95% UCLs of the mean soil concentrations for arsenic, barium, vanadium, and zinc (3.3, 183, 26.1, and 61.5 mg/kg, respectively) are lower than their respective background screening values (4.4, 200, 33, and 76 mg/kg, respectively). Because the 95% UCL is a conservative estimate of the true mean soil concentration, it is likely that the actual exposures to these elements at SWMU 96 are within background levels, and risks from these exposures are within the background levels shown in Table 21.

For total chromium, lead, mercury, silver, and thallium, the 95% UCLs (16.2, 23.5, 0.026, 10.5, and 0.64 mg/kg, respectively) also show significantly lower HQs when used as the exposure point concentrations. For lead and mercury, all of the HQs are reduced to values less than unity when exposure is based upon the 95% UCL. For total chromium and silver, the HQs for plants are reduced to 16 and 5.3, respectively. For thallium, the HQ for plants is reduced to less than unity, and the HQs for the omnivorous and insectivorous deer mice are reduced to 3.6 and 6.9, respectively. With the exception of the HQ for total chromium exposure in plants, these HQs represent a low risk potential to these receptors.

It should be noted from Table 21 that the HQ for chromium exposure in plants to background concentrations is also high (HQ = 13). This indicates that the plant toxicity benchmark for chromium is highly conservative and probably overestimates the actual risk to plants from exposure to chromium at this site. This could be the result of two factors associated with the toxicological studies upon which the benchmark was based. First, in both of the studies evaluated by Efroymsen et al. (1997) to determine the plant toxicity benchmark for chromium, the chromium was freshly added to the soil in a form that is highly available to the plants ($K_2Cr_2O_7$). As a result, the bioavailability of the chromium in the toxicity test is expected to be much greater than that found at SWMU 96. Second, in both studies, the chromium added to the soil was chromium VI. The concentrations of chromium in the soil at SWMU 96 that result in HQs greater than unity are based upon total chromium, which is likely to be dominated by chromium III. The levels of chromium VI at this site (evaluated separately) did not result in an HQ greater than unity for plants. If chromium VI is more toxic to plants than chromium III (as is the case with animals), the toxicity benchmark based upon chromium VI will overestimate risk from total chromium. Further, because only two plant toxicity studies were available, Efroymsen et al. (1997) placed low confidence on the resulting benchmark. Therefore, it is likely that actual risk to plants from chromium at SWMU 96 is significantly overestimated by the HQs calculated in this risk assessment because of conservatism and uncertainties associated with the plant toxicity benchmark for this COPEC.

For bis(2-ethylhexyl)phthalate, exposure of the omnivorous and insectivorous deer mice to the 95% UCL concentration (1.2 mg/kg) reduces the HQs to values less than unity. Exposure of the burrowing owl to the 95% UCL concentration reduces its HQ to 7.8. When the area use factor of 0.13 is applied to this HQ, it is further reduced to 1.0. Therefore, the predicted risk to these receptors from exposure to bis(2-ethylhexyl)phthalate is accounted for by the conservative assumptions used in the initial calculation of the HQs.

PCB exposures were based upon total PCBs and risk was conservatively based upon toxicity values for Aroclor-1254. Aroclor-specific detections at this site were limited to Aroclor-1254 and Aroclor-1260; 95% UCLs for these analytes are 0.023 and 0.036 mg/kg, respectively. Based upon these values, the Aroclor-specific HQs for the omnivorous deer mouse are less than unity and those for the insectivorous deer mice are 1.6 and 1.9 for Aroclor-1254 and Aroclor-1260, respectively. Therefore, risk to the deer mouse from PCB exposure at SWMU 96 is considered to be low.

For the ten polynuclear aromatic hydrocarbons (PAHs) that showed HQs greater than unity for the omnivorous and insectivorous deer mice (i.e., benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, fluoranthene, indeno(1,2,3-cd)pyrene, phenanthrene, and pyrene), exposures to the 95% UCLs (1.07, 0.28, 2.5, 0.45, 0.43, 1.5, 3.0, 0.42, 1.1, and 3.7, respectively) also resulted in significantly lower HQ values. In the case of fluoranthene, the HQs for both the omnivorous and insectivorous deer mice were reduced to values less than unity. For benzo(a)pyrene, benzo(g,h,i)perylene, benzo(k)fluoranthene, indeno(1,2,3-cd)pyrene, and pyrene, the HQs for the omnivorous deer mouse was reduced to lower than unity and those for the insectivorous deer mouse were reduced to values less than 2. For benzo(a)anthracene, benzo(b)fluoranthene, chrysene, and phenanthrene, the HQs for the omnivorous deer mouse ranged from 1.8 to 5.2 when based upon the 95% UCL, and those for the insectivorous deer mouse ranged from 3.6 to 10 (the highest being for benzo(b)fluoranthene in both cases). It should be noted from Table 17 that

Table 21
 HQs for Ecological Receptors Exposed to Background Concentrations at SWMU 96

COPEC	Plant HQ	Deer Mouse HQ (Herbivorous)	Deer Mouse HQ (Omnivorous)	Deer Mouse HQ (Insectivorous)	Burrowing Owl HQ
Arsenic	4.4E-1	3.1E-1	2.8E+0	5.2E+0	2.2E-3
Barium	4.0E-1	5.0E-1	1.8E+0	3.0E+0	2.2E-2
Cadmium	1.7E-1	2.4E-2	2.5E-2	2.6E-2	8.1E-4
Chromium (total)	1.3E+1	2.2E-5	3.9E-5	5.6E-5	4.3E-2
Chromium VI	NA	NA	NA	NA	NA
Copper	1.7E-1	7.3E-2	4.8E-2	2.4E-2	1.5E-3
Lead	2.2E-1	1.2E-2	9.5E-3	6.7E-3	6.6E-3
Mercury (organic)	1.7E-1	1.3E-1	1.3E-1	1.3E-1	7.1E-1
Mercury (inorganic)	1.7E-1	5.7E-4	5.7E-4	5.7E-4	1.0E-2
Nickel	8.5E-1	1.1E-2	1.6E-2	2.0E-2	9.4E-4
Selenium	5.0E-1	1.0E-1	1.5E-1	2.0E-1	3.3E-2
Silver	2.5E-1	2.3E-3	1.4E-3	6.0E-4	-
Thallium	5.5E-1	1.4E-1	3.1E+0	6.0E+0	-
Vanadium	1.7E+1	3.4E-1	7.0E+0	1.4E+1	7.8E-3
Zinc	1.5E+0	5.7E-2	3.5E-2	1.2E-2	1.8E-1
HI ^a	3.5E+1	1.7E+0	1.5E+1	2.8E+1	1.0E+0

Note: **Bold text** indicates HQ or HI exceeds unity.

^aThe HI is the sum of individual HQs.

HI = Hazard index.

HQ = Hazard quotient.

NA = Not applicable (background value not calculated).

SWMU = Solid Waste Management Unit.

- = Insufficient toxicity data available for risk estimation purposes.

for seven of these ten PAHs (benzo(a)anthracene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, indeno(1,2,3-cd)pyrene, and phenanthrene), compound-specific toxicity information could not be found, and the toxicity benchmark used to evaluate potential risk is conservatively based upon benzo(a)pyrene, which is considered to be among the most toxic PAHs. Based upon the reduction of HQs for PAHs to values less than 10 based upon the use of the 95% UCLs as exposure point concentrations and the conservative nature of the toxicity benchmark values used for most of the PAHs, it is concluded that HQs for these compounds shown in Table 18 significantly overestimate the potential for risk to the deer mouse, and that the actual potential for risk is likely to be low.

Based upon this uncertainty analysis, ecological risks at SWMU 96 are expected to be low. HQs greater than unity were initially predicted; however, closer examination of the exposure assumptions and toxicity benchmarks revealed an overestimation of risk primarily attributed to conservatism in the exposure concentrations, in the assumed area use factor, and in the toxicity benchmark values used in the HQ calculations for this site.

VII.3.6 Risk Interpretation

Ecological risks associated with SWMU 96 were estimated through a risk assessment that incorporated site-specific information when available. Initial calculations of HQs indicated a potential for risk for nine inorganic and 12 organic COPECs. However, based upon the analysis of uncertainties associated with these HQs, the actual potential for risk to ecological receptors is expected to be low. This is primarily due to the use of maximum detected values as the exposure point concentrations for these HQs. Predicted risks from exposures based upon the 95% UCL concentrations are significantly lower. For arsenic, barium, vanadium, and zinc, the 95% UCL concentrations were found to be within the background ranges for these COPECs and those for lead and thallium were less than the plant toxicity benchmarks for these elements. All HQs based upon the 95% UCLs were less than or equal to 10 and/or were attributable to conservative toxicity benchmarks or (in the case of the burrowing owl) to conservatively assumed area use. Based upon this final analysis, ecological risks associated with SWMU 96 are expected to be low.

VII.3.7 Risk Assessment Scientific/Management Decision Point

After potential ecological risks associated with the site have been assessed, a decision is made regarding whether the site should be recommended for NFA or whether additional data should be collected to assess actual ecological risk at the site more thoroughly. With respect to this site, ecological risks are predicted to be low. The scientific/management decision is to recommend this site for NFA.

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APPENDIX 1 EXPOSURE PATHWAY DISCUSSION FOR CHEMICAL AND RADIONUCLIDE CONTAMINATION

Introduction

Sandia National Laboratories/New Mexico (SNL/NM) uses a default set of exposure routes and associated default parameter values developed for each future land-use designation being considered for SNL/NM Environmental Restoration (ER) Project sites. This default set of exposure scenarios and parameter values are invoked for risk assessments unless site-specific information suggests other parameter values. Because many SNL/NM solid waste management units (SWMUs) have similar types of contamination and physical settings, SNL/NM believes that the risk assessment analyses at these sites can be similar. A default set of exposure scenarios and parameter values facilitates the risk assessments and subsequent review.

The default exposure routes and parameter values used are those that SNL/NM views as resulting in a Reasonable Maximum Exposure (RME) value. Subject to comments and recommendations by the U.S. Environmental Protection Agency (EPA) Region VI and New Mexico Environment Department (NMED), SNL/NM will use these default exposure routes and parameter values in future risk assessments.

At SNL/NM, all SWMUs exist within the boundaries of the Kirtland Air Force Base. Approximately 240 potential waste and release sites have been identified where hazardous, radiological, or mixed materials may have been released to the environment. Evaluation and characterization activities have occurred at all of these sites to varying degrees. Among other documents, the SNL/NM ER draft Environmental Assessment (DOE 1996) presents a summary of the hydrogeology of the sites and the biological resources present. When evaluating potential human health risk the current or reasonably foreseeable land use negotiated and approved for the specific SWMU/AOC, aggregate, or watershed will be used. The following references generally document these land uses: Workbook: Future Use Management Area 2 (DOE et al. September 1995); Workbook: Future Use Management Area 1 (DOE et al. October 1995); Workbook: Future Use Management Areas 3, 4, 5, and 6 (DOE and USAF January 1996); Workbook: Future Use Management Area 7 (DOE and USAF March 1996). At this time, all SNL/NM SWMUs have been tentatively designated for either industrial or recreational future land use. The NMED has also requested that risk calculations be performed based upon a residential land-use scenario. Therefore, all three land-use scenarios will be addressed in this document.

The SNL/NM ER Project has screened the potential exposure routes and identified default parameter values to be used for calculating potential intake and subsequent hazard index (HI), excess cancer risk and dose values. The EPA (EPA 1989) provides a summary of exposure routes that could potentially be of significance at a specific waste site. These potential exposure routes consist of:

- Ingestion of contaminated drinking water
- Ingestion of contaminated soil

- Ingestion of contaminated fish and shellfish
- Ingestion of contaminated fruits and vegetables
- Ingestion of contaminated meat, eggs, and dairy products
- Ingestion of contaminated surface water while swimming
- Dermal contact with chemicals in water
- Dermal contact with chemicals in soil
- Inhalation of airborne compounds (vapor phase or particulate)
- External exposure to penetrating radiation (immersion in contaminated air; immersion in contaminated water; and exposure from ground surfaces with photon-emitting radionuclides)

Based upon the location of the SNL/NM SWMUs and the characteristics of the surface and subsurface at the sites, we have evaluated these potential exposure routes for different land-use scenarios to determine which should be considered in risk assessment analyses (the last exposure route is pertinent to radionuclides only). At SNL/NM SWMUs, there is currently no consumption of fish, shellfish, fruits, vegetables, meat, eggs, or dairy products that originate on site. Additionally, no potential for swimming in surface water is present due to the high-desert environmental conditions. As documented in the RESRAD computer code manual (ANL 1993), risks resulting from immersion in contaminated air or water are not significant compared to risks from other radiation exposure routes.

For the industrial and recreational land-use scenarios, SNL/NM ER has, therefore, excluded the following four potential exposure routes from further risk assessment evaluations at any SNL/NM SWMU:

- Ingestion of contaminated fish and shellfish
- Ingestion of contaminated fruits and vegetables
- Ingestion of contaminated meat, eggs, and dairy products
- Ingestion of contaminated surface water while swimming
- Dermal contact with chemicals in water

That part of the exposure pathway for radionuclides related to immersion in contaminated air or water is also eliminated.

Based upon this evaluation, for future risk assessments the exposure routes that will be considered are shown in Table 1.

Table 1
Exposure Pathways Considered for Various Land-Use scenarios

Industrial	Recreational	Residential
Ingestion of contaminated drinking water	Ingestion of contaminated drinking water	Ingestion of contaminated drinking water
Ingestion of contaminated soil	Ingestion of contaminated soil	Ingestion of contaminated soil
Inhalation of airborne compounds (vapor phase or particulate)	Inhalation of airborne compounds (vapor phase or particulate)	Inhalation of airborne compounds (vapor phase or particulate)
Dermal contact (nonradiological constituents only) soil only	Dermal contact (nonradiological constituents only) soil only	Dermal contact (nonradiological constituents only) soil only
External exposure to penetrating radiation from ground surfaces	External exposure to penetrating radiation from ground surfaces	External exposure to penetrating radiation from ground surfaces

Equations and Default Parameter Values for Identified Exposure Routes

In general, SNL/NM expects that ingestion of compounds in drinking water and soil will be the more significant exposure routes for chemicals; external exposure to radiation may also be significant for radionuclides. All of the above routes will, however, be considered for their appropriate land-use scenarios. The general equation for calculating potential intakes via these routes is shown below. The equations are taken from "Assessing Human Health Risks Posed by Chemicals: Screening-Level Risk Assessment" (NMED March 2000) and "Technical Background Document for Development of Soil Screening Levels" (NMED December 2000). Equations from both documents are based upon the "Risk Assessment Guidance for Superfund" (RAGS): Volume 1 (EPA 1989, 1991). These general equations also apply to calculating potential intakes for radionuclides. A more in-depth discussion of the equations used in performing radiological pathway analyses with the RESRAD code may be found in the RESRAD Manual (ANL 1993). RESRAD is the only code designated by the U.S. Department of Energy (DOE) in DOE Order 5400.5 for the evaluation of radioactively contaminated sites (DOE 1993). The Nuclear Regulatory Commission (NRC) has approved the use of RESRAD for dose evaluation by licensees involved in decommissioning, NRC staff evaluation of waste disposal requests, and dose evaluation of sites being reviewed by NRC staff. EPA Science Advisory Board reviewed the RESRAD model. EPA used RESRAD in their rulemaking on radiation site cleanup regulations. RESRAD code has been verified, undergone several benchmarking analyses, and been included in the International Atomic Energy Agency's VAMP and BIOMOVS II projects to compare environmental transport models.

Also shown are the default values SNL/NM ER will use in RME risk assessment calculations for industrial, recreational, and residential land-use scenarios, based upon EPA and other governmental agency guidance. The pathways and values for chemical contaminants are discussed first, followed by those for radionuclide contaminants. RESRAD input parameters that are left as the default values provided with the code are not discussed. Further information relating to these parameters may be found in the RESRAD Manual (ANL 1993) or by directly accessing the RESRAD websites at: <http://web.ead.anl.gov/resrad/home2/> or <http://web.ead.anl.gov/resrad/documents/>.

Generic Equation for Calculation of Risk Parameter Values

The equation used to calculate the risk parameter values (i.e., hazard quotients/HI, excess cancer risk, or radiation total effective dose equivalent [TEDE] [dose]) is similar for all exposure pathways and is given by:

$$\begin{aligned} \text{Risk (or Dose)} &= \text{Intake} \times \text{Toxicity Effect (either carcinogenic, noncarcinogenic, or radiological)} \\ &= C \times (\text{CR} \times \text{EFD}/\text{BW}/\text{AT}) \times \text{Toxicity Effect} \end{aligned} \quad (1)$$

where;

- C = contaminant concentration (site specific)
- CR = contact rate for the exposure pathway
- EFD = exposure frequency and duration
- BW = body weight of average exposure individual
- AT = time over which exposure is averaged.

For nonradiological constituents of concern (COCs), the total risk/dose (either cancer risk or HI) is the sum of the risks/doses for all of the site-specific exposure pathways and contaminants. For radionuclides, the calculated radiation exposure, expressed as TEDE is compared directly to the exposure guidelines of 15 millirem per year (mrem/year) for industrial and recreational future use and 75 mrem/year for the unlikely event that institutional control of the site is lost and the site is used for residential purposes (EPA 1997).

The evaluation of the carcinogenic health hazard produces a quantitative estimate for excess cancer risk resulting from the COCs present at the site. This estimate is evaluated for determination of further action by comparison of the quantitative estimate with the potentially acceptable risk of 1E-5 for nonradiological carcinogens. The evaluation of the noncarcinogenic health hazard produces a quantitative estimate (i.e., the HI) for the toxicity resulting from the COCs present at the site. This estimate is evaluated for determination of further action by comparison of this quantitative estimate with the EPA standard HI of unity (1). The evaluation of the health hazard from radioactive compounds produces a quantitative estimate of doses resulting from the COCs present at the site. This estimated dose is used to calculate an assumed risk. However, this calculated risk is presented for illustration purposes only, not to determine compliance with regulations.

The specific equations used for the individual exposure pathways can be found in RAGS (EPA 1989) and are outlined below. The RESRAD Manual (ANL 1993) describes similar equations for the calculation of radiological exposures.

Soil Ingestion

A receptor can ingest soil or dust directly by working in the contaminated soil. Indirect ingestion can occur from sources such as unwashed hands introducing contaminated soil to food that is then eaten. An estimate of intake from ingesting soil will be calculated as follows:

$$I_s = \frac{C_s * IR * CF * EF * ED}{BW * AT}$$

where:

- I_s = Intake of contaminant from soil ingestion (milligrams [mg]/kilogram [kg]-day)
- C_s = Chemical concentration in soil (mg/kg)
- IR = Ingestion rate (mg soil/day)
- CF = Conversion factor (1E-6 kg/mg)
- EF = Exposure frequency (days/year)
- ED = Exposure duration (years)
- BW = Body weight (kg)
- AT = Averaging time (period over which exposure is averaged) (days)

It should be noted that it is conservatively assumed that the receptor only ingests soil from the contaminated source.

Soil Inhalation

A receptor can inhale soil or dust directly by working in the contaminated soil. An estimate of intake from inhaling soil will be calculated as follows (EPA August 1997):

$$I_s = \frac{C_s * IR * EF * ED * \left(\frac{1}{VF} \text{ or } \frac{1}{PEF} \right)}{BW * AT}$$

where:

- I_s = Intake of contaminant from soil inhalation (mg/kg-day)
- C_s = Chemical concentration in soil (mg/kg)
- IR = Inhalation rate (cubic meters [m³]/day)
- EF = Exposure frequency (days/year)
- ED = Exposure duration (years)
- VF = soil-to-air volatilization factor (m³/kg)
- PEF = particulate emission factor (m³/kg)
- BW = Body weight (kg)
- AT = Averaging time (period over which exposure is averaged) (days)

Soil Dermal Contact

$$D_a = \frac{C_s * CF * SA * AF * ABS * EF * ED}{BW * AT}$$

where:

- D_a = Absorbed dose (mg/kg-day)
- C_s = Chemical concentration in soil (mg/kg)
- CF = Conversion factor (1E-6 kg/mg)
- SA = Skin surface area available for contact (cm²/event)
- AF = Soil to skin adherence factor (mg/cm²)
- ABS = Absorption factor (unitless)
- EF = Exposure frequency (events/year)

- ED = Exposure duration (years)
 BW = Body weight (kg)
 AT = Averaging time (period over which exposure is averaged) (days)

Groundwater Ingestion

A receptor can ingest water by drinking it or through using household water for cooking. An estimate of intake from ingesting water will be calculated as follows (EPA August 1997):

$$I_w = \frac{C_w * IR * EF * ED}{BW * AT}$$

where:

- I_w = Intake of contaminant from water ingestion (mg/kg/day)
 C_w = Chemical concentration in water (mg/liter [L])
 IR = Ingestion rate (L/day)
 EF = Exposure frequency (days/year)
 ED = Exposure duration (years)
 BW = Body weight (kg)
 AT = Averaging time (period over which exposure is averaged) (days)

Groundwater Inhalation

The amount of a constituent taken into the body via exposure to volatilization from showering or other household water uses will be evaluated using the concentration of the constituent in the water source (EPA 1991 and 1992). An estimate of intake from volatile inhalation from groundwater will be calculated as follows (EPA 1991):

$$I_w = \frac{C_w * K * IR_i * EF * ED}{BW * AT}$$

where:

- I_w = Intake of volatile in water from inhalation (mg/kg/day)
 C_w = Chemical concentration in water (mg/L)
 K = volatilization factor (0.5 L/m³)
 IR_i = Inhalation rate (m³/day)
 EF = Exposure frequency (days/year)
 ED = Exposure duration (years)
 BW = Body weight (kg)
 AT = Averaging time (period over which exposure is averaged—days)

For volatile compounds, volatilization from groundwater can be an important exposure pathway from showering and other household uses of groundwater. This exposure pathway will only be evaluated for organic chemicals with a Henry's Law constant greater than 1×10^{-5} and with a molecular weight of 200 grams/mole or less (EPA 1991).

Tables 2 and 3 show the default parameter values suggested for use by SNL/NM at SWMUs, based upon the selected land-use scenarios for nonradiological and radiological COCs,

respectively. References are given at the end of the table indicating the source for the chosen parameter values. SNL/NM uses default values that are consistent with both regulatory guidance and the RME approach. Therefore, the values chosen will, in general, provide a conservative estimate of the actual risk parameter. These parameter values are suggested for use for the various exposure pathways, based upon the assumption that a particular site has no unusual characteristics that contradict the default assumptions. For sites for which the assumptions are not valid, the parameter values will be modified and documented.

Summary

SNL/NM will use the described default exposure routes and parameter values in risk assessments at sites that have an industrial, recreational, or residential future land-use scenario. There are no current residential land-use designations at SNL/NM ER sites, but NMED has requested this scenario to be considered to provide perspective of the risk under the more restrictive land-use scenario. For sites designated as industrial or recreational land use, SNL/NM will provide risk parameter values based upon a residential land-use scenario to indicate the effects of data uncertainty on risk value calculations or in order to potentially mitigate the need for institutional controls or restrictions on SNL/NM ER sites. The parameter values are based upon EPA guidance and supplemented by information from other government sources. If these exposure routes and parameters are acceptable, SNL/NM will use them in risk assessments for all sites where the assumptions are consistent with site-specific conditions. All deviations will be documented.

Table 2
Default Nonradiological Exposure Parameter Values for Various Land-Use scenarios

Parameter	Industrial	Recreational	Residential
General Exposure Parameters			
Exposure Frequency (day/yr)	250 ^{a,b}	8.7 (4 hr/wk for 52 wk/yr) ^{a,b}	350 ^{a,b}
Exposure Duration (yr)	25 ^{a,b,c}	30 ^{a,b,c}	30 ^{a,b,c}
Body Weight (kg)	70 ^{a,b,c}	70 Adult ^{a,b,c} 15 Child ^{a,b,c}	70 Adult ^{a,b,c} 15 Child ^{a,b,c}
Averaging Time (days) for Carcinogenic Compounds (= 70 yr x 365 day/yr)	25,550 ^{a,b}	25,550 ^{a,b}	25,550 ^{a,b}
for Noncarcinogenic Compounds (= ED x 365 day/yr)	9,125 ^{a,b}	10,950 ^{a,b}	10,950 ^{a,b}
Soil Ingestion Pathway			
Ingestion Rate (mg/day)	100 ^{a,b}	200 Child ^{a,b} 100 Adult ^{a,b}	200 Child ^{a,b} 100 Adult ^{a,b}
Inhalation Pathway			
Inhalation Rate (m ³ /day)	20 ^{a,b}	15 Child ^a 30 Adult ^a	10 Child ^a 20 Adult ^a
Volatilization Factor (m ³ /kg)	Chemical Specific	Chemical Specific	Chemical Specific
Particulate Emission Factor (m ³ /kg)	1.36E9 ^a	1.36E9 ^a	1.36E9 ^a
Water Ingestion Pathway			
Ingestion Rate (liter/day)	2.4 ^a	2.4 ^a	2.4 ^a
Dermal Pathway			
Skin Adherence Factor (mg/cm ²)	0.2 ^a	0.2 Child ^a 0.07 Adult ^a	0.2 Child ^a 0.07 Adult ^a
Exposed Surface Area for Soil/Dust (cm ² /day)	3,300 ^a	2,800 Child ^a 5,700 Adult ^a	2,800 Child ^a 5,700 Adult ^a
Skin Adsorption Factor	Chemical Specific	Chemical Specific	Chemical Specific

^aTechnical Background Document for Development of Soil Screening Levels (NMED 2000).

^bRisk Assessment Guidance for Superfund, Vol. 1, Part B (EPA 1991).

^cExposure Factors Handbook (EPA August 1997).

ED = Exposure duration.

EPA = U.S. Environmental Protection Agency.

hr = Hour(s).

kg = Kilogram(s).

m = Meter(s).

mg = Milligram(s).

NA = Not available.

wk = Week(s).

yr = Year(s).

Table 3
Default Radiological Exposure Parameter Values for Various Land-Use scenarios

Parameter	Industrial	Recreational	Residential
General Exposure Parameters			
Exposure Frequency	8 hr/day for 250 day/yr	4 hr/wk for 52 wk/yr.	365 day/yr
Exposure Duration (yr)	25 ^{a,b}	30 ^{a,b}	30 ^{a,b}
Body Weight (kg)	70 Adult ^{a,b}	70 Adult ^{a,b}	70 Adult ^{a,b}
Soil Ingestion Pathway			
Ingestion Rate	100 mg/day ^c	100 mg/day ^c	100 mg/day ^c
Averaging Time (days) (= 30 yr x 365 day/yr)	10,950 ^d	10,950 ^d	10,950 ^d
Inhalation Pathway			
Inhalation Rate (m ³ /yr)	7,300 ^{d,e}	10,950 ^e	7,300 ^{d,e}
Mass Loading for Inhalation g/m ³	1.36 E-5 ^d	1.36 E-5 ^d	1.36 E-5 ^d
Food Ingestion Pathway			
Ingestion Rate, Leafy Vegetables (kg/yr)	NA	NA	16.5 ^c
Ingestion Rate, Fruits, Non-Leafy Vegetables & Grain (kg/yr)	NA	NA	101.8 ^b
Fraction Ingested	NA	NA	0.25 ^{b,d}

^aRisk Assessment Guidance for Superfund, Vol. 1, Part B (EPA 1991).

^bExposure Factors Handbook (EPA August 1997).

^cEPA Region VI guidance (EPA 1996).

^dFor radionuclides, RESRAD (ANL 1993).

^eSNL/NM (February 1998).

EPA = U.S. Environmental Protection Agency.

g = Gram(s)

hr = Hour(s).

kg = Kilogram(s).

m = Meter(s).

mg = Milligram(s).

NA = Not applicable.

wk = Week(s).

yr = Year(s).

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APPENDIX 2 CALCULATION OF THE UPPER CONFIDENCE LIMITS OF MEAN CONCENTRATIONS

For conservatism, Sandia National Laboratories/New Mexico uses the maximum concentration of the constituents of concern (COCs) for initial risk calculation. If the maximum concentrations produce risk above New Mexico Environment Department (NMED) guidelines, conservatism with this approach is evaluated and, if appropriate, a more realistic approach is applied. When the site has been adequately characterized, an estimate of the mean concentration of the COCs is more representative of actual site conditions. The NMED has proposed the use of the 95% upper confidence limit (UCL) of the mean to represent average concentrations at a site (NMED December 2000). The 95% UCL is calculated according to NMED guidance (Tharp June 2002) using the U.S. Environmental Protection Agency ProUCL program (EPA April 2002). Attached are the outputs from that program and the calculated UCLs used in the risk analysis.

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General Statistics

SWMU 96 - HH		
Summary Statistics for		Benzo(a)anthracene
Number of Samples		202
Minimum		0.003
Maximum		7.9
Mean		0.179529703
Median		0.005
Standard Deviation		0.861911509
Variance		0.7428914494
Coefficient of Variation		4.800940985
Skewness		7.406584455
Lilliefors Test Statistic		0.4750494106
Lilliefors 5% Critical Value		0.06233874246
Data not Normal at 5% Significance Level		
Data not Lognormal: Try Non-parametric UCL		
95% UCL (Assuming Normal Data)		
Student's-t		0.2797418671
95% UCL (Adjusted for Skewness)		
Adjusted-CLT		0.3130483519
Modified-t		0.2850090456
95% Non-parametric UCL		
CLT		0.2792800125
Jackknife		0.2797418671
Standard Bootstrap		0.2783407033
Bootstrap-t		0.3710079215
Chebyshev (Mean, Std)		0.4438702568

General Statistics

SWMU 96 - HH		
Summary Statistics for		Benzo(a)pyrene
Number of Samples		202
Minimum		0.001
Maximum		2.73
Mean		0.08718069307
Median		0.005
Standard Deviation		0.253040683
Variance		0.06402958724
Coefficient of Variation		2.902485333
Skewness		6.931213243
Lilliefors Test Statistic		0.4315453581
Lilliefors 5% Critical Value		0.06233874246
Data not Normal at 5% Significance Level		
Data not Lognormal: Try Non-parametric UCL		
95% UCL (Assuming Normal Data)		
Student's-t		0.1166010618
95% UCL (Adjusted for Skewness)		
Adjusted-CLT		0.1257429209
Modified-t		0.1180481567
95% Non-parametric UCL		
CLT		0.1164654702
Jackknife		0.1166010618
Standard Bootstrap		0.1158866596
Bootstrap-t		0.1328643388
Chebyshev (Mean, Std)		0.1647860082

General Statistics

SWMU 96 -HH	
Summary Statistics for	Benzo(b)fluoranthene
Number of Samples	202
Minimum	0.001165
Maximum	12.4
Mean	0.275907401
Median	0.005
Standard Deviation	1.437730678
Variance	2.067069502
Coefficient of Variation	5.210917405
Skewness	7.299413818
Lilliefors Test Statistic	0.4641214945
Lilliefors 5% Critical Value	0.06233874246
Data not Normal at 5% Significance Level	
Data not Lognormal: Try Non-parametric UCL	
97.5% UCL (Assuming Normal Data)	
Student's-t	0.4753751105
97.5% UCL (Adjusted for Skewness)	
Adjusted-CLT	0.5493587241
Modified-t	0.4840340141
97.5% Non-parametric UCL	
CLT	0.4741741774
Jackknife	0.4753751105
Standard Bootstrap	0.4706855874
Bootstrap-t	0.8689700987
Chebyshev (Mean, Std)	0.907641266

General Statistics

SWMU 96 - HH	
Summary Statistics for	Benzo(ghi)perylene
Number of Samples	202
Minimum	0.0025
Maximum	4.24
Mean	0.1107920792
Median	0.005
Standard Deviation	0.4403244946
Variance	0.1938856605
Coefficient of Variation	3.974331899
Skewness	7.474151367
Lilliefors Test Statistic	0.4612349635
Lilliefors 5% Critical Value	0.06233874246
Data not Normal at 5% Significance Level	
Data not Lognormal: Try Non-parametric UCL	
95% UCL (Assuming Normal Data)	
Student's-t	0.1619874398
95% UCL (Adjusted for Skewness)	
Adjusted-CLT	0.1791600896
Modified-t	0.1647028292
95% Non-parametric UCL	
CLT	0.1617514923
Jackknife	0.1619874398
Standard Bootstrap	0.1625032506
Bootstrap-t	0.2141838829
Chebyshev (Mean, Std)	0.245835665

General Statistics

SWMU 96 - HH		
Summary Statistics for		Benzo(k)fluoranthene
Number of Samples		202
Minimum		0.0025
Maximum		3.88
Mean		0.1060668317
Median		0.005
Standard Deviation		0.4246118214
Variance		0.1802951988
Coefficient of Variation		4.003247902
Skewness		7.471631417
Lilliefors Test Statistic		0.4667372199
Lilliefors 5% Critical Value		0.06233874246
Data not Normal at 5% Significance Level		
Data not Lognormal: Try Non-parametric UCL		
95% UCL (Assuming Normal Data)		
Student's-t		0.1554353215
95% UCL (Adjusted for Skewness)		
Adjusted-CLT		0.1719895172
Modified-t		0.1580529312
95% Non-parametric UCL		
CLT		0.1552077936
Jackknife		0.1554353215
Standard Bootstrap		0.1565197434
Bootstrap-t		0.2081095461
Chebyshev (Mean, Std)		0.236291481

General Statistics

SWMU 96 -HH			
Summary Statistics for		Indeno(1,2,3-c,d)pyrene	
Number of Samples			202
Minimum			0.003335
Maximum			3.97
Mean			0.1055206683
Median			0.005
Standard Deviation			0.4211818503
Variance			0.177394151
Coefficient of Variation			3.991463066
Skewness			7.446547207
Lilliefors Test Statistic			0.4614425458
Lilliefors 5% Critical Value			0.06233874246
Data not Normal at 5% Significance Level			
Data not Lognormal: Try Non-parametric UCL			
95 % UCL (Assuming Normal Data)			
Student's-t			0.1544903644
95 % UCL (Adjusted for Skewness)			
Adjusted-CLT			0.1708549516
Modified-t			0.1570781124
95 % Non-parametric UCL			
CLT			0.1542646745
Jackknife			0.1544903644
Standard Bootstrap			0.1537063551
Bootstrap-t			0.1977392884
Chebyshev (Mean, Std)			0.2346933762

General Statistics

SWMU 96 - HH		
Summary Statistics for		Methylene chloride
Number of Samples		223
Minimum		0.000125
Maximum		0.101
Mean		0.004435179372
Median		0.0023
Standard Deviation		0.009640368412
Variance		9.293670312E-005
Coefficient of Variation		2.173614098
Skewness		6.448045699
Lilliefors Test Statistic		0.3274025503
Lilliefors 5% Critical Value		0.05933094837
Data not Normal at 5% Significance Level		
Data not Lognormal: Try Non-parametric UCL		
95% UCL (Assuming Normal Data)		
Student's-t		0.005501491826
95% UCL (Adjusted for Skewness)		
Adjusted-CLT		0.005794892078
Modified-t		0.005547950373
95% Non-parametric UCL		
CLT		0.005497042295
Jackknife		0.005501491826
Standard Bootstrap		0.005491762547
Bootstrap-t		0.006008931667
Chebyshev (Mean, Std)		0.007249139892

General Statistics

SWMU 96 - HH	
Summary Statistics for	Phenanthrene
Number of Samples	202
Minimum	0.002
Maximum	8.01
Mean	0.198060396
Median	0.005
Standard Deviation	0.9031046858
Variance	0.8155980735
Coefficient of Variation	4.559743916
Skewness	7.147562555
Lilliefors Test Statistic	0.4613622546
Lilliefors 5% Critical Value	0.06233874246
Data not Normal at 5% Significance Level	
Data not Lognormal: Try Non-parametric UCL	
95% UCL (Assuming Normal Data)	
Student's-t	0.3030619815
95% UCL (Adjusted for Skewness)	
Adjusted-CLT	0.3367228955
Modified-t	0.3083878868
95% Non-parametric UCL	
CLT	0.3025780536
Jackknife	0.3030619815
Standard Bootstrap	0.3002829264
Bootstrap-t	0.4240467343
Chebyshev (Mean, Std)	0.4750345289

General Statistics

SWMU 96 - HH		
Summary Statistics for		Arsenic
Number of Samples		207
Minimum		0.114
Maximum		7.51
Mean		2.843019
Median		2.86
Standard Deviation		0.984224
Variance		0.968697
Coefficient of Variation		0.34619
Skewness		0.581814
Lilliefors Test Statistic		0.057909
Lilliefors 5% Critical Value		0.061581
Data are Normal at 5% Significance Level		
Recommended UCL to use		Student's-t
95% UCL (Assuming Normal Data)		
Student's-t		2.956049
95% UCL (Adjusted for Skewness)		
Adjusted-CLT		2.958497
Modified-t		2.95651
95% Non-parametric UCL		
CLT		2.955541
Jackknife		2.956049
Standard Bootstrap		2.956554
Bootstrap-t		2.963653
Chebyshev (Mean, Std)		3.141204

General Statistics

SWMU 96 -HH	
Summary Statistics for Barium	
Number of Samples	207
Minimum	46.6
Maximum	509
Mean	148.4855
Median	142
Standard Deviation	67.47874
Variance	4553.381
Coefficient of Variation	0.454447
Skewness	1.50654
Lilliefors Test Statistic	0.110498
Lilliefors 5% Critical Value	0.061581
Data not Normal at 5% Significance Level	
Data not Lognormal: Try Non-parametric UCL	
99% UCL (Assuming Normal Data)	
Student's-t	159.4818
99% UCL (Adjusted for Skewness)	
Adjusted-CLT	160.3641
Modified-t	159.5637
99% Non-parametric UCL	
CLT	159.3963
Jackknife	159.4818
Standard Bootstrap	159.5995
Bootstrap-t	160.6562
Chebyshev (Mean, Std)	195.1514

General Statistics

SWMU 96 -HH	
Summary Statistics for	Cadmium
Number of Samples	227
Minimum	0.004705
Maximum	14
Mean	0.177688
Median	0.023
Standard Deviation	0.945278
Variance	0.893551
Coefficient of Variation	5.319889
Skewness	13.99667
Lilliefors Test Statistic	0.4274
Lilliefors 5% Critical Value	0.058806
Data not Normal at 5% Significance Level	
Data not Lognormal: Try Non-parametric UCL	
95% UCL (Assuming Normal Data)	
Student's-t	0.281311
95% UCL (Adjusted for Skewness)	
Adjusted-CLT	0.343165
Modified-t	0.291025
95% Non-parametric UCL	
CLT	0.280886
Jackknife	0.281311
Standard Bootstrap	0.278353
Bootstrap-t	0.607431
Chebyshev (Mean, Std)	0.451166

General Statistics

SWMU 96 - HH	
Summary Statistics for	Silver
Number of Samples	207
Minimum	0.0155
Maximum	76.4
Mean	1.060801
Median	0.12
Standard Deviation	6.207768
Variance	38.53638
Coefficient of Variation	5.851961
Skewness	9.758751
Lilliefors Test Statistic	0.468614
Lilliefors 5% Critical Value	0.061581
Data not Normal at 5% Significance Level	
Data not Lognormal: Try Non-parametric UCL	
99% UCL (Assuming Normal Data)	
Student's-t	2.072419
99% UCL (Adjusted for Skewness)	
Adjusted-CLT	2.641269
Modified-t	2.121195
99% Non-parametric UCL	
CLT	2.06455
Jackknife	2.072419
Standard Bootstrap	2.06778
Bootstrap-t	4.136535
Chebyshev (Mean, Std)	5.35387

General Statistics

SWMU 96 - HH	
Summary Statistics for	Thallium
Number of Samples	197
Minimum	0.095
Maximum	2.03
Mean	0.491282
Median	0.358
Standard Deviation	0.453826
Variance	0.205958
Coefficient of Variation	0.923759
Skewness	1.203491
Lilliefors Test Statistic	0.230751
Lilliefors 5% Critical Value	0.063125
Data not Normal at 5% Significance Level	
Data not Lognormal: Try Non-parametric UCL	
95% UCL (Assuming Normal Data)	
Student's-t	0.544719
95% UCL (Adjusted for Skewness)	
Adjusted-CLT	0.547428
Modified-t	0.545181
95% Non-parametric UCL	
CLT	0.544466
Jackknife	0.544719
Standard Bootstrap	0.544205
Bootstrap-t	0.551299
Chebyshev (Mean, Std)	0.632221

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General Statistics

SWMU 96 - ECO		
Summary Statistics for		Aroclor 1254
Number of Samples		98
Minimum		0.00025
Maximum		0.164
Mean		0.01356785714
Median		0.01635
Standard Deviation		0.02053264091
Variance		0.0004215893428
Coefficient of Variation		1.51332968
Skewness		4.949501765
Lilliefors Test Statistic		0.3893187154
Lilliefors 5% Critical Value		0.08949951545
Data not Normal at 5% Significance Level		
Data not Lognormal: Try Non-parametric UCL		
95% UCL (Assuming Normal Data)		
Student's-t		0.01701236108
95% UCL (Adjusted for Skewness)		
Adjusted-CLT		0.01808751767
Modified-t		0.017185195
95% Non-parametric UCL		
CLT		0.01697946441
Jackknife		0.01701236108
Standard Bootstrap		0.01690970667
Bootstrap-t		0.01982852137
Chebyshev (Mean, Std)		0.0226086928

General Statistics

SWMU 96 - ECO		
Summary Statistics for		Aroclor 1260
Number of Samples		98
Minimum		0.00075
Maximum		0.196
Mean		0.020915306
Median		0.0164
Standard Deviation		0.033849031
Variance		0.001145757
Coefficient of Variation		1.618385656
Skewness		3.328863823
Lilliefors Test Statistic		0.407280772
Lilliefors 5% Critical Value		0.089499515
Data not Normal at 5% Significance Level		
Data not Lognormal: Try Non-parametric UCL		
95 % UCL (Assuming Normal Data)		
Student's-t		0.026593734
95 % UCL (Adjusted for Skewness)		
Adjusted-CLT		0.027768063
Modified-t		0.026785365
95 % Non-parametric UCL		
CLT		0.026539502
Jackknife		0.026593734
Standard Bootstrap		0.026280798
Bootstrap-t		0.027852692
Chebyshev (Mean, Std)		0.035819552

General Statistics

SWMU 96 -ECO		
Summary Statistics for		Arsenic
Number of Samples		103
Minimum		1.03
Maximum		7.51
Mean		3.167767
Median		3.13
Standard Deviation		1.03408
Variance		1.069321
Coefficient of Variation		0.326438
Skewness		0.717581
Lilliefors Test Statistic		0.053815
Lilliefors 5% Critical Value		0.0873
Data are Normal at 5% Significance Level		
Recommended UCL to use		Student's-t
95 % UCL (Assuming Normal Data)		
Student's-t		3.336899
95 % UCL (Adjusted for Skewness)		
Adjusted-CLT		3.34306
Modified-t		3.338099
95 % Non-parametric UCL		
CLT		3.335363
Jackknife		3.336899
Standard Bootstrap		3.334476
Bootstrap-t		3.341532
Chebyshev (Mean, Std)		3.611899

General Statistics

SWMU 96 -ECO									
Summary Statistics for	Bartum							Summary Statistics for	In(Bartum)
Number of Samples	103							Minimum	3.975936
Minimum	53.3							Maximum	6.232448
Maximum	509							Mean	5.042146
Mean	169.5971							Standard Deviation	0.428494
Median	154							Variance	0.183607
Standard Deviation	76.57083							Lilliefors Test Statistic	0.044304
Variance	5863.092							Lilliefors 5% Critical Value	0.0873
Coefficient of Variation	0.451487							Data are Lognormal at 5% Significance Level	
Skewness	1.467929								
95% UCL (Assuming Normal Data)								Estimates Assuming Lognormal Distribution	
Student's-t	182.1208							MLE Mean	169.686
								MLE Standard Deviation	76.17812
95% UCL (Adjusted for Skewness)								MLE Coefficient of Variation	0.448936
Adjusted-CLT	183.1731							MLE Skewness	1.437287
Modified-t	182.3027							MLE Median	154.8019
								MLE 80% Quantile	222.3435
95% Non-parametric UCL								MLE 90% Quantile	268.4758
CLT	182.0071							MLE 95% Quantile	313.2553
Jackknife	182.1208							MLE 99% Quantile	419.399
Standard Bootstrap	182.0409							MVU Estimate of Median	154.664
Bootstrap-t	183.6751							MVU Estimate of Mean	169.5214
Chebyshev (Mean, Std)	202.4839							MVU Estimate of Std. Dev.	75.8152
								MVU Estimate of SE of Mean	7.452043
								UCL Assuming Lognormal Distribution	
								95% H-UCL	183.0783
								95% Chebyshev (MVUE) UCL	202.0041
								99% Chebyshev (MVUE) UCL	243.6683
								Recommended UCL to use:	
								Student's-t or H-UCL	

General Statistics

SWMU 96 - ECO		
Summary Statistics for		Benzo(a)anthracene
Number of Samples		100
Minimum		0.003
Maximum		7.9
Mean		0.32021
Median		0.082
Standard Deviation		1.206180293
Variance		1.4548709
Coefficient of Variation		3.766841427
Skewness		5.184164659
Lilliefors Test Statistic		0.4677917987
Lilliefors 5% Critical Value		0.0886
Data not Normal at 5% Significance Level		
Data not Lognormal: Try Non-parametric UCL		
97.5% UCL (Assuming Normal Data)		
Student's-t		0.5595422542
97.5% UCL (Adjusted for Skewness)		
Adjusted-CLT		0.6471080053
Modified-t		0.5699639829
97.5% Non-parametric UCL		
CLT		0.5566169931
Jackknife		0.5595422542
Standard Bootstrap		0.5621571763
Bootstrap-t		1.188485051
Chebyshev (Mean, Std)		1.073469352

General Statistics

SWMU 96 -ECO		
Summary Statistics for		Benzo(a)pyrene
Number of Samples		100
Minimum		0.001
Maximum		2.73
Mean		0.133262
Median		0.082
Standard Deviation		0.3343613613
Variance		0.11179752
Coefficient of Variation		2.509052553
Skewness		5.531412479
Lilliefors Test Statistic		0.4391549503
Lilliefors 5% Critical Value		0.0886
Data not Normal at 5% Significance Level		
Data not Lognormal: Try Non-parametric UCL		
95% UCL (Assuming Normal Data)		
Student's-t		0.1887790526
95% UCL (Adjusted for Skewness)		
Adjusted-CLT		0.2080216249
Modified-t		0.191861537
95% Non-parametric UCL		
CLT		0.1882595498
Jackknife		0.1887790526
Standard Bootstrap		0.1895565033
Bootstrap-t		0.237341147
Chebyshev (Mean, Std)		0.2790067385

General Statistics

SWMU 96 - ECO		
Summary Statistics for		Benzo(b)fluoranthene
Number of Samples		100
Minimum		0.001165
Maximum		12.4
Mean		0.51489295
Median		0.082
Standard Deviation		2.017100031
Variance		4.068692535
Coefficient of Variation		3.9175134
Skewness		5.05916639
Lilliefors Test Statistic		0.4555322048
Lilliefors 5% Critical Value		0.0886
Data not Normal at 5% Significance Level		
Data not Lognormal: Try Non-parametric UCL		
99% UCL (Assuming Normal Data)		
Student's-t		0.9918575357
99% UCL (Adjusted for Skewness)		
Adjusted-CLT		1.18524047
Modified-t		1.00886561
99% Non-parametric UCL		
CLT		0.9841405876
Jackknife		0.9918575357
Standard Bootstrap		0.9892517326
Bootstrap-t		2.566059912
Chebyshev (Mean, Std)		2.52188214

General Statistics

SWMU 96 - ECO		
Summary Statistics for		Benzo(ghi)perylene
Number of Samples		100
Minimum		0.0025
Maximum		4.24
Mean		0.18218
Median		0.082
Standard Deviation		0.6080817891
Variance		0.3697634622
Coefficient of Variation		3.337807603
Skewness		5.43140542
Lilliefors Test Statistic		0.4644576428
Lilliefors 5% Critical Value		0.0886
Data not Normal at 5% Significance Level		
Data not Lognormal: Try Non-parametric UCL		
95 % UCL (Assuming Normal Data)		
Student's-t		0.2831453404
95 % UCL (Adjusted for Skewness)		
Adjusted-CLT		0.3174907954
Modified-t		0.288649905
95 % Non-parametric UCL		
CLT		0.2822005537
Jackknife		0.2831453404
Standard Bootstrap		0.2808871683
Bootstrap-t		0.4054084476
Chebyshev (Mean, Std)		0.4472367068

General Statistics

SWMU 96 - ECO	
Summary Statistics for	Benzo(k)fluoranthene
Number of Samples	100
Minimum	0.0025
Maximum	3.88
Mean	0.173465
Median	0.08175
Standard Deviation	0.5859083576
Variance	0.3432886035
Coefficient of Variation	3.377674791
Skewness	5.446282698
Lilliefors Test Statistic	0.4710169085
Lilliefors 5% Critical Value	0.0886
Data not Normal at 5% Significance Level	
Data not Lognormal: Try Non-parametric UCL	
95% UCL (Assuming Normal Data)	
Student's-t	0.2707486843
95% UCL (Adjusted for Skewness)	
Adjusted-CLT	0.303934887
Modified-t	0.2760670552
95% Non-parametric UCL	
CLT	0.2698383488
Jackknife	0.2707486843
Standard Bootstrap	0.2700817139
Bootstrap-t	0.3813608513
Chebyshev (Mean, Std)	0.4288565321

General Statistics

SWMU 96 - ECO	
Summary Statistics for Chromium	
Number of Samples	103
Minimum	2.85
Maximum	80.8
Mean	8.531068
Median	7.6
Standard Deviation	7.849293
Variance	61.6114
Coefficient of Variation	0.920083
Skewness	7.838231
Lilliefors Test Statistic	0.274755
Lilliefors 5% Critical Value	0.0873
Data not Normal at 5% Significance Level	
Data not Lognormal: Try Non-parametric UCL	
99% UCL (Assuming Normal Data)	
Student's-t	10.359
99% UCL (Adjusted for Skewness)	
Adjusted-CLT	11.50741
Modified-t	10.45856
99% Non-parametric UCL	
CLT	10.3303
Jackknife	10.359
Standard Bootstrap	10.29146
Bootstrap-t	12.47529
Chebyshev (Mean, Std)	16.22644

General Statistics

SWMU 96 - ECO	
Summary Statistics for	Chrysene
Number of Samples	100
Minimum	0.003165
Maximum	11.5
Mean	0.444411
Median	0.082
Standard Deviation	1.736813
Variance	3.01652
Coefficient of Variation	3.908124
Skewness	5.145804
Lilliefors Test Statistic	0.452308
Lilliefors 5% Critical Value	0.0886
Data not Normal at 5% Significance Level	
Data not Lognormal: Try Non-parametric UCL	
97.5 % UCL (Assuming Normal Data)	
Student's-t	0.789032
97.5 % UCL (Adjusted for Skewness)	
Adjusted-CLT	0.914156
Modified-t	0.803928
97.5 % Non-parametric UCL	
CLT	0.78482
Jackknife	0.789032
Standard Bootstrap	0.780024
Bootstrap-t	1.354749
Chebyshev (Mean, Std)	1.52905

General Statistics

SWMU 96:	
Summary Statistics for	Ethylhexyl)phthalate, bis(2-
Number of Samples	100
Minimum	0.0035
Maximum	12.8
Mean	0.311189
Median	0.08175
Standard Deviation	1.421963183
Variance	2.021979294
Coefficient of Variation	4.569451951
Skewness	7.535354535
Lilliefors Test Statistic	0.4636079162
Lilliefors 5% Critical Value	0.0886
Data not Normal at 5% Significance Level	
Data not Lognormal: Try Non-parametric UCL	
97.5% UCL (Assuming Normal Data)	
Student's-t	0.5933372459
97.5% UCL (Adjusted for Skewness)	
Adjusted-CLT	0.7449510521
Modified-t	0.6111955738
97.5% Non-parametric UCL	
CLT	0.5898886623
Jackknife	0.5933372459
Standard Bootstrap	0.5785638437
Bootstrap-t	1.484322463
Chebyshev (Mean, Std)	1.199204723

General Statistics

SWMU 96 - ECO	
Summary Statistics for	Fluoranthene
Number of Samples	100
Minimum	0.005
Maximum	14.5
Mean	0.62655
Median	0.082
Standard Deviation	2.337898933
Variance	5.465771423
Coefficient of Variation	3.73138446
Skewness	4.926972446
Lilliefors Test Statistic	0.4227768375
Lilliefors 5% Critical Value	0.0886
Data not Normal at 5% Significance Level	
Data not Lognormal: Try Non-parametric UCL	
99% UCL (Assuming Normal Data)	
Student's-t	1.179370871
99% UCL (Adjusted for Skewness)	
Adjusted-CLT	1.397419004
Modified-t	1.19856881
99% Non-parametric UCL	
CLT	1.170426622
Jackknife	1.179370871
Standard Bootstrap	1.177273919
Bootstrap-t	2.512877712
Chebyshev (Mean, Std)	2.952730068

General Statistics

SWMU 96 - ECO		
Summary Statistics for		Indeno(1,2,3-c,d)pyrene
Number of Samples		100
Minimum		0.003335
Maximum		3.97
Mean		0.17141175
Median		0.082
Standard Deviation		0.5811861309
Variance		0.3377773188
Coefficient of Variation		3.390585131
Skewness		5.430495078
Lilliefors Test Statistic		0.4701157502
Lilliefors 5% Critical Value		0.0886
Data not Normal at 5% Significance Level		
Data not Lognormal: Try Non-parametric UCL		
95% UCL (Assuming Normal Data)		
Student's-t		0.2679113601
95% UCL (Adjusted for Skewness)		
Adjusted-CLT		0.300732051
Modified-t		0.2731715742
95% Non-parametric UCL		
CLT		0.2670083616
Jackknife		0.2679113601
Standard Bootstrap		0.2624999851
Bootstrap-t		0.343290778
Chebyshev (Mean, Std)		0.4247449112

General Statistics

SWMU 96 - ECO			
Summary Statistics for		Lead	
Number of Samples			103
Minimum			2.64
Maximum			97
Mean			10.63039
Median			6.64
Standard Deviation			13.09567
Variance			171.4966
Coefficient of Variation			1.231909
Skewness			4.094586
Lilliefors Test Statistic			0.296472
Lilliefors 5% Critical Value			0.0873
Data not Normal at 5% Significance Level			
Data not Lognormal: Try Non-parametric UCL			
99% UCL (Assuming Normal Data)			
Student's-t			13.68009
99% UCL (Adjusted for Skewness)			
Adjusted-CLT			14.6581
Modified-t			13.76686
99% Non-parametric UCL			
CLT			13.6322
Jackknife			13.68009
Standard Bootstrap			13.58002
Bootstrap-t			15.40455
Chebyshev (Mean, Std)			23.46926

General Statistics

SWMU 96 - ECO	
Summary Statistics for Mercury	
Number of Samples	127
Minimum	0.001125
Maximum	0.254
Mean	0.016715
Median	0.0136
Standard Deviation	0.024435
Variance	0.000597
Coefficient of Variation	1.461863
Skewness	7.443659
Lilliefors Test Statistic	0.261731
Lilliefors 5% Critical Value	0.07862
Data not Normal at 5% Significance Level	
Data not Lognormal: Try Non-parametric UCL	
95% UCL (Assuming Normal Data)	
Student's-t	0.020308
95% UCL (Adjusted for Skewness)	
Adjusted-CLT	0.021812
Modified-t	0.020547
95% Non-parametric UCL	
CLT	0.020282
Jackknife	0.020308
Standard Bootstrap	0.020311
Bootstrap-t	0.023255
Chebyshev (Mean, Std)	0.026166

General Statistics

SWMU 96 - ECO		
Summary Statistics for		Phenanthrene
Number of Samples		100
Minimum		0.002
Maximum		8.01
Mean		0.357642
Median		0.082
Standard Deviation		1.261401778
Variance		1.591134447
Coefficient of Variation		3.52699565
Skewness		4.991626754
Lilliefors Test Statistic		0.436024858
Lilliefors 5% Critical Value		0.0886
Data not Normal at 5% Significance Level		
Data not Lognormal: Try Non-parametric UCL		
97.5% UCL (Assuming Normal Data)		
Student's-t		0.607931391
97.5% UCL (Adjusted for Skewness)		
Adjusted-CLT		0.695991421
Modified-t		0.6184254691
97.5% Non-parametric UCL		
CLT		0.6048722053
Jackknife		0.607931391
Standard Bootstrap		0.6094345096
Bootstrap-t		1.058237993
Chebyshev (Mean, Std)		1.145387158

General Statistics

SWMU 96 - ECO	
Summary Statistics for	Pyrene
Number of Samples	100
Minimum	0.004335
Maximum	18.8
Mean	0.749687
Median	0.082
Standard Deviation	2.982045
Variance	8.892591
Coefficient of Variation	3.977721
Skewness	5.086417
Lilliefors Test Statistic	0.437629
Lilliefors 5% Critical Value	0.0886
Data not Normal at 5% Significance Level	
Data not Lognormal: Try Non-parametric UCL	
99% UCL (Assuming Normal Data)	
Student's-t	1.454823
99% UCL (Adjusted for Skewness)	
Adjusted-CLT	1.742318
Modified-t	1.480103
99% Non-parametric UCL	
CLT	1.443414
Jackknife	1.454823
Standard Bootstrap	1.43919
Bootstrap-t	3.66516
Chebyshev (Mean, Std)	3.716784

General Statistics

SWMU 96 - ECO	
Summary Statistics for	Silver
Number of Samples	103
Minimum	0.0155
Maximum	76.4
Mean	1.988001
Median	0.122
Standard Deviation	8.712738
Variance	75.91179
Coefficient of Variation	4.382662
Skewness	6.87356
Lilliefors Test Statistic	0.46292
Lilliefors 5% Critical Value	0.0873
Data not Normal at 5% Significance Level	
Data not Lognormal: Try Non-parametric UCL	
99% UCL (Assuming Normal Data)	
Student's-t	4.017015
99% UCL (Adjusted for Skewness)	
Adjusted-CLT	5.13094
Modified-t	4.11392
99% Non-parametric UCL	
CLT	3.985151
Jackknife	4.017015
Standard Bootstrap	4.010786
Bootstrap-t	7.862733
Chebyshev (Mean, Std)	10.52988

General Statistics

SWMU 96 - ECO		
Summary Statistics for		Thallium
Number of Samples		95
Minimum		0.095
Maximum		1.64
Mean		0.446868
Median		0.273
Standard Deviation		0.424529
Variance		0.180225
Coefficient of Variation		0.950009
Skewness		1.185191
Lilliefors Test Statistic		0.228022
Lilliefors 5% Critical Value		0.090902
Data not Normal at 5% Significance Level		
Data not Lognormal: Try Non-parametric UCL		
95% UCL (Assuming Normal Data)		
Student's-t		0.519224
95% UCL (Adjusted for Skewness)		
Adjusted-CLT		0.52417
Modified-t		0.520107
95% Non-parametric UCL		
CLT		0.518511
Jackknife		0.519224
Standard Bootstrap		0.519463
Bootstrap-t		0.527473
Chebyshev (Mean, Std)		0.636723

SWMU 96 - ECO	
Summary Statistics for	Vanadium
Number of Samples	95
Minimum	10.6
Maximum	50.2
Mean	24.79789
Median	22.9
Standard Deviation	7.563096
Variance	57.20042
Coefficient of Variation	0.304989
Skewness	1.139172
95% UCL (Assuming Normal Data)	26.08693
Student's-t	26.08693
Adjusted-CLT	26.17114
Modified-t	26.10205
95% Non-parametric UCL	26.07423
CLT	26.08693
Jackknife	26.06113
Standard Bootstrap	26.15338
Bootstrap-t	28.18021
Chebyshev (Mean, Std)	
Summary Statistics for	In(Vanadium)
Minimum	2.360854
Maximum	3.916015
Mean	3.16884
Standard Deviation	0.287228
Variance	0.0825
Lilliefors Test Statistic	0.069724
Lilliefors 5% Critical Value	0.090902
Data are Lognormal at 5% Significance Level	
Estimates Assuming Lognormal Distribution	
MLE Mean	24.78131
MLE Standard Deviation	7.267249
MLE Coefficient of Variation	0.293255
MLE Skewness	0.904985
MLE Median	23.77987
MLE 80% Quantile	30.31211
MLE 90% Quantile	34.39557
MLE 95% Quantile	38.14253
MLE 99% Quantile	46.38296
MVU Estimate of Median	23.76955
MVU Estimate of Mean	24.77012
MVU Estimate of Std. Dev.	7.251125
MVU Estimate of SE of Mean	0.743575
UCL Assuming Lognormal Distribution	
95% H-UCL	26.08449
95% Chebyshev (MVUE) UCL	28.01129
99% Chebyshev (MVUE) UCL	32.1686
Recommended UCL to use:	
Student's-t or H-UCL	

General Statistics

SWMU 96 - ECO	
Summary Statistics for	Zinc
Number of Samples	95
Minimum	10.7
Maximum	168
Mean	35.40211
Median	30
Standard Deviation	25.5657
Variance	653.6051
Coefficient of Variation	0.722152
Skewness	3.011483
Lilliefors Test Statistic	0.266639
Lilliefors 5% Critical Value	0.090902
Data not Normal at 5% Significance Level	
Data not Lognormal: Try Non-parametric UCL	
99 % UCL (Assuming Normal Data)	
Student's-t	41.60986
99 % UCL (Adjusted for Skewness)	
Adjusted-CLT	43.10114
Modified-t	41.74493
99 % Non-parametric UCL	
CLT	41.50408
Jackknife	41.60986
Standard Bootstrap	41.43427
Bootstrap-t	44.66349
Chebyshev (Mean, Std)	61.50048

Addendum D

ADDENDUM D

**FIELD REPORT FOR SUPPLEMENTAL INVESTIGATIONS AT SOLID WASTE
MANAGEMENT UNITS 96, 187, AND 226 COMPLETED JUNE 2002
(SNL/NM APRIL 2003)**

ACRONYMS AND ABBREVIATIONS

ADS	activity data sheet
ARCOG	Analysis Request and Chain of Custody
bgs	below ground surface
BH	borehole
BSI	background soils investigation
CEARP	Comprehensive Environmental Assessment and Response Program
COC	constituent of concern
CVR	Contract Verification Review (form)
DOE	U. S. Department of Energy
DQO	data quality objective
EB	equipment rinsate blank
EGIS	Environmental Geographic Information System
EPA	U. S. Environmental Protection Agency
ER	environmental restoration
FB	field blank
FOP	field operating procedure
g	gram
GP	Geoprobe™
GPS	global positioning system
³ H	tritium
HWB	Hazardous Waste Bureau
ISS	Integrated Safety and Security (Records Center)
KAFB	Kirtland Air Force Base
L _c	critical level
MDA	minimum detectable activity
MDL	method detection limit
NFA	no further action
NMED	New Mexico Environment Department
PCB	polychlorinated biphenyl
PGS	plutonium grid sample
Pu	plutonium
QA	quality assurance
QC	quality control
RCRA	Resource Conservation and Recovery Act
RL	reporting limit
RSI	Request for Supplemental Information
SAP	sampling and analysis plan
SD	sediment
SMO	sample management office
SNL/NM	Sandia National Laboratories, New Mexico
SVOC	semi-volatile organic compound
SWMU	solid waste management unit
TA	Technical Area
TAL	Target Analyte List (metals)
TB	trip blank
U	uranium
VOC	volatile organic compound

chemicals, to have been disposed in sewer drains. SWMU 187 is limited in extent to the soils adjacent to the sanitary sewer lines where there have been pipe breaks, cracks, or loose joints where contaminants could have been released. Wastewater or solid materials carried by the system are not included in SWMU 187.

The acid waste line is a buried, vitrified clay pipe running from TA-I south to a surface discharge point just southwest of TA-IV. The line is a relic structure from the 1950s that used to carry liquid wastes from buildings in TA-I to a discharge point on the edge of the mesa above Tijeras Arroyo. The use of the line was discontinued in the mid- to late-1960's. Sometime after discontinuance the northern portions of the line were isolated and incorporated into the sanitary sewer system. The remaining portions of the line were abandoned in place. The acid waste line was designated SWMU 226 after the CEARP Phase 1 interviews. North of I Street (in the center of TA-I), SWMU 226 is limited to soils adjacent to the pipeline, particularly those areas where pipe breaks, cracks, or loose joints exist. From I Street south to the pipeline outfall (SWMU 46), SWMU 226 includes all the abandoned line, sediments within the pipe, and soil near the abandoned line where the potential COCs have been detected. Soils at the discharge point are not part of SWMU 226 but rather are designated and being investigated as SWMU 46.

The U.S. Department of Energy (DOE) and SNL/NM submitted a work plan to the NMED in February 1995 (SNL/NM February 1995) detailing the programs and plans for investigating these SWMUs as well as all other designated SWMUs in TA-I. SNL/NM Facilities Departments had been, and continue to be, involved with infrastructure upgrades and new construction within TA-I, including removal, repair, and/or replacement of sewer and drain lines. Working from video camera surveys of the underground line interiors obtained by SNL/NM Facilities, SNL/NM ER located significant breaks and cracks in the lines and developed a sampling and analysis program to characterize any contaminants that may have been released. A conceptual model was developed and samples were collected adjacent to the pipe deficiencies and at or below the pipe depth. The sampling strategy, approved by NMED prior to implementation, assumed that any materials escaping the pipe from breaks or cracks would spread downward and outward and be detectable in a conical plume beneath and adjacent to the pipe. Samples were collected using either a bucket-type soil hand-auger or a hydraulically powered Geoprobe™ push-type sampler.

Investigatory sampling and analysis were completed at the SWMUs during the spring and summer of 1995. Samples from all three SWMUs were collected using similar strategies, procedures, and analyzed for the same list of parameters (volatile organic compounds [VOCs], semi-volatile organic compounds [SVOCs], polychlorinated biphenyls [PCBs], the Environmental Protection Agency's [EPA] Target Analyte List [TAL] metals, gamma-emitting radionuclides, isotopic uranium [U] and plutonium [Pu], and tritium [³H]). Field quality control samples were also collected in accordance with the TA-I work plan (SNL/NM February 1995). In summary the 1995 sampling event consisted of:

- Fifty-five subsurface soil samples were collected adjacent to the underground storm-drain pipes in SWMU 96. Additionally, 29 sediment samples were collected from surfaces at two storm-drain inlets and five storm-drain outfall areas. These locations were where the storm drain system transitioned from open ditch to underground pipe, and vice-versa.
- Eighty-six subsurface soil samples were collected in SWMU 187.

number of samples agreed upon in the September 2001 meeting. NMED's 1998 technical comments had requested re-sampling at 134 locations in the three SWMUs, and NMED had agreed to sample 54 locations in the September 2001 meeting. NMED's new requirements included: 1) re-sampling and additional offset sampling at specified locations for specific constituents, and 2) systematic grid sampling for plutonium in surface soils in TA-I. These new NMED requirements for additional site characterization sampling in TA-I lead to the current DQOs and development of the SAP (SNL/NM December 2001).

1.2 Supplemental Investigation Objective

The NMED required additional site characterization prior to accepting SWMUs 96, 187, and 226 for NFA status. The objective of the supplemental investigation was to collect and provide the requested additional information detailed in the September 21, 2001 meeting with SNL/NM ER and NMED (Lyon September 2001).

The SAP (SNL/NM December 2001) provided details for the specific requirements to be followed for collecting and analyzing the additional soil samples. COCs included VOCs, SVOCs, PCBs, metals, Pu, and ^3H . The sampling and analysis activities were designed to meet the following objectives:

- Resample those locations specified by NMED where analytical results showed VOCs or SVOCs at levels of concern. In most instances a level of concern was prompted by unusually high laboratory reporting limits or method detection limits.
- Collect and analyze additional soil samples offset from the original sampling locations. Offset samples were collected to document the COC source.
- Complete a systematic surface soil survey of plutonium concentrations in TA-I. This survey was to aid in interpreting the original plutonium concentration data.

2.0 DATA QUALITY OBJECTIVES

As described in the SAP, additional sampling and analysis was conducted at SWMUs 96, 187, and 226 to provide the supplemental information requested by NMED/HWB and bolster the SNL/NM proposals for NFA. The additional site characterization data has increased our knowledge of the SWMUs and has better defined the nature, extent, and source of any suspected contamination. Sample analysis data collected during this investigation had sufficiently low detection levels and is of sufficient quality (e.g., free of inadvertent laboratory contamination or other field or laboratory quality control errors) for use in justifying an NFA Proposal.

The supplemental investigations were limited in scope to SWMUs 96, 187, and 226 as delineated in the TA-I (ADS 1302) RCRA Facility Investigation Work Plan (SNL/NM February 1995). In general terms, the project scope was limited to those soils adjacent to significant cracks and breaks in the storm drain pipes, the sanitary sewer, and the acid waste line, principally in TA-I. Soils at the outlets of the storm drainpipe are also included in this project scope. Additionally, at the request of NMED, a surface soil survey of plutonium radioactivity

within the sanitary or storm drains. Contaminants may have migrated from significant cracks or breaks in the underground piping downward and outward at 45-degree angles from the pipe deficiencies. Contaminants would not be expected in the soils above the flow line of the deficiencies in the underground pipe. Earlier investigations utilized field screening tests to guide sampling depths for characterizing possible contaminant releases from cracks or breaks in the underground piping. Samples were collected within 18-inches lateral to, and at or below significant pipe breaks or cracks. If field-screening methods indicated any contamination then samples were collected from deeper zones in order to characterize the vertical extent of contamination. Additionally, where pipe breaks or cracks were found to be "clustered," instead of sampling adjacent to all the observed pipe faults only the downstream or largest breach was sampled in order to obtain data for the local "worst case" scenario.

The sampling strategies for this investigation addressed the NMED requirements so as to provide the requested information in further support of the NFA recommendations. Sample locations were selected by the NMED and presented to SNL/NM ER Project during a September 21, 2001 meeting (Lyon September 2001). During the 2002 sampling, selected locations determined by the 1995 investigation with detections of organic compounds were resampled at the original (1995) sampling location and depth and were analyzed for organic compounds, only. At many of the VOC locations concern was prompted by unusually high laboratory reporting limits or method detection limits. Offset samples were located at 20- to 40-foot away from the original (1995) sampling points, perpendicular to the underground pipe axis, and at the same depth as the original (1995) sample and analyzed for location-specific COCs. In summary, when the COCs included organic compounds there were three samples collected: 1) a resample of the original (1995) soil boring, 2) an offset sample located to one side of the original location, and 3) an offset sample located to the opposite side of the original location. When metals or radionuclides were the COC of interest then only two offset samples (on opposite sides of the original sample location) were collected. Offset samples were collected from the same depths as the original (1995) samples.

In some instances the offset samples could not be located at 20-feet from the original sample point because of aboveground or underground obstructions. In most of these instances the sampling location was moved along the same perpendicular line at a distance of 9 to 37 ft. from the original (1995) sample point. For several locations, NMED/HWB personnel inspected the location and selected an appropriate offset sampling point.

The plutonium survey sampling was designed to determine the statistical significance of plutonium concentrations in surface soil in the main portion of TA-I. First, a regular grid was constructed over a map of TA-I. The portion of TA-I to be covered by the grid was mutually agreed upon by SNL ER and NMED/HWB. The grid consisted of 36 rectangles. TA-I surface soils have been highly disturbed by construction activities, i.e. the ground is nearly covered with buildings, roads, walkways, parking lots, etc. Therefore, individual sampling points within each grid element were located by the field team using professional judgment and approved by the NMED/HWB. Sampling points were selected from areas where surface soils are present and preference was given to locations appearing to be natural or less disturbed than others.

The majority of the sampling was performed in May and June of 2002 (SNL/NM June 2002). However, four SWMU 96 locations were sampled in January 2002 due to storm-water drain improvements that impacted the sampling locations. Sampling methods used included both manual and machine-power assisted methods. Surface and near sub-surface soils were manually sampled using a scoop or spade, or a bucket-type hand auger. Subsurface soils were collected using the Geoprobe™ push-tool technology.

The Analysis Request and Chain of Custody form (ARCOG) is controlled by the SMO. Sampling team members entered sample description information on the ARCOG form immediately after collection and established the documented chain of custody. The unique control number for the ARCOG was obtained from the SMO and entered on the ARCOG. Upon completion of the ARCOG, the samples were transported to the SMO Shipping Facility in Building 928. The ARCOG was checked at the shipping facility for accuracy and completeness. A member of the sampling team relinquished custody of the samples to the Shipping Facility manager when they signed and dated the ARCOG. The AR/COC numbers used for the supplemental investigation are listed in Table 1, along with the other sampling summary information. The details for the resamples and offset samples from SWMU 96, 187, and 226 are provided in Table 2; and the details for the plutonium grid samples are provided in Table 3.

In summary, Tables 1 through 3 show that 22 locations were sampled in SWMU 96 (Figure 1); 21 locations were sampled in SWMU 187 (Figure 2); and 8 locations were sampled in SWMU 226 (Figure 2). Additionally, 33 locations were sampled as part of the plutonium grid survey (Figure 3).

Two types of field measurements were made--sample location survey and field sample screening. A location survey was required to:

- Navigate to previously sampled locations for re-sampling,
- Document and record new sampling locations, and
- Establish the surface soil grid for the plutonium survey in TA-I.

Navigation to previously sampled points was accomplished with support from Environmental Geographic Information System (EGIS). EGIS retrieved New Mexico State Plane coordinates for previously sampled locations from the EGIS database. The previously sampled coordinate locations were electronically loaded into the EGIS Global Positioning System (GPS). Sample locations were marked for reference with stakes, pin flags, nails, or paint.

All new sample locations (including samples collected from the plutonium survey grid) were surveyed using the EGIS GPS. As the sampling crew moved from location to location, the EGIS personnel followed them to new sampling locations with the GPS and took readings to obtain the coordinates. These locations were converted to New Mexico State Plane coordinates and downloaded to the EGIS database and are presented in Tables 2 and 3.

Field screening measurements were collected at each soil boring location in accordance with the TA-I Site Health and Safety Plan to monitor for worker health and safety. A photoionization detector was used to monitor VOCs in and around the boreholes, in soil retrieved by the sampling device, and in the workers' breathing zones. Ambient air background measurements, periodic measurements of soil vapors, and breathing zone air measurements were recorded on field forms or in field logbooks. Although VOCs were monitored, none were detected (SNL/NM June 2002).

Sampling equipment was decontaminated before use and between sampling locations. Equipment decontamination generally involved dry brushing to remove soil and debris, a wet wash with detergent solution, wet rinses with deionized water, followed by air-drying. Equipment decontamination followed the field operating procedure, "General Equipment Decontamination," FOP 94-26, and "Decontaminating Drilling and other Field Equipment," FOP 94-57. Disposable

In summary, the sampling and analysis procedures outlined in the NMED-approved SAP (SNL/NM December 2001; NMED February 2002) were followed during the field implementation. The quality of the data generated by the sampling event is sufficient to meet the DQOs identified in the SAP. Analytical data will be posted in summary tables for presentation and transmittal to NMED as a response to their Technical Comments on the SWMU 96, 187, and 226 NFA Proposal (NMED March 1998). Data will be reported in table formats following reporting conventions developed by the ER Project.

5.0 REFERENCES

DOE, see U. S. Department of Energy

EPA, see U. S. Environmental Protection Agency

Fleck, H., March 3, 1999. Meeting Notes in Memorandum to B. Langkopf, March 3, 1999, Sandia National Laboratories, Albuquerque, New Mexico.

Lyon, M., September 21, 2001. Meeting Notes in Memorandum to B. Langkopf, September 21, 2001, Sandia National Laboratories/New Mexico, Albuquerque, New Mexico.

NMED, see New Mexico Environment Department

New Mexico Environment Department (NMED), March 1998. NMED Technical Comments: SNL SWMUs 96, 187, 226, Proposals for NFA, 7th Round, May 1997." Letter from Robert S. Dinwiddie, NMED to Michael Zamorski, U. S. Department of Energy Albuquerque Operations Office, dated March 17, 1998, Santa Fe, New Mexico.

New Mexico Environment Department (NMED), February 2002. NMED Approval of SNL/NM's Sampling and Analysis Plan for Supplemental Investigations at Solid Waste Management Units 96, 187, and 226. Letter from William P. Moats, NMED to Michael Zamorski, U.S. Department of Energy Albuquerque Operations Office, and Peter Davies, Sandia National Laboratories, Santa Fe, New Mexico. February 7, 2002.

SNL/NM, see Sandia National Laboratories/New Mexico

Sandia National Laboratories/New Mexico (SNL/NM), February 1995. "Technical Area I (ADS 1302), RCRA Facility Investigation Work Plan, Volumes 1 and 2." U.S. Department of Energy, Albuquerque Operations Office and Sandia National Laboratories, Environmental Restoration Project, Albuquerque, New Mexico.

Sandia National Laboratories/New Mexico (SNL/NM), May 1997a. "Proposal for Risk-Based No Further Action Environmental Restoration Site 96, Storm Drain System, Operable Unit 1302." Environmental Restoration Project, Sandia National Laboratories, New Mexico.

Sandia National Laboratories/New Mexico (SNL/NM), May 1997b. "Proposal for Risk-Based No Further Action Environmental Restoration Site 187, Sanitary Sewer System, Operable Unit 1302." Environmental Restoration Project, Sandia National Laboratories, New Mexico.

Table 1 May – June 2002 Supplemental Investigation Sampling Summary

ARCO Number	SWMU	Ship Date	Number of Samples	Analytes
605198	96	10-JAN-02	2	Iso-Pu
			4	RCRA Metals
			1	RCRA Metals (dup)
			1	RCRA Metals (EB)
			3	SVOCs
			1	SVOCs (EB)
605533	96	23-May-02	6	Iso-Pu
			1	Iso-Pu (dup)
			3	PCBs
			1	PCBs (EB)
			4	RCRA Metals
			1	RCRA Metals (dup)
			1	RCRA Metals (EB)
			6	VOCs
			1	VOCs (dup)
			1	VOCs (TB)
			1	VOCs (EB)
605534	187	30-MAY-02	4	Iso-Pu
			1	Iso-Pu (dup)
			2	RCRA Metals+Ni
			1	RCRA Metals (EB)
			3	SVOCs
			1	SVOCs (EB)
			4	Tritium
			3	VOCs
			1	VOCs (TB)
			1	VOCs (FB)
605535	187	13-JUN-02	1	Iso-Pu
			7	Tritium
			3	VOCs
			1	VOCs (dup)
			1	VOCs (TB)
			1	VOCs (EB)
605536	226	12-JUN-02	4	Iso-Pu
			4	SVOCs
			1	SVOCs (EB)
			3	VOCs
			1	VOCs (TB)
			1	VOCs (FB)
605537	Plutonium Grid Samples	19-JUN-02	33	Iso-Pu
			2	Iso-Pu (dup)

Notes:

All Samples sent to General Engineering Laboratories (GEL), Charleston SC.

- ARCO = Analysis Request and Chain of Custody.
- dup = Duplicate sample.
- EB = Equipment blank.
- FB = Field blank.
- Iso-Pu = Isotopic plutonium.
- PCBs = Polychlorinated biphenyls.
- RCRA = Resource Conservation and Recovery Act.
- SVOCs = Semivolatile organic compounds.
- TB = Trip blank.
- VOCs = Volatile organic compounds.

Table 2. SWMU 96, 187, and 226 Resampling and Offset Samples for Off-Site Laboratory Analyses (Continued)

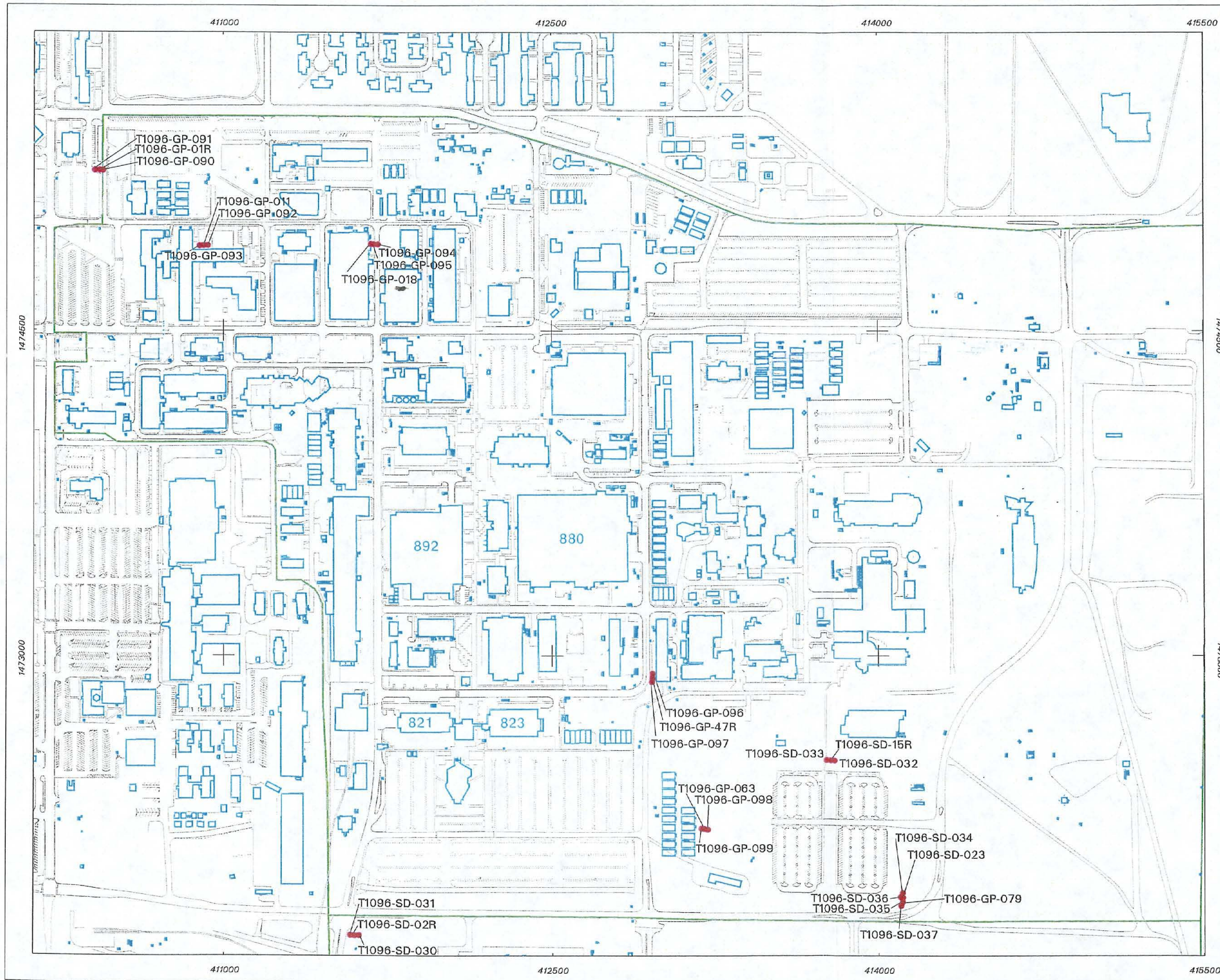
AR-COC/ SMO Sample Number	Previous Sample ID (or associated sample)	ER Sample ID	Remarks ^b	Sample Type	Sample Depth ^a (ft)	Northing	Easting	VOC (8260B)	SVOC (8270C)	PCB (8082)	RCRA Metals	Isotopic Plutonium	Tritium
605198/ 058574	T1096-GP-063	T1096-GP-098	Offset 16 ft east of original point	Soil	10	1472201.38	413210.75				X		
605198/ 058575	T1096-GP-063	T1096-GP-099	Offset 12 ft west of original point	Soil	10	1472205.63	413182.72				X		
	T1096-GP-079		Original Point			1471872.63	414099.72						
605198/ 058581	T1096-GP-079	T1096-SD-036	Offset 20 ft north of original point	Sediment	0	1471893.00	414099.72					X	
605198/ 058582	T1096-GP-079	T1096-SD-037	Offset 20 ft south of original point	Sediment	0	1471852.63	414101.63					X	
605198/ 058585		T1096-EB	Equipment Blank	EB	NA	NA	NA				X		
605198/ 058586		T1096-EB	Equipment Blank	EB	NA	NA	NA		X				
	T1187-BH-032		Original Point			1475152.13	411222.56						
605534/ 059247	T1187-BH-032	T1187-BH-088	Offset 26 ft east of original point	Soil	7	1475154.00	411248.94					X	
605534/ 059248	T1187-BH-032	T1187-BH-089	Offset 29 ft west of original point	Soil	7	1475152.38	411195.00					X	
605534/ 059248	T1187-BH-032	T1187-BH-089	Offset 29 ft west of original point	Duplicate	7	1475152.38	411195.00					X	
	T1187-BH-034		Original Point			1475132.13	410924.38						
605534/ 059249	T1187-BH-034	T1187-BH-090	Offset 20 ft southeast of original	Soil	4	1475120.25	410937.13						X
605534/ 059250	T1187-BH-034	T1187-BH-091	Offset 20 ft northwest of original	Soil	4	1475149.13	410912.72						X
	T1187-BH-044		Original Point			1474515.75	411102.88						
605534/ 059251	T1187-BH-044	T1187-BH-092	Offset 20 ft north of original point	Soil	7	1474535.88	411103.28					X	
605534/ 059252	T1187-BH-044	T1187-BH-093	Offset 24.5 ft south of original	Soil	7	1474490.63	411102.84					X	
	T1187-BH-049		Original Point			1474012.38	410579.94						
605535/ 059267	T1187-BH-049	T1187-BH-094	Offset 25 ft north of original point	Soil	7	1474037.50	410579.97					X	X
	T1187-BH-049	T1187-BH-095	2 nd Offset Sample Not Collected; Location on KAFB Property										
605534/ 059255	T1187-BH-056	T1187-BH-56R	Resampled original point	Soil	9	1473478.50	411753.47		X				
605534/ 059256	T1187-BH-056	T1187-BH-096	Offset 11 ft east of original point	Soil	9	1473478.38	411763.81		X				
605534/ 059257	T1187-BH-056	T1187-BH-097	Offset 20 ft west of original point	Soil	9	1473475.75	411733.09		X				
605534/ 059258	T1187-BH-060	T1187-BH-60R	Resampled original point	Soil	5	1472935.88	411887.94	X					
605534/ 059259	T1187-BH-060	T1187-BH-098	Offset 9.8 ft north of original point	Soil	5	1472946.63	411887.88	X					X
605534/ 059260	T1187-BH-060	T1187-BH-099	Offset 20 ft south of original point	Soil	5	1472915.38	411886.75	X					X
	T1187-BH-061		Original Point			1473573.00	411388.47						
605534/ 059261	T1187-BH-061	T1187-BH-100	21 ft east of original point	Soil	8	1473573.00	411408.84				X		
605534/ 059262	T1187-BH-061	T1187-BH-101	Offset 20 ft west of original point	Soil	8	1473573.00	411369.28				X		
605534/ 059263		T1187-BH-00-TB	Trip Blank	TB	NA	NA	NA	X					
605534/ 059264		T1187-BH-00-FB	Field Blank	FB	NA	NA	NA	X					

Refer to footnotes at end of table.

Table 3. SWMU 96, 187, and 226 Plutonium Grid Samples for Off-Site Laboratory Analyses

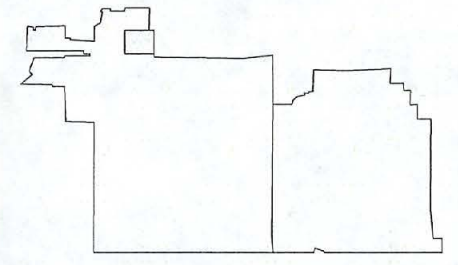
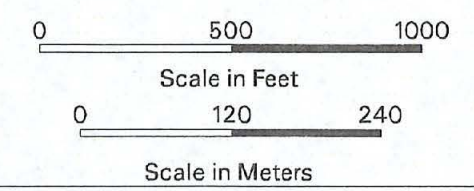
AR-COC/ SMO Sample Number	ER Sample ID	Sample Type	Sample Depth ^a (ft)	Northing	Easting	VOC (8260B)	SVOC (8270C)	PCB (8082)	RCRA Metals	Isotopic Plutonium	Tritium
605537/ 059448	T1BSI-PGS-001	Surface Soil	0	410566.28	1475072.50					X	
605537/ 059449	T1BSI-PGS-002	Surface Soil	0	411315.81	1475167.13					X	
605537/ 059450	T1BSI-PGS-003	Surface Soil	0	412097.94	1474985.75					X	
605537/ 059451	T1BSI-PGS-004	Surface Soil	0	412869.28	1474931.25					X	
605537/ 059452	T1BSI-PGS-005	Surface Soil	0	413624.88	1475043.88					X	
605537/ 059453	T1BSI-PGS-006	Surface Soil	0	414358.72	1475123.25					X	
605537/ 059454	T1BSI-PGS-007	Surface Soil	0	414426.75	1474443.50					X	
605537/ 059455	T1BSI-PGS-008	Surface Soil	0	413641.44	1474450.50					X	
605537/ 059456	T1BSI-PGS-009	Surface Soil	0	412830.53	1474432.75					X	
605537/ 059457	T1BSI-PGS-010	Surface Soil	0	412129.16	1474466.13					X	
605537/ 059458	T1BSI-PGS-011	Surface Soil	0	411346.81	1474478.50					X	
605537/ 059459	T1BSI-PGS-012	Surface Soil	0	410582.59	1474470.75					X	
605537/ 059460	T1BSI-PGS-013	Surface Soil	0	410721.72	1473936.38					X	
605537/ 059461	T1BSI-PGS-014	Surface Soil	0	411312.31	1473840.88					X	
605537/ 059462	T1BSI-PGS-015	Surface Soil	0	412127.88	1473887.88					X	
605537/ 059463	T1BSI-PGS-016	Surface Soil	0	412830.63	1473840.38					X	
605537/ 059464	T1BSI-PGS-017	Surface Soil	0	413601.41	1473783.75					X	
605537/ 059465	T1BSI-PGS-018	Surface Soil	0	414386.78	1473844.38					X	
605537/ 059466	T1BSI-PGS-019	Surface Soil	0	414333.19	1473152.88					X	
605537/ 059467	T1BSI-PGS-020	Surface Soil	0	413539.53	1473257.00					X	
605537/ 059468	T1BSI-PGS-021	Surface Soil	0	412885.78	1473282.63					X	
605537/ 059469	T1BSI-PGS-022	Surface Soil	0	412141.56	1473332.13					X	
605537/ 059470	T1BSI-PGS-023	Surface Soil	0	411330.22	1473359.13					X	
605537/ 059471	T1BSI-PGS-024	Surface Soil	0	412138.25	1471907.13					X	

Refer to footnotes at end of table.



Legend

- Geoprobe™ and Sediment Sample Location
 - GP = Geoprobe™
 - SD = Sediment
 - R = Resampled
- Road / Parking
- Technical Area I Boundary
- ▭ Building / Structure

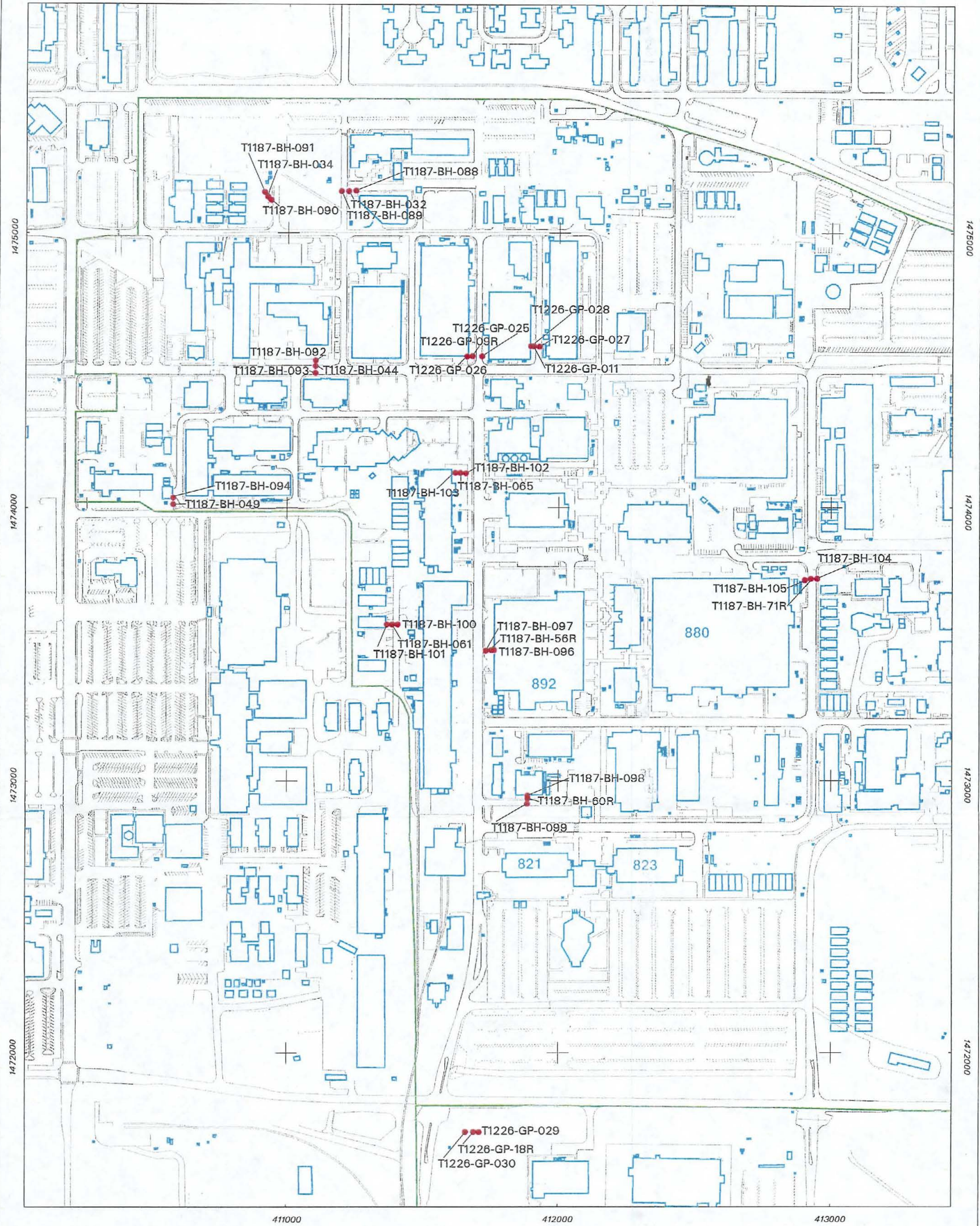


Sandia National Laboratories, New Mexico
Environmental Geographic Information System

Figure 1
Original, Resampled, and
Offset Sample Locations
SWMU 96
January and May, 2002
Transverse Mercator Projection, New Mexico State Plane Coordinate System,
Central Zone, 1927 North American Horizontal Datum,
1928 North American Vertical Datum



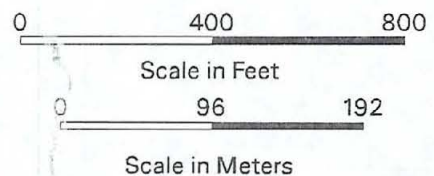
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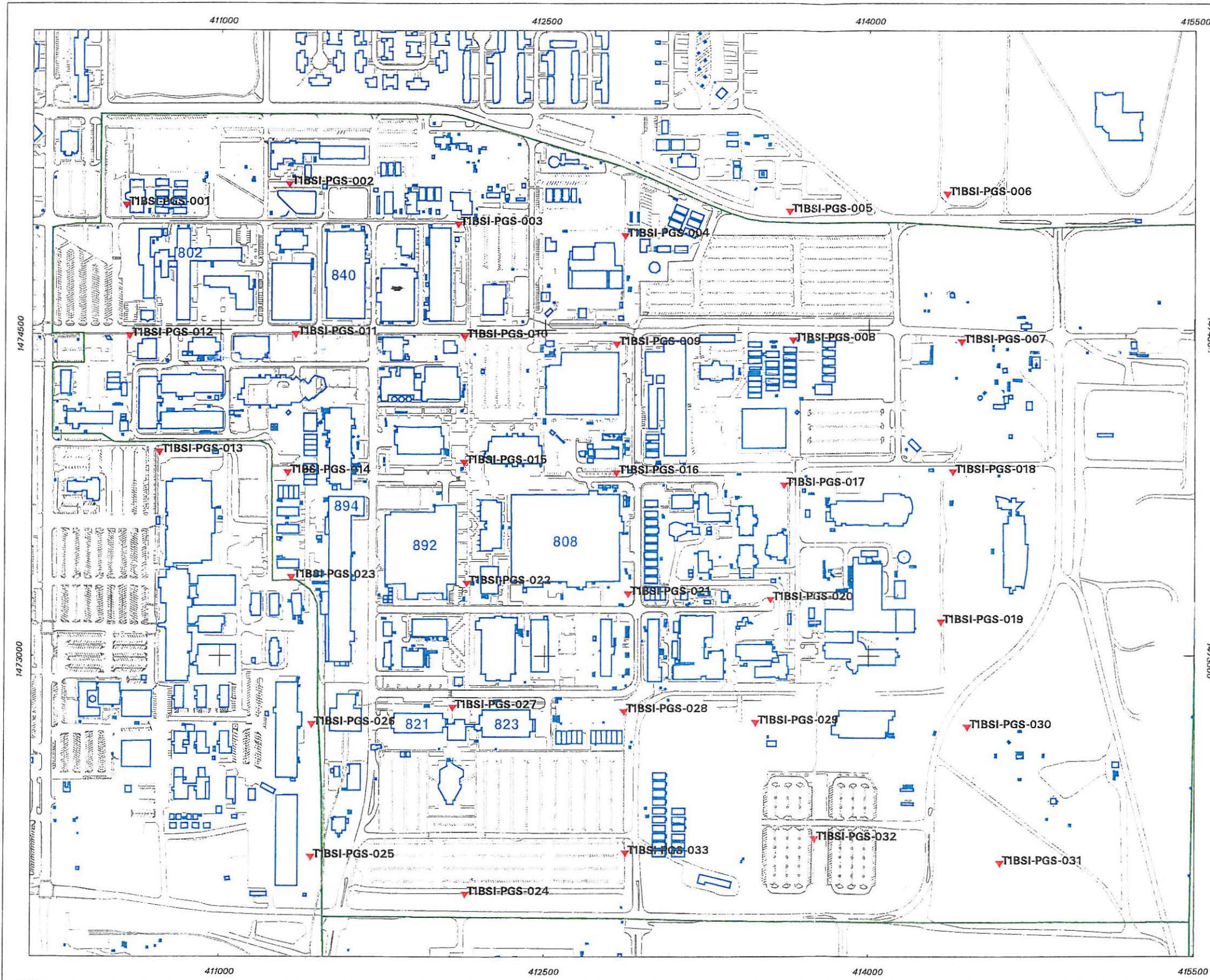


Legend





- Geoprobe™ and Borehole Sample Location
GP = Geoprobe™
BH = Borehole
R = Resampled
- Road / Parking
- SNL Technical Area Boundary
- Building / Structure

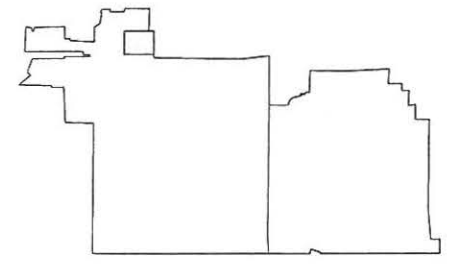
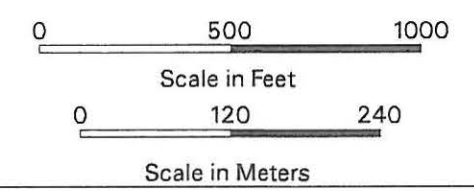
Figure 2
Original, Resampled, and
Offset Sample Locations
SWMUs 187 and 226
May and June, 2002





Legend

-  Road / Parking / Walkway
 -  Technical Area I Boundary
 -  Building / Structure
 -  Surface Soil Sample Location
- BSI = Background Soil Investigation*
PGS = Plutonium Grid Sample




Sandia National Laboratories, New Mexico
 Environmental Geographic Information System

Figure 3
Plutonium Survey Sample
Locations, SWMUs 96, 187,
and 226, June 2002



Transverse Mercator Projection, New Mexico State Plane Coordinate System,
 Central Zone, 1927 North American Horizontal Datum,
 1928 North American Vertical Datum

	1:6000	MAPID=030280
		SNL EGIS ORG. 6135
	DHelfrich	dh030280.aml 03/14/03

Addendum E

Bldg. 870

BUILDING 870



October 24, 2003

Project No. 842717.01

Brenda Langkopf
Sandia National Laboratories/New Mexico
P.O. Box 5800, M/S 1087
Albuquerque, NM 87185-1087

Building 870 Sampling Summary.
Sandia National Laboratories/New Mexico
Task Order CPA56064, Purchase Order 107802

Miss Langkopf:

Soil sampling results for sampling conducted at Building 870 are presented in "Results of Soil Sampling Activities at Building 870" (PRC, 1993, SHEARS # 27553) and "Analytical Results for Additional Sampling at Building 870" (IT, 1994, SHEARS # 27682). PRC Environmental Management collected samples from October 13 through 15, 1993. IT Corporation collected samples on December 29, 1993. The samples are documented on chain of custody numbers: 6653, 6932, 6654, and 508324. PRC Environmental Management collected a total of 22 soil samples, 1 duplicate soil sample, 2 trip blank samples, and 3 equipment rinsate samples. The soil samples were collected to characterize potential release sites adjacent to renovated areas of Building 870. The locations of Building 870 as well as sample sites are depicted in Figures 1 and 2. A summary of the samples collected by PRC Environmental Management is presented in Table 1. Detected compounds are summarized in Tables 3 and 4. IT Corporation collected a total of 6 soil samples and 1 tar-like globule sample. The soil samples collected by IT Corporation were collected from a borehole at Site 8 (Figure 2) to verify the presence of several polynuclear aromatic hydrocarbon compounds present in previous soil sampling. Results of the sampling conducted by IT Corporation are presented in Table 1b.

Respectfully submitted,

SHAW ENVIRONMENTAL, INC.

Lara Beasley

cc: M. Skelly, SNL/NM (w/ enclosures)
M. Goodrich, Shaw Environmental, Inc. (w/o enclosures)
Project File (w/ enclosures)

**TABLE 1
BUILDING 870 SAMPLING SUMMARY**

Sample Identification Number	Location and Depth	Analytical Parameters	Date	Time
SNLA-013406-1	Equipment Rinsate	VOCs	10/14/93	0750
SNLA-013406-2	Equipment Rinsate	SVOCs and ethylene glycol	10/14/93	0750
SNLA-013406-3	Equipment Rinsate	TC metals	10/14/93	0750
SNLA-013428-1	Site 1, 2-5' bgs	VOCs	10/14/93	0950
SNLA-013428-2	Site 1, 2-5' bgs	SVOCs, ethylene glycol, TC metals, pH, TCLP metals	10/14/93	0950
SNLA-013429-1	Site 1, 10-12' bgs	VOCs	10/14/93	1005
SNLA-013429-2	Site 1, 10-12' bgs	SVOCs, ethylene glycol, TC metals, pH, TCLP metals	10/14/93	1005
SNLA-013430-1	Site 1, 15-17' bgs	VOCs	10/14/93	1025
SNLA-013430-2	Site 1, 15-17' bgs	SVOCs, ethylene glycol, TC metals, pH, TCLP metals	10/14/93	1025
SNLA-013431-1	Site 1, 20-22' bgs	VOCs	10/14/93	1035
SNLA-013431-2	Site 1, 20-22' bgs	SVOCs, ethylene glycol, TC metals, pH, TCLP metals	10/14/93	1035
SNLA-013432-1	Site 2, 2-5' bgs	VOCs	10/14/93	0755
SNLA-013432-2	Site 2, 2-5' bgs	SVOCs, ethylene glycol, TC metals, pH, TCLP metals	10/14/93	0810
SNLA-013433-1	Site 2, 10-12' bgs	VOCs	10/14/93	0840
SNLA-013433-2	Site 2, 10-12' bgs	SVOCs, ethylene glycol, TC metals, pH, TCLP metals	10/14/93	0840
SNLA-013434-1	Site 2, 15-17' bgs	VOCs	10/14/93	0905
SNLA-013434-2	Site 2, 15-17' bgs	SVOCs, ethylene glycol, TC metals, pH, TCLP metals	10/14/93	0905
SNLA-013435-1	Site 2, 20-22' bgs	VOCs	10/14/93	0920
SNLA-013435-2	Site 2, 20-22' bgs	SVOCs, ethylene glycol, TC metals, pH, TCLP metals	10/14/93	0920
SNLA-013436-1	Site 3, 2-5' bgs	VOCs	10/13/93	1310
SNLA-013436-2	Site 3, 5-8' bgs	SVOCs, ethylene glycol, TC metals, pH, TCLP metals	10/13/93	1315
SNLA-013437-1	Site 3, 10-12' bgs	VOCs	10/13/93	1325
SNLA-013437-2	Site 3, 10-12' bgs	SVOCs, ethylene glycol, TC metals, pH, TCLP metals	10/13/93	1325

TABLE 1 (Continued)
BUILDING 870 SAMPLING SUMMARY

Sample Identification Number	Location and Depth	Analytical Parameters	Date	Time
SNLA-013438-1	Site 3, 15-17' bgs	VOCs	10/13/93	1340
SNLA-013438-2	Site 3, 15-17' bgs	SVOCs, ethylene glycol, TC metals, pH, TCLP metals	10/13/93	1340
SNLA-013439-1	Site 3, 20-22' bgs	VOCs	10/13/93	1400
SNLA-013439-2	Site 3, 20-22' bgs	SVOCs, ethylene glycol, TC metals, pH, TCLP metals	10/13/93	1400
SNLA-013440-1	Site 4, 5-7' bgs	VOCs	10/13/93	1025
SNLA-013440-2	Site 4, 5-7' bgs	SVOCs, ethylene glycol, TC metals, pH, TCLP metals	10/13/93	1025
SNLA-013441-1	Site 4, 7-9' bgs	VOCs	10/13/93	1035
SNLA-013405-1	Duplicate of SNLA-013441-1	VOCs	10/13/93	1035
SNLA-013441-2	Site 4, 10-12' bgs	SVOCs, ethylene glycol, TC metals, pH, TCLP metals	10/13/93	1040
SNLA-013405-2	Duplicate of SNLA-013441-2	SVOCs, ethylene glycol, TC metals, pH, TCLP metals	10/13/93	1040
SNLA-013442-1	Site 4, 15-17' bgs	VOCs	10/13/93	1105
SNLA-013442-2	Site 4, 15-17' bgs	SVOCs, ethylene glycol, TC metals, pH, TCLP metals	10/13/93	1105
SNLA-013404-1	Site 4, 18-20' bgs	VOCs	10/13/93	1130
SNLA-013404-2	Site 4, 18-20' bgs	SVOCs, ethylene glycol, TC metals, pH, TCLP metals	10/13/93	1135
SNLA-013459-1	Site 5, 2-5' bgs	VOCs	10/14/93	1110
SNLA-013459-2	Site 5, 2-5' bgs	SVOCs, ethylene glycol, TC metals, TCLP metals	10/14/93	1110
SNLA-013460-1	Site 6, 2-5' bgs	VOCs	10/14/93	1140
SNLA-013460-2	Site 6, 2-5' bgs	SVOCs, ethylene glycol, TC metals, TCLP metals	10/14/93	1140
SNLA-013461-1 *	Site 7, 5-6' bgs	VOCs	10/15/93	1220
SNLA-013461-2 *	Site 7, 5-6' bgs	SVOCs, TC metals, TCLP metals	10/15/93	1220
SNLA-013462-1	Site 8, 5-6' bgs	VOCs	10/15/93	1332

**TABLE 1 (Continued)
BUILDING 870 SAMPLING SUMMARY**

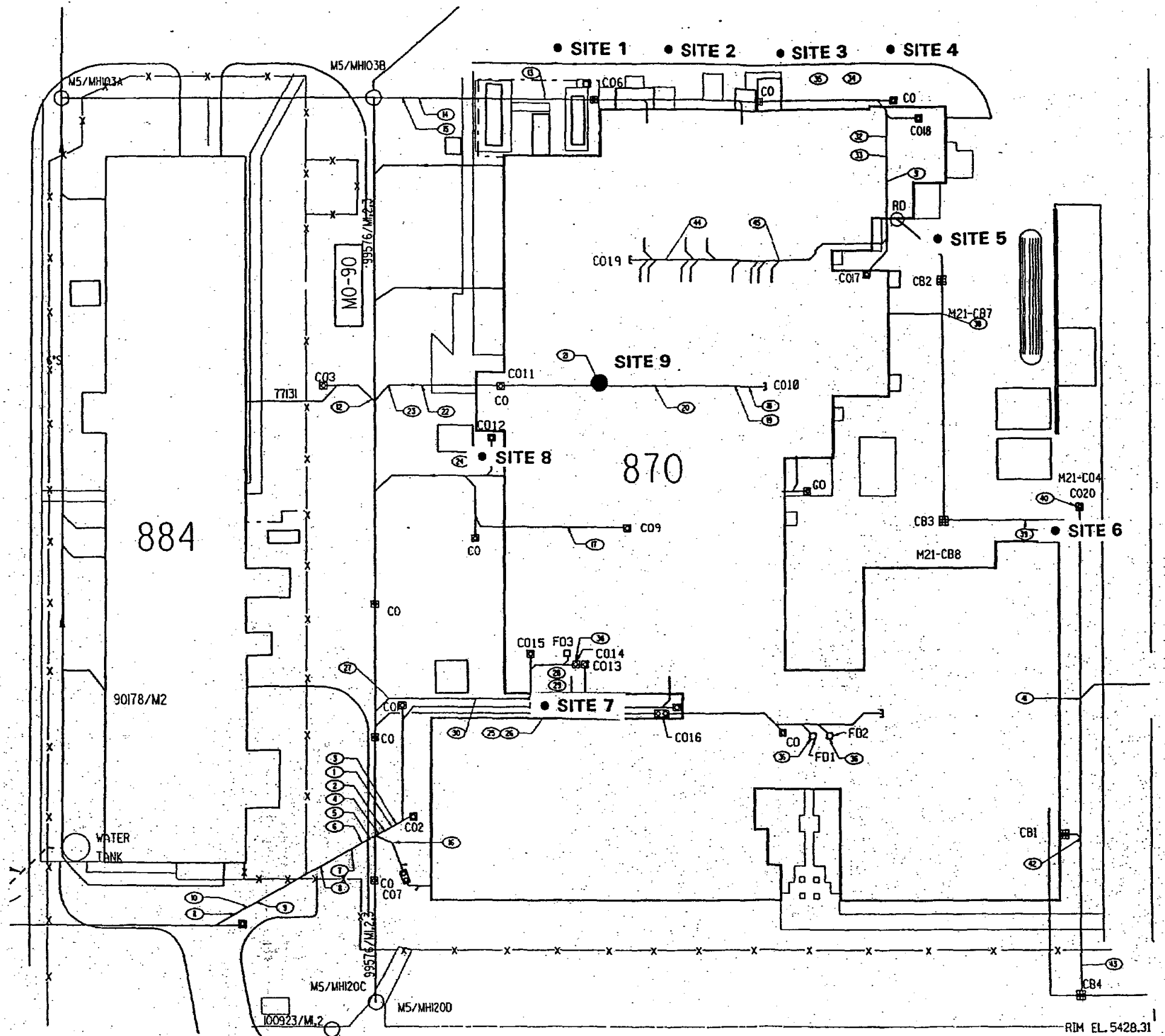
Sample Identification Number	Location and Depth	Analytical Parameters	Date	Time
SNLA-013462-2	Site 8, 5-6' bgs	SVOCs, TC metals, TCLP metals	10/15/93	1332
SNLA-013463-1	Site 9, 5-6' bgs	VOCs	10/15/93	1346
SNLA-013463-2	Site 9, 5-6' bgs	SVOCs, TC metals, TCLP metals	10/15/93	1346
SNLA-013464-1	Site 9, 10-11' bgs	VOCs	10/15/93	1420
SNLA-013464-2	Site 9, 10-11' bgs	SVOCs, TC metals, TCLP metals	10/15/93	1420
SNLA-013407-1	Trip Blank	VOCs	10/14/93	1500
SNLA-013465-1	Trip Blank	VOCs	10/15/93	1635

Notes:

- Additional sample volume collected for matrix spike and matrix spike duplicate analyses
- VOC Volatile Organic Compound
- SVOC Semivolatile Organic Compound
- TC Toxicity Characteristic
- TCLP Toxicity Characteristic Leaching Procedure
- bgs Below Ground Surface

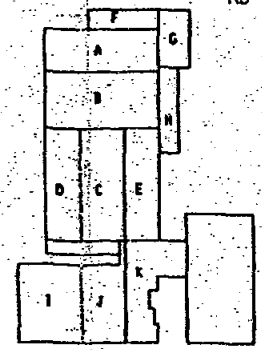
TABLE 3
VOLATILE ORGANIC COMPOUNDS - METHOD 8240

Sample Identification Number	Sample Location and Depth	Compound Detected and Concentration ($\mu\text{g}/\text{kg}$)
SNLA-013404-1	Site 4, 18-20' bgs	Methylene chloride 2.5 (BJ)
SNLA-013405-1	Duplicate of SNLA-013441-1	1,2-Dichloropropane 1.6 (J)
SNLA-013406-1	Equipment Rinsate	Methylene chloride 2.1 (BJ) Trichloroethene 1.6 (J)
SNLA-013407-1	Trip Blank	Acetone 130.0 (B) 2-Butanone 20.0 (B) 2-Hexanone 3.8 (J) Methylene chloride 64.0 (B) Toluene 8.4 (J) Xylenes (Total) 3.6 (J)
SNLA-013429-1	Site 1, 10-12' bgs	Ethylbenzene 4.3 (J) Methylene chloride 1.0 (J) Xylenes (Total) 34.0
SNLA-013430-1	Site 1, 15-17' bgs	Acetone 11.0 1,2-Dichloropropane 1.4 (J) Methylene chloride 2.8 (J)
SNLA-013431-1	Site 1, 20-22' bgs	Acetone 7.3 (J) Methylene chloride 1.9 (J)
SNLA-013434-1	Site 2, 15-17' bgs	Acetone 4.9 (BJ) Methylene chloride 1.6 (J)
SNLA-013435-1	Site 2, 20-22' bgs	Acetone 4.8 (BJ) Methylene chloride 1.2 (J)
SNLA-013436-1	Site 3, 2-5' bgs	2-Butanone 1.8 (BJ) Methylene chloride 1.2 (BJ)
SNLA-013438-1	Site 3, 15-17' bgs	Methylene chloride 1.5 (J)
SNLA-013440-1	Site 4, 5-7' bgs	Acetone 13.0 2-Butanone 1.6 (BJ) Methylene chloride 1.3 (J)
SNLA-013441-1	Site 4, 7-9' bgs	Methylene chloride 1.2 (BJ)
SNLA-013442-1	Site 4, 15-17' bgs	Acetone 8.9 (J) Methylene chloride 1.9 (J)
SNLA-013459-1	Site 5, 2-5' bgs	Acetone 16.0 2-Butanone 1.3 (BJ) Methylene chloride 2.2 (J)
SNLA-013460-1	Site 6, 2-5' bgs	Acetone 13.0 Methylene chloride 2.8 (J)
SNLA-013461-1	Site 7, 5-6' bgs	Acetone 7.6 (J) Methylene chloride 2.3 (J)



- FINDINGS**
- ① 12" FROM CO2, 4" SERVICE
 - ② 13" FROM CO2, REPAIR OF BROKEN PIPE, OFFSET
 - ③ 18" TO 25" FROM CO2 STANDING WATER
 - ④ 16" FROM CO2, TOP OF PIPE TIE-IN
 - ⑤ 19" FROM CO2, 4" SERVICE
 - ⑥ 23" FROM CO2, 1" DIA. HOLE IN PIPE
 - ⑦ 28" TO 31" FROM CO2, ROCKS AND DIRT
 - ⑧ 41" TO 58" FROM CO2, CRACKS IN PIPE
 - ⑨ 65" FROM CO2, OFFSET JOINT
 - ⑩ 66" FROM CO2, CRACK IN PIPE
 - ⑪ 74" FROM CO2, OFFSET JOINT
 - ⑫ 38" FROM CO3, STANDING WATER
 - ⑬ 15" FROM CO6, EXPOSED GASKET
 - ⑭ 85" FROM CO6, EXPOSED GASKET
 - ⑮ 78" FROM CO6, STANDING WATER
 - ⑯ 25" FROM CO7, EXPOSED GASKET
 - ⑰ 28" FROM CO9, 4" SERVICE
 - ⑱ 8" FROM CO10, 2" SERVICE
 - ⑲ 12" FROM CO10, 2" SERVICE
 - ⑳ 25" FROM 4" S, 2" SERVICE
 - ㉑ 38" FROM 4" S, HOLE IN PIPE
 - ㉒ 38" TO 35" FROM CO11, STANDING WATER
 - ㉓ 45" FROM CO11, 4" SERVICE
 - ㉔ 3" FROM CO12, STANDING WATER
 - ㉕ 28" TO 38" FROM CO13, STANDING WATER
 - ㉖ 28" FROM CO13, 4" SERVICE
 - ㉗ 88" FROM CO13, EXPOSED GASKET
 - ㉘ 9" FROM CO15, 2" SERVICE
 - ㉙ 13" FROM CO15, OFFSET JOINT
 - ㉚ 15" FROM CO15, STANDING WATER
 - ㉛ 38" FROM CO17, 2" SERVICE
 - ㉜ 58" FROM CO17, 2" SERVICE
 - ㉝ 38" FROM CO17, ROCKS AND DEBRIS
 - ㉞ 35" FROM CO18, STANDING WATER
 - ㉟ 55" FROM CO18, STANDING WATER
 - ㊱ BLOCKED OR GROUTED LINE
 - ㊲ 27" FROM CB2, PIPE BROKEN
 - ㊳ 15" FROM CB2, SERVICE
 - ㊴ 25" TO 68" FROM CB2, SAG IN LINE
 - ㊵ CO20 BLOCKED WITH CONCRETE
 - ㊶ 189" FROM CB4, PLUGGED CO
 - ㊷ 62" FROM CB4, CAMERA STUCK UNDERWATER
 - ㊸ 11" FROM CB4, SERVICE TO THE RIGHT
 - ㊹ 15" FROM CO19, CRACK IN PIPE
 - ㊺ 55" FROM CO19, HEAVY BUILD-UP AT DROP IN PIPE

- LEGEND**
- CO - CLEANOUT
 - CB - CATCH BASIN
 - FD - FLOOR DRAIN
 - S - SANITARY SEWER
 - SS - STORM SEWER
 - MH - MANHOLE
 - RD - ROOF DRAIN
 - SITE 1 - Building 870 soil sampling location



P.O. OR S.D.	REV	DATE	DESCRIPTION	BY	CHKD	APP
U.S. DEPARTMENT OF ENERGY MANAGEMENT SUPPORT DIVISION WRIGHT AIR FORCE BASE EAST ALBUQUERQUE, NEW MEXICO						
SANDIA NATIONAL LABORATORIES PLANT ENGINEERING ALBUQUERQUE, NEW MEXICO; LIVERMORE, CALIFORNIA; TONOPAH, NEVADA						
FIGURE 2 BUILDING 870 SOIL SAMPLING LOCATIONS			P.O. OR S.D. PROJECT NO.			
UTILITY			BUILDING 870		DATE: 5/28-31	
Greiner			D		E017107MIB	
CAD DRAWING COMPUTER SYSTEMS DIV. 7902 DESIGN DIVISION 7909 FILE NAME: E017107MIB			UTILITY		BUILDING 870 DATE: 5/28-31	
REFERENCE FILES: 80040.30			E017107MIB		80040.30	

TABLE 4

SEMIVOLATILE ORGANIC COMPOUNDS - METHOD 8270

Sample Identification Number	Sample Location and Depth	Compound Detected and Concentration ($\mu\text{g}/\text{kg}$)
SNLA-013431-2	Site 1, 20-22' bgs	Bis(2-ethylhexyl)phthalate 41 (J)
SNLA-013432-2	Site 2, 2-5' bgs	Di-n-butyl-phthalate 71 (J)
SNLA-013442-2	Site 4, 15-17' bgs	Diethyl phthalate 42 (J)
SNLA-013461-2	Site 7, 5-6' bgs	Fluoranthene 59 (J) Pyrene 54 (J) Benzo(b)fluoranthene 48 (J)
SNLA-013462-2	Site 8, 5-6' bgs	Naphthalene 260 (J) 2-Methylnaphthalene 74 (J) Acenaphthene 490 (J) Dibenzofuran 300 (J) Fluorene 500 (J) Phenanthrene 5,700 Anthracene 1,200 Fluoranthene 8,000 Pyrene 7,300 Benzo(a)anthracene 3,600 Chrysene 3,600 Benzo(b)fluoranthene 4,600 Benzo(k)fluoranthene 2,200 Benzo(a)pyrene 3,200 Indeno(1,2,3-cd)pyrene 1,600 Benzo(g,h,i)perylene 1,800

Notes: bgs Below Ground Surface
(J) Concentration between the instrument detection limit (IDL) and the Enseco reporting limit. Reported value is estimated.

Table 1b
Result of Analysis
for Soil Samples Collected at Building 870
Borehole No. 8A

Depth Sample No. ER9200 Compound	2 foot 1895 (µg/kg)	4 foot 1896 (µg/kg)	6 foot 1897 (µg/kg)	8 foot 1898 (µg/kg)	12 feet 1900 (µg/kg)	Suspected Source 1901 (µg/kg)
Napthalene	65	190	ND(330)	ND(330)	ND(330)	ND(9900)
Acenaphthene	240	370	ND(330)	ND(330)	ND(330)	ND(9900)
Dibenzofuran	110	250	ND(330)	ND(330)	ND(330)	ND(9900)
Fluorene	200	350	ND(330)	ND(330)	ND(330)	ND(9900)
Phenanthrene	3100	5100	ND(330)	ND(330)	390	12000
Anthracene	600	970	ND(330)	ND(330)	47 ^j	1400
Fluoranthene	4700	8300	ND(330)	ND(330)	510	20000
Pyrene	6200	7600	ND(330)	ND(330)	400	19000
Benzo(a)anthracene	2500	3700	ND(330)	ND(330)	190 ^j	9600
Chrysene	3000	4000	ND(330)	ND(330)	230 ^j	12000
Benzo(b)fluoranthene	3300	4600	ND(330)	ND(330)	250 ^j	15000
Benzo(k)fluoranthene	1700	2300	ND(330)	ND(330)	100 ^j	1100
Benzo(a)pyrene	2400	3000	ND(330)	ND(330)	160 ^j	7800
Indeno(1,2,3-cd)pyrene	1200	1700	ND(330)	ND(330)	80 ^j	4600
Benzo(g,h,i)perylene	1300	1800	ND(330)	ND(330)	84 ^j	4900

Analyte present below quantitation limit, estimated concentration.
 ND-Not detected at indicated concentration.

SDDA/OAWDL

STORM DRAIN DISCHARGE AREA AND OLD ACID WASTE DRAIN LINE



October 24, 2003

Project No. 842717.01

Brenda Langkopf
Sandia National Laboratories/New Mexico
P.O. Box 5800, M/S 1087
Albuquerque, NM 87185-1087

Storm Drain Discharge Area and
Old Acid Waste Drain Line Sampling Summary.
Sandia National Laboratories/New Mexico
Task Order CPA56064, Purchase Order 107802

Miss Langkopf:

Soil and sediment sampling results for sampling conducted at the Storm Drain Discharge Area (SDDA) and Old Acid Waste Drain Line (OAWDL) Investigation are presented in "Storm Drain Discharge Area and Old Acid Waste Drain Line Site Investigation Southeast of Technical Area I" (IT, 1992, SHEARS # 27252, 27235, 27236, and 27237). IT Corporation collected samples on May 6, 7, 8 and 11, 1992. The samples are documented on chain of custody numbers: 03524 through 03527, 03530, 03531, 03534, 03535, 03537, 03538, 03547 through 03549, 03550, 03553, 03565, 03566, 03569, 03581 through 03584, 03586 through 03593, 03601, 03627, 03628, 03684, and 03687. A total of 30 soil samples, 4 duplicate soil samples, 3 sediment samples, 1 field blank sample, and 4 equipment rinsate samples were collected. The soil samples were collected to determine the type and extent of contamination in soils adjacent to the SDDA. The sediment samples were collected to determine the type and extent of contamination within the OAWDL. The locations of the SDDA and OAWDL as well as sample locations are depicted in Figures 1 and 2. A summary of the samples collected is presented in Table 1. Soil sample results are summarized in Tables 2, 3, 6, and 7.

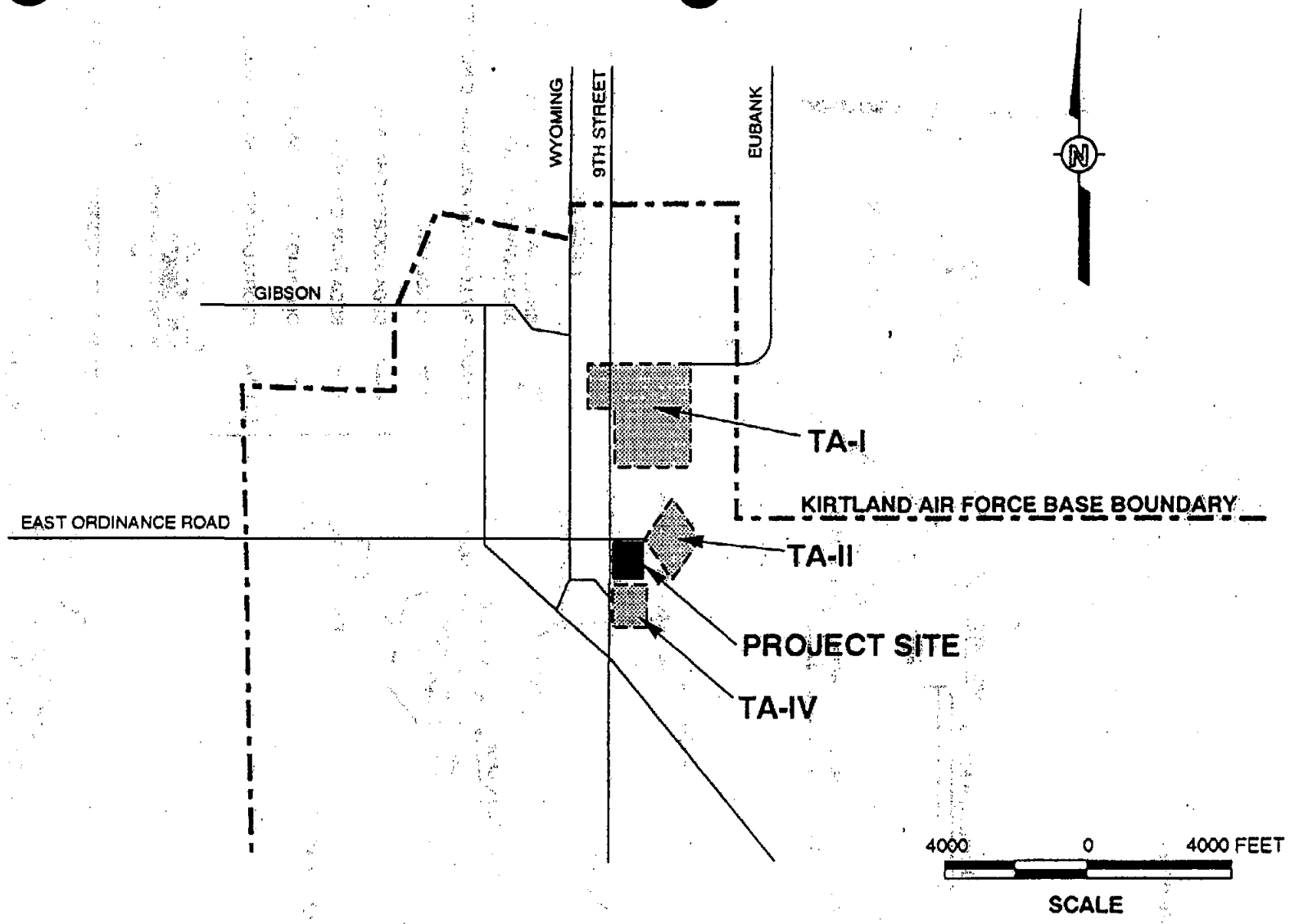
Respectfully submitted,

SHAW ENVIRONMENTAL, INC.



Lara Beasley

cc: M. Skelly, SNL/NM (w/ enclosures)
M. Goodrich, Shaw Environmental, Inc. (w/o enclosures)
Project File (w/ enclosures)



2

Figure 1
Site Location Map for the SDDA and OAWDL Site Investigation
Sandia National Laboratories, New Mexico

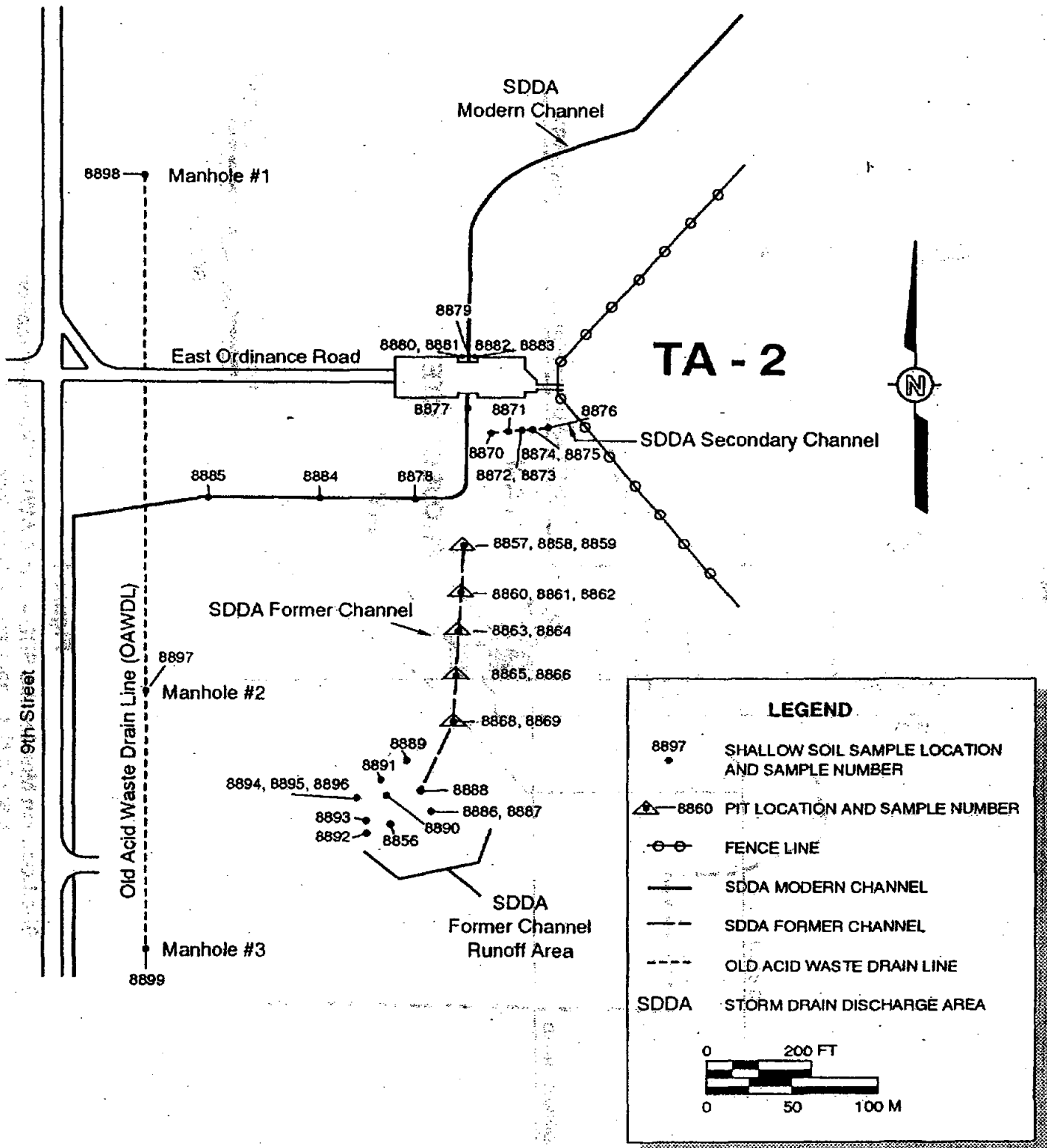


Figure 2
Soil Sample Location Map
SDDA and OAWDL Site Investigation
Sandia National Laboratories, New Mexico

Table 1
Sample Summary
Storm Drain Discharge Area and Old Acid Waste Drain Line

Sample Number SNLA00-	Date Collected	Sample Area	Collection Method	Sample Matrix	Quality Control Designation	Sample Depth (feet)
8857	5/7/92	SDDA-FC	BH	Soil	Routine	3'
8858	5/7/92	SDDA-FC	BH	Soil	Routine	6'
8859	5/7/92	SDDA-FC	BH	Soil	Dup 8858	6'
8860	5/7/92	SDDA-FC	BH	Soil	Routine	3'
8861	5/7/92	SDDA-FC	BH	Soil	Routine	6'
8862	5/7/92	SDDA-FC	NA	Water	Equip Rinse	NA
8863	5/7/92	SDDA-FC	BH	Soil	Routine	3'
8864	5/7/92	SDDA-FC	BH	Soil	Routine	6'
8865	5/7/92	SDDA-FC	BH	Soil	Routine	3'
8866	5/7/92	SDDA-FC	BH	Soil	Routine/SNL	6'
8868	5/8/92	SDDA-FC	BH	Soil	Routine/SNL	3'
8869	5/8/92	SDDA-FC	BH	Soil	Routine	6'
8870	5/8/92	SDDA-MC	HA	Soil	Routine	1'
8871	5/8/92	SDDA-MC	HA	Soil	Routine	1'
8872	5/8/92	SDDA-MC	NA	Water	Equip Rinse	NA
8873	5/8/92	SDDA-MC	HA	Soil	Routine/SNL	1'
8874	5/8/92	SDDA-MC	HA	Soil	Routine	1'
8875	5/8/92	SDDA-MC	HA	Soil	Dup 8874	1'
8876	5/8/92	SDDA-MC	HA	Soil	Routine	1'
8877	5/8/92	SDDA-MC	HA	Soil	Routine	1'
8878	5/8/92	SDDA-MC	HA	Soil	Routine	1'
8879	5/11/92	SDDA-MC	HA	Soil	Routine	1'
8880	5/11/92	SDDA-MC	HA	Soil	Routine	1'
8881	5/11/92	SDDA-MC	NA	Water	Field Blank	NA
8882	5/11/92	SDDA-MC	HA	Soil	Routine	1'
8883	5/11/92	SDDA-MC	NA	Water	Equip Rinse	NA
8884	5/11/92	SDDA-MC	HA	Soil	Routine	1'
8885	5/11/92	SDDA-MC	HA	Soil	Routine	1'
8886	5/6/92	SDDA-FCRA	HA	Soil	Routine	1'
8886	5/11/92	SDDA-FCRA	HA	Soil	Routine	1'
8887	5/11/92	SDDA-FCRA	HA	Soil	Dup 8886	1'
8888	5/11/92	SDDA-FCRA	HA	Soil	Routine/SNL	1'

Table 1 (Continued)
Sample Summary
Storm Drain Discharge Area and Old Acid Waste Drain Line

Sample Number SNLA00-	Date Collected	Sample Area	Collection Method	Sample Matrix	Quality Control Designation	Sample Depth (feet)
8889	5/11/92	SDDA-FCRA	HA	Soil	Routine	1'
8890	5/11/92	SDDA-FCRA	HA	Soil	Routine	1'
8891	5/11/92	SDDA-FCRA	HA	Soil	Routine	1'
8892	5/11/92	SDDA-FCRA	HA	Soil	Routine/SNL	1'
8893	5/11/92	SDDA-FCRA	HA	Soil	Routine	1'
8894	5/11/92	SDDA-FCRA	HA	Soil	Routine	1'
8895	5/11/92	SDDA-FCRA	HA	Soil	Dup-8894	1'
8896	5/11/92	SDDA-FCRA	NA	Water	Equip Rinse	NA
8897	5/12/92	Manhole No. 2	Scoop	Sediment	Routine	NA
889B	5/12/92	Manhole No. 1	Scoop	Sediment	Routine	NA
8899	5/12/92	Manhole No. 3	Scoop	Sediment	Routine	NA

NA = Not applicable.

Routine/SNL = Split samples collected for radioactive screening by SNL.

SDDA-FCRA = Storm Drain Discharge Area—Former Channel Runoff Area.

SDDA-FC = Storm Drain Discharge Area—Former Channel.

SDDA-MC = Storm Drain Discharge Area—Modern Channel.

HA = Hand auger.

BH = Backhoe.

Dup = Duplicate soil sample.

Table 2
Detected Total Metals in Soil Samples Collected
from the Storm Drain Discharge Area (Method 6010/7000 Series)

Results in mg/kg

Sample SNLA00-	Sample Area	Sample Depth (feet)	Arsenic (7060) ^a	Barium (6010)	Selenium (7740)	Cadmium (6010)	Total Chromium (6010)	Lead (7421)	Mercury (7471)	Silver (6010)
Proposed Correction Levels in Soil ^b			80	400	NL	40	NL	NL	20	200
8857	SDDA-FC	3'	3.4	122	ND <1.0	ND <0.50	5.0	14.0	ND <0.10	ND <1.0
8858	SDDA-FC	6'	2.3	82.6	ND <1.0	ND <0.50	3.0	6.6	ND <0.10	ND <1.0
8859	SDDA-FC	6' (Dup)	2.2	77.8	ND <1.0	ND <0.50	3.6	6.9	ND <0.10	ND <1.0
8860	SDDA-FC	3'	3.9	161	ND <2.0	ND <0.50	4.6	14.6	ND <0.10	ND <1.0
8861	SDDA-FC	6'	2.4	110	ND <1.0	ND <0.50	5.1	6.3	ND <0.10	ND <1.0
8863	SDDA-FC	3'	3.0	135	ND <2.0	ND <0.50	3.6	4.5	ND <0.10	ND <1.0
8864	SDDA-FC	6'	3.7	126	ND <1.0	ND <0.50	4.3	10.8	ND <0.10	ND <1.0
8865	SDDA-FC	3'	3.4	113	ND <2.0	ND <0.50	5.0	8.9	ND <0.10	ND <1.0
8866	SDDA-FC	6'	2.0	64.3	ND <1.0	ND <0.50	2.7	5.3	ND <0.10	ND <1.0
8868	SDDA-FC	3'	3.1	186	ND <1.0	ND <0.50	6.4	3.4	ND <0.10	ND <1.0
8869	SDDA-FC	6'	0.68	68.1	ND <1.0	ND <0.50	4.9	2.5	ND <0.10	ND <1.0
8870	SDDA-MC	1'	3.7	108	ND <1.0	ND <0.50	3.5	16.0	ND <0.10	ND <1.0
8871	SDDA-MC	1'	2.9	103	ND <2.0	ND <0.50	5.3	23.8	ND <0.10	ND <1.0
8873	SDDA-MC	1'	3.5	141	ND <1.0	ND <0.50	7.6	20.2	ND <0.10	ND <1.0
8874	SDDA-MC	1'	2.6	84.7	ND <1.0	ND <0.50	5.1	15.5	ND <0.10	ND <1.0
8875	SDDA-MC	1' (Dup)	3.2	87.2	ND <1.0	ND <0.50	5.0	7.6	ND <0.10	ND <1.0
8876	SDDA-MC	1'	3.4	ND <1.0	ND <1.0	ND <0.50	ND <1.0	10.6	ND <0.10	ND <1.0
8877	SDDA-MC	1'	1.4	72.6	ND <1.0	ND <0.50	3.2	6.6	ND <0.10	ND <1.0
8878	SDDA-MC	1'	1.0	66.1	ND <1.0	ND <0.50	2.9	3.3	ND <0.10	ND <1.0
8879	SDDA-MC	1'	2.5	34.6	ND <2.0	ND <0.50	1.6	2.9	ND <0.10	ND <1.0
38880	SDDA-MC	1'	1.4	44.2	ND <1.0	ND <0.50	3.5	13.2	ND <0.10	ND <1.0

Table 2 (Continued)

**Detected Total Metals in Soil Samples Collected
from the Storm Drain Discharge Area (Method 6010/7000 Series)**

Results in mg/kg

Sample SNLA00-	Sample Area	Sample Depth (feet)	Arsenic (7060) ^a	Barium (6010)	Selenium (7740)	Cadmium (6010)	Total Chromium (6010)	Lead (7421)	Mercury (7471)	Silver (6010)
8882	SDDA-MC	1'	1.7	63.0	ND <1.0	ND <0.50	3.0	4.7	ND <0.10	ND <1.0
8884	SDDA-MC	1'	0.87	52.9	ND <1.0	ND <0.50	2.0	3.3	ND <0.10	ND <1.0
8885	SDDA-MC	1'	1.6	67.9	ND <1.0	ND <0.50	1.9	4.8	ND <0.10	ND <1.0
8886	SDDA-FCRA	1'	3.9	110	ND <1.0	ND <0.50	7.8	9.9	ND <0.10	ND <1.0
8886	SDDA-FCRA	1'	3.9	66.9	ND <1.0	ND <0.50	3.7	7.6	ND <0.10	ND <1.0
8887	SDDA-FCRA	1' (Dup)	3.4	68.7	ND <5.0	ND <0.50	3.8	5.2	ND <0.10	ND <1.0
8888	SDDA-FCRA	1'	2.9	108	ND <5.0	ND <0.50	4.3	6.4	ND <0.10	ND <1.0
8889	SDDA-FCRA	1'	2.4	85.9	ND <5.0	ND <0.50	3.7	4.1	ND <0.10	ND <1.0
8890	SDDA-FCRA	1'	2.1	90.6	ND <5.0	ND <0.50	4.0	4.7	ND <0.10	ND <1.0
8891	SDDA-FCRA	1'	2.4	146	ND <5.0	ND <0.50	4.2	6.5	ND <0.10	ND <1.0
8892	SDDA-FCRA	1'	3.2	108	ND <5.0	ND <0.50	6.1	12.0	ND <0.10	ND <1.0
8893	SDDA-FCRA	1'	2.2	189	ND <5.0	ND <0.50	4.8	6.0	ND <0.10	ND <1.0
8894	SDDA-FCRA	1'	2.9	137	ND <5.0	ND <0.50	4.7	12.0	ND <0.10	ND <1.0
8895	SDDA-FCRA	1' (Dup)	2.5	228	ND <5.0	ND <0.50	3.6	5.7	0.18	ND <1.0

^aNumber in parenthesis is the EPA Test Method reference number.

^bFrom EPA, 1990a.

NI = Value not listed.

Dup = Duplicate soil sample.

ND = Analyte not detected at respective laboratory reporting limits.

SDDA-FCRA = Storm Drain Discharge Area—Former Channel Runoff Area.

SDDA-FC = Storm Drain Discharge Area—Former Channel.

SDDA-MC = Storm Drain Discharge Area—Modern Channel.

Table 3

**TCLP Leachate Analyses^a of Soil Samples Collected
from the Storm Drain Discharge Area (Method 6010/7000 Series)**

Results in mg/L

Sample SNLA00-	Sample Area	Sample Depth (feet)	Arsenic (6010)	Barium (6010)	Selenium (7740)	Cadmium (6010)	Total Chromium (6010)	Lead (6010)	Mercury (7470)	Silver (6010)
TCLP Regulatory Level ^b			5.0	100.0	1.0	1.0	5.0	5.0	0.2	5.0
8857	SDDA-FC	3'	ND <1.0	0.85	ND <0.050	ND <0.050	ND <0.10	ND <0.50	ND <0.0020	ND <0.10
8858	SDDA-FC	6'	ND <1.0	0.78	ND <0.10	ND <0.050	ND <0.10	ND <0.50	ND <0.0020	ND <0.10
8859	SDDA-FC	6' (Dup)	ND <1.0	0.79	ND <0.050	ND <0.050	ND <0.10	ND <0.50	ND <0.0020	ND <0.10
8860	SDDA-FC	3'	ND <1.0	1.7	ND <0.10	ND <0.050	ND <0.10	ND <0.50	ND <0.0020	ND <0.10
8861	SDDA-FC	6'	ND <1.0	1.23	ND <0.050	ND <0.050	ND <0.10	ND <0.50	ND <0.0020	ND <0.10
8863	SDDA-FC	3'	ND <1.0	1.6	ND <0.050	ND <0.050	ND <0.10	ND <0.50	ND <0.0020	ND <0.10
8864	SDDA-FC	6'	ND <1.0	0.82	ND <0.10	ND <0.050	ND <0.10	ND <0.50	ND <0.0020	ND <0.10
8865	SDDA-FC	3'	ND <1.0	1.4	ND <0.10	ND <0.050	ND <0.10	ND <0.50	ND <0.0020	ND <0.10
8866	SDDA-FC	6'	ND <1.0	0.61	ND <0.050	ND <0.050	ND <0.10	ND <0.50	0.018	ND <0.10
8868	SDDA-FC	3'	ND <1.0	1.4	ND <0.10	ND <0.050	ND <0.10	ND <0.50	ND <0.0020	ND <0.10
8869	SDDA-FC	6'	ND <1.0	0.85	ND <0.10	ND <0.050	ND <0.10	ND <0.50	ND <0.0020	ND <0.10
8870	SDDA-MC	1'	ND <1.0	2.0	ND <0.10	ND <0.050	ND <0.10	ND <0.50	ND <0.0020	ND <0.10
8871	SDDA-MC	1'	ND <1.0	2.0	ND <0.10	ND <0.050	ND <0.10	ND <0.50	ND <0.0020	ND <0.10
8873	SDDA-MC	1'	ND <1.0	1.9	ND <0.10	ND <0.050	ND <0.10	ND <0.50	ND <0.0020	ND <0.10
8874	SDDA-MC	1'	ND <1.0	1.6	ND <0.10	ND <0.050	ND <0.10	ND <0.50	ND <0.0020	ND <0.10
8875	SDDA-MC	1' (Dup)	ND <1.0	1.4	ND <0.10	ND <0.050	ND <0.10	ND <0.50	ND <0.0020	ND <0.10
8876	SDDA-MD	1'	ND <1.0	1.9	ND <0.10	ND <0.050	ND <0.10	ND <0.50	ND <0.0020	ND <0.10
8877	SDDA-MC	1'	ND <1.0	0.88	ND <0.10	ND <0.050	ND <0.10	ND <0.50	ND <0.0020	ND <0.10
8878	SDDA-MC	1'	ND <1.0	0.74	ND <0.10	ND <0.050	ND <0.10	ND <0.50	ND <0.0020	ND <0.10
8879	SDDA-MC	1'	ND <1.0	0.43	ND <0.010	ND <0.050	0.42	ND <0.50	ND <0.0020	ND <0.10
8880	SDDA-MC	1'	ND <1.0	0.54	ND <0.010	ND <0.050	ND <0.10	ND <0.50	ND <0.0020	ND <0.10
8882	SDDA-MC	1'	ND <1.0	0.65	ND <0.010	ND <0.050	ND <0.10	ND <0.50	ND <0.0020	ND <0.10

Table 3 (Continued)

TCLP Leachate Analyses^a of Soil Samples Collected
from the Storm Drain Discharge Area (Method 6010/7000 Series)

Results in mg/L

Sample SNLA00-	Sample Area	Sample Depth (feet)	Arsenic (6010)	Barium (6010)	Selenium (7740)	Cadmium (6010)	Total Chromium (6010)	Lead (6010)	Mercury (7470)	Silver (6010)
8884	SDDA-MC	1'	ND <1.0	0.76	ND <0.010	ND <0.050	0.95	ND <0.50	ND <0.0020	ND <0.10
8885	SDDA-MC	1'	ND <1.0	0.86	ND <0.010	ND <0.050	0.14	ND <0.50	ND <0.0020	ND <0.10
8886	SDDA-FCRA	1'	ND <1.0	1.7	ND <0.10	ND <0.050	ND <0.10	ND <0.50	ND <0.0020	ND <0.10
8886	SDDA-FCRA	1'	ND <1.0	1.2	ND <0.010	ND <0.050	ND <0.10	ND <0.50	ND <0.0020	ND <0.10
8887	SDDA-FCRA	1' (Dup)	ND <1.0	1.6	ND <0.050	ND <0.050	1.7	ND <0.50	ND <0.0020	ND <0.10
8888	SDDA-FCRA	1'	ND <1.0	2.1	ND <0.10	ND <0.050	ND <0.10	ND <0.50	ND <0.0020	ND <0.10
8889	SDDA-FCRA	1'	ND <1.0	1.8	ND <0.10	ND <0.050	3.0	ND <0.50	ND <0.0020	ND <0.10
8890	SDDA-FCRA	1'	ND <1.0	1.7	ND <0.10	ND <0.050	1.5	ND <0.50	ND <0.0020	ND <0.10
8891	SDDA-FCRA	1'	ND <1.0	1.7	ND <0.10	ND <0.050	3.6	ND <0.50	ND <0.0020	ND <0.10
8892	SDDA-FCRA	1'	ND <1.0	1.3	ND <0.050	ND <0.050	ND <0.10	ND <0.50	ND <0.0020	ND <0.10
8893	SDDA-FCRA	1'	ND <1.0	2.2	ND <0.10	ND <0.050	ND <0.10	ND <0.50	ND <0.0020	ND <0.10
8894	SDDA-FCRA	1'	ND <1.0	1.4	ND <0.10	ND <0.050	ND <0.10	ND <0.50	ND <0.0020	ND <0.10
8895	SDDA-FCRA	1' (Dup)	ND <1.0	1.2	ND <0.10	ND <0.050	ND <0.10	ND <0.50	ND <0.0020	ND <0.10

^aValues corrected for matrix effects.

^bFrom EPA 1990b

Dup = Duplicate soil sample

ND = Analyte not detected at laboratory reporting limit.

SDDA-FCRA = Storm Drain Discharge Area—Former Channel Runoff Area.

SDDA-FC = Storm Drain Discharge Area—Former Channel.

SDDA-MC = Storm Drain Discharge Area—Modern Channel.

Table 6

**Summary of Radiological Analyses of Soil Samples
from the SDDA and OAWDL**

(Results in pCi/g)

Sample SNLA-00	Sample Area	¹³⁷ Cs	⁴⁰ K	²²⁴ Ra	²²⁶ Ra	²²⁸ Ra	Tritium	Percent Moisture	Gross Alpha	Gross Beta	²³⁴ Th
8857	SDDA-FC	0.0807 [0.0272]	20.0 [2.9]	0.811 [0.117]	0.777 [0.081]	0.820 [0.107]	ND (50)	3.37%	19.8 [8.7]	21.4 [6.0]	0.99 [0.208]
8858	SDDA-FC	ND (0.031)	20.8 [3.0]	0.92 [0.133]	0.87 [0.088]	0.958 [0.118]	ND (50)	2.50%	10.6 [6.2]	23.5 [6.2]	0.771 [0.224]
8859 (dup)	SDDA-FC	ND (0.027)	17.8 [2.6]	0.99 [0.14]	0.906 [0.090]	1.03 [0.12]	ND (50)	2.25%	12.8 [8.8]	23.8 [6.2]	0.569 [0.178]
8860	SDDA-FC	0.0725 [0.0297]	19.0 [2.8]	0.922 [0.133]	0.900 [0.093]	0.966 [0.124]	ND (50)	3.78%	15.6 [7.4]	18.3 [5.3]	0.877 [0.234]
8861	SDDA-FC	ND (0.032)	22.6 [3.2]	0.843 [0.122]	0.784 [0.084]	0.927 [0.119]	ND (50)	2.48%	13.9 [6.8]	21.6 [6.0]	0.905 [0.227]
8863	SDDA-FC	ND (0.024)	16.9 [2.5]	0.765 [0.112]	0.685 [0.074]	0.783 [0.104]	ND (50)	2.74%	ND (10.0)	17.4 [5.3]	0.969 [0.206]
8864	SDDA-FC	ND (0.036)	22.3 [3.2]	0.799 [0.118]	0.765 [0.083]	0.856 [0.116]	ND (50)	1.99%	ND (10.0)	17.6 [5.2]	0.892 [0.227]
8865	SDDA-FC	0.0608 [0.027]	22.5 [3.3]	0.951 [0.142]	0.935 [0.101]	1.01 [0.14]	ND (50)	4.28%	13.4 [7.3]	15.1 [4.8]	1.39 [0.31]
8866	SDDA-FC	ND (0.029)	21.4 [3.1]	0.830 [0.12]	0.750 [0.083]	0.847 [0.113]	ND (50)	1.74%	13.5 [7.0]	21.9 [6.0]	1.26 [0.26]
8868	SDDA-FC	ND (0.020)	16.5 [1.8]	0.683 [0.069]	0.673 [0.053]	0.750 [0.204]	ND (50)	1.28%	8.52 [5.2]	24.7 [6.8]	--
8869	SDDA-FC	ND (0.020)	18.7 [2.6]	0.619 [0.089]	0.702 [0.065]	0.777 [0.082]	ND (50)	0.76%	8.99 [5.65]	24.2 [6.8]	--
8870	SDDA-MC	0.0434 [0.0163]	16.3 [1.8]	0.721 [0.079]	0.664 [0.055]	0.865 [0.085]	ND (50)	19.25%	ND (7.8)	19.2 [5.9]	--
8871	SDDA-MC	0.173 [0.031]	17.6 [2.6]	0.740 [0.102]	0.768 [0.072]	0.935 [0.099]	ND (50)	6.28%	18.6 [8.2]	21.5 [6.3]	--
8873	SDDA-MC	0.253 [0.044]	17.9 [2.6]	0.836 [0.120]	0.810 [0.080]	0.910 [0.104]	ND (50)	9.23%	12.5 [7.3]	23.7 [6.6]	--
8874	SDDA-MC	0.131 [0.027]	17.8 [2.5]	0.806 [0.107]	0.750 [0.071]	0.858 [0.092]	ND (50)	9.22%	18.6 [8.6]	21.3 [6.3]	--
8875 (dup)	SDDA-MC	0.0638 [0.0195]	17.2 [1.9]	0.777 [0.079]	0.790 [0.060]	0.802 [0.079]	ND (50)	24.47%	15.1 [7.5]	27.3 [7.5]	--
8876	SDDA-MC	0.186 [0.031]	15.9 [1.8]	0.775 [0.082]	0.724 [0.060]	0.881 [0.088]	ND (50)	10.35%	15.6 [7.9]	25.8 [7.2]	--
8877	SDDA-MC	0.248 [0.041]	18.5 [2.7]	0.696 [0.102]	0.755 [0.071]	0.904 [0.097]	ND (50)	11.65%	20.0 [8.8]	29.8 [7.8]	--
8878 (dup)	SDDA-MC	ND (0.022)	18.8 [2.7]	0.801 [0.113]	0.842 [0.080]	0.832 [0.094]	ND (50)	2.17%	13.7 [7.2]	23.6 [6.8]	--
8879	SDDA-MC	ND (0.018)	20.5 [2.9]	0.510 [0.076]	0.536 [0.053]	0.538 [0.065]	ND (50)	5.96%	12.0 [7.2]	24.6 [7.0]	--
8880	SDDA-MC	ND (0.019)	24.9 [2.6]	0.581 [0.063]	0.546 [0.047]	0.618 [0.069]	ND (50)	5.25%	10.5 [6.2]	22.3 [6.4]	--
8882	SDDA-MC	ND (0.024)	20.2 [2.2]	0.739 [0.077]	0.681 [0.056]	0.817 [0.080]	ND (50)	6.99%	22.6 [9.6]	25.1 [6.5]	--
8884	SDDA-MC	ND (0.018)	22.3 [3.2]	0.538 [0.079]	0.592 [0.059]	0.628 [0.074]	ND (50)	2.77%	5.54 [4.52]	21.6 [5.9]	--
8885	SDDA-MC	ND (0.021)	21.9 [3.2]	0.629 [0.095]	0.682 [0.068]	0.711 [0.086]	ND (50)	3.15%	18.5 [8.8]	24.7 [6.5]	--
8886	SDDA-FCRA	0.0255 [0.0195]	21.1 [3.1]	0.737 [0.111]	0.659 [0.075]	0.810 [0.109]	ND (50)	6.52%	10.8 [6.9]	18.2 [5.4]	--

Table 6 (Continued)
Summary of Radiological Analyses of Soil Samples
from the SDDA and OAWDL

(Results in pCi/g)

Sample SNLA-00	Sample Area	¹³⁷ Cs	⁴⁰ K	²²⁴ Ra	²²⁶ Ra	²²⁸ Ra	Tritium	Percent Moisture	Gross Alpha	Gross Beta	²³⁴ Th
8886	SDDA-FCRA	0.133 [0.026]	18.4 [2.6]	0.746 [0.102]	0.778 [0.072]	0.879 [0.092]	ND (50)	3.95%	14.4 [7.0]	22.5 [6.1]	--
8887	SDDA-FCRA	0.0733 [0.0208]	20.8 [2.2]	0.777 [0.082]	0.725 [0.058]	0.898 [0.088]	ND (50)	7.02%	17.7 [8.7]	21.8 [6.0]	--
8888	SDDA-FCRA	0.0413 [0.0174]	19.2 [2.8]	0.983 [0.134]	0.957 [0.091]	1.20 [0.12]	ND (50)	7.31%	26.6 [10.6]	25.5 [6.6]	--
8889	SDDA-FCRA	ND (0.019)	18.4 [2.0]	0.681 [0.071]	0.648 [0.054]	0.775 [0.076]	ND (50)	4.32%	7.15 [5.16]	18.9 [5.5]	--
8890	SDDA-FCRA	ND (0.021)	18.6 [2.0]	0.797 [0.086]	0.763 [0.061]	0.856 [0.087]	ND (50)	5.94%	13.3 [7.2]	22.6 [6.1]	--
8891	SDDA-FCRA	0.0471 [0.0162]	18.4 [2.7]	0.704 [0.101]	0.763 [0.071]	0.837 [0.092]	ND (50)	3.12%	15.9 [7.8]	20.1 [5.7]	--
8892	SDDA-FCRA	0.206 [0.038]	19.7 [2.9]	0.951 [0.130]	0.973 [0.091]	1.07 [0.12]	ND (50)	3.07%	20.8 [9.0]	26.0 [6.7]	--
8893	SDDA-FCRA	ND (0.023)	18.0 [1.9]	0.676 [0.071]	0.652 [0.053]	0.746 [0.076]	ND (50)	3.76%	17.4 [8.5]	19.2 [5.5]	--
8894	SDDA-FCRA	0.0358 [0.0145]	17.7 [2.5]	0.594 [0.090]	0.728 [0.068]	0.746 [0.082]	ND (50)	3.43%	15.9 [7.7]	25.0 [6.8]	--
8895 (dup)	SDDA-FCRA	0.0591 [0.0194]	18.2 [2.0]	0.732 [0.080]	0.779 [0.063]	0.792 [0.084]	ND (50)	3.50%	19.2 [8.8]	18.4 [5.3]	--
8897	OAWDL Manhole #2	0.664 [0.142]	15.5 [3.1]	1.28 [0.23]	1.01 [0.18]	1.25 [0.31]	ND (50)	6.75%	44.9 [14.7]	38.8 [9.1]	--
8898	OAWDL Manhole #1	0.226 [0.086]	22.4 [3.2]	1.31 [0.20]	0.857 [0.161]	1.11 [0.27]	ND (50)	19.69%	28.2 [10.8]	29.2 [7.3]	--
8899	OAWDL Manhole #3	0.333 [0.055]	13.1 [2.0]	0.844 [0.098]	0.687 [0.069]	0.732 [0.090]	ND (50)	7.74%	15.2 [7.4]	21.4 [5.8]	--

- isotope activity not reported.
- ND (0.022) = Not detected at respective laboratory reporting limit.
- [0.146] = 2-sigma error in brackets.
- SDDA = Storm Drain Discharge Area.
- OAWDL = Old Acid Waste Drain Line.
- FC = Former channel.
- MC = Modern channel.
- FCRA = Former channel run off area.
- pCi/g = picocuries per gram.
- Dup = Duplicate sample.

Table 7
Summary of Duplicate Soil Analyses

Parameter	SNLA008858	SNLA008859	RPD ^a	SNLA008874	SNLA008875	RPD ^a	SNLA008886	SNLA008887	RPD ^a	SNLA008894	SNLA008895	RPD ^a
Total Metals (mg/kg)												
Arsenic	2.3	2.2	4.4	2.6	3.2	20.7	3.9	3.4	13.7	2.9	2.5	14.8
Barium	82.8	77.8	6.0	84.7	87.2	2.9	66.9	68.7	2.7	228	110	69.8
Selenium	ND	ND	NC	ND	ND	NC	ND	ND	NC	ND	ND	NC
Cadmium	ND	ND	NC	ND	ND	NC	ND	ND	NC	ND	ND	NC
Chromium	3.0	3.6	18.2	5.1	5.0	2.0	3.7	7.6	69.0	4.7	3.8	26.5
Lead	6.6	6.9	4.4	15.5	7.6	68.4	7.6	5.2	37.5	12.0	5.7	71.2
Mercury	ND	ND	NC	ND	ND	NC	ND	ND	NC	ND	0.18	NC
Silver	ND	ND	NC	ND	ND	NC	ND	ND	NC	ND	ND	NC
TCLP Leachate (mg/L)												
Arsenic	ND	ND	NC	ND	ND	NC	ND	ND	NC	ND	ND	NC
Barium	0.78	0.77	1.3	1.5	1.4	6.9	1.2	1.5	22.2	1.4	1.2	15.4
Cadmium	ND	ND	NC	ND	ND	NC	ND	ND	NC	ND	ND	NC
Selenium	ND	ND	NC	ND	ND	NC	ND	ND	NC	ND	ND	NC
Chromium	ND	ND	NC	ND	ND	NC	ND	1.5	NC	ND	ND	NC
Lead	ND	ND	NC	ND	ND	NC	ND	ND	NC	ND	ND	NC
Mercury	ND	ND	NC	ND	ND	NC	ND	ND	NC	ND	ND	NC
Silver	ND	ND	NC	ND	ND	NC	ND	ND	NC	ND	ND	NC

^aRPD = Relative percent difference =

$$\frac{|R_1 - R_2|}{(R_1 + R_2)/2} \times 100$$

ND = Not reported at laboratory detection limit.

NC = Not calculable.

Cross Connect

STORM DRAIN/SANITARY SEWER CROSS-CONNECT ELIMINATION





October 24, 2003

Project No. 842717.01

Brenda Langkopf
Sandia National Laboratories/New Mexico
P.O. Box 5800, M/S 1087
Albuquerque, NM 87185-1087

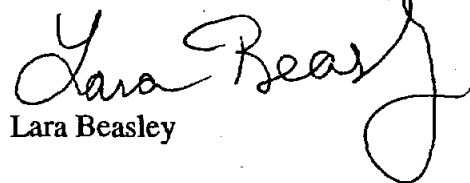
Storm Drain/Sanitary Sewer
Cross-Connect Elimination Sampling Summary,
Sandia National Laboratories/New Mexico
Task Order CPA56064, Purchase Order 107802

Miss Langkopf:

Subsurface soil sampling results for sampling conducted at the Storm Drain/Sanitary Sewer Cross-Connect Elimination Project are presented in "Field and Laboratory Documentation for Subsurface Soil Samples for TA-I Storm Drain/Sanitary Sewer Cross-Connect Elimination Project" (IT, 1993, SHEARS # 12479). IT Corporation collected samples from March 15 through March 17, 1993. The samples are documented on chain of custody numbers: 6042, 6081, and 6074 through 6077. A total of 14 subsurface soil samples, 1 duplicate soil sample, 1 trip blank, and 1 equipment rinsate sample were collected. The soil samples were collected to determine the type and extent of contamination in soils adjacent to the cross-connection to aid in the development of health and safety requirements for excavation activities. A summary of the samples collected is presented in Table 1. The analytical laboratory results are attached.

Respectfully submitted,

SHAW ENVIRONMENTAL, INC.



Lara Beasley

cc: M. Skelly, SNL/NM (w/ enclosures)
M. Goodrich, Shaw Environmental, Inc. (w/o enclosures)
Project File (w/ enclosures)



Table 1
Sample Summary
Storm Drain/Sanitary Sewer Cross-Connect Elimination Project
SNL/NM TA-1

Sample Number ER9200	Date Collected	Sample Area	Collection Method	Sample Matrix	Sample Type	Analyses	Sample Depth (feet)
4692	3/15/93	Bldg 882	Geoprobe	Soil	Environmental	^a Rad Screen	4 - 6
4693	3/15/93	Bldg 882	Geoprobe	Soil	Environmental	^b TM, pH, PCB, TCN	4 - 6
4694	3/15/93	Bldg 892, SE	Geoprobe	Soil	Environmental	Rad Screen	4 - 6
4695	3/15/93	Bldg 892, SE	Geoprobe	Soil	Environmental	TM, pH, PCB, TCN	4 - 6
4696	3/15/93	Bldg 892, S-1	Geoprobe	Soil	Environmental	Rad Screen	4 - 6
4697	3/15/93	Bldg 892, S-1	Geoprobe	Soil	Environmental	TM, pH, PCB, TCN	4 - 6
4698	3/15/93	Bldg 892, S-2	Geoprobe	Soil	Environmental	Rad Screen	4.5 - 6.5
4699	3/15/93	Bldg 892, S-2	Geoprobe	Soil	Environmental	TM, pH, PCB, TCN	4.5 - 6.5
4700	3/15/93	Bldg 892, S-3	Geoprobe	Soil	Environmental	Rad Screen	4.5 - 6.5
4701	3/15/93	Bldg 892, S-3	Geoprobe	Soil	Environmental	TM, pH, PCB, TCN	4.5 - 6.5
4702	3/16/93	Bldg 892, W-1	Geoprobe	Soil	Environmental	Rad Screen	5 - 7
4703	3/16/93	Bldg 892, W-1	Geoprobe	Soil	Environmental	TM, pH, PCB, TCN	5 - 7
4704	3/16/93	Bldg 892, W-2	Geoprobe	Soil	Environmental	Rad Screen	5.5 - 7.5
4705	3/16/93	Bldg 892, W-2	Geoprobe	Soil	Environmental	TM, pH, PCB, TCN	5.5 - 7.5
4706	3/16/93	Bldg 892, W-2	Geoprobe	Soil	Dup 4705	TM, pH, PCB, TCN	5.5 - 7.5

Refer to footnotes at end of table.
ALJ-93/WP/SNL.R2885



Table 1 (Continued)

Sample Summary

Storm Drain/Sanitary Sewer Cross-Connect Elimination Project Soil Samples
SNL/NM TA-1

Sample Number ER9200	Date Collected	Sample Area	Collection Method	Sample Matrix	Sample Type	Analyses	Sample Depth (feet)
4707	3/16/93	Bldg 892, N	Geoprobe	Soil	Environmental	Rad Screen	5.5 - 7.5
4708	3/16/93	Bldg 892, N	Geoprobe	Soil	Environmental	TM, pH, PCB, TCN, VOC, SVOC	5.5 - 7.5
4709	3/16/93	Bldg 892, N	Geoprobe	Soil	Environmental	As, Pb, U, Th, Pu	5.5 - 7.5
4710	N/A	N/A	N/A	Water	Trip Blank	VOC	N/A
4711	3/16/93	Bldg 840, N-1	Geoprobe	Soil	Environmental	Rad Screen	4 - 6
4712	3/16/93	Bldg 840, N-1	Geoprobe	Soil	MS/MSD	TM, pH, PCB, TCN	4 - 6
4713	3/16/93	Bldg 840, N-1	e	Water	Equip Rinsate	TM, pH, PCB, TCN	N/A
4714	3/16/93	Bldg 840, N-2	Geoprobe	Soil	Environmental	Rad Screen	4 - 6
4715	3/16/93	Bldg 840, N-2	Geoprobe	Soil	Environmental	TM, pH, PCB, TCN	4 - 6
4716	3/17/93	Bldg 840, W-1	Geoprobe	Soil	Environmental	Rad Screen	4 - 6
4717	3/17/93	Bldg 840, W-1	Geoprobe	Soil	Environmental	TM, pH, PCB, TCN	4 - 6
4718	3/17/93	Bldg 840, W-2	Geoprobe	Soil	Environmental	Rad Screen	4 - 6
4719	3/17/93	Bldg 840, W-2	Geoprobe	Soil	Environmental	TM, pH, PCB, TCN	4 - 6
4720	3/17/93	Bldg 867	Geoprobe	Soil	Environmental	TM, pH, PCB, TCN	4 - 6
4721	3/17/93	Bldg 867	Geoprobe	Soil	Environmental	Rad Screen	4 - 6

Refer to footnotes at end of table.

AL/S-93/WP/SNL:R2885

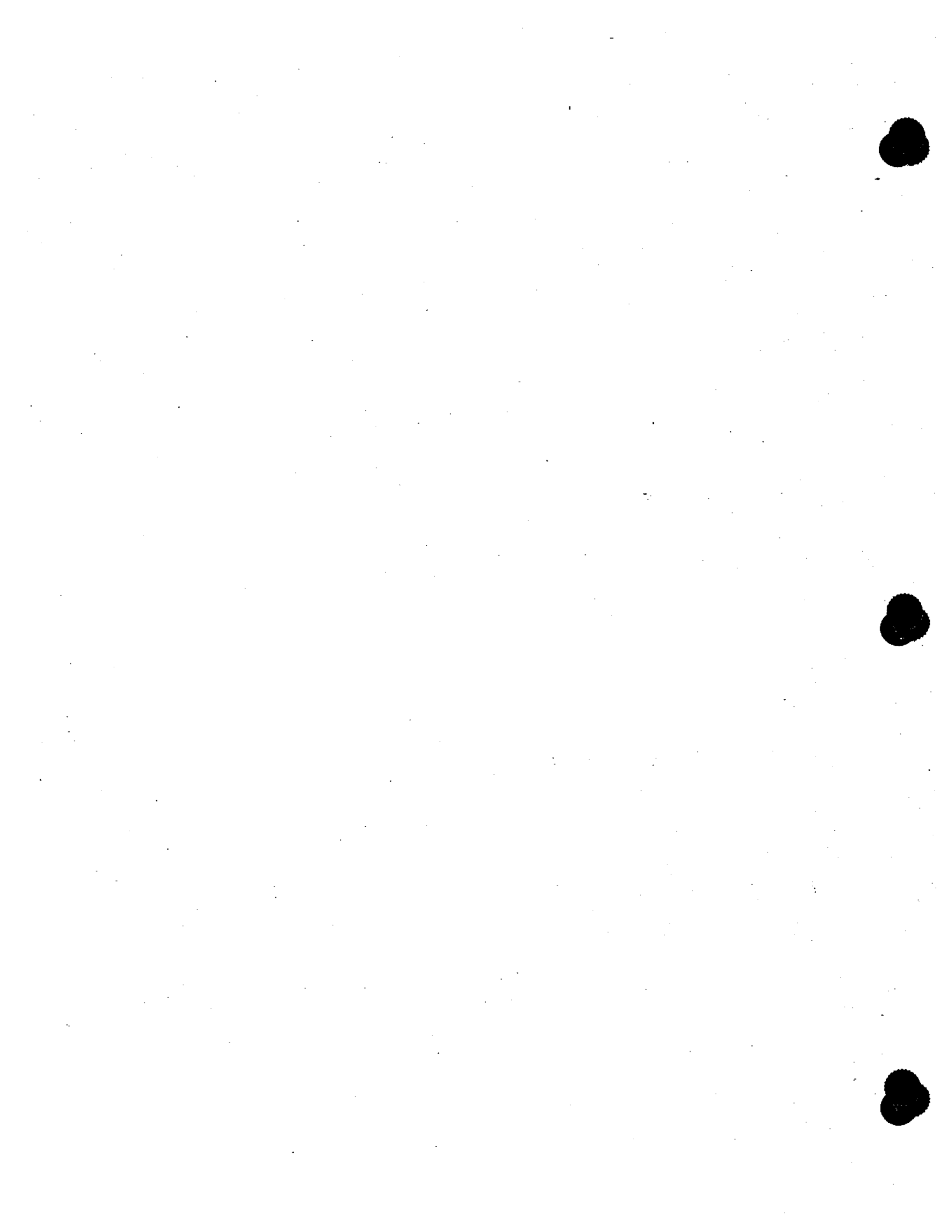


Table 1 (Continued)

Sample Summary
Storm Drain/Sanitary Sewer Cross-Connect Elimination Project Soil Samples
SNL/NM TA-1

Sample Number ER9200	Date Collected	Sample Area	Collection Method	Sample Matrix	Sample Type	Analyses	Sample Depth (feet)
4722	3/17/93	Bldg 802	Geoprobe	Soil	Environmental	Rad Screen	5 - 8
4290	3/17/93	Bldg 802	Geoprobe	Soil	Environmental	TM, pH, PCB, TCN	5 - 8
4291	3/17/93	Bldg 802	Geoprobe	Soil	Environmental	trit, U, Th, Pu	5 - 8

NA = not applicable.

Geoprobe = hydraulically driven hollow-tube sampling device.

Dup = duplicate soil sample.

MS/MSD = matrix spike; matrix spike duplicate.

^a Soil sample sent to SNL/NM Dept 7715 for radiological screening.

^b Sample sent to contract laboratory for analysis of total RCRA metals (TM), pH, polychlorinated biphenyls (PCB), and total cyanide (TCN).

^c Sample was also analyzed for volatile organic compounds (VOC) and semivolatile organic compounds (SVOC).

^d Sample sent to contract laboratory for analyses of tritium (trit), isotopic uranium (U), isotopic thorium (Th), and isotopic plutonium (Pu).

^e The equipment rinsate was collected by pouring deionized water through decontaminated sampling instruments and collecting the water in sample jars.



LABORATORY NARRATIVE

Project Name: Sandia
Project Number: 76100
Sample Delivery Group: SNL-SS-031
Batch Number(s): 1605
QC Set(s): Sample Preparation - Inorganics:
Metals Laboratory - Preparation/Analysis:
HYD032593-1, ICP031993-3, CV032293-2
Sample Analysis - Inorganics:
Metals Laboratory - Preparation/Analysis:
HYD032593-1, ICP031993-3, CV032293-2
Sample Preparation - Organics:
PBS032393-9
Sample Analysis - Organic Extractions - GC:
PBS032393-9
Narrative Date: April 13, 1993

Sample Receipt

The samples were received at ENCOTEC without incident. Standard chain-of-custody procedures were followed. After log-in, the samples were stored at 4°C until sample preparation or analysis.

Sample Preparation - Inorganics - Metals & General Chemistry

Preparation/digestion of samples, where applicable, was performed within holding time and with chain of custody maintained. Sample preparation proceeded without incident. A method blank, laboratory control sample, and laboratory control sample duplicate were processed with each QC set.

Sample Analysis - Inorganics - Metals & General Chemistry

Sample analysis was performed without incident, within holding times, with chain of custody maintained, and according to the referenced methods. Quality control results are summarized as follows:

- The method blanks did not contain any target analytes at or above the reported detection limit.

- Laboratory control samples and laboratory control sample duplicates were analyzed along with the samples referenced within the QC sets; please see the appropriate forms for results.

Sample Preparation - Organics

All sample extractions were performed within holding time and with chain of custody maintained. Sample extraction proceeded without incident. Surrogates were added to all samples. A method blank, laboratory control sample, laboratory control sample duplicate, matrix spike, and matrix spike duplicate were processed with each QC set. If requested, the matrix spike fortification was performed using a client-specific sample from this project.

Sample Analysis - Organic Extractions - GC

Sample analysis was performed without incident, within holding times, with chain of custody maintained, and according to method 8080 for PCBs only. Quality control results are summarized as follows:

- Analysis of surrogates was performed on all samples; please see the appropriate forms for results.

- The method blanks did not contain any target analytes at or above the reported detection limit.

- A Laboratory control sample and laboratory control sample duplicate were analyzed along with the samples referenced within the QC sets; please see the appropriate forms for results.

- A matrix spike and matrix spike duplicate were analyzed on client ID ER 9200 4697-1; please see the appropriate forms for results.

Summary

All inorganic analyses were performed by inductively coupled plasma emission spectroscopy, hydride and cold vapor atomic absorption, and classical wet chemistry methodologies. According to quality control data, accuracy and precision were satisfactorily maintained.

PCB analysis by method 8080 did not indicate the presence of any target analytes.

I certify that the data presented as part of this report meets the minimum quality assurance standards specified in the referenced analytical method(s). I have examined and am familiar with the information contained in this report and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, complete and meets the minimum standards specified in 40 CFR 136, SW-846. Any exceptions, outliers and/or problems encountered during the analysis of samples contained within this report have been narrated and an assessment of the quality of the data is presented. I am aware that there are significant penalties for submitting with knowledge, false information, including the possibility of fines and/or imprisonment.

Jane Hancock
Jane Hancock
QA/QC Chemist

4/13/93
Date

Environmental Control Technology Corporation
Analyst Cross-Reference List

SDG#: SNL-SS-031

Test

PCB

Total cyanide

pH

%TS

ICP

CVAA

HYAA

Analyst

Don Ward

Steve Carter

Sean Markiewicz

Sean Markiewicz

Annie Broderick

Laura Wilmoth

Alexey Stiop

Polychlorinated Biphenyls

ENVIRONMENTAL CONTROL TECHNOLOGY CORPORATION
3985 Research Park Drive * Ann Arbor, MI 48108
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ORGANIC ANALYSIS DATA SUMMARY SHEET

Project Name: Sandia
Project Number: 76100
Method: 8080
Report Date: April 6, 1993

Sample I.D.: ER9200 4693-1
Sample Date: 03/15/93
Date Received: 03/17/93
Date Extracted: 03/23/93
Date Analyzed: 03/30/93
ENCOTEC I.D.: 200008024
QC Set I.D.: PBS032393-9

U = Analyte not detected
B = Analyte present in
method blank

AROCLOR	CAS NUMBER	CONC. (ug/Kg)	DETECTION LIMIT (ug/Kg)
PCB-1016	12674-11-2	U	80
PCB-1221	11104-28-2	U	80
PCB-1232	11141-16-5	U	80
PCB-1242	53469-21-9	U	80
PCB-1248	12672-29-6	U	80
PCB-1254	11097-69-1	U	80
PCB-1260	11096-82-5	U	80

Analysis reported on a X WET DRY weight basis.

Percent solids 91.0

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ORGANIC ANALYSIS DATA SUMMARY SHEET

Project Name: Sandia
Project Number: 76100
Method: 8080
Report Date: April 6, 1993

Sample I.D.: ER9200 4695-1
Sample Date: 03/15/93
Date Received: 03/17/93
Date Extracted: 03/23/93
Date Analyzed: 03/30/93
ENCOTEC I.D.: 200008025
QC Set I.D.: PBS032393-9

U = Analyte not detected
B = Analyte present in
method blank

AROCLOR	CAS NUMBER	CONC. (ug/Kg)	DETECTION LIMIT (ug/Kg)
PCB-1016	12674-11-2	U	80
PCB-1221	11104-28-2	U	80
PCB-1232	11141-16-5	U	80
PCB-1242	53469-21-9	U	80
PCB-1248	12672-29-6	U	80
PCB-1254	11097-69-1	U	80
PCB-1260	11096-82-5	U	80

Analysis reported on a X WET _____ DRY weight basis.

Percent solids 88.8

ENVIRONMENTAL CONTROL TECHNOLOGY CORPORATION
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ORGANIC ANALYSIS DATA SUMMARY SHEET

Project Name: Sandia
Project Number: 76100
Method: 8080
Report Date: April 6, 1993

Sample I.D.: ER9200 4697-1
Sample Date: 03/15/93
Date Received: 03/17/93
Date Extracted: 03/23/93
Date Analyzed: 03/30/93
ENCOTEC I.D.: 200008026
QC Set I.D.: PBS032393-9

U = Analyte not detected
B = Analyte present in
method blank

AROCLOR	CAS NUMBER	CONC. (ug/Kg)	DETECTION LIMIT (ug/Kg)
PCB-1016	12674-11-2	U	80
PCB-1221	11104-28-2	U	80
PCB-1232	11141-16-5	U	80
PCB-1242	53469-21-9	U	80
PCB-1248	12672-29-6	U	80
PCB-1254	11097-69-1	U	80
PCB-1260	11096-82-5	U	80

Analysis reported on a X WET DRY weight basis.

Percent solids 91.4

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ORGANIC ANALYSIS DATA SUMMARY SHEET

Project Name: Sandia
Project Number: 76100
Method: 8080
Report Date: April 6, 1993

Sample I.D.: ER9200 4699-1
Sample Date: 03/15/93
Date Received: 03/17/93
Date Extracted: 03/23/93
Date Analyzed: 03/31/93
ENCOTEC I.D.: 200008027
QC Set I.D.: PBS032393-9

U = Analyte not detected
B = Analyte present in
method blank

AROCLOR	CAS NUMBER	CONC. (ug/Kg)	DETECTION LIMIT (ug/Kg)
PCB-1016	12674-11-2	U	80
PCB-1221	11104-28-2	U	80
PCB-1232	11141-16-5	U	80
PCB-1242	53469-21-9	U	80
PCB-1248	12672-29-6	U	80
PCB-1254	11097-69-1	U	80
PCB-1260	11096-82-5	U	80

Analysis reported on a X WET _____ DRY weight basis.

Percent solids 85.9

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ORGANIC ANALYSIS DATA SUMMARY SHEET

Project Name: Sandia
Project Number: 76100
Method: 8080
Report Date: April 6, 1993

Sample I.D.: ER9200 4701-1
Sample Date: 03/15/93
Date Received: 03/17/93
Date Extracted: 03/23/93
Date Analyzed: 03/31/93
ENCOTEC I.D.: 200008028
QC Set I.D.: PBS032393-9

U = Analyte not detected
B = Analyte present in
method blank

AROCLOR	CAS NUMBER	CONC. (ug/Kg)	DETECTION LIMIT (ug/Kg)
PCB-1016	12674-11-2	U	80
PCB-1221	11104-28-2	U	80
PCB-1232	11141-16-5	U	80
PCB-1242	53469-21-9	U	80
PCB-1248	12672-29-6	U	80
PCB-1254	11097-69-1	U	80
PCB-1260	11096-82-5	U	80

Analysis reported on a X WET DRY weight basis.

Percent solids 92.0

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ORGANIC ANALYSIS DATA SUMMARY SHEET

Project Name: Sandia
Project Number: 76100
Method: 8080
Report Date: April 6, 1993

Sample I.D.: Method Blank
Sample Date: NA
Date Received: NA
Date Extracted: 03/23/93
Date Analyzed: 03/30/93
ENCOTEC I.D.: MB032393-1
QC Set I.D.: PBS032393-9

U = Analyte not detected
B = Analyte present in
method blank

AROCLOR	CAS NUMBER	CONC. (ug/Kg)	DETECTION LIMIT (ug/Kg)
PCB-1016	12674-11-2	U	80
PCB-1221	11104-28-2	U	80
PCB-1232	11141-16-5	U	80
PCB-1242	53469-21-9	U	80
PCB-1248	12672-29-6	U	80
PCB-1254	11097-69-1	U	80
PCB-1260	11096-82-5	U	80

Analysis reported on a X WET DRY weight basis.

Percent solids NA

ENVIRONMENTAL CONTROL TECHNOLOGY CORPORATION
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SOILS\SOLIDS MATRIX SURROGATE RECOVERY
POLYCHLORINATED BIPHENYLS

Project Name: Sandia
Project Number: 76100
Method: 8080
Report Date: April 6, 1993
QC Set I.D.: PBS032393-9

<u>ENCOTEC</u> <u>Sample Number</u>	<u>Percent Recovery</u> <u>2,4,5,6-TCMX</u> <u>(50-150)</u>	<u>Percent Recovery</u> <u>Decachlorobiphenyl</u> <u>(32-136)</u>
200008024	84	78
200008025	82	78
200008026	85	81
200008027	89	79
200008028	93	84
MB032393-1	97	78
LCS032393-9	92	79
LCD032393-9	102	89
200008026 MS	86	79
200008026 MSD	92	78

All samples fortified with 33 ug/Kg of surrogate analyte.

* Value outside of established quality control windows.
DL = Sample matrix diluted, therefore surrogate recoveries are not applicable.
MI = Matrix interferences caused distortion to recovery value.

RECOVERY: 0 out of 20 outside QC Windows.

ENVIRONMENTAL CONTROL TECHNOLOGY CORPORATION
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SOIL MATRIX LABORATORY CONTROL SAMPLE (LCS) AND LABORATORY CONTROL SAMPLE DUPLICATE (LCD) RECOVERY
 POLYCHLORINATED BIPHENYLS

Project Name: Sandia
 Project Number: 76100
 Method: 8080
 Report Date: April 6, 1993
 QC Set I.D.: PBS032393-9

SAMPLE SPIKED - ENCOTEC ID: LCS/LCD032393-9

Aroclor	Concentration Spiked (ug/Kg)	LCS Conc. (ug/Kg)	% Rec.	LCD Conc. (ug/Kg)	% Rec.	RPD	QUALITY CONTROL WINDOWS	
							RPD	% Recovery
PCB 1221	333	302	91	334	100	10	20	48-163
PCB 1248	333	247	74	274	82	10	19	39-155
PCB 1260	333	272	82	300	90	9.8	23	37-166

RPD = Relative Percent Difference.

* Value outside of quality control windows.

RPD: 0 out of 3 outside QC Windows.

RECOVERY: 0 out of 6 outside QC Windows.

Note:

13

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SOIL/SOLIDS MATRIX SPIKE (MS) AND MATRIX SPIKE DUPLICATE (MSD) RECOVERY
 POLYCHLORINATED BIPHENYLS

Project Name: Sandia
 Project Number: 76100
 Method: 8080
 Report Date: April 6, 1993
 QC Set I.D.: PBS032393-9

SAMPLE SPIKED - ENCOTEC ID: 200008026

CLIENT ID: ER9200 4697-1

<u>Aroclor</u>	<u>Concentration Spiked (ug/Kg)</u>	<u>Sample Result (ug/Kg)</u>	<u>MS Conc (ug/Kg)</u>	<u>% Rec</u>	<u>MSD Conc (ug/Kg)</u>	<u>% Rec</u>	<u>RPD</u>	<u>QUALITY CONTROL WINDOWS</u>	
								<u>RPD</u>	<u>%Recovery</u>
PCB 1221	333	80 U	288	86	307	92	6.4	20	48-163
PCB 1248	333	80 U	243	73	259	78	6.4	19	39-155
PCB 1260	333	80 U	272	82	265	80	2.6	23	37-166

U = Analyte not detected in non-spiked sample.

MI = Matrix interferences caused distortion to recovery value.

RPD = Relative Percent Difference.

* Value outside of quality control windows.

RPD: 0 out of 3 outside QC Windows.

RECOVERY: 0 out of 6 outside QC Windows.

Note:

Inorganic Parameters

Metals

ENVIRONMENTAL CONTROL TECHNOLOGY CORPORATION
3985 Research Park Drive * Ann Arbor, MI 48108
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INORGANICS ANALYSIS (METALS) DATA SUMMARY SHEET
SOIL MATRIX

Project Name: Sandia
Project Number: 76100
Report Date: April 5, 1993

Sample I.D.: ER9200 4693-1 U = Analyte not detected.
Sample Date: 03/15/93
Date Received: 03/17/93
ENCOTECH I.D.: 200008024

ANALYTE	QC SET ID	ANALYSIS DATE	METHOD	CONC. (mg/Kg)	DETECTION LIMIT (mg/Kg)
Arsenic	HYD032593-1	03/26/93	7061	3.2	1.1
Barium	ICP031993-3	03/24/93	6010	194	1.1
Cadmium	ICP031993-3	03/24/93	6010	U	0.27
Chromium	ICP031993-3	03/24/93	6010	7.5	1.1
Lead	ICP031993-3	03/24/93	6010	5.3	2.2
Mercury	CV032293-2	03/23/93	7470	U	0.044
Selenium	HYD032593-1	03/26/93	7741	0.11	0.11
Silver	ICP031993-3	03/24/93	6010	U	0.55

Results reported on a dry weight basis.

Percent Total Solids 91.0

Note:

Form 110MSN1G.GEN

Rev. 10/14/92

INORGANICS ANALYSIS (METALS) DATA SUMMARY SHEET
SOIL MATRIX

Project Name: Sandia
Project Number: 76100
Report Date: April 5, 1993

Sample I.D.: ER9200 4695-1
Sample Date: 03/15/93
Date Received: 03/17/93
ENCOTECH I.D.: 200008025

U = Analyte not detected.

ANALYTE	QC SET ID	ANALYSIS DATE	METHOD	CONC. (mg/Kg)	DETECTION LIMIT (mg/Kg)
Arsenic	HYD032593-1	03/26/93	7061	6.2	1.1
Barium	ICP031993-3	03/24/93	6010	591	1.1
Cadmium	ICP031993-3	03/24/93	6010	U	0.28
Chromium	ICP031993-3	03/24/93	6010	9.9	1.1
Lead	ICP031993-3	03/24/93	6010	6.2	2.3
Mercury	CV032293-2	03/23/93	7470	U	0.045
Selenium	HYD032593-1	03/26/93	7741	0.14	0.11
Silver	ICP031993-3	03/24/93	6010	U	0.56

Results reported on a dry weight basis.

Percent Total Solids 88.8

Note:

Form 110MSN1G.GEN

Rev. 10/14/92

ENVIRONMENTAL CONTROL TECHNOLOGY CORPORATION
3985 Research Park Drive * Ann Arbor, MI 48108
313 / 761-1389

INORGANICS ANALYSIS (METALS) DATA SUMMARY SHEET
SOIL MATRIX

Project Name: Sandia
Project Number: 76100
Report Date: April 5, 1993

Sample I.D.: ER9200 4697-1
Sample Date: 03/15/93
Date Received: 03/17/93
ENCOTEC I.D.: 200008026

U = Analyte not detected.

ANALYTE	QC SET ID	ANALYSIS DATE	METHOD	CONC. (mg/Kg)	DETECTION LIMIT (mg/Kg)
Arsenic	HYD032593-1	03/26/93	7061	3.4	1.1
Barium	ICP031993-3	03/24/93	6010	244	1.1
Cadmium	ICP031993-3	03/24/93	6010	0.34	0.27
Chromium	ICP031993-3	03/24/93	6010	6.4	1.1
Lead	ICP031993-3	03/24/93	6010	5.1	2.2
Mercury	CV032293-2	03/23/93	7470	U	0.044
Selenium	HYD032593-1	03/26/93	7741	U	0.11
Silver	ICP031993-3	03/24/93	6010	U	0.55

Results reported on a dry weight basis.

Percent Total Solids 91.4

Note:

Form 110MSN1G.GEN

Rev. 10/14/92

ENVIRONMENTAL CONTROL TECHNOLOGY CORPORATION
3985 Research Park Drive * Ann Arbor, MI 48108
313 / 761-1389

INORGANICS ANALYSIS (METALS) DATA SUMMARY SHEET
SOIL MATRIX

Project Name: Sandia
Project Number: 76100
Report Date: April 5, 1993

Sample I.D.: ER9200 4699-1
Sample Date: 03/15/93
Date Received: 03/17/93
ENCOTEC I.D.: 200008027

U = Analyte not detected.

ANALYTE	QC SET ID	ANALYSIS DATE	METHOD	CONC. (mg/Kg)	DETECTION LIMIT (mg/Kg)
Arsenic	HYD032593-1	03/26/93	7061	5.3	1.2
Barium	ICP031993-3	03/24/93	6010	191	1.2
Cadmium	ICP031993-3	03/24/93	6010	U	0.29
Chromium	ICP031993-3	03/24/93	6010	8.3	1.2
Lead	ICP031993-3	03/24/93	6010	5.1	2.3
Mercury	CV032293-2	03/23/93	7470	U	0.047
Selenium	HYD032593-1	03/26/93	7741	U	0.12
Silver	ICP031993-3	03/24/93	6010	U	0.58

Results reported on a dry weight basis.

Percent Total Solids 85.9

Note:

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INORGANICS ANALYSIS (METALS) DATA SUMMARY SHEET
SOIL MATRIX

Project Name: Sandia
Project Number: 76100
Report Date: April 5, 1993

Sample I.D.: ER9200 4701-1
Sample Date: 03/15/93
Date Received: 03/17/93
ENCOTEC I.D.: 200008028

U = Analyte not detected.

ANALYTE	QC SET ID	ANALYSIS DATE	METHOD	CONC. (mg/Kg)	DETECTION LIMIT (mg/Kg)
Arsenic	HYD032593-1	03/26/93	7061	3.6	1.1
Barium	ICP031993-3	03/24/93	6010	130	1.1
Cadmium	ICP031993-3	03/24/93	6010	U	0.27
Chromium	ICP031993-3	03/24/93	6010	5.8	1.1
Lead	ICP031993-3	03/24/93	6010	4.3	2.2
Mercury	CV032293-2	03/23/93	7470	U	0.044
Selenium	HYD032593-1	03/26/93	7741	U	0.11
Silver	ICP031993-3	03/24/93	6010	U	0.54

Results reported on a dry weight basis.

Percent Total Solids 92.0

Note:

Form 110MSN1G.GEN

Rev. 10/14/92

INORGANICS ANALYSIS (METALS) DATA SUMMARY SHEET
SOIL MATRIX

Project Name: Sandia
Project Number: 76100
Report Date: April 08, 1993

Sample I.D.: Method Blank U = Analyte not detected.
Sample Date: NA
Date Received: NA
ENCOTEC I.D.: MBSNL-SS-031

ANALYTE	QC SET ID	ANALYSIS DATE	METHOD	CONC. (mg/Kg)	DETECTION LIMIT (mg/Kg)
Arsenic	HYD032593-1	03/26/93	7061	U	0.10
Barium	ICP031993-3	03/24/93	6010	U	1.0
Cadmium	ICP031993-3	03/24/93	6010	U	0.25
Chromium	ICP031993-3	03/24/93	6010	U	1.0
Lead	ICP031993-3	03/24/93	6010	U	2.0
Mercury	CV032293-2	03/23/93	7470	U	0.04
Selenium	HYD032593-1	03/26/93	7741	U	0.1
Silver	ICP031993-3	03/24/93	6010	U	0.5

Results reported on a dry weight basis.

Percent Total Solids NA

Note:

Form 110MSN1G.GEN

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SOIL MATRIX LABORATORY CONTROL SAMPLE (LCS) AND LABORATORY CONTROL SAMPLE DUPLICATE (LCD) RECOVERY
 INORGANICS - METALS

Project Name: Sandia
 Project Number: 76100
 Report Date: April 08, 1993

Parameter	QC Set ID	Conc Spiked (mg/Kg)	LCS Conc (mg/Kg)	% Rec	LCD Conc (mg/Kg)	% Rec	RPD	QUALITY CONTROL WINDOWS	
								RPD	% Rec
Arsenic	HYD032593-1	0.20	0.203	102	0.207	104	2.0	20	80-120
Barium	ICP031993-3	50	48	96	49	98	2.1	20	80-120
Cadmium	ICP031993-3	10	9.4	94	9.4	94	0	20	80-120
Chromium	ICP031993-3	50	48	96	48	96	0	20	80-120
Lead	ICP031993-3	50	46	92	46	92	0	20	80-120
Mercury	CV032293-2	0.40	0.42	105	0.40	100	4.9	20	80-120
Selenium	HYD032593-1	0.20	0.21	105	0.22	110	4.5	20	80-120
Silver	ICP031993-3	25	24	96	24	96	0	20	80-120

* = Value outside QC windows.

RECOVERY: 0 out of 16 outside QC Windows.
 RPD: 0 out of 8 outside QC Windows.

Inorganic Parameters

General Chemistry

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INORGANICS ANALYSIS (GENERAL) DATA SUMMARY SHEET
SOIL MATRIX

Project Name: Sandia
Project Number: 76100
Report Date: March 26, 1993

Sample I.D.: ER 9200 4693-1
Sample Date: 03/15/93
Date Received: 03/17/93
ENCOTEC I.D.: 200008024

U = Analyte not detected.

ANALYTE	QC SET ID	ANALYSIS DATE	UNITS	CONC.	DETECTION LIMIT
Total Cyanide	CN031893A	03/22/93	mg/Kg	U	0.10
pH	pH031893	03/18/93	S.U.	7	0.5-12.5
Total Solids	TS031993	03/19/93	%	91.0	0.1

Results reported on a dry weight basis.

Note:

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INORGANICS ANALYSIS (GENERAL) DATA SUMMARY SHEET
SOIL MATRIX

Project Name: Sandia
Project Number: 76100
Report Date: March 26, 1993

Sample I.D.: ER 9200 4695-1
Sample Date: 03/15/93
Date Received: 03/17/93
ENCOTEC I.D.: 200008025

U = Analyte not detected.

ANALYTE	QC SET ID	ANALYSIS DATE	UNITS	CONC.	DETECTION LIMIT
Total Cyanide	CN031893A	03/22/93	mg/Kg	U	0.10
pH	pH031893	03/18/93	S.U.	7	0.5-12.5
Total Solids	TS031993	03/19/93	%	88.8	0.1

Results reported on a dry weight basis.

Note:

Form 120WSN1G.GEN

Rev. 10/07/92

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INORGANICS ANALYSIS (GENERAL) DATA SUMMARY SHEET
SOIL MATRIX

Project Name: Sandia
Project Number: 76100
Report Date: March 26, 1993

Sample I.D.: ER 9200 4697-1
Sample Date: 03/16/93
Date Received: 03/17/93
ENCOTEC I.D.: 200008026

U = Analyte not detected.

ANALYTE	QC SET ID	ANALYSIS DATE	UNITS	CONC.	DETECTION LIMIT
Total Cyanide	CN031893B	03/22/93	mg/Kg	U	0.10
pH	pH031893	03/18/93	S.U.	7	0.5-12.5
Total Solids	TS031993	03/19/93	%	91.4	0.1

Results reported on a dry weight basis.

Note:

Form 120WSN1G.GEN

Rev. 10/07/92

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INORGANICS ANALYSIS (GENERAL) DATA SUMMARY SHEET
SOIL MATRIX

Project Name: Sandia
Project Number: 76100
Report Date: March 26, 1993

Sample I.D.: ER 9200 4699-1
Sample Date: 03/15/93
Date Received: 03/17/93
ENCOTEC I.D.: 200008027

U = Analyte not detected.

ANALYTE	QC SET ID	ANALYSIS DATE	UNITS	CONC.	DETECTION LIMIT
Total Cyanide	CN031893B	03/22/93	mg/Kg	U	0.10
pH	PH031893	03/18/93	S.U.	7	0.5-12.5
Total Solids	TS031993	03/19/93	%	85.9	0.1

Results reported on a dry weight basis.

Note:

Form 120WSN1G.GEN

Rev. 10/07/92

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INORGANICS ANALYSIS (GENERAL) DATA SUMMARY SHEET
SOIL MATRIX

Project Name: Sandia
Project Number: 76100
Report Date: March 26, 1993

Sample I.D.: ER 9200 4701-1
Sample Date: 03/15/93
Date Received: 03/17/93
ENCOTECH I.D.: 200008028

U = Analyte not detected.

ANALYTE	QC SET ID	ANALYSIS DATE	UNITS	CONC.	DETECTION LIMIT
Total Cyanide	CN031893B	03/22/93	mg/Kg	U	0.10
pH	PH031893	03/18/93	S.U.	7	0.5-12.5
Total Solids	TS031993	03/19/93	%	92.0	0.1

Results reported on a dry weight basis.

Note:

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INORGANICS ANALYSIS (GENERAL) DATA SUMMARY SHEET
SOIL MATRIX

Project Name: Sandia
Project Number: 76100
Report Date: April 08, 1993

Sample I.D.: Method Blank
Sample Date: NA
Date Received: NA
ENCOTEC I.D.: MBSNL-SS-031-1

U = Analyte not detected.

ANALYTE	QC SET ID	ANALYSIS DATE	UNITS	CONC.	DETECTION LIMIT
Total Solids	TS031993	03/19/93	%	U	0.1
Total Cyanide	CN031893A	03/22/93	mg/L	U	0.10

Note:

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INORGANICS ANALYSIS (GENERAL) DATA SUMMARY SHEET
SOIL MATRIX

Project Name: Sandia
Project Number: 76100
Report Date: April 08, 1993

Sample I.D.: Method Blank
Sample Date: NA
Date Received: NA
ENCOTEC I.D.: MBSNL-SS-031-2

U = Analyte not detected.

ANALYTE	QC SET ID	ANALYSIS DATE	UNITS	CONC.	DETECTION LIMIT
Total Cyanide	CN031893B	03/22/93	mg/L	U	0.10

Note:

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SOIL MATRIX LABORATORY CONTROL SAMPLE (LCS) AND LABORATORY CONTROL SAMPLE DUPLICATE (LCD) RECOVERY
 INORGANICS - GENERAL

Project Name: Sandia
 Project Number: 76100
 Report Date: April 08, 1993

Analyte	QC Set ID	Units	Conc Spiked	Conc LCS	% Rec	Conc LCD	% Rec	RPD	QUALITY CONTROL WINDOWS	
									RPD	% Rec
Total Cyanide	CN031893A	mg/Kg	1.86	1.69	91	1.63	88	3.6	20	80 - 120
									20	80 - 120
									20	80 - 120
									20	80 - 120
									20	80 - 120
									20	80 - 120
									20	80 - 120
									20	80 - 120
									20	80 - 120
									20	80 - 120
									20	80 - 120
									20	80 - 120
									20	80 - 120
									20	80 - 120
									20	80 - 120
									20	80 - 120

* Value is outside quality control windows.
 Recovery: 0 out of 2 outside QC Windows.
 RPD: 0 out of 1 outside QC Windows.

Note:

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SOIL MATRIX LABORATORY CONTROL SAMPLE (LCS) AND LABORATORY CONTROL SAMPLE DUPLICATE (LCD) RECOVERY
 INORGANICS - GENERAL

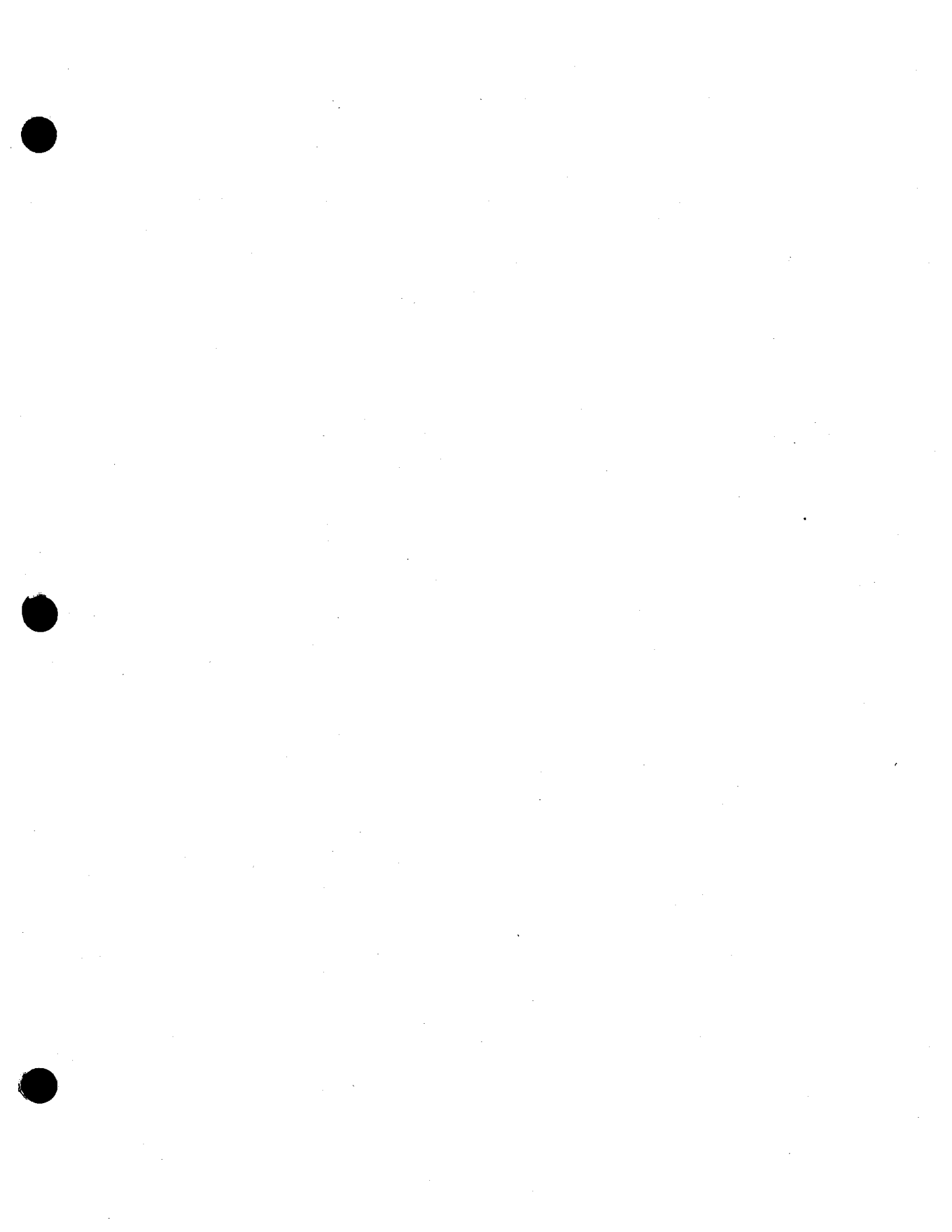
Project Name: Sandia
 Project Number: 76100
 Report Date: April 08, 1993

Analyte	QC Set ID	Units	Conc Spiked	Conc LCS	% Rec	Conc LCD	% Rec	RPD	QUALITY CONTROL WINDOWS	
									RPD	% Rec
Total Cyanide	CN031893B	mg/Kg	1.86	1.80	97	1.77	95	1.7	20	80 - 120
									20	80 - 120
									20	80 - 120
									20	80 - 120
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									20	80 - 120
									20	80 - 120
									20	80 - 120

* Value is outside quality control windows.

Recovery: 0 out of 2 outside QC Windows.
 RPD: 0 out of 1 outside QC Windows.

Note:





LABORATORY NARRATIVE

Project Name: Sandia
Project Number: 76100
Sample Delivery Group: SNL-SS-032
Batch Number(s): 1604
QC Set(s): Sample Preparation - Inorganics:
Metals Laboratory - Preparation/Analysis:
ICP031993-3, ICP031993-1, HYD032593-1,
CV031893-1, CV032293-1
Sample Analysis - Inorganics:
Metals Laboratory - Preparation/Analysis:
ICP031993-3, ICP031993-1, HYD032593-1,
CV031893-1, CV032293-1
Sample Preparation - Organics:
BS040293-1, PBS032293-8, PBW031993-2
Sample Analysis - Organic Extractions - GC:
PBW031993-2, PBS032293-8
Sample Analysis - Organics - GC/MS:
032293G, BS040293-1
Narrative Date: April 13, 1993

Sample Receipt

The samples were received at ENCOTEC with incident. Sample ER 9200 4713-1 was incorrectly labelled ER 9200 4713-2 and sample ER 9200 4713-2 was incorrectly labelled ER 9200 4713-1. The project manager was notified and the client contacted to confirm the discrepancy.

Standard chain-of-custody procedures were followed. After log-in, the samples were stored at 4°C and/or chemically preserved where required per EPA protocol until sample preparation or analysis.

Sample Preparation - Inorganics - Metals & General Chemistry

Preparation/digestion of samples, where applicable, was performed within holding time and with chain of custody maintained. Sample preparation proceeded without incident. A method blank, laboratory control sample, and laboratory control sample duplicate were processed with each QC set. Matrix spike and matrix spike duplicate fortification was performed on the client-specific sample ER9200 4712.

Sample Analysis - Inorganics - Metals & General Chemistry

Sample analysis was performed without incident, within holding times, with chain of custody maintained, and according to the referenced methods. Quality control results are summarized as follows:



Sample Analysis - Organics - GC/MS

Sample analysis was performed without incident, within holding times, with chain of custody maintained, and according to methods 8240 and 8270. Quality control results are summarized as follows:

- Surrogates were added to all samples and analyzed by the referenced methods. Please see the enclosed forms for results.

- Method blanks did not contain any target analytes at or above the reported detection limit.

- Analysis of laboratory control samples and laboratory control sample duplicates was performed along with the samples referenced within the QC set. Please see the enclosed forms for results.

- Matrix spike and matrix spike duplicate analysis was performed on samples ER-9200-4708-2 and ER-9200-4708-1. Please see the enclosed forms for results.

Summary

All inorganic analyses were performed by inductively coupled plasma emission spectroscopy, hydride and cold vapor atomic absorption, and classical wet chemistry methodologies. According to quality control data, accuracy and precision were satisfactorily maintained.

PCB analysis by method 8080 did not indicate the presence of any target analytes.

No problems were encountered with the analysis of these samples by methods 8240 or 8270.

I certify that the data presented as part of this report meets the minimum quality assurance standards specified in the referenced analytical method(s). I have examined and am familiar with the information contained in this report and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, complete and meets the minimum standards specified in 40 CFR 136, SW-846. Any exceptions, outliers and/or problems encountered during the analysis of samples contained within this report have been narrated and an assessment of the quality of the data is presented. I am aware that there are significant penalties for submitting with knowledge, false information, including the possibility of fines and/or imprisonment.

Jane Hancock
Jane Hancock
QA/QC Chemist

7/13/93
Date

Environmental Control Technology Corporation
Analyst Cross-Reference List

SDG#: SNL-SS-032

Test	Analyst
8240	Don Fitzpatrick
PCB	Don Ward
ICP	Annie Broderick
HYAA	Laura Wilmoth
CVAA	Laura Wilmoth
Total Cyanide	Chris McCarthy
pH	Sean Markiewicz
TS	Sean Markiewicz

Volatile Organics

008

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VOC DATA
for samples?

SOIL MATRIX SURROGATE RECOVERY
VOLATILE ORGANICS

Project Name: Sandia
Project Number: 76100
Method: 8240 X 8260
Report Date: April 06, 1993
QC Set I.D.: 032293G

<u>ENCOTEC</u> <u>Sample I.D.</u>	<u>% Recovery</u> <u>D8-Toluene</u> (81-117)	<u>% Recovery</u> <u>BFB</u> (74-121)	<u>% Recovery</u> <u>D4-1,2-Dichloroethane</u> (70-121)
200008013	101	99	92
200008017	98	99	96
MB032293-1G	102	99	96
LCS032293-1G	101	99	96
LCD032293-1G	100	99	98
200008017 MS	100	100	95
200008017 MSD	99	101	93

All samples fortified with 0.05 mg/Kg of each surrogate analyte.

* Value outside of established quality control windows.
DL = Sample matrix diluted, therefore surrogate recoveries are not applicable.
MI = Matrix interferences caused distortion to recovery value.

RECOVERY: 0 out of 21 outside QC Windows.

Note:

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SOIL MATRIX LABORATORY CONTROL SAMPLE (LCS) AND LABORATORY CONTROL SAMPLE DUPLICATE (LCD) RECOVERY
 VOLATILE ORGANICS

Project Name: Sandia
 Project Number: 76100
 Method: 624 ___ 8240 X 8260 ___
 Report Date: March 26, 1993
 QC Set I.D.: 032293G

SAMPLE SPIKED - ENCOTEC ID: LCS, LCD032293-1G

CLIENT ID: NA

QUALITY CONTROL WINDOWS

Compound	Concentration Spiked (mg/Kg)	Conc LCS	% Rec	Conc LCD	% Rec	RPD	RPD	% Recovery
Benzene	0.050	0.0534	107	0.0524	105	1.9	15	76-127
Bromodichloromethane	0.050	0.0543	109	0.0548	110	0.9	15	78-131
Bromoform	0.050	0.0492	98	0.0527	105	6.8	15	68-124
Carbon tetrachloride	0.050	0.0516	103	0.0519	104	0.6	15	70-136
Chlorobenzene	0.050	0.0495	99	0.0499	100	0.8	15	75-130
Chloroform	0.050	0.0492	98	0.0485	97	1.4	15	78-126
Dibromochloromethane	0.050	0.0539	108	0.0563	113	4.4	15	67-133
1,1-Dichloroethane	0.050	0.0479	96	0.0468	94	2.3	15	66-140
1,2-Dichloroethane	0.050	0.0513	103	0.0526	105	2.5	15	63-140
1,1-Dichloroethene	0.050	0.0537	107	0.0539	108	0.4	15	61-145
trans-1,2-Dichloroethene	0.050	0.0527	105	0.0531	106	0.8	15	69-143
1,2-Dichloropropane	0.050	0.0474	95	0.0484	97	2.1	15	70-122
Ethylbenzene	0.050	0.0532	106	0.0530	106	0.4	15	73-129
Methylene chloride	0.050	0.0547	109	0.0546	109	0.2	15	61-163
1,1,2,2-Tetrachloroethane	0.050	0.0480	96	0.0433	87	10	15	68-120
Tetrachloroethene	0.050	0.0512	102	0.0526	105	2.7	15	61-135
Toluene	0.050	0.0515	103	0.0518	104	0.6	15	76-125
1,1,1-Trichloroethane	0.050	0.0500	100	0.0498	100	0.4	15	67-129
1,1,2-Trichloroethane	0.050	0.0489	98	0.0512	102	4.6	15	73-125
Trichloroethene	0.050	0.0524	105	0.0590	118	12	15	71-120

RPD = Relative Percent Difference

* Value outside of quality control windows.

RPD: 0 out of 20 outside QC Windows
 RECOVERY: 0 out of 40 outside QC Windows

Note:

011

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SOIL MATRIX SPIKE (MS) AND MATRIX SPIKE DUPLICATE (MSD) RECOVERY
 VOLATILE ORGANICS

Project Name: Sandia
 Project Number: 76100
 Method: 8240 X 8260
 Report Date: April 06, 1993
 QC Set I.D.: 032293G

SAMPLE SPIKED - ENCOTEC ID: 200008017

CLIENT ID: ER 9200 4708-2

QUALITY
 CONTROL WINDOWS

Compound	Concentration Spiked (mg/Kg)	Sample Result (mg/Kg)	Conc MS	% Rec	Conc MSD	% Rec	RPD	RPD	% Recovery
1,1-Dichloroethene	0.050	0.005U	0.0542	108	0.0591	118	8.6	22	59-172
Trichloroethene	0.050	0.005U	0.0550	110	0.0548	110	0.4	24	62-137
Chlorobenzene	0.050	0.005U	0.0554	111	0.0562	112	1.4	21	60-133
Toluene	0.050	0.005U	0.0548	110	0.0570	114	3.9	21	59-139
Benzene	0.050	0.005U	0.0554	111	0.0550	110	0.7	21	66-142

012

U = Analyte not detected in non-spiked sample
 RPD = Relative Percent Difference
 * Value outside of quality control windows.

MI = Matrix interferences caused distortion to recovery value.

RPD: 0 out of 5 outside QC Windows
 RECOVERY: 0 out of 10 outside QC Windows

Note:

Semivolatile Organics

013

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SEMIVOLATILE ORGANICS DATA SUMMARY SHEET

Project Name: Sandia
 Project Number: 76100
 Method: 8270
 Report Date: April 7, 1993

Sample I.D.: ER9200 4708-1
 Sample Date: 03/16/93
 Date Received: 03/17/93
 Date Extracted: 03/24/93
 Date Analyzed: 03/31/93
 ENCOTEC I.D.: 200008016
 QC Set I.D.: BS040293-1

U = Analyte not detected.
 J = Analyte present at level
 less than detection limit.
 B = Analyte present in
 method blank.

HAZARDOUS SUBSTANCE LIST
 BASE-NEUTRAL EXTRACTABLES

HAZARDOUS SUBSTANCE LIST BASE-NEUTRAL EXTRACTABLES	CAS #	CONC. (mg/Kg)	DETECTION LIMIT (mg/Kg)
Acenaphthene	83-32-9	U	0.330
Acenaphthylene	208-96-8	U	0.330
Anthracene	120-12-7	U	0.330
Benzidine	92-87-5	U	2.66
Benzo(a)anthracene	56-55-1	U	0.330
Benzo(b)fluoranthene	205-99-2	U	0.330
Benzo(k)fluoranthene	207-08-9	U	0.330
Benzo(ghi)perylene	191-24-2	U	0.330
Benzoic acid	65-85-0	U	1.67
Benzo(a)pyrene	50-32-8	U	0.330
Benzyl alcohol	100-51-6	U	0.330
Bis(2-chloroethoxy) methane	111-91-1	U	0.330
Bis(2-chloroethyl) ether	111-44-4	U	0.330
Bis(2-chloroisopropyl) ether	39638-32-9*	U	0.330
Bis(2-ethylhexyl) phthalate	117-81-7	0.066 J	0.330
4-Bromophenyl phenyl ether	101-55-3	U	0.330
Butyl benzyl phthalate	85-68-7	U	0.330
4-Chloroaniline	106-47-8	U	0.330
2-Chloronaphthalene	91-58-7	U	0.330
4-Chlorophenyl phenyl ether	7005-72-3	U	0.330
Chrysene	218-01-9	U	0.330
Dibenz(a,h)anthracene	53-70-3	U	0.330
Dibenzofuran	132-64-9	U	0.330
Di-n-butyl phthalate	84-74-2	U	0.330
1,2-Dichlorobenzene	95-50-1	U	0.330
1,3-Dichlorobenzene	541-73-1	U	0.330
1,4-Dichlorobenzene	106-46-7	U	0.330
3,3'-Dichlorobenzidine	91-94-1	U	0.670
Diethyl phthalate	84-66-2	U	0.330
Dimethyl phthalate	131-11-3	U	0.330
2,4-Dinitrotoluene	121-14-2	U	0.330
2,6-Dinitrotoluene	606-20-2	U	0.330
Di-n-octyl phthalate	117-84-0	U	0.330
Fluoranthene	206-44-0	U	0.330
Fluorene	86-73-7	U	0.330
Hexachlorobenzene	118-74-1	U	0.330

* Same as 2,2'-Oxybis(1-chloropropane) 108-60-1

SEMIVOLATILE ORGANICS DATA SUMMARY SHEET

Project Name: Sandia
 Project Number: 76100
 Method: 8270

Report Date: April 7, 1993

Sample I.D.: ER9200 4708-1
 Sample Date: 03/16/93
 Date Received: 03/17/93
 Date Extracted: 03/24/93
 Date Analyzed: 03/31/93
 ENCOTEC I.D.: 200008016
 QC Set I.D.: BS040293-1

U = Analyte not detected.
 J = Analyte present at level
 less than detection limit.
 B = Analyte present in
 method blank.

HAZARDOUS SUBSTANCE LIST
 BASE NEUTRAL EXTRACTABLES

HAZARDOUS SUBSTANCE LIST BASE NEUTRAL EXTRACTABLES	CAS #	CONC. (mg/Kg)	DETECTION LIMIT (mg/Kg)
Hexachlorobutadiene	87-68-3	U	0.330
Hexachlorocyclopentadiene	77-47-4	U	0.330
Hexachloroethane	67-72-1	U	0.330
Indeno(1,2,3-cd)pyrene	193-39-5	U	0.330
Isophorone	78-59-1	U	0.330
2-Methylnaphthalene	91-57-6	U	0.330
Naphthalene	91-20-3	U	0.330
2-Nitroaniline	88-74-4	U	1.67
3-Nitroaniline	99-09-2	U	1.67
4-Nitroaniline	100-01-6	U	1.67
Nitrobenzene	98-95-3	U	0.330
N-Nitrosodiphenylamine*	86-30-6	U	0.330
N-Nitroso-di-n-propylamine	621-64-7	U	0.330
Phenanthrene	85-01-8	U	0.330
Pyrene	129-00-0	U	0.330
1,2,4-Trichlorobenzene	120-82-1	U	0.330

ACID EXTRACTABLES

ACID EXTRACTABLES	CAS #	CONC. (mg/Kg)	DETECTION LIMIT (mg/Kg)
4-Chloro-3-methylphenol	59-50-7	U	0.330
2-Chlorophenol	95-57-8	U	0.330
2,4-Dichlorophenol	120-83-2	U	0.330
2,4-Dimethylphenol	105-67-9	U	0.330
4,6-Dinitro-2-methylphenol	534-52-1	U	1.67
2,4-Dinitrophenol	51-28-5	U	1.67
2-Methylphenol	95-48-7	U	0.330
4-Methylphenol	106-44-5	U	0.330
2-Nitrophenol	88-75-5	U	0.330
4-Nitrophenol	100-02-7	U	1.67
Pentachlorophenol	87-86-5	U	1.67
Phenol	108-95-2	U	0.330
2,4,5-Trichlorophenol	95-95-4	U	0.330
2,4,6-Trichlorophenol	88-06-2	U	0.330

* Compound cannot be separated from Diphenylamine.

Analysis reported on X WET DRY weight basis.
 Percent total solids 95.0

Note:

ENVIRONMENTAL CONTROL TECHNOLOGY CORPORATION
3985 Research Park Drive * Ann Arbor, MI 48108
313 / 761-1389

SEMIVOLATILE ORGANICS DATA SUMMARY SHEET

Project Name: Sandia
Project Number: 76100
Method: 8270
Report Date: April 7, 1993

Sample I.D.: Method Blank
Sample Date: NA
Date Received: NA
Date Extracted: 03/24/93
Date Analyzed: 03/31/93
ENCOTEC I.D.: MB032493-2D
QC Set I.D.: BS040293-1

U = Analyte not detected.
J = Analyte present at level
less than detection limit.
B = Analyte present in
method blank.

HAZARDOUS SUBSTANCE LIST
BASE-NEUTRAL EXTRACTABLES

	CAS #	CONC. (mg/Kg)	DETECTION LIMIT (mg/Kg)
Acenaphthene	83-32-9	U	0.330
Acenaphthylene	208-96-8	U	0.330
Anthracene	120-12-7	U	0.330
Benzidine	92-87-5	U	2.66
Benzo(a)anthracene	56-55-3	U	0.330
Benzo(b)fluoranthene	205-99-2	U	0.330
Benzo(k)fluoranthene	207-08-9	U	0.330
Benzo(ghi)perylene	191-24-2	U	0.330
Benzoic acid	65-85-0	U	1.67
Benzo(a)pyrene	50-32-8	U	0.330
Benzyl alcohol	100-51-6	U	0.330
Bis(2-chloroethoxy) methane	111-91-1	U	0.330
Bis(2-chloroethyl) ether	111-44-4	U	0.330
Bis(2-chloroisopropyl) ether	39638-32-9*	U	0.330
Bis(2-ethylhexyl) phthalate	117-81-7	U	0.330
4-Bromophenyl phenyl ether	101-55-3	U	0.330
Butyl benzyl phthalate	85-68-7	U	0.330
4-Chloroaniline	106-47-8	U	0.330
2-Chloronaphthalene	91-58-7	U	0.330
4-Chlorophenyl phenyl ether	7005-72-3	U	0.330
Chrysene	218-01-9	U	0.330
Dibenz(a,h)anthracene	53-70-3	U	0.330
Dibenzofuran	132-64-9	U	0.330
Di-n-butyl phthalate	84-74-2	U	0.330
1,2-Dichlorobenzene	95-50-1	U	0.330
1,3-Dichlorobenzene	541-73-1	U	0.330
1,4-Dichlorobenzene	106-46-7	U	0.330
3,3'-Dichlorobenzidine	91-94-1	U	0.670
Diethyl phthalate	84-66-2	U	0.330
Dimethyl phthalate	131-11-3	U	0.330
2,4-Dinitrotoluene	121-14-2	U	0.330
2,6-Dinitrotoluene	606-20-2	U	0.330
Di-n-octyl phthalate	117-84-0	U	0.330
Fluoranthene	206-44-0	U	0.330
Fluorene	86-73-7	U	0.330
Hexachlorobenzene	118-74-1	U	0.330

* Same as 2,2'-Oxybis(1-chloropropane) 108-60-1

SEMIVOLATILE ORGANICS DATA SUMMARY SHEET

Project Name: Sandia

Project Number: 76100

Method: 8270

Report Date: April 7, 1993

Sample I.D.: Method Blank

Sample Date: NA

Date Received: NA

Date Extracted: 03/24/93

Date Analyzed: 03/31/93

ENCOTEC I.D.: MB032493-2D

QC Set I.D.: BS040293-1

U = Analyte not detected.

J = Analyte present at level
less than detection limit.B = Analyte present in
method blank.HAZARDOUS SUBSTANCE LIST
BASE NEUTRAL EXTRACTABLES

HAZARDOUS SUBSTANCE LIST BASE NEUTRAL EXTRACTABLES	CAS #	CONC. (mg/Kg)	DETECTION LIMIT (mg/Kg)
Hexachlorobutadiene	87-68-3	U	0.330
Hexachlorocyclopentadiene	77-47-4	U	0.330
Hexachloroethane	67-72-1	U	0.330
Indeno(1,2,3-cd)pyrene	193-39-5	U	0.330
Isophorone	78-59-1	U	0.330
2-Methylnaphthalene	91-57-6	U	0.330
Naphthalene	91-20-3	U	0.330
2-Nitroaniline	88-74-4	U	1.67
3-Nitroaniline	99-09-2	U	1.67
4-Nitroaniline	100-01-6	U	1.67
Nitrobenzene	98-95-3	U	0.330
N-Nitrosodiphenylamine*	86-30-6	U	0.330
N-Nitroso-di-n-propylamine	621-64-7	U	0.330
Phenanthrene	85-01-8	U	0.330
Pyrene	129-00-0	U	0.330
1,2,4-Trichlorobenzene	120-82-1	U	0.330

ACID EXTRACTABLES

ACID EXTRACTABLES	CAS #	CONC. (mg/Kg)	DETECTION LIMIT (mg/Kg)
4-Chloro-3-methylphenol	59-50-7	U	0.330
2-Chlorophenol	95-57-8	U	0.330
2,4-Dichlorophenol	120-83-2	U	0.330
2,4-Dimethylphenol	105-67-9	U	0.330
4,6-Dinitro-2-methylphenol	534-52-1	U	1.67
2,4-Dinitrophenol	51-28-5	U	1.67
2-Methylphenol	95-48-7	U	0.330
4-Methylphenol	106-44-5	U	0.330
2-Nitrophenol	88-75-5	U	0.330
4-Nitrophenol	100-02-7	U	1.67
Pentachlorophenol	87-86-5	U	1.67
Phenol	108-95-2	U	0.330
2,4,5-Trichlorophenol	95-95-4	U	0.330
2,4,6-Trichlorophenol	88-06-2	U	0.330

* Compound cannot be separated from Diphenylamine.

Analysis reported on X WET _____ DRY weight basis.Percent total solids NA

Note:

Form 096SSL1G.GEN Page 2

017

Rev. 10/26/92

ENVIRONMENTAL CONTROL TECHNOLOGY CORPORATION
3985 Research Park Drive * Ann Arbor, MI 48108
313 / 761-1389

SEMIVOLATILE ORGANICS DATA SUMMARY SHEET

Project Name: Sandia
Project Number: 76100
Method: 8270
Report Date: April 7, 1993

Sample I.D.: Method Blank
Sample Date: NA
Date Received: NA
Date Extracted: 04/02/93
Date Analyzed: 04/05/93
ENCOTEC I.D.: MB040293-1A
QC Set I.D.: BS040293-1

U = Analyte not detected.
J = Analyte present at level
less than detection limit.
B = Analyte present in
method blank.

HAZARDOUS SUBSTANCE LIST
BASE-NEUTRAL EXTRACTABLES

HAZARDOUS SUBSTANCE LIST BASE-NEUTRAL EXTRACTABLES	CAS #	CONC. (mg/Kg)	DETECTION LIMIT (mg/Kg)
Acenaphthene	83-32-9	U	0.330
Acenaphthylene	208-96-8	U	0.330
Anthracene	120-12-7	U	0.330
Benzidine	92-87-5	U	2.66
Benzo(a)anthracene	56-55-3	U	0.330
Benzo(b)fluoranthene	205-99-2	U	0.330
Benzo(k)fluoranthene	207-08-9	U	0.330
Benzo(ghi)perylene	191-24-2	U	0.330
Benzoic acid	65-85-0	U	1.67
Benzo(a)pyrene	50-32-8	U	0.330
Benzyl alcohol	100-51-6	U	0.330
Bis(2-chloroethoxy) methane	111-91-1	U	0.330
Bis(2-chloroethyl) ether	111-44-4	U	0.330
Bis(2-chloroisopropyl) ether	39638-32-9*	U	0.330
Bis(2-ethylhexyl) phthalate	117-81-7	0.15 J	0.330
4-Bromophenyl phenyl ether	101-55-3	U	0.330
Butyl benzyl phthalate	85-68-7	U	0.330
4-Chloroaniline	106-47-8	U	0.330
2-Chloronaphthalene	91-58-7	U	0.330
4-Chlorophenyl phenyl ether	7005-72-3	U	0.330
Chrysene	218-01-9	U	0.330
Dibenz(a,h)anthracene	53-70-3	U	0.330
Dibenzofuran	132-64-9	U	0.330
Di-n-butyl phthalate	84-74-2	U	0.330
1,2-Dichlorobenzene	95-50-1	U	0.330
1,3-Dichlorobenzene	541-73-1	U	0.330
1,4-Dichlorobenzene	106-46-7	U	0.330
3,3'-Dichlorobenzidine	91-94-1	U	0.670
Diethyl phthalate	84-66-2	U	0.330
Dimethyl phthalate	131-11-3	U	0.330
2,4-Dinitrotoluene	121-14-2	U	0.330
2,6-Dinitrotoluene	606-20-2	U	0.330
Di-n-octyl phthalate	117-84-0	U	0.330
Fluoranthene	206-44-0	U	0.330
Fluorene	86-73-7	U	0.330
Hexachlorobenzene	118-74-1	U	0.330

* Same as 2,2'-Oxybis(1-chloropropane) 108-60-1

SEMIVOLATILE ORGANICS DATA SUMMARY SHEET

Project Name: Sandia

Project Number: 76100

Method: 8270

Report Date: April 7, 1993

Sample I.D.: Method Blank

Sample Date: NA

Date Received: NA

Date Extracted: 04/02/93

Date Analyzed: 04/05/93

ENCOTEC I.D.: MB040293-1A

QC Set I.D.: BS040293-1

U = Analyte not detected.

J = Analyte present at level
less than detection limit.B = Analyte present in
method blank.

HAZARDOUS SUBSTANCE LIST BASE NEUTRAL EXTRACTABLES	CAS #	CONC. (mg/Kg)	DETECTION LIMIT (mg/Kg)
Hexachlorobutadiene	87-68-3	U	0.330
Hexachlorocyclopentadiene	77-47-4	U	0.330
Hexachloroethane	67-72-1	U	0.330
Indeno(1,2,3-cd)pyrene	193-39-5	U	0.330
Isophorone	78-59-1	U	0.330
2-Methylnaphthalene	91-57-6	U	0.330
Naphthalene	91-20-3	U	0.330
2-Nitroaniline	88-74-4	U	1.67
3-Nitroaniline	99-09-2	U	1.67
4-Nitroaniline	100-01-6	U	1.67
Nitrobenzene	98-95-3	U	0.330
N-Nitrosodiphenylamine*	86-30-6	U	0.330
N-Nitroso-di-n-propylamine	621-64-7	U	0.330
Phenanthrene	85-01-8	U	0.330
Pyrene	129-00-0	U	0.330
1,2,4-Trichlorobenzene	120-82-1	U	0.330
ACID EXTRACTABLES	CAS #	CONC. (mg/Kg)	DETECTION LIMIT (mg/Kg)
4-Chloro-3-methylphenol	59-50-7	U	0.330
2-Chlorophenol	95-57-8	U	0.330
2,4-Dichlorophenol	120-83-2	U	0.330
2,4-Dimethylphenol	105-67-9	U	0.330
4,6-Dinitro-2-methylphenol	534-52-1	U	1.67
2,4-Dinitrophenol	51-28-5	U	1.67
2-Methylphenol	95-48-7	U	0.330
4-Methylphenol	106-44-5	U	0.330
2-Nitrophenol	88-75-5	U	0.330
4-Nitrophenol	100-02-7	U	1.67
Pentachlorophenol	87-86-5	U	1.67
Phenol	108-95-2	U	0.330
2,4,5-Trichlorophenol	95-95-4	U	0.330
2,4,6-Trichlorophenol	88-06-2	U	0.330

* Compound cannot be separated from Diphenylamine.

Analysis reported on X WET DRY weight basis.Percent total solids NA

Note:

Form 096SSL1G.GEN Page 2.

019

Rev. 10/26/92

ENVIRONMENTAL CONTROL TECHNOLOGY CORPORATION
 3985 Research Park Drive * Ann Arbor, MI 48108
 313 / 761-1389

SOIL MATRIX SURROGATE RECOVERY
 SEMIVOLATILE ORGANICS

Project Name: Sandia
 Project Number: 76100
 Method: 8270
 Report Date: April 14, 1993
 QC Set I.D.: BS040293-1

ENCOTECH Sample I. D.	BASE-NEUTRAL EXTRACTABLE ANALYTES			ACID EXTRACTABLE ANALYTES		
	% Recovery Nitrobenzene -d5 (23-120)	% Recovery 2-Fluorobi- phenyl (30-115)	% Recovery Terphenyl -d14 (18-137)	% Recovery Phenol-d5 (24-113)	% Recovery 2-Fluoro- phenol (25-121)	% Recovery 2,4,6-Tribromo- phenol (19-122)
200008016	73	95	112	100	105	81
MB032493-2D	83	99	124	104	110	84
MB040293-1A	95	99	103	84	91	98
LCS040293-1	92	89	96	90	94	104
LCD040293-1	90	96	100	92	94	105
200008016 MS	86	92	92	89	93	98
200008016 MSD	87	92	97	92	93	103

All samples fortified with 3.33/6.66 mg/Kg, base-neutral/acid analytes respectively.

* Value outside of quality control windows.

DL = Sample extract diluted, therefore surrogate recoveries not applicable.

MI = Matrix interferences caused distortion to recovery value.

RECOVERY: 0 out of 42 outside QC Windows

Note:

ENVIRONMENTAL CONTROL TECHNOLOGY CORPORATION
 3985 Research Park Drive * Ann Arbor, MI 48108
 313 / 761-1389

SOIL MATRIX LABORATORY CONTROL SAMPLE (LCS) AND LABORATORY CONTROL SAMPLE DUPLICATE (LCD) RECOVERY
 SEMIVOLATILE ORGANICS

Project Name: Sandia
 Project Number: 76100
 Method: 8270
 QC Set I.D.: April 14, 1993

Report Date:

SAMPLE SPIKED - ENCOTEC ID: LCS/LCD040293-1

CLIENT ID: NA

Compound	Concentration Spiked (mg/Kg)	Conc LCS	% Rec	Conc LCD	% Rec	RPD	QUALITY CONTROL WINDOWS	
							RPD	% Recovery
1,2,4-Trichlorobenzene	3.33	3.21	96	3.28	98	2.2	23	38 - 107
Acenaphthene	3.33	3.04	91	3.44	103	12	19	31 - 137
2,4-Dinitrotoluene	3.33	2.68	80	2.75	82	2.6	47	28 - 89
Pyrene	3.33	3.36	101	3.57	107	6.1	36	35 - 142
n-Nitroso-di-n-propylamine	3.33	2.84	85	3.12	94	9.4	38	41 - 126
1,4-Dichlorobenzene	3.33	3.17	95	3.14	94	1.0	27	28 - 104
Pentachlorophenol	5.00	4.94	99	5.30	106	7.0	47	17 - 109
Phenol	5.00	3.92	78	4.36	87	11	35	26 - 90
2-Chlorophenol	5.00	4.64	93	4.90	98	5.4	50	25 - 102
4-Chloro-3-methylphenol	5.00	4.40	88	4.42	88	0.4	33	26 - 103
4-Nitrophenol	5.00	4.15	83	4.75	95	13	50	11 - 114

RPD = Relative Percent Difference

* Value outside of quality control windows.

RPD: 0 out of 11 outside QC Windows

RECOVERY: 0 out of 22 outside QC Windows

Note:

021

ENVIRONMENTAL CONTROL TECHNOLOGY CORPORATION
 3985 Research Park Drive * Ann Arbor, MI 48108
 313 / 761-1389

SOIL MATRIX SPIKE (MS) AND MATRIX SPIKE DUPLICATE (MSD) RECOVERY
 SEMIVOLATILE ORGANICS

Project Name: Sandia
 Project Number: 76100
 Method: 8270
 Report Date: April 14, 1993
 QC Set I.D.: BS040293-1

SAMPLE SPIKED - ENCOTEC ID: 200008016

CLIENT ID: ER92004708-1

QUALITY
 CONTROL WINDOWS

Compound	Concentration Spiked (mg/Kg)	Sample Result (mg/Kg)	Conc MS	% Rec	Conc MSD	% Rec	RPD	RPD	% Recovery
1,2,4-Trichlorobenzene	3.33	0.330 U	3.34	100	3.24	97	3.0	23	38 - 107
Acenaphthene	3.33	0.330 U	3.22	97	3.19	96	0.9	19	31 - 137
2,4-Dinitrotoluene	3.33	0.330 U	2.69	81	2.53	76	6.1	47	28 - 89
Pyrene	3.33	0.330 U	3.31	99	3.55	107	7.0	36	35 - 142
n-Nitroso-di-n-propylamine	3.33	0.330 U	2.94	88	2.99	90	1.7	38	41 - 126
1,4-Dichlorobenzene	3.33	0.330 U	3.06	92	3.23	97	5.4	27	28 - 104
Pentachlorophenol	5.00	1.67 U	4.61	92	4.52	90	2.0	47	17 - 109
Phenol	5.00	0.330 U	4.31	86	4.04	81	6.5	35	26 - 90
2-Chlorophenol	5.00	0.330 U	4.79	96	4.74	95	1.0	50	25 - 102
4-Chloro-3-methylphenol	5.00	0.330 U	4.53	91	4.45	89	1.8	33	26 - 103
4-Nitrophenol	5.00	1.67 U	4.00	80	3.70	74	7.8	50	11 - 114

022

U = Analyte not detected in non-spiked sample
 RPD = Relative Percent Difference
 * Value outside of quality control windows.

MI = Matrix interferences caused distortion to recovery value.

RPD: 0 out of 11 outside QC Windows
 RECOVERY: 0 out of 22 outside QC Windows

Note:

Polychlorinated Biphenyls

ENVIRONMENTAL CONTROL TECHNOLOGY CORPORATION
3985 Research Park Drive * Ann Arbor, MI 48108
313 / 761-1389

ORGANIC ANALYSIS DATA SUMMARY SHEET

Project Name: Sandia
Project Number: 76100
Method: 8080
Report Date: April 6, 1993

Sample I.D.: ER9200 4703-1
Sample Date: 03/16/93
Date Received: 03/17/93
Date Extracted: 03/22/93
Date Analyzed: 03/30/93
ENCOTEC I.D.: 200008014
QC Set I.D.: PBS032293-8

U = Analyte not detected
B = Analyte present in
method blank

AROCLOR	CAS NUMBER	CONC. (ug/Kg)	DETECTION LIMIT (ug/Kg)
PCB-1016	12674-11-2	U	80
PCB-1221	11104-28-2	U	80
PCB-1232	11141-16-5	U	80
PCB-1242	53469-21-9	U	80
PCB-1248	12672-29-6	U	80
PCB-1254	11097-69-1	U	80
PCB-1260	11096-82-5	U	80

Analysis reported on a X WET DRY weight basis.

Percent solids 87.4

ENVIRONMENTAL CONTROL TECHNOLOGY CORPORATION
3985 Research Park Drive * Ann Arbor, MI 48108
313 / 761-1389

ORGANIC ANALYSIS DATA SUMMARY SHEET

Project Name: Sandia
Project Number: 76100
Method: 8080
Report Date: April 6, 1993

Sample I.D.: ER9200 4705-1
Sample Date: 03/16/93
Date Received: 03/17/93
Date Extracted: 03/22/93
Date Analyzed: 03/30/93
ENCOTEC I.D.: 200008015
QC Set I.D.: PBS032293-8

U = Analyte not detected
B = Analyte present in
method blank

AROCLOR	CAS NUMBER	CONC. (ug/Kg)	DETECTION LIMIT (ug/Kg)
PCB-1016	12674-11-2	U	80
PCB-1221	11104-28-2	U	80
PCB-1232	11141-16-5	U	80
PCB-1242	53469-21-9	U	80
PCB-1248	12672-29-6	U	80
PCB-1254	11097-69-1	U	80
PCB-1260	11096-82-5	U	80

Analysis reported on a X WET DRY weight basis.

Percent solids 87.3

ENVIRONMENTAL CONTROL TECHNOLOGY CORPORATION
3985 Research Park Drive * Ann Arbor, MI 48108
313 / 761-1389

ORGANIC ANALYSIS DATA SUMMARY SHEET

Project Name: Sandia
Project Number: 76100
Method: 8080
Report Date: April 6, 1993

Sample I.D.: ER9200 4708-1
Sample Date: 03/16/93
Date Received: 03/17/93
Date Extracted: 03/22/93
Date Analyzed: 03/30/93
ENCOTEC I.D.: 200008016
QC Set I.D.: PBS032293-8

U = Analyte not detected
B = Analyte present in
method blank

AROCLOR	CAS NUMBER	CONC. (ug/Kg)	DETECTION LIMIT (ug/Kg)
PCB-1016	12674-11-2	U	80
PCB-1221	11104-28-2	U	80
PCB-1232	11141-16-5	U	80
PCB-1242	53469-21-9	U	80
PCB-1248	12672-29-6	U	80
PCB-1254	11097-69-1	U	80
PCB-1260	11096-82-5	U	80

Analysis reported on a X WET _____ DRY weight basis.

Percent solids 95.0

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ORGANIC ANALYSIS DATA SUMMARY SHEET

Project Name: Sandia
Project Number: 76100
Method: 8080
Report Date: April 6, 1993

Sample I.D.: ER9200 4712-1
Sample Date: 03/16/93
Date Received: 03/17/93
Date Extracted: 03/22/93
Date Analyzed: 03/30/93
ENCOTEC I.D.: 200008018
QC Set I.D.: PBS032293-8

U = Analyte not detected
B = Analyte present in
method blank

AROCLOR	CAS NUMBER	CONC. (ug/Kg)	DETECTION LIMIT (ug/Kg)
PCB-1016	12674-11-2	U	80
PCB-1221	11104-28-2	U	80
PCB-1232	11141-16-5	U	80
PCB-1242	53469-21-9	U	80
PCB-1248	12672-29-6	U	80
PCB-1254	11097-69-1	U	80
PCB-1260	11096-82-5	U	80

Analysis reported on a X WET DRY weight basis.

Percent solids 87.9

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ORGANIC ANALYSIS DATA SUMMARY SHEET

Project Name: Sandia
Project Number: 76100
Method: 8080
Report Date: April 6, 1993

Sample I.D.: ER9200 4713-3
Sample Date: 03/16/93
Date Received: 03/17/93
Date Extracted: 03/19/93
Date Analyzed: 03/29/93
ENCOTEC I.D.: 200008021
QC Set I.D.: PBW031993-2

U = Analyte not detected
B = Analyte present in
method blank

AROCLOR	CAS NUMBER	CONC. (ug/L)	DETECTION LIMIT (ug/L)
PCB-1016	12674-11-2	U	0.5
PCB-1221	11104-28-2	U	0.5
PCB-1232	11141-16-5	U	0.5
PCB-1242	53469-21-9	U	0.5
PCB-1248	12672-29-6	U	0.5
PCB-1254	11097-69-1	U	0.5
PCB-1260	11096-82-5	U	0.5

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ORGANIC ANALYSIS DATA SUMMARY SHEET

Project Name: Sandia
Project Number: 76100
Method: 8080
Report Date: April 6, 1993

Sample I.D.: ER9200 4715-1
Sample Date: 03/16/93
Date Received: 03/17/93
Date Extracted: 03/22/93
Date Analyzed: 03/30/93
ENCOTEC I.D.: 200008023
QC Set I.D.: PBS032293-8

U = Analyte not detected
B = Analyte present in
method blank

AROCLOR	CAS NUMBER	CONC. (ug/Kg)	DETECTION LIMIT (ug/Kg)
PCB-1016	12674-11-2	U	80
PCB-1221	11104-28-2	U	80
PCB-1232	11141-16-5	U	80
PCB-1242	53469-21-9	U	80
PCB-1248	12672-29-6	U	80
PCB-1254	11097-69-1	U	80
PCB-1260	11096-82-5	U	80

Analysis reported on a X WET DRY weight basis.

Percent solids 83.9

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ORGANIC ANALYSIS DATA SUMMARY SHEET

Project Name: Sandia
Project Number: 76100
Method: 8080
Report Date: April 6, 1993

Sample I.D.: Method Blank
Sample Date: NA
Date Received: NA
Date Extracted: 03/22/93
Date Analyzed: 03/30/93
ENCOTEC I.D.: MB032293-1
QC Set I.D.: PBS032293-8

U = Analyte not detected
B = Analyte present in
method blank

AROCLOR	CAS NUMBER	CONC. (ug/Kg)	DETECTION LIMIT (ug/Kg)
PCB-1016	12674-11-2	U	80
PCB-1221	11104-28-2	U	80
PCB-1232	11141-16-5	U	80
PCB-1242	53469-21-9	U	80
PCB-1248	12672-29-6	U	80
PCB-1254	11097-69-1	U	80
PCB-1260	11096-82-5	U	80

Analysis reported on a X WET DRY weight basis.

Percent solids NA

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ORGANIC ANALYSIS DATA SUMMARY SHEET

Project Name: Sandia
Project Number: 76100
Method: 8080
Report Date: April 6, 1993

Sample I.D.: Method Blank
Sample Date: NA
Date Received: NA
Date Extracted: 03/19/93
Date Analyzed: 03/29/93
ENCOTEC I.D.: MB031993-1
QC Set I.D.: PBW031993-2

U = Analyte not detected
B = Analyte present in
method blank

AROCLOR	CAS NUMBER	CONC. (ug/L)	DETECTION LIMIT (ug/L)
PCB-1016	12674-11-2	U	0.5
PCB-1221	11104-28-2	U	0.5
PCB-1232	11141-16-5	U	0.5
PCB-1242	53469-21-9	U	0.5
PCB-1248	12672-29-6	U	0.5
PCB-1254	11097-69-1	U	0.5
PCB-1260	11096-82-5	U	0.5

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SOILS\SOLIDS MATRIX SURROGATE RECOVERY
POLYCHLORINATED BIPHENYLS

Project Name: Sandia
Project Number: 76100
Method: 8080
Report Date: April 6, 1993
QC Set I.D.: PBS032293-8

<u>ENCOTEC</u> <u>Sample Number</u>	<u>Percent Recovery</u> <u>2,4,5,6-TCMX</u> (50-150)	<u>Percent Recovery</u> <u>Decachlorobiphenyl</u> (32-136)
200008014	66	56
200008015	70	72
200008016	73	76
200008018	67	67
200008023	58	61
MB032293-1	91	72
LCS032293-8	65	65
LCD032293-8	87	97
200008018 MS	69	72
200008018 MSD	75	65

All samples fortified with 33 ug/Kg of surrogate analyte.

* Value outside of established quality control windows.

DL = Sample matrix diluted, therefore surrogate recoveries are not applicable.

MI = Matrix interferences caused distortion to recovery value.

RECOVERY: 0 out of 20 outside QC Windows.

ENVIRONMENTAL CONTROL TECHNOLOGY CORPORATION
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WATER MATRIX SURROGATE RECOVERY
POLYCHLORINATED BIPHENYLS

Project Name: Sandia
Project Number: 76100
Method: 8080
Report Date: April 6, 1993
QC Set I.D.: PBW031993-2

ENCOTEC <u>Sample Number</u>	Percent Recovery <u>2,4,5,6-TCMX</u> (60-140)	Percent Recovery <u>Decachlorobiphenyl</u> (32-138)
200008021	76	95
MB031993-1	70	92
LCS031993-2	76	95
LCD031993-2	75	96
200008021 MS	75	97
200008021 MSD	83	97

All samples fortified with 0.5 ug/L of surrogate analyte.

- * Value outside of established quality control windows.
- DL = Sample matrix diluted, therefore surrogate recoveries are not applicable.
- MI = Matrix interferences caused distortion to recovery value.

RECOVERY: 0 out of 12 outside QC Windows.

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SOIL MATRIX LABORATORY CONTROL SAMPLE (LCS) AND LABORATORY CONTROL SAMPLE DUPLICATE (LCD) RECOVERY
 POLYCHLORINATED BIPHENYLS

Project Name: Sandia
 Project Number: 76100
 Method: 8080
 Report Date: April 6, 1993
 QC Set I.D.: PBS032293-8

SAMPLE SPIKED - ENCOTEC ID: LCS, LCD032293-8

Aroclor	Concentration Spiked (ug/Kg)	LCS Conc. (ug/Kg)	% Rec.	LCD Conc. (ug/Kg)	% Rec.	RPD	QUALITY CONTROL WINDOWS	
							RPD	% Recovery
PCB 1221	333	253	76	313	94	21*	20	48-163
PCB 1248	333	232	70	259	78	11	19	39-155
PCB 1260	333	216	65	243	73	12	23	37-166

034

RPD = Relative Percent Difference.
 * Value outside of quality control windows.

RPD: 1 out of 3 outside QC Windows.
 RECOVERY: 0 out of 6 outside QC Windows.

Note:

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WATER MATRIX LABORATORY CONTROL SAMPLE (LCS) AND LABORATORY CONTROL SAMPLE DUPLICATE (LCD) RECOVERY
 POLYCHLORINATED BIPHENYLS

Project Name: Sandia
 Project Number: 76100
 Method: 8080
 Report Date: April 6, 1993
 QC Set I.D.: PBW031993-2

SAMPLE SPIKED - ENCOTEC ID: LCS, LCD031993-2

Aroclor	Concentration Spiked (ug/L)	LCS Conc. (ug/L)	% Rec.	LCD Conc. (ug/L)	% Rec.	RPD	QUALITY CONTROL WINDOWS	
							RPD	% Recovery
PCB 1221	5.0	4.75	95	4.81	96	1.2	34	48-160
PCB 1248	5.0	4.85	97	4.95	99	2.0	32	57-127
PCB 1260	5.0	4.31	86	4.48	90	3.9	23	41-123

032

RPD = Relative Percent Difference.

* Value outside of quality control windows.

RPD: 0 out of 3 outside QC Windows.

RECOVERY: 0 out of 6 outside QC Windows.

Note:

Form 057CWN5G.GN1

Rev. 02/10/93

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SOIL/SOLIDS MATRIX SPIKE (MS) AND MATRIX SPIKE DUPLICATE (MSD) RECOVERY
 POLYCHLORINATED BIPHENYLS

Project Name: Sandia
 Project Number: 76100
 Method: 8080
 Report Date: April 6, 1993
 QC Set I.D.: PBS032293-8

SAMPLE SPIKED - ENCOTEC ID: 200008018

CLIENT ID: ER9200 4712-1

Aroclor	Concentration Spiked (ug/Kg)	Sample Result (ug/Kg)	MS Conc (ug/Kg)	% Rec	MSD Conc (ug/Kg)	% Rec	RPD	QUALITY CONTROL WINDOWS	
								RPD	%Recovery
PCB 1221	333	80 U	265	80	293	88	10	20	48-163
PCB 1248	333	80 U	253	76	247	74	2.4	19	39-155
PCB 1260	333	80 U	245	74	227	68	7.6	23	37-166

036

U = Analyte not detected in non-spiked sample.

MI = Matrix interferences caused distortion to recovery value.

RPD = Relative Percent Difference.

* Value outside of quality control windows.

RPD: 0 out of 3 outside QC Windows.

RECOVERY: 0 out of 6 outside QC Windows.

Note:

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WATER MATRIX SPIKE (MS) AND MATRIX SPIKE DUPLICATE (MSD) RECOVERY
 POLYCHLORINATED BIPHENYLS

Project Name: Sandia
 Project Number: 76100
 Method: 8080
 Report Date: April 6, 1993
 QC Set I.D.: PBW031993-2

SAMPLE SPIKED - ENCOTEC ID: 200008021

CLIENT ID: ER9200 4713-2

Aroclor	Concentration Spiked (ug/L)	Sample Result (ug/L)	MS Conc (ug/L)	% Rec	MSD Conc (ug/L)	% Rec	RPD	QUALITY CONTROL WINDOWS	
								RPD	%Recovery
PCB 1221	10	0.5 U	9.68	97	10.6	106	9.1	34	48-160
PCB 1248	10	0.5 U	9.94	99	10.0	100	0.60	32	57-127
PCB 1260	10	0.5 U	7.98	80	8.28	83	3.7	23	41-123

037

U = Analyte not detected in non-spiked sample.

MI = Matrix interferences caused distortion to recovery value.

RPD = Relative Percent Difference.

* Value outside of quality control windows.

RPD: 0 out of 3 outside QC Windows.

RECOVERY: 0 out of 6 outside QC Windows.

Inorganic Parameters

Metals

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INORGANICS ANALYSIS (METALS) DATA SUMMARY SHEET
SOIL MATRIX

Project Name: Sandia
Project Number: 76100
Report Date: April 5, 1993

Sample I.D.: ER9200 4703-1 U = Analyte not detected.
Sample Date: 03/16/93
Date Received: 03/17/93
ENCOTEC I.D.: 200008014

ANALYTE	QC SET ID	ANALYSIS DATE	METHOD	CONC. (mg/Kg)	DETECTION LIMIT (mg/Kg)
Arsenic	HYD032593-1	03/26/93	7061	4.6	1.1
Barium	ICP031993-3	03/24/93	6010	349	1.1
Cadmium	ICP031993-3	03/24/93	6010	0.30	0.29
Chromium	ICP031993-3	03/24/93	6010	7.6	1.1
Lead	ICP031993-3	03/24/93	6010	11	2.3
Mercury	CV031893-1	03/19/93	7470	U	0.046
Selenium	HYD032593-1	03/26/93	7741	U	0.11
Silver	ICP031993-3	03/24/93	6010	U	0.57

Results reported on a dry weight basis.

Percent Total Solids 87.4

Note:

Form 110MSN1G.GEN

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INORGANICS ANALYSIS (METALS) DATA SUMMARY SHEET
SOIL MATRIX

Project Name: Sandia
Project Number: 76100
Report Date: April 5, 1993

Sample I.D.: ER9200 4705-1 U = Analyte not detected.
Sample Date: 03/16/93
Date Received: 03/17/93
ENCOTEC I.D.: 200008015

ANALYTE	QC SET ID	ANALYSIS DATE	METHOD	CONC. (mg/Kg)	DETECTION LIMIT (mg/Kg)
Arsenic	HYD032593-1	03/26/93	7061	4.3	1.1
Barium	ICP031993-3	03/24/93	6010	296	1.1
Cadmium	ICP031993-3	03/24/93	6010	U	0.28
Chromium	ICP031993-3	03/24/93	6010	7.0	1.1
Lead	ICP031993-3	03/24/93	6010	6.0	2.2
Mercury	CV031893-1	03/19/93	7470	U	0.044
Selenium	HYD032593-1	03/26/93	7741	U	0.11
Silver	ICP031993-3	03/24/93	6010	U	0.56

Results reported on a dry weight basis.

Percent Total Solids 89.3

Note:

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INORGANICS ANALYSIS (METALS) DATA SUMMARY SHEET
SOIL MATRIX

Project Name: Sandia
Project Number: 76100
Report Date: April 5, 1993

Sample I.D.: ER9200 4708-1 U = Analyte not detected.
Sample Date: 03/16/93
Date Received: 03/17/93
ENCOTEC I.D.: 200008016

ANALYTE	QC SET ID	ANALYSIS DATE	METHOD	CONC. (mg/Kg)	DETECTION LIMIT (mg/Kg)
Arsenic	HYD032593-1	03/26/93	7061	4.6	1.1
Barium	ICP031993-3	03/24/93	6010	268	1.1
Cadmium	ICP031993-3	03/24/93	6010	0.31	0.26
Chromium	ICP031993-3	03/24/93	6010	7.7	1.1
Lead	ICP031993-3	03/24/93	6010	6.9	2.1
Mercury	CV031893-1	03/19/93	7470	U	0.042
Selenium	HYD032593-1	03/26/93	7741	0.11	0.11
Silver	ICP031993-3	03/24/93	6010	U	0.53

Results reported on a dry weight basis.

Percent Total Solids 95.0

Note:

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Rev. 10/14/92

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INORGANICS ANALYSIS (METALS) DATA SUMMARY SHEET
SOIL MATRIX

Project Name: Sandia
Project Number: 76100
Report Date: April 5, 1993

Sample I.D.: ER9200 4712-1 U = Analyte not detected.
Sample Date: 03/16/93
Date Received: 03/17/93
ENCOTEC I.D.: 200008018

ANALYTE	QC SET ID	ANALYSIS DATE	METHOD	CONC. (mg/Kg)	DETECTION LIMIT (mg/Kg)
Arsenic	HYD032593-1	03/26/93	7061	4.2	1.1
Barium	ICP031993-3	03/24/93	6010	275	1.1
Cadmium	ICP031993-3	03/24/93	6010	0.40	0.28
Chromium	ICP031993-3	03/24/93	6010	13	1.1
Lead	ICP031993-3	03/24/93	6010	9.2	2.3
Mercury	CV031893-1	03/19/93	7470	U	0.046
Selenium	HYD032593-1	03/26/93	7741	0.13	0.11
Silver	ICP031993-3	03/24/93	6010	U	0.57

Results reported on a dry weight basis.

Percent Total Solids 87.9

Note:

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INORGANICS ANALYSIS (METALS) DATA SUMMARY SHEET
LIQUID MATRIX

Project Name: Sandia
Project Number: 76100
Report Date: April 5, 1993

Sample I.D.: ER9200 4713-1
Sample Date: 03/16/93
Date Received: 03/17/93
ENCOTECH I.D.: 200008019

U = Analyte not detected.

ANALYTE	QC SET ID	ANALYSIS DATE	METHOD	CONC. (mg/L)	DETECTION LIMIT (mg/L)
Arsenic	HYD032593-1	03/26/93	7061	U	0.002
Barium	ICP031993-1	03/23/93	6010	U	0.02
Cadmium	ICP031993-1	03/23/93	6010	U	0.005
Chromium	ICP031993-1	03/23/93	6010	U	0.02
Lead	ICP031993-1	03/23/93	6010	U	0.04
Mercury	CV032293-1	03/23/93	7470	U	0.0002
Selenium	HYD032593-1	03/26/93	7741	U	0.002
Silver	ICP031993-1	03/23/93	6010	U	0.01

Note:

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Rev. 09/03/92

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INORGANICS ANALYSIS (METALS) DATA SUMMARY SHEET
SOIL MATRIX

Project Name: Sandia
Project Number: 76100
Report Date: April 5, 1993

Sample I.D.: ER9200 4715-1
Sample Date: 03/16/93
Date Received: 03/17/93
ENCOTEC I.D.: 200008023

U = Analyte not detected.

ANALYTE	QC SET ID	ANALYSIS DATE	METHOD	CONC. (mg/Kg)	DETECTION LIMIT (mg/Kg)
Arsenic	HYD032593-1	03/26/93	7061	4.8	1.2
Barium	ICP031993-3	03/24/93	6010	275	1.2
Cadmium	ICP031993-3	03/24/93	6010	0.53	0.30
Chromium	ICP031993-3	03/24/93	6010	14	1.2
Lead	ICP031993-3	03/24/93	6010	11	2.4
Mercury	CV031893-1	03/19/93	7470	U	0.048
Selenium	HYD032593-1	03/26/93	7741	0.14	0.12
Silver	ICP031993-3	03/24/93	6010	U	0.60

Results reported on a dry weight basis.
Percent Total Solids 83.9

Note:

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INORGANICS ANALYSIS (METALS) DATA SUMMARY SHEET
SOIL MATRIX

Project Name: Sandia
Project Number: 76100
Report Date: April 08, 1993

Sample I.D.: Method Blank
Sample Date: NA
Date Received: NA
ENCOTEC I.D.: MBSNL-SS-032-1

U = Analyte not detected.

ANALYTE	QC SET ID	ANALYSIS DATE	METHOD	CONC. (mg/Kg)	DETECTION LIMIT (mg/Kg)
Arsenic	HYD032593-1	03/26/93	7061	U	0.10
Barium	ICP031993-3	03/24/93	6010	U	1.0
Cadmium	ICP031993-3	03/24/93	6010	U	0.2
Chromium	ICP031993-3	03/24/93	6010	U	1.0
Lead	ICP031993-3	03/24/93	6010	U	2.0
Mercury	CV031893-1	03/19/93	7470	U	0.04
Selenium	HYD032593-1	03/26/93	7741	U	0.1
Silver	ICP031993-3	03/24/93	6010	U	0.5

Results reported on a dry weight basis.

Percent Total Solids NA

Note:

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INORGANICS ANALYSIS (METALS) DATA SUMMARY SHEET
WATER MATRIX

Project Name: Sandia
Project Number: 76100
Report Date: April 08, 1993

Sample I.D.: Method Blank U = Analyte not detected.
Sample Date: NA
Date Received: NA
ENCOTEC I.D.: MBSNL-SS-032-2

ANALYTE	QC SET ID	ANALYSIS DATE	METHOD	CONC. (mg/L)	DETECTION LIMIT (mg/L)
Arsenic	HYD032593-1	03/26/93	7061	U	0.002
Barium	ICP031993-1	03/22/93	6010	U	0.02
Cadmium	ICP031993-1	03/22/93	6010	U	0.005
Chromium	ICP031993-1	03/22/93	6010	U	0.02
Lead	ICP031993-1	03/22/93	6010	U	0.04
Mercury	CV032293-1	03/23/93	7470	U	0.0002
Selenium	HYD032593-1	03/26/93	7741	U	0.002
Silver	ICP031993-1	03/22/93	6010	U	0.01

Note:

Form 110MWN1G.GEN

Rev. 09/03/92

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SOIL MATRIX LABORATORY CONTROL SAMPLE (LCS) AND LABORATORY CONTROL SAMPLE DUPLICATE (LCD) RECOVERY
 INORGANICS - METALS

Project Name: Sandia
 Project Number: 76100
 Report Date: April 08, 1993

Parameter	QC Set ID	Conc Spiked (mg/Kg)	LCS Conc (mg/Kg)	% Rec	LCD Conc (mg/Kg)	% Rec	RPD	QUALITY CONTROL WINDOWS	
								RPD	% Rec
Arsenic	HYD032593-1	0.20	0.203	102	0.207	104	2.0	20	80-120
Barium	ICP031993-3	50	48	96	49	98	2.1	20	80-120
Cadmium	ICP031993-3	10	9.4	94	9.4	94	0	20	80-120
Chromium	ICP031993-3	50	48	96	48	96	0	20	80-120
Lead	ICP031993-3	50	46	92	46	92	0	20	80-120
Mercury	CV031893-1	0.40	0.36	90	0.37	92	2.8	20	80-120
Selenium	HYD032593-1	0.20	0.21	105	0.22	110	4.5	20	80-120
Silver	ICP031993-3	25	24	96	24	96	0	20	80-120

* = Value outside QC windows.

RECOVERY: 0 out of 16 outside QC Windows.
 RPD: 0 out of 8 outside QC Windows.

042

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WATER MATRIX LABORATORY CONTROL SAMPLE (LCS) AND LABORATORY CONTROL SAMPLE DUPLICATE (LCD) RECOVERY
 INORGANICS - METALS

Project Name: Sandia
 Project Number: 76100
 Report Date: April 08, 1993

Analyte	QC Set ID	Conc Spiked (mg/L)	Conc LCS (mg/L)	% Rec	Conc LCD (mg/L)	% Rec	RPD	QUALITY CONTROL WINDOWS	
								RPD	% Rec
Arsenic	HYD032593-1	0.004	0.0041	102	0.0041	102	0	20	80-120
Barium	ICP031993-1	1.0	0.96	96	0.97	97	1.0	20	80-120
Cadmium	ICP031993-1	0.20	0.19	95	0.19	95	0	20	80-120
Chromium	ICP031993-1	1.0	0.95	95	0.95	95	0	20	80-120
Lead	ICP031993-1	1.0	0.93	93	0.93	93	0	20	80-120
Mercury	CVO32293-1	0.0021	0.0020	95	0.0021	100	5.0	20	80-120
Selenium	HYD032593-1	0.004	0.0043	108	0.0044	110	2.3	20	80-120
Silver	ICP031993-1	0.50	0.47	94	0.47	94	0	20	80-120

* = Value outside QC windows.

RECOVERY: 0 out of 16 outside QC Windows.
 RPD: 0 out of 8 outside QC Windows.

Note:

848

Form 110MWN5G.MF1

Rev. 10/08/92

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SOIL MATRIX SPIKE (MS) AND MATRIX SPIKE DUPLICATE (MSD) RECOVERY
 INORGANICS - METALS

Project Name: Sandia
 Project Number: 76100
 Report Date: April 07, 1993

SAMPLE SPIKED - ENCOTEC ID: 200008018 MS/MSD

CLIENT ID: ER92004712-1

Analyte	QC Set ID	Conc Spiked (mg/Kg)	Sample Result (mg/Kg)	Conc MS		Conc MSD		RPD	QUALITY CONTROL WINDOWS	
				(mg/Kg)	% Rec	(mg/Kg)	% Rec		RPD	% Rec
Arsenic	HYD032593-1	0.23	4.15	4.46	135	4.39	104	1.6	20	75-125
Barium	ICP031993-3	57	275	621	607	364	156	52*	20	75-125
Cadmium	ICP031993-3	11	0.41	11.2	98	11	96	1.8	20	75-125
Chromium	ICP031993-3	57	13.2	67	94	67	94	0	20	75-125
Lead	ICP031993-3	57	9.2	61.1	91	60	89	1.8	20	75-125
Mercury	CV031893-1	0.46	0.04 U	0.41	89	0.43	93	4.8	20	75-125
Selenium	HYD032593-1	0.23	0.12	0.35	100	0.34	96	2.9	20	75-125
Silver	ICP031993-3	28	0.5 U	27.5	98	27.1	97	1.5	20	75-125

Results reported on a dry weight basis.

MI = Matrix interferences caused distortion to recovery value. DL = Spike diluted out.
 U = Analyte was not detected in the unspiked sample. * = Value outside QC windows.

RECOVERY: 0 out of 12 outside QC Windows.
 RPD: 1 out of 8 outside QC Windows.

Form 110MSN3G.MF1

Rev. 10/08/92

049

Inorganic Parameters

General Chemistry

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INORGANICS ANALYSIS (GENERAL) DATA SUMMARY SHEET
SOIL MATRIX

Project Name: Sandia
Project Number: 76100
Report Date: March 26, 1993

Sample I.D.: ER 9200 4703-1
Sample Date: 03/16/93
Date Received: 03/17/93
ENCOTEC I.D.: 200008014

U = Analyte not detected.

ANALYTE	QC SET ID	ANALYSIS DATE	UNITS	CONC.	DETECTION LIMIT
Total Cyanide	CN031893A	03/22/93	mg/Kg	U	0.10
pH	PH031893	03/18/93	S.U.	7	0.5-12.5
Total Solids	TS031993	03/19/93	%	87.4	0.1

Results reported on a dry weight basis.

Note:

Form 120WSN1G.GEN

Rev. 10/07/92

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INORGANICS ANALYSIS (GENERAL) DATA SUMMARY SHEET
SOIL MATRIX

Project Name: Sandia
Project Number: 76100
Report Date: March 26, 1993

Sample I.D.: ER 9200 4705-1
Sample Date: 03/16/93
Date Received: 03/17/93
ENCOTEC I.D.: 200008015

U = Analyte not detected.

ANALYTE	QC SET ID	ANALYSIS DATE	UNITS	CONC.	DETECTION LIMIT
Total Cyanide	CN031893A	03/22/93	mg/Kg	U	0.10
pH	pH031893	03/18/93	S.U.	7	0.5-12.5
Total Solids	TS031993	03/19/93	%	89.3	0.1

Results reported on a dry weight basis.

Note:

Form 120WSN1G.GEN

Rev. 10/07/92

052

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INORGANICS ANALYSIS (GENERAL) DATA SUMMARY SHEET
SOIL MATRIX

Project Name: Sandia
Project Number: 76100
Report Date: March 26, 1993

Sample I.D.: ER 9200 4708-1
Sample Date: 03/16/93
Date Received: 03/17/93
ENCOTEC I.D.: 200008016

U = Analyte not detected.

ANALYTE	QC SET ID	ANALYSIS DATE	UNITS	CONC.	DETECTION LIMIT
Total Cyanide	CN031893A	03/22/93	mg/Kg	U	0.10
pH	PH031893	03/18/93	S.U.	7	0.5-12.5
Total Solids	TS031993	03/19/93	%	95.0	0.1

Results reported on a dry weight basis.

Note:

Form 120WSN1G.GEN

Rev. 10/07/92

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INORGANICS ANALYSIS (GENERAL) DATA SUMMARY SHEET
SOIL MATRIX

Project Name: Sandia
Project Number: 76100
Report Date: March 26, 1993

Sample I.D.: ER 9200 4712-1 MS/MSD
Sample Date: 03/16/93
Date Received: 03/17/93
ENCOTECH I.D.: 200008018

U = Analyte not detected.

ANALYTE	QC SET ID	ANALYSIS DATE	UNITS	CONC.	DETECTION LIMIT
Total Cyanide	CN031893A	03/22/93	mg/Kg	U	0.10
pH	PH031893	03/18/93	S.U.	8	0.5-12.5
Total Solids	TS031993	03/19/93	%	87.9	0.1

Results reported on a dry weight basis.

Note:

Form 120WSN1G.GEN

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INORGANICS ANALYSIS (GENERAL) DATA SUMMARY SHEET
WATER MATRIX

Project Name: Sandia
Project Number: 76100
Report Date: March 26, 1993

Sample I.D.: ER 9200 4713-2

Sample Date: 03/16/93

Date Received: 03/17/93

ENCOTECH I.D.: 200008020, 200008022

U = Analyte not detected

ANALYTE	QC SET ID	ANALYSIS DATE	METHOD	UNITS	CONC.	DETECTION LIMIT
Cyanide, Total	CN031893A	03/22/93	9012	mg/L	U	0.01
pH	PH031893	03/18/93	9040, 9041	S.U.	8.4	0.5 - 12.5

Note: -4, pH

Form 12DWWN1G.GEN

Rev. 11/05/92

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INORGANICS ANALYSIS (GENERAL) DATA SUMMARY SHEET
SOIL MATRIX

Project Name: Sandia
Project Number: 76100
Report Date: March 26, 1993

Sample I.D.: ER 9200 4715-1
Sample Date: 03/16/93
Date Received: 03/17/93
ENCOTECH I.D.: 200008023

U = Analyte not detected.

ANALYTE	QC SET ID	ANALYSIS DATE	UNITS	CONC.	DETECTION LIMIT
Total Cyanide	CN031893A	03/22/93	mg/Kg	U	0.10
pH	PH031893	03/18/93	S.U.	8	0.5-12.5
Total Solids	TS031993	03/19/93	%	83.9	0.1

Results reported on a dry weight basis.

Note:

Form 120WSN1G.GEN

Rev. 10/07/92

058

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INORGANICS ANALYSIS (GENERAL) DATA SUMMARY SHEET
SOIL MATRIX

Project Name: Sandia
Project Number: 76100
Report Date: April 08, 1993

Sample I.D.: Method Blank
Sample Date: NA
Date Received: NA
ENCOTEC I.D.: MBSNL-SS-032-1

U = Analyte not detected.

ANALYTE	QC SET ID	ANALYSIS DATE	UNITS	CONC.	DETECTION LIMIT
Total Solids	TS031993	03/19/93	%	U	0.1
Total Cyanide	CN031893A	03/22/93	mg/Kg	U	0.10

Note:

Form 120WSN1G.GEN

Rev. 10/07/92

057

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INORGANICS ANALYSIS (GENERAL) DATA SUMMARY SHEET
WATER MATRIX

Project Name: Sandia
Project Number: 76100
Report Date: April 08, 1993

Sample I.D.: Method Blank

Sample Date: NA

Date Received: NA

ENCOTEC I.D.: MBSNL-SS-032-2

U = Analyte not detected

ANALYTE	QC SET ID	ANALYSIS DATE	METHOD	UNITS	CONC.	DETECTION LIMIT
Cyanide, Total	CN031893A	03/22/93	9012	mg/L	U	0.01

Note:

Form 120WVN1G.GEN

Rev. 11/05/92

058

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WATER MATRIX LABORATORY CONTROL SAMPLE (LCS) AND LABORATORY CONTROL SAMPLE DUPLICATE (LCD) RECOVERY
 INORGANICS - GENERAL

Project Name: Sandia
 Project Number: 76100
 Report Date: April 08, 1993

<u>Analyte</u>	<u>QC Set ID</u>	<u>Units</u>	<u>Conc Spiked</u>	<u>Conc LCS</u>	<u>% Rec</u>	<u>Conc LCD</u>	<u>% Rec</u>	<u>RPD</u>	<u>QUALITY CONTROL WINDOWS</u>	
									<u>RPD</u>	<u>% Rec</u>
Cyanide, total	CN031893A	mg/L	0.186	0.169	91	0.163	88	3.6	20	80 - 120

* Value is outside quality control windows.

Recovery: 0 out of 2 outside QC Windows.
 RPD: 0 out of 1 outside QC Windows.

Note:

Form 120WVN5G.GEN

Rev. 11/02/92

DBD

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SOIL MATRIX SPIKE (MS) AND MATRIX SPIKE DUPLICATE (MSD) RECOVERY
 INORGANICS - GENERAL

Project Name: Sandia
 Project Number: 76100
 Report Date: April 08, 1993

Analyte	ENCOTEC	QC	Conc	Sample	Conc MS	%	Conc MSD	%	RPD	QC WINDOW	
	Sample ID									Set ID	Spiked (mg/Kg)
Total Cyanide	200008018	CN031893A	2.12	<0.10	2.17	102	2.22	105	2.3	20	75 - 125

081

Results reported on a dry weight basis.

MI = Matrix interference caused distortion to recovery value. DL = Spike diluted out.

U = Analyte is undetected in the unspiked sample.

* Value is outside quality control windows.

RECOVERY: 0 out of 2 outside QC Windows

RPD: 0 out of 1 outside QC Windows

Note:





LABORATORY NARRATIVE

Project Name: Sandia
Project Number: 76100
Sample Delivery Group: SNL-SS-033
Batch Number(s): 1608
QC Set(s): Sample Preparation - Inorganics:
Metals Laboratory - Preparation/Analysis:
ICP032693-3, HYD032993-1, CV032693-1
Sample Analysis - Inorganics:
Metals Laboratory - Preparation/Analysis:
ICP032693-3, HYD032993-1, CV032693-1
Sample Preparation - Organics:
PBS032493-10
Sample Analysis - Organic Extractions - GC:
PBS032493-10
Narrative Date: April 13, 1993

Sample Receipt

The samples were received at ENCOTEC with incident. Sample ER 9200 4717-1 was received but the sample ID was not marked on the sample label. The project manager was notified and the client contacted, confirming the identity of the unlabelled sample.

Standard chain-of-custody procedures were followed. After log-in, the samples were stored at 4°C until sample preparation or analysis.

Sample Preparation - Inorganics - Metals & General Chemistry

Preparation/digestion of samples, where applicable, was performed within holding time and with chain of custody maintained. Sample preparation proceeded without incident. A method blank, laboratory control sample, and laboratory control sample duplicate were processed with each QC set.

Sample Analysis - Inorganics - Metals & General Chemistry

Sample analysis was performed without incident, within holding times, with chain of custody maintained, and according to the referenced methods. Quality control results are summarized as follows:

- The method blanks did not contain any target analytes at or above the reported detection limit.

- Laboratory control samples and laboratory control sample duplicates were analyzed along with the samples referenced within the QC sets; please see the appropriate forms for results.

Sample Preparation - Organics

All sample extractions were performed within holding time and with chain of custody maintained. Sample extraction proceeded without incident. Surrogates were added to all samples. A method blank, laboratory control sample, laboratory control sample duplicate, matrix spike, and matrix spike duplicate were processed with each QC set. If requested, the matrix spike fortification was performed using a client-specific sample from this project.

Sample Analysis - Organic Extractions - GC

Sample analysis was performed without incident, within holding times, with chain of custody maintained, and according to method 8080 for PCBs only. Quality control results are summarized as follows:

- Analysis of surrogates was performed on all samples; please see the appropriate form for results.

- The method blank did not contain any target analytes at or above the reported detection limit.

- A laboratory control sample and laboratory control sample duplicate were analyzed along with the samples referenced within the QC set; please see the appropriate form for results.

- A matrix spike and matrix spike duplicate were analyzed on client ID ER 9200 4720-1; please see the appropriate form for results.

Summary

All inorganic analyses were performed by inductively coupled plasma emission spectroscopy, hydride and cold vapor atomic absorption, and classical wet chemistry methodologies. According to quality control data, accuracy and precision were satisfactorily maintained.

PCB analysis by method 8080 did not indicate the presence of any target analytes.

I certify that the data presented as part of this report meets the minimum quality assurance standards specified in the referenced analytical method(s). I have examined and am familiar with the information contained in this report and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, complete and meets the minimum standards specified in 40 CFR 136, SW-846. Any exceptions, outliers and/or problems encountered during the analysis of samples contained within this report have been narrated and an assessment of the quality of the data is presented. I am aware that there are significant penalties for submitting with knowledge, false information, including the possibility of fines and/or imprisonment.

Jane Hancock
Jane Hancock
QA/QC Chemist

1/3/93
Date

Environmental Control Technology Corporation
Analyst Cross-Reference List

SDG#: SNL-SS-033

Test

PCB

Total Cyanide

pH

TS

HYAA

ICP

CVAA

Analyst

Don Ward

Steve Carter

Sean Markiewicz

Sean Markiewicz

Laura Wilmoth

Annie Broderick

Laura Wilmoth

Polychlorinated Biphenyls

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ORGANIC ANALYSIS DATA SUMMARY SHEET

Project Name: Sandia
Project Number: 76100
Method: 8080
Report Date: April 6, 1993

Sample I.D.: ER9200 4719-1
Sample Date: 03/17/93
Date Received: 03/18/93
Date Extracted: 03/24/93
Date Analyzed: 03/30/93
ENCOTEC I.D.: 200008039
QC Set I.D.: PBS032493-10

U = Analyte not detected
B = Analyte present in
method blank

AROCLOR	CAS NUMBER	CONC. (ug/Kg)	DETECTION LIMIT (ug/Kg)
PCB-1016	12674-11-2	U	80
PCB-1221	11104-28-2	U	80
PCB-1232	11141-16-5	U	80
PCB-1242	53469-21-9	U	80
PCB-1248	12672-29-6	U	80
PCB-1254	11097-69-1	U	80
PCB-1260	11096-82-5	U	80

Analysis reported on a X WET DRY weight basis.

Percent solids 86.7

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ORGANIC ANALYSIS DATA SUMMARY SHEET

Project Name: Sandia
Project Number: 76100
Method: 8080
Report Date: April 6, 1993

Sample I.D.: ER9200 4720-1
Sample Date: 03/17/93
Date Received: 03/18/93
Date Extracted: 03/24/93
Date Analyzed: 03/30/93
ENCOTEC I.D.: 200008040
QC Set I.D.: PBS032493-10

U = Analyte not detected
B = Analyte present in
method blank

AROCLOR	CAS NUMBER	CONC. (ug/Kg)	DETECTION LIMIT (ug/Kg)
PCB-1016	12674-11-2	U	80
PCB-1221	11104-28-2	U	80
PCB-1232	11141-16-5	U	80
PCB-1242	53469-21-9	U	80
PCB-1248	12672-29-6	U	80
PCB-1254	11097-69-1	U	80
PCB-1260	11096-82-5	U	80

Analysis reported on a X WET DRY weight basis.

Percent solids 95.9

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ORGANIC ANALYSIS DATA SUMMARY SHEET

Project Name: Sandia
Project Number: 76100
Method: 8080
Report Date: April 6, 1993

Sample I.D.: ER9200 4290-1
Sample Date: 03/17/93
Date Received: 03/18/93
Date Extracted: 03/24/93
Date Analyzed: 03/30/93
ENCOTEC I.D.: 200008041
QC Set I.D.: PBS032493-10

U = Analyte not detected
B = Analyte present in
method blank

AROCLOR	CAS NUMBER	CONC. (ug/Kg)	DETECTION LIMIT (ug/Kg)
PCB-1016	12674-11-2	U	80
PCB-1221	11104-28-2	U	80
PCB-1232	11141-16-5	U	80
PCB-1242	53469-21-9	U	80
PCB-1248	12672-29-6	U	80
PCB-1254	11097-69-1	U	80
PCB-1260	11096-82-5	U	80

Analysis reported on a X WET DRY weight basis.

Percent solids 90.9

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ORGANIC ANALYSIS DATA SUMMARY SHEET

Project Name: Sandia
Project Number: 76100
Method: 8080
Report Date: April 6, 1993

Sample I.D.: ER9200 4717-1
Sample Date: 03/17/93
Date Received: 03/18/93
Date Extracted: 03/24/93
Date Analyzed: 03/30/93
ENCOTEC I.D.: 200008042
QC Set I.D.: PBS032493-10

U = Analyte not detected
B = Analyte present in
method blank

AROCLOR	CAS NUMBER	CONC. (ug/Kg)	DETECTION LIMIT (ug/Kg)
PCB-1016	12674-11-2	U	80
PCB-1221	11104-28-2	U	80
PCB-1232	11141-16-5	U	80
PCB-1242	53469-21-9	U	80
PCB-1248	12672-29-6	U	80
PCB-1254	11097-69-1	U	80
PCB-1260	11096-82-5	U	80

Analysis reported on a X WET _____ DRY weight basis.

Percent solids 87.9

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ORGANIC ANALYSIS DATA SUMMARY SHEET

Project Name: Sandia
Project Number: 76100
Method: 8080
Report Date: April 6, 1993

Sample I.D.: Method Blank
Sample Date: NA
Date Received: NA
Date Extracted: 03/24/93
Date Analyzed: 03/30/93
ENCOTECH I.D.: MB032493-1
QC Set I.D.: PBS032493-10

U = Analyte not detected
B = Analyte present in
method blank

AROCLOR	CAS NUMBER	CONC. (ug/Kg)	DETECTION LIMIT (ug/Kg)
PCB-1016	12674-11-2	U	80
PCB-1221	11104-28-2	U	80
PCB-1232	11141-16-5	U	80
PCB-1242	53469-21-9	U	80
PCB-1248	12672-29-6	U	80
PCB-1254	11097-69-1	U	80
PCB-1260	11096-82-5	U	80

Analysis reported on a X WET DRY weight basis.

Percent solids NA

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SOILS\SOLIDS MATRIX SURROGATE RECOVERY
POLYCHLORINATED BIPHENYLS

Project Name: Sandia
Project Number: 76100
Method: 8080
Report Date: April 6, 1993
QC Set I.D.: PBS032493-10

<u>ENCOTEC</u> <u>Sample Number</u>	<u>Percent Recovery</u> <u>2,4,5,6-TCMX</u> <u>(50-150)</u>	<u>Percent Recovery</u> <u>Decachlorobiphenyl</u> <u>(32-136)</u>
200008039	107	107
200008040	100	96
200008041	105	108
200008042	107	106
MB032493-1	95	93
LCS032493-10	124	106
LCD032493-10	98	100
200008040 MS	103	108
200008040 MSD	102	94

All samples fortified with 33 ug/Kg of surrogate analyte.

* Value outside of established quality control windows.

DL = Sample matrix diluted, therefore surrogate recoveries are not applicable.

MI = Matrix interferences caused distortion to recovery value.

RECOVERY: 0 out of 18 outside QC Windows.

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SOIL MATRIX LABORATORY CONTROL SAMPLE (LCS) AND LABORATORY CONTROL SAMPLE DUPLICATE (LCD) RECOVERY
 POLYCHLORINATED BIPHENYLS

Project Name: Sandia
 Project Number: 76100
 Method: B080
 Report Date: April 6, 1993
 QC Set I.D.: PBS032493-10

SAMPLE SPIKED - ENCOTEC ID: LCS/LCD032493-10

Aroclor	Concentration Spiked (ug/Kg)	LCS Conc. (ug/Kg)	% Rec.	LCD Conc. (ug/Kg)	% Rec.	RPD	QUALITY CONTROL WINDOWS	
							RPD	% Recovery
PCB 1221	333	380	114	339	102	11.4	20	48-163
PCB 1248	333	353	106	321	96	9.5	19	39-155
PCB 1260	333	337	101	321	96	4.9	23	37-166

RPD = Relative Percent Difference.

* Value outside of quality control windows.

RPD: 0 out of 3 outside QC Windows.

RECOVERY: 0 out of 6 outside QC Windows.

Note:

Form 057CSL5G.GN1

Rev. 02/02/93

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SOIL/SOLIDS MATRIX SPIKE (MS) AND MATRIX SPIKE DUPLICATE (MSD) RECOVERY
 POLYCHLORINATED BIPHENYLS

Project Name: Sandia
 Project Number: 76100
 Method: 8080
 Report Date: April 6, 1993
 QC Set I.D.: PBS032493-10

SAMPLE SPIKED - ENCOTEC ID: 200008040

CLIENT ID: ER9200 4720-1

<u>Aroclor</u>	<u>Concentration Spiked (ug/Kg)</u>	<u>Sample Result (ug/Kg)</u>	<u>MS Conc (ug/Kg)</u>	<u>% Rec</u>	<u>MSD Conc (ug/Kg)</u>	<u>% Rec</u>	<u>RPD</u>	<u>QUALITY CONTROL WINDOWS</u>	
								<u>RPD</u>	<u>%Recovery</u>
PCB 1221	333	80 U	342	103	351	105	2.6	20	48-163
PCB 1248	333	80 U	369	111	326	98	12	19	39-155
PCB 1260	333	80 U	348	105	305	92	13	23	37-166

U = Analyte not detected in non-spiked sample.

MI = Matrix interferences caused distortion to recovery value.

RPD = Relative Percent Difference.

* Value outside of quality control windows.

RPD: 0 out of 3 outside QC Windows.

RECOVERY: 0 out of 6 outside QC Windows.

Note:

Inorganic Parameters

Metals

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INORGANICS ANALYSIS (METALS) DATA SUMMARY SHEET
SOIL MATRIX

Project Name: Sandia
Project Number: 76100
Report Date: April 06, 1993

Sample I.D.: ER 9200 4719-1 U = Analyte not detected.
Sample Date: 03/17/93
Date Received: 03/18/93
ENCOTEC I.D.: 200008039

ANALYTE	QC SET ID	ANALYSIS DATE	METHOD	CONC. (mg/Kg)	DETECTION LIMIT (mg/Kg)
Arsenic	HYD032993-1	03/30/93	7061	2.4	1.2
Barium	ICP032693-3	03/29/93	6010	224	1.2
Cadmium	ICP032693-3	03/29/93	6010	U	0.29
Chromium	ICP032693-3	03/29/93	6010	7.7	1.2
Lead	ICP032693-3	03/29/93	6010	8.2	2.3
Mercury	CV032693-1	03/29/93	7470	U	0.05
Selenium	HYD032993-1	03/30/93	7741	U	0.12
Silver	ICP032693-3	03/29/93	6010	U	0.58

Results reported on a dry weight basis.

Percent Total Solids 86.7

Note:

Form 110MSN1G.GEN

Rev. 10/14/92

ENVIRONMENTAL CONTROL TECHNOLOGY CORPORATION
3985 Research Park Drive * Ann Arbor, MI 48108
313 / 761-1389

INORGANICS ANALYSIS (METALS) DATA SUMMARY SHEET
SOIL MATRIX

Project Name: Sandia
Project Number: 76100
Report Date: April 06, 1993

Sample I.D.: ER 9200 4720-1 U = Analyte not detected.
Sample Date: 03/17/93
Date Received: 03/18/93
ENCOTEC I.D.: 200008040

ANALYTE	QC SET ID	ANALYSIS DATE	METHOD	CONC. (mg/Kg)	DETECTION LIMIT (mg/Kg)
Arsenic	HYD032993-1	03/30/93	7061	1.1	1.0
Barium	ICP032693-3	03/29/93	6010	126	1.0
Cadmium	ICP032693-3	03/29/93	6010	U	0.26
Chromium	ICP032693-3	03/29/93	6010	3.3	1.0
Lead	ICP032693-3	03/29/93	6010	5.5	2.1
Mercury	CV032693-1	03/29/93	7470	U	0.04
Selenium	HYD032993-1	03/30/93	7741	U	0.1
Silver	ICP032693-3	03/29/93	6010	U	0.52

Results reported on a dry weight basis.

Percent Total Solids 95.9

Note:

Form 110MSN1G.GEN

Rev. 10/14/92

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INORGANICS ANALYSIS (METALS) DATA SUMMARY SHEET
SOIL MATRIX

Project Name: Sandia
Project Number: 76100
Report Date: April 06, 1993

Sample I.D.: ER 9200 4290-1
Sample Date: 03/17/93
Date Received: 03/18/93
ENCOTECH I.D.: 200008041

U = Analyte not detected.

ANALYTE	QC SET ID	ANALYSIS DATE	METHOD	CONC. (mg/Kg)	DETECTION LIMIT (mg/Kg)
Arsenic	HYD032993-1	03/30/93	7061	3.6	1.1
Barium	ICP032693-3	03/29/93	6010	120	1.1
Cadmium	ICP032693-3	03/29/93	6010	U	0.28
Chromium	ICP032693-3	03/29/93	6010	4.0	1.1
Lead	ICP032693-3	03/29/93	6010	4.0	2.2
Mercury	CV032693-1	03/29/93	7470	U	0.045
Selenium	HYD032993-1	03/30/93	7741	U	0.11
Silver	ICP032693-3	03/29/93	6010	U	0.56

Results reported on a dry weight basis.

Percent Total Solids 89.2

Note:

Form 110MSN1G.GEN

Rev. 10/14/92

ENVIRONMENTAL CONTROL TECHNOLOGY CORPORATION
3985 Research Park Drive * Ann Arbor, MI 48108
313 / 761-1389

INORGANICS ANALYSIS (METALS) DATA SUMMARY SHEET
SOIL MATRIX

Project Name: Sandia
Project Number: 76100
Report Date: April 06, 1993

Sample I.D.: ER 9200 4717-1 U = Analyte not detected.
Sample Date: 03/17/93
Date Received: 03/18/93
ENCOTECH I.D.: 200008042

ANALYTE	QC SET ID	ANALYSIS DATE	METHOD	CONC. (mg/Kg)	DETECTION LIMIT (mg/Kg)
Arsenic	HYD032993-1	03/30/93	7061	4.7	1.1
Barium	ICP032693-3	03/29/93	6010	421	1.1
Cadmium	ICP032693-3	03/29/93	6010	U	0.28
Chromium	ICP032693-3	03/29/93	6010	5.0	1.1
Lead	ICP032693-3	03/29/93	6010	5.0	2.3
Mercury	CV032693-1	03/29/93	7470	U	0.05
Selenium	HYD032993-1	03/30/93	7741	U	0.11
Silver	ICP032693-3	03/29/93	6010	U	0.56

Results reported on a dry weight basis.

Percent Total Solids 88.5

Note:

Form 110MSN1G.GEN

Rev. 10/14/92

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313 / 761-1389

INORGANICS ANALYSIS (METALS) DATA SUMMARY SHEET
SOIL MATRIX

Project Name: Sandia
Project Number: 76100
Report Date: April 08, 1993

Sample I.D.: Method Blank
Sample Date: NA
Date Received: NA
ENCOTEC I.D.: MBSNL-SS-033

U = Analyte not detected.

ANALYTE	QC SET ID	ANALYSIS DATE	METHOD	CONC. (mg/Kg)	DETECTION LIMIT (mg/Kg)
Arsenic	HYD032993-1	03/30/93	7061	U	0.10
Barium	ICP032693-3	03/29/93	6010	U	1.0
Cadmium	ICP032693-3	03/29/93	6010	U	0.25
Chromium	ICP032693-3	03/29/93	6010	U	1.0
Lead	ICP032693-3	03/29/93	6010	U	2.0
Mercury	CV032693-1	03/29/93	7470	U	0.04
Selenium	HYD032993-1	03/30/93	7741	U	0.1
Silver	ICP032693-3	03/29/93	6010	U	0.5

Results reported on a dry weight basis.

Percent Total Solids NA

Note:

Form 110MSN1G.GEN

Rev. 10/14/92

ENVIRONMENTAL CONTROL TECHNOLOGY CORPORATION
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SOIL MATRIX LABORATORY CONTROL SAMPLE (LCS) AND LABORATORY CONTROL SAMPLE DUPLICATE (LCD) RECOVERY
 INORGANICS - METALS

Project Name: Sandia
 Project Number: 76100
 Report Date: April 08, 1993

Parameter	QC Set ID	Conc Spiked (mg/Kg)	LCS Conc (mg/Kg)	% Rec	LCD Conc (mg/Kg)	% Rec	RPD	QUALITY CONTROL WINDOWS	
								RPD	% Rec
Arsenic	HYD032993-1	0.20	0.185	92	0.19	95	2.7	20	80-120
Barium	ICP032693-3	50	50	100	49.5	99	1.0	20	80-120
Cadmium	ICP032693-3	10	9.45	94	9.55	96	1.1	20	80-120
Chromium	ICP032693-3	50	47.5	95	48	96	1.0	20	80-120
Lead	ICP032693-3	50	47.5	95	46.4	93	1.9	20	80-120
Mercury	CV032693-1	0.40	0.41	102	0.38	95	7.5	20	80-120
Selenium	HYD032993-1	0.20	0.224	112	0.224	112	0	20	80-120
Silver	ICP032693-3	25	24.2	97	24.4	98	0.8	20	80-120

* = Value outside QC windows.

RECOVERY: 0 out of 16 outside QC Windows.
 RPD: 0 out of 8 outside QC Windows.

19

Inorganic Parameters

General Chemistry

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INORGANICS ANALYSIS (GENERAL) DATA SUMMARY SHEET
SOIL MATRIX

Project Name: Sandia
Project Number: 76100
Report Date: April 5, 1993

Sample I.D.: ER 9200 4719-1
Sample Date: 03/17/93
Date Received: 03/18/93
ENCOTEC I.D.: 200008039

U = Analyte not detected.

ANALYTE	QC SET ID	ANALYSIS DATE	UNITS	CONC.	DETECTION LIMIT
Total Cyanide	CN032393A	03/29/93	mg/kg	U	0.10
pH	PH032393	03/23/93	S.U.	7	0.5-12.5
Total Solids	TS031993	03/19/93	%	86.7	0.1

Results reported on a dry weight basis.

Note:

Form 120WSN1G.GEN

Rev. 10/07/92

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3985 Research Park Drive * Ann Arbor, MI 48108
313 / 761-1389

INORGANICS ANALYSIS (GENERAL) DATA SUMMARY SHEET
SOIL MATRIX

Project Name: Sandia
Project Number: 76100
Report Date: April 5, 1993

Sample I.D.: ER 9200 4720-1
Sample Date: 03/17/93
Date Received: 03/18/93
ENCOTEC I.D.: 200008040

U = Analyte not detected.

ANALYTE	QC SET ID	ANALYSIS DATE	UNITS	CONC.	DETECTION LIMIT
Total Cyanide	CN032393A	03/29/93	mg/kg	U	0.10
pH	pH032393	03/23/93	S.U.	7	0.5-12.5
Total Solids	TS031993	03/19/93	%	95.9	0.1

Results reported on a dry weight basis.

Note:

Form 120WSN1G.GEN

Rev. 10/07/92

ENVIRONMENTAL CONTROL TECHNOLOGY CORPORATION
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313 / 761-1389

INORGANICS ANALYSIS (GENERAL) DATA SUMMARY SHEET
SOIL MATRIX

Project Name: Sandia
Project Number: 76100
Report Date: April 5, 1993

Sample I.D.: ER 9200 4290-1
Sample Date: 03/17/93
Date Received: 03/18/93
ENCOTECH I.D.: 200008041

U = Analyte not detected.

ANALYTE	QC SET ID	ANALYSIS DATE	UNITS	CONC.	DETECTION LIMIT
Total Cyanide	CN032393A	03/29/93	mg/kg	U	0.10
pH	pH032393	03/23/93	S.U.	7	0.5-12.5
Total Solids	TS031993	03/19/93	%	90.9	0.1

Results reported on a dry weight basis.

Note:

Form 120WSN1G.GEN

Rev. 10/07/92

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313 / 761-1389

INORGANICS ANALYSIS (GENERAL) DATA SUMMARY SHEET
SOIL MATRIX

Project Name: Sandia
Project Number: 76100
Report Date: April 5, 1993

Sample I.D.: ER 9200 4717-1
Sample Date: 03/17/93
Date Received: 03/18/93
ENCOTEC I.D.: 200008042

U = Analyte not detected.

ANALYTE	QC SET ID	ANALYSIS DATE	UNITS	CONC.	DETECTION LIMIT
Total Cyanide	CN032393A	03/29/93	mg/kg	U	0.10
pH	PH032393	03/23/93	S.U.	7	0.5-12.5
Total Solids	TS031993	03/19/93	%	87.9	0.1

Results reported on a dry weight basis.

Note:

Form 120WSN1G.GEN

Rev. 10/07/92

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313 / 761-1389

INORGANICS ANALYSIS (GENERAL) DATA SUMMARY SHEET
SOIL MATRIX

Project Name: Sandia
Project Number: 76100
Report Date: April 08, 1993

Sample I.D.: Method Blank
Sample Date: NA
Date Received: NA
ENCOTEC I.D.: MBSNL-SS-033

U = Analyte not detected.

ANALYTE	QC SET ID	ANALYSIS DATE	UNITS	CONC.	DETECTION LIMIT
Total Solids	TS031993	03/19/93	%	U	0.1
Total Cyanide	CN032393A	03/29/93	mg/Kg	U	0.10

Note:

ENVIRONMENTAL CONTROL TECHNOLOGY CORPORATION
 3985 Research Park Drive * Ann Arbor, MI 48108
 313 / 761-1389

SOIL MATRIX LABORATORY CONTROL SAMPLE (LCS) AND LABORATORY CONTROL SAMPLE DUPLICATE (LCD) RECOVERY
 INORGANICS - GENERAL

Project Name: Sandia
 Project Number: 76100
 Report Date: April 08, 1993

<u>Analyte</u>	<u>QC Set ID</u>	<u>Units</u>	<u>Conc Spiked</u>	<u>Conc LCS</u>	<u>% Rec</u>	<u>Conc LCD</u>	<u>% Rec</u>	<u>RPD</u>	<u>QUALITY CONTROL WINDOWS</u>	
									<u>RPD</u>	<u>% Rec</u>
Total Cyanide	CN032393A	mg/Kg	1.86	1.65	89	1.70	91	2.8	20	80 - 120
									20	80 - 120
									20	80 - 120
									20	80 - 120
									20	80 - 120
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									20	80 - 120
									20	80 - 120
									20	80 - 120
									20	80 - 120
									20	80 - 120

* Value is outside quality control windows.
 Recovery: 0 out of 2 outside QC Windows.
 RPD: 0 out of 1 outside QC Windows.

Note:

26

Rocky Mountain Analytical Laboratory
4955 Yarrow Street, Arvada, CO 80002 (303) 421-6611

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MAR 2 2 1993

IT CORP.-ALBUQUERQUE

MM

03/17/93

Jim Fish
Sandia National Laboratory - Division 7725
PO Box 5800
Albuquerque, NM 871855800

Dear Mr. Fish:

This letter acknowledges the acceptance of one sample at Rocky Mountain Analytical Laboratory (RMAL) which has been assigned to project number 028127. Attached are the Sample Description Information form, cross-referencing the RMAL sample number to client description, and a copy of the signed Chain of Custody.

If you have any questions or need additional information, please contact me at (303)421-6611. Thank you.

Sincerely,



Ellen La Riviere
Program Administrator





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MAR 29 1993

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301455.31.02

ANALYTICAL RESULTS
FOR
SANDIA NATIONAL LABORATORY
ENSECO-RMAL NO. 028127

MARCH 26, 1993

Reviewed by:



Ellen La Riviere

Enseco Incorporated
4955 Yarrow Street
Arvada, Colorado 80002
303/421-6611 Fax: 303/431-7171

I. OVERVIEW

On March 17, 1993, Enseco-Rocky Mountain Analytical Laboratory received one soil sample from Sandia National Laboratory.

This report presents the analytical results as well as supporting information to aid in the evaluation and interpretation of the data and is arranged in the following order:

- I. Overview
- II. Sample Description Information/Analytical Test Requests
- III. Analytical Results
- IV. Quality Control Report

DISCUSSION

"J" values have been reported for the volatiles, semivolatiles, and metals analyses. A "J" value indicates an estimated value. For Methods 8240 and 8270 a "J" value is where the mass spectra data indicate the presence of a compound which meets identification criteria; however, the result is less than the reporting limit but greater than the instrument detection limit (IDL). For metals analyses "J" values are reported for those analytes which lie between the IDL and the Enseco reporting limit. Analytes which were not detected at or below the reporting limit are reported as "ND" and do not have "J" flags.

Metals Data Review

Enseco protocol states that samples analyzed by graphite furnace atomic absorption (GFAA), will have a spiked aliquot analyzed with each sample. If the spike recovery does not meet established criteria, the reporting limit for that analysis is raised proportionately. Poor spike recoveries of this type are typically due to interferences from the sample matrix.

In reviewing the GFAA metals data it is necessary to know what the nominal reporting limits are in order to determine whether or not those limits were raised due to matrix interference. The most common GFAA elements and their nominal reporting limits are listed in the table below. These are provided to facilitate the review of the GFAA metals data.

Common GFAA Elements

Reporting Limit / Units

<u>Element</u>	<u>Aqueous (mg/L)</u>	<u>Soil (mg/kg)</u>	<u>Waste (mg/kg)</u>	<u>Leachate (mg/L)</u>
Arsenic	0.005	0.5 **	0.5 **	0.05 **
Lead	0.005	0.5	0.5 **	0.05 **
Selenium	0.005	0.5	0.5	0.05
Thallium	0.005	0.5	0.5	0.05

**For the matrix listed, the preferred method for this element is by Method 6010

II. SAMPLE DESCRIPTION INFORMATION/ANALYTICAL TEST REQUESTS

Sample Description Information

The Sample Description Information lists all of the samples received in this project together with the internal laboratory identification number assigned for each sample. Each project received at Enseco - RMAL is assigned a unique six digit number. Samples within the project are numbered sequentially. The laboratory identification number is a combination of the six digit project code and the sample sequence number.

Also given in the Sample Description Information is the Sample Type (matrix), Date of Sampling (if known) and Date of Receipt at the laboratory.

Analytical Test Requests

The Analytical Test Requests lists the analyses that were performed on each sample. The Custom Test column indicates where tests have been modified to conform to the specific requirements of this project.

SAMPLE DESCRIPTION INFORMATION
for
Sandia National Laboratory

Lab ID	Client ID	Matrix	Sampled Date	Time	Received Date
028127-0001-SA	ER92004706-1	SOIL	16 MAR 93	10:55	17 MAR 93

ANALYTICAL TEST REQUESTS
for
Sandia National Laboratory

Lab ID: 028127	Group Code	Analysis Description	Custom Test?
0001	A	RCRA Total Metals done by ICP Prep - Total Metals, ICP Selenium, Furnace AA Prep - Total Metals, Furnace AA Arsenic, Furnace AA Mercury, Cold Vapor AA Prep - Mercury, Cold Vapor AA Cyanide, Total pH PCBs Prep - PCBs by GC	N N N N N N N N N N

III. ANALYTICAL RESULTS

The analytical results for this project are presented in the following data tables. Each data table includes sample identification information, and when available and appropriate, dates sampled, received, authorized, prepared and analyzed. The authorization date is the date when the project was defined by the client such that laboratory work could begin. The date prepared is typically the date an extraction or digestion was initiated. For volatile organic compounds in water, the date prepared is the date the screening of the sample was performed.

Data sheets contain a listing of the parameters measured in each test, the analytical results and the Enseco reporting limit. Reporting limits are adjusted to reflect dilution of the sample, when appropriate. Solid and waste samples are reported on an "as received" basis, i.e. no correction is made for moisture content.

PCBs

Method 8080

Client Name: Sandia National Laboratory
Client ID: ER92004706-1
Lab ID: 028127-0001-SA
Matrix: SOIL
Authorized: 17 MAR 93

Sampled: 16 MAR 93
Prepared: 18 MAR 93

Received: 17 MAR 93
Analyzed: 19 MAR 93

Parameter	Result	Wet wt. Units	Reporting Limit
Aroclor 1016	ND	ug/kg	33
Aroclor 1221	ND	ug/kg	33
Aroclor 1232	ND	ug/kg	33
Aroclor 1242	ND	ug/kg	33
Aroclor 1248	ND	ug/kg	33
Aroclor 1254	ND	ug/kg	33
Aroclor 1260	ND	ug/kg	33

ND = Not detected
NA = Not applicable

Reported By: Richard Powell

Approved By: William Sullivan

Metals

Total Metals

Client Name: Sandia National Laboratory
 Client ID: ER92004706-1
 Lab ID: 028127-0001-SA
 Matrix: SOIL
 Authorized: 17 MAR 93

Sampled: 16 MAR 93
 Prepared: See Below

Received: 17 MAR 93
 Analyzed: See Below

Parameter	Result	Wet wt. Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Arsenic	4.2	mg/kg	0.50	7060	19 MAR 93	22 MAR 93
Barium	93.6	mg/kg	1.0	6010	19 MAR 93	21 MAR 93
Cadmium	ND	mg/kg	0.50	6010	19 MAR 93	21 MAR 93
Chromium	4.3	mg/kg	1.0	6010	19 MAR 93	21 MAR 93
Lead	5.6	mg/kg	5.0	6010	19 MAR 93	21 MAR 93
Mercury	ND	mg/kg	0.10	7471	22 MAR 93	22 MAR 93
Selenium	ND	mg/kg	1.0	7740	19 MAR 93	22 MAR 93
Silver	0.76	mg/kg	1.0	6010	19 MAR 93	21 MAR 93 J

Note J : Result is detected below the reporting limit or is an estimated concentration.

ND = Not detected
 NA = Not applicable

Reported By: Steven Gouy

Approved By: John Laferty

General Inorganics

Enseco
A Corning Company

Client Name: Sandia National Laboratory

Client ID: ER92004706-1

Lab ID: 028127-0001-SA

Matrix: SOIL

Authorized: 17 MAR 93

Sampled: 16 MAR 93

Prepared: See Below

Received: 17 MAR 93

Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Cyanide	ND	mg/kg	0.50	9010/9012	NA	24 MAR 93
pH	7.8	units	--	9045	NA	25 MAR 93

ND = Not detected
NA = Not applicable

Reported By: Mark Woolley

Approved By: Richard Murphy

IV. QUALITY CONTROL REPORT

The Enseco laboratories operate under a vigorous QA/QC program designed to ensure the generation of scientifically valid, legally defensible data by monitoring every aspect of laboratory operations. Routine QA/QC procedures include the use of approved methodologies, independent verification of analytical standards, use of duplicate Laboratory Control Samples to assess the precision and accuracy of the methodology on a routine basis, and a rigorous system of data review.

The standard laboratory QC package is designed to:

- 1) establish a strong, cost-effective QC program that ensures the generation of scientifically valid, legally defensible data;
- 2) assess the laboratory's performance of the analytical method using control limits generated with a well-defined matrix;
- 3) establish clear-cut guidelines for acceptability of analytical data so that QC decisions can be made immediately at the bench; and
- 4) provide a standard set of reportables which assures the client of the quality of his data.

The Enseco QC program is based upon monitoring the precision and accuracy of an analytical method by analyzing a set of Duplicate Control Samples (DCS) at frequent, well-defined intervals. Each DCS is a well-characterized matrix which is spiked with target compounds at 5-100 times the reporting limit, depending upon the methodology being monitored. The purpose of the DCS is not to duplicate the sample matrix, but rather to provide an interference-free, homogeneous matrix from which to gather data to establish control limits. These limits are used to determine whether data generated by the laboratory on any given day is in control.

Control limits for accuracy (percent recovery) are based on the average, historical percent recovery +/- 3 standard deviation units. Control limits for precision (relative percent difference) range from 0 (identical duplicate DCS results) to the average, historical relative percent difference + 3 standard deviation units. These control limits are fairly narrow based on the consistency of the matrix being monitored and are updated on a quarterly basis.

For each batch of samples analyzed, an additional control measure is taken in the form of a Single Control Sample (SCS). The SCS consists of a control matrix that is spiked with surrogate compounds appropriate to the method being used. In cases where no surrogate is available, (e.g., metals or conventional analyses) a single DCS serves as the control sample. An SCS is prepared for each sample lot for which the DCS pair are not analyzed. The recovery of the SCS is charted in exactly the same manner as described for the DCS, and provides a daily check on the performance of the method.

Accuracy for DCS and SCS is measured by Percent Recovery.

$$\% \text{ Recovery} = \frac{\text{Measured Concentration}}{\text{Actual Concentration}} \times 100$$

Precision for DCS is measured by Relative Percent Difference (RPD).

$$\text{RPD} = \frac{|\text{Measured Concentration DCS1} - \text{Measured Concentration DCS2}|}{(\text{Measured Concentration DCS1} + \text{Measured Concentration DCS2})/2} \times 100$$

All samples analyzed concurrently by the same test are assigned the same QC lot number. Projects which contain numerous samples, analyzed over several days, may have multiple QC lot numbers associated with each test. The QC information which follows includes a listing of the QC lot numbers associated with each of the samples reported, DCS and SCS (where applicable) recoveries from the QC lots associated with the samples, and control limits for these lots. The QC data is reported by test code, in the order that the tests are reported in the analytical results section of this report.

QC LOT ASSIGNMENT REPORT
Semivolatile Organics by GC

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
028127-0001-SA	SOIL	PCB-S	18 MAR 93-8A	18 MAR 93-8A

DUPLICATE CONTROL SAMPLE REPORT
Semivolatile Organics by GC

Analyte	Concentration			AVG	Accuracy Average (%)		Precision (RPD)	
	Spiked	DCS1	Measured DCS2		DCS	Limits	DCS	Limit
Category: PCB-S Matrix: SOIL QC Lot: 18 MAR 93-8A Concentration Units: ug/kg								
Aroclor 1254	166.7	132	132	132	79	49-130	0.1	20

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT
Semivolatile Organics by GC

Analyte	Result	Units	Reporting Limit
Test: 8080-PCB-S			
Matrix: SOIL			
QC Lot: 18 MAR 93-8A QC Run: 18 MAR 93-8A			
Aroclor 1016	ND	ug/kg	33
Aroclor 1221	ND	ug/kg	33
Aroclor 1232	ND	ug/kg	33
Aroclor 1242	ND	ug/kg	33
Aroclor 1248	ND	ug/kg	33
Aroclor 1254	ND	ug/kg	33
Aroclor 1260	ND	ug/kg	33

QC LOT ASSIGNMENT REPORT
Metals Analysis and Preparation

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
028127-0001-SA	SOIL	ICP-S	19 MAR 93-9A	19 MAR 93-9A
028127-0001-SA	SOIL	SE-FAA-S	19 MAR 93-9A	19 MAR 93-9A
028127-0001-SA	SOIL	AS-FAA-S	19 MAR 93-9A	19 MAR 93-9A
028127-0001-SA	SOIL	HG-CVAA-S	22 MAR 93-9P	22 MAR 93-9P

DUPLICATE CONTROL SAMPLE REPORT
Metals Analysis and Preparation

Analyte	Concentration			AVG	Accuracy		Precision	
	Spiked	DCS1	Measured DCS2		Average (%) DCS	Limits	(RPD) DCS	Limit
Category: ICP-S								
Matrix: SOIL								
QC Lot: 19 MAR 93-9A								
Concentration Units: mg/kg								
Aluminum	10700	8050	8070	8060	75	47-153	0.3	20
Antimony	55.2	44.2	43.2	43.7	79	18-362	2.2	50
Arsenic	145	145	147	146	101	59-141	1.5	20
Barium	503	484	484	484	96	76-124	0.1	20
Beryllium	129	137	137	137	106	53-131	0.3	20
Cadmium	154	154	155	154	100	68-132	0.3	20
Calcium	7390	7360	7350	7360	100	79-121	0.2	20
Chromium	151	140	141	140	93	66-133	0.5	20
Cobalt	122	123	123	123	101	70-130	0.3	20
Copper	162	173	173	173	107	70-132	0.3	20
Iron	15400	13900	13900	13900	91	66-134	0.1	20
Lead	148	143	142	143	96	66-135	0.4	20
Magnesium	3740	3450	3470	3460	92	74-126	0.5	20
Manganese	423	427	429	428	101	74-125	0.3	20
Molybdenum	159	156	157	157	98	71-129	0.4	20
Nickel	166	168	168	168	101	67-133	0.2	20
Potassium	4050	3490	3510	3500	86	68-132	0.6	20
Silver	104	106	107	106	102	76-124	0.6	20
Sodium	747	660	675	667	89	57-130	2.3	20
Vanadium	154	151	151	151	98	73-127	0.4	20
Zinc	530	526	527	527	99	65-135	0.3	20

Category: SE-FAA-S
Matrix: SOIL
QC Lot: 19 MAR 93-9A
Concentration Units: mg/kg

Selenium	143	138	144	142	99	68-132	4.2	20
----------	-----	-----	-----	-----	----	--------	-----	----

Category: AS-FAA-S
Matrix: SOIL
QC Lot: 19 MAR 93-9A
Concentration Units: mg/kg

Arsenic	145	144	149	146	101	59-141	3.4	20
---------	-----	-----	-----	-----	-----	--------	-----	----

Calculations are performed before rounding to avoid round-off errors in calculated results.

DUPLICATE CONTROL SAMPLE REPORT
Metals Analysis and Preparation (cont.)

Analyte	Concentration Spiked	Concentration		AVG	Accuracy Average(%)		Precision (RPD)		
		DCS1	Measured DCS2		DCS	Limits	DCS	Limit	
Category: HG-CVAA-S Matrix: SOIL QC Lot: 22 MAR 93-9P Concentration Units: mg/kg									
Mercury	29.0	31.1	29.5	30.3	105	52-148	5.3	20	

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT
Metals Analysis and Preparation

Analyte	Result	Units	Reporting Limit
Test: ICP-RCRA-S			
Matrix: SOIL			
QC Lot: 19 MAR 93-9A QC Run: 19 MAR 93-9A			
Barium	ND	mg/kg	1.0
Cadmium	ND	mg/kg	0.50
Chromium	ND	mg/kg	1.0
Lead	ND	mg/kg	5.0
Silver	ND	mg/kg	1.0

Test: SE-FAA-S
Matrix: SOIL
QC Lot: 19 MAR 93-9A QC Run: 19 MAR 93-9A

Selenium	ND	mg/kg	0.50
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Test: AS-FAA-S
Matrix: SOIL
QC Lot: 19 MAR 93-9A QC Run: 19 MAR 93-9A

Arsenic	ND	mg/kg	0.50
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Test: HG-CVAA-S
Matrix: SOIL
QC Lot: 22 MAR 93-9P QC Run: 22 MAR 93-9P

Mercury	ND	mg/kg	0.10
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QC LOT ASSIGNMENT REPORT
Wet Chemistry Analysis and Preparation

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
028127-0001-SA	SOIL	CN-S	24 MAR 93-9M	24 MAR 93-9M
028127-0001-SA	AQUEOUS	PH-A	25 MAR 93-9M	

DUPLICATE CONTROL SAMPLE REPORT
Wet Chemistry Analysis and Preparation

Analyte	Concentration		Measured	AVG	Accuracy		Precision	
	Spiked	DCS1			DCS2	DCS	Limits	(RPD)

Category: CN-S
Matrix: SOIL
QC Lot: 24 MAR 93-9M
Concentration Units: mg/kg

Cyanide	10.0	9.16	8.58	8.87	89	75-125	6.5	20
---------	------	------	------	------	----	--------	-----	----

Category: PH-A
Matrix: AQUEOUS
QC Lot: 25 MAR 93-9M
Concentration Units: units

pH	9.10	9.06	9.08	9.07	100	98-102	0.2	5
----	------	------	------	------	-----	--------	-----	---

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT
Wet Chemistry Analysis and Preparation

Analyte	Result	Units	Reporting Limit
Test: CNTOT-TEC-S			
Matrix: SOIL			
QC Lot: 24 MAR 93-9M QC Run: 24 MAR 93-9M			
Cyanide	ND	mg/kg	0.50

 * Sandia Radiation Sample Diagnostic Program (7715) 3-25-1993 *

 H-3 Analysis Program Version 3.0

Batch Number : 930111
 Laboratory ID : SNL-7715/881
 Client : N. DURAND /B. BISHOP (7725/IT) 930111
 Count Date : 24-Mar-93
 Data Mode : Alpha/Beta
 Region of Interest : 0-12
 Count Protocol : 3
 Count Time : 10.0 minutes
 Background cpm : 16.10 +- 2.63
 Background tSIE : 453.7
 Background Eff : 0.487
 Sample Aliquot : 0.200 g

H-3 MDA = 2.86E+01 pCi/g
 H-3 CL = 1.63E+01 pCi/g

Flag Description:

H-3 Efficiency = 0.9491 - exp(-0.0014*tSIE^1.0299)

>CL : Result > 2-sigma Error and Result > Critical Level.
 <CL : Result < 2-sigma Error and Result < Critical Level.
 @CL : Result < 2-sigma Error and Result > Critical Level.
 @CL : Result > 2-sigma Error and Result < Critical Level.

Analyzed by: *[Signature]* 3/24/93 Reviewed by: *[Signature]* 3/24/93

S#	RSDP Client						H-3 Activity		Flag
	ID	ID	cpm	Error	tSIE	Eff	pCi/g	Error	
2	01	92004692-1	1.91E+01	2.91E+00	300	0.345	1.96E+01	2.56E+01	@CL
3	02	ER92004694	1.64E+01	2.71E+00	328	0.373	1.81E+00	2.28E+01	<CL
4	03	92004696-1	1.58E+01	2.64E+00	333	0.379	-1.78E+00	2.22E+01	<CL
5	04	92004698-1	1.84E+01	2.86E+00	324	0.369	1.40E+01	2.37E+01	<CL
6	05	92004700-1	1.93E+01	2.92E+00	336	0.382	1.89E+01	2.32E+01	@CL
7	06	92004702-1	1.61E+01	2.69E+00	347	0.392	0.00E+00	2.16E+01	<CL
8	07	92004704-1	1.83E+01	2.83E+00	325	0.370	1.34E+01	2.35E+01	<CL
9	08	92004707-1	1.88E+01	2.86E+00	324	0.370	1.64E+01	2.36E+01	@CL
10	09	92004711-1	1.82E+01	2.81E+00	326	0.372	1.27E+01	2.33E+01	<CL
11	10	92004714-1	1.79E+01	2.76E+00	282	0.326	1.24E+01	2.64E+01	<CL
12	11	92004716-1	1.75E+01	2.78E+00	289	0.333	9.47E+00	2.59E+01	<CL
13	12	92004718-1	1.76E+01	2.74E+00	303	0.349	9.69E+00	2.46E+01	<CL
14	13	92004721-1	2.00E+01	2.95E+00	338	0.384	2.29E+01	2.32E+01	@CL
15	14	92004722-1	1.46E+01	2.58E+00	337	0.383	-8.83E+00	2.17E+01	<CL

 * Sandia Radiation Sample Diagnostic Program (7715) 3-25-1993 *

 Gross Beta Analysis Program Version 3.0

Batch Number : 930111
 Laboratory ID : SNL-7715/881
 Client : N. DURAND /B. BISHOP (7725/IT) 930111
 Count Date : 24-Mar-93
 Data Mode : Alpha/Beta
 Region of Interest : 18-2000
 Count Protocol : 3
 Count Time : 10.0 minutes
 Background cpm : 26.50 +- 3.26
 Background tSIE : 453.7
 Background Eff : 0.786
 Sample Aliquot : 0.200 g

Gross Beta MDA = 2.25E+01 pCi/g
 Gross Beta CL = 1.29E+01 pCi/g

Gross Beta Efficiency = 0.7870 - exp(-0.0317*tSIE^0.8701)

Flag Description:

>CL : Result > 2-sigma Error and Result > Critical Level.
 <CL : Result < 2-sigma Error and Result < Critical Level.
 @CL : Result < 2-sigma Error and Result > Critical Level.
 @CL : Result > 2-sigma Error and Result < Critical Level.

Analyzed by: Shump Cole 3/24/93 Reviewed by: [Signature] 3/24/93

S#	RSDP Client		Gross Beta Activity						
	ID	ID	cpm	Error	tSIE	Eff	pCi/g	Error	Flag
2	01	92004692-1	2.70E+01	3.29E+00	300	0.776	1.45E+00	1.34E+01	<CL
3	02	ER92004694	2.93E+01	3.42E+00	328	0.780	8.09E+00	1.36E+01	<CL
4	03	92004696-1	2.93E+01	3.42E+00	333	0.780	8.08E+00	1.36E+01	<CL
5	04	92004698-1	3.18E+01	3.57E+00	324	0.779	1.53E+01	1.40E+01	>CL
6	05	92004700-1	2.71E+01	3.29E+00	336	0.780	1.73E+00	1.34E+01	<CL
7	06	92004702-1	2.84E+01	3.37E+00	347	0.781	5.48E+00	1.35E+01	<CL
8	07	92004704-1	3.09E+01	3.52E+00	325	0.779	1.27E+01	1.39E+01	<CL
9	08	92004707-1	2.37E+01	3.08E+00	324	0.779	-8.09E+00	1.30E+01	<CL
10	09	92004711-1	2.86E+01	3.38E+00	326	0.779	6.07E+00	1.36E+01	<CL
11	10	92004714-1	2.93E+01	3.42E+00	282	0.773	8.15E+00	1.38E+01	<CL
12	11	92004716-1	3.02E+01	3.48E+00	289	0.775	1.08E+01	1.39E+01	<CL
13	12	92004718-1	3.03E+01	3.48E+00	303	0.777	1.10E+01	1.38E+01	<CL
14	13	92004721-1	2.98E+01	3.45E+00	338	0.781	9.52E+00	1.37E+01	<CL
15	14	92004722-1	3.06E+01	3.50E+00	337	0.780	1.18E+01	1.38E+01	<CL

 * Sandia Radiation Sample Diagnostic Program (7715) 3-25-1993 *

 Gross Alpha Analysis Program Version 3.0

Batch Number : 930111
 Laboratory ID : SNL-7715/881
 Client : N. DURAND /B. BISHOP (7725/IT) 930111
 Count Date : 24-Mar-93
 Data Mode : Alpha/Beta
 Region of Interest : 20-300
 Count Protocol : 3
 Count Time : 10.0 minutes
 Background cpm : 2.10 +- 0.92
 Background tSIE : 453.7
 Background Eff : 0.995
 Sample Aliquot : 0.200 g

Gross Alpha MDA = 5.45E+00 pCi/g
 Gross Alpha CL = 2.88E+00 pCi/g

Gross Alpha Efficiency = 0.9949 - exp(-0.0357*tSIE^0.9257)

Flag Description:

>CL : Result > 2-sigma Error and Result > Critical Level.
 <CL : Result < 2-sigma Error and Result < Critical Level.
 @CL : Result < 2-sigma Error and Result > Critical Level.
 @CL : Result > 2-sigma Error and Result < Critical Level.

Analyzed by: *[Signature]* ^{3/} _{24/93} Reviewed by: *[Signature]* _{3/24/93}

S#	RSDP Client		cpm	Error	tSIE	Eff	Gross Alpha Activity		
	ID	ID					pCi/g	Error	Flag
2	01	92004692-1	2.70E+00	1.04E+00	300	0.994	1.36E+00	3.14E+00	<CL
3	02	ER92004694	2.80E+00	1.06E+00	328	0.994	1.59E+00	3.17E+00	<CL
4	03	92004696-1	2.10E+00	9.17E-01	333	0.994	0.00E+00	2.94E+00	<CL
5	04	92004698-1	2.20E+00	9.38E-01	324	0.994	2.27E-01	2.97E+00	<CL
6	05	92004700-1	1.80E+00	8.49E-01	336	0.994	-6.79E-01	2.83E+00	<CL
7	06	92004702-1	2.90E+00	1.08E+00	347	0.995	1.81E+00	3.20E+00	<CL
8	07	92004704-1	2.30E+00	9.59E-01	325	0.994	4.53E-01	3.00E+00	<CL
9	08	92004707-1	3.10E+00	1.11E+00	324	0.994	2.27E+00	3.27E+00	<CL
10	09	92004711-1	2.90E+00	1.08E+00	326	0.994	1.81E+00	3.20E+00	<CL
11	10	92004714-1	1.90E+00	8.72E-01	282	0.994	-4.53E-01	2.87E+00	<CL
12	11	92004716-1	2.30E+00	9.59E-01	289	0.994	4.53E-01	3.01E+00	<CL
13	12	92004718-1	2.90E+00	1.08E+00	303	0.994	1.81E+00	3.20E+00	<CL
14	13	92004721-1	2.40E+00	9.80E-01	338	0.995	6.79E-01	3.04E+00	<CL
15	14	92004722-1	3.50E+00	1.18E+00	337	0.994	3.17E+00	3.39E+00	@CL

 * SNL Radiation Sample Diagnostic Program (7715)/881 18-MAR-93 12:08:46 *

 N.DURAND_92004692-1

Operator: S. Durand Cole 3/18/93 Reviewed by [Signature] 3/22/93

 *
 Data File : 93009501.DAT * Sample Quantity: 793.000 GRAM
 Acquire Date: 18-MAR-93 11:17:43 * Efficiency File: SMAR1.EFF
 Sample Date: 15-MAR-93 12:00:00 * Library File: RSDP.LIB
 Sample Type: SOLID *

 *
 Preset Live Time: 3000.0 sec * FWHM at 1332 KeV : 2.8 KeV
 Elapsed Live Time: 3000.0 sec * Peak Search Sensitivity: 4.0
 Elapsed Real Time: 3001.0 sec * Gaussian Assymetry : 10.0 %

 *
 Detector : DET1 * Fit Iterations : 20.
 Calib Date : 13-JAN-93 10:41:56 * Energy Tolerance: 2.0 KeV
 KeV/Channel: .5008: * Half Life Ratio : 8.0
 Offset : -1.4574 * Abundance Limit : 50.00 %

[Summary Report -- SNL (7715) -- version 1.1]

Nuclide	Activity (pCi /GRAM)	2-sigma Error	MDA (pCi /GRAM)
U-238	1.39E+00	5.70E-01	-----
TH-234	1.39E+00	5.71E-01	-----
U-234	Not Detected	-----	9.85E+00
RA-226	5.74E-01	7.75E-02	-----
PB-214	6.50E-01	8.86E-02	-----
BI-214	5.91E-01	7.98E-02	-----
PB-210	Not Detected	-----	0.00E+00
TH-232	7.29E-01	1.79E-01	-----
RA-228	7.29E-01	1.79E-01	-----
AC-228	7.29E-01	1.79E-01	-----
TH-228	5.55E-01	5.37E-02	-----
RA-224	Not Significant	-----	-----
PB-212	5.77E-01	5.59E-02	-----
BI-212	9.35E-01	3.55E-01	-----
TL-208	6.70E-01	1.25E-01	-----
U-235	Not Detected	-----	2.27E-01
TH-231	Not Detected	-----	3.68E-01
AC-227	Not Detected	-----	1.44E+00
TH-227	Not Detected	-----	2.56E-01
AM-241	Not Detected	-----	1.66E-01
AM-243	Not Detected	-----	3.99E+00
NP-237	Not Detected	-----	2.32E-01
TH-229	Not Detected	-----	1.10E-01
BE-7	Not Detected	-----	2.00E-01
BA-133	Not Detected	-----	3.09E-02
BI-207	Not Detected	-----	2.72E-02
CD-109	Not Detected	-----	8.37E-01
CE-139	Not Detected	-----	2.58E-02
CE-144	Not Detected	-----	2.08E-01
CM-243	Not Detected	-----	1.08E-01

Rad Data

CO-57	Not Detected	-----	2.71E-02
CO-58	Not Detected	-----	2.57E-02
CO-60	Not Detected	-----	3.14E-02
CR-51	Not Detected	-----	2.15E-01
CS-134	Not Detected	-----	2.40E-02
CS-137	Not Detected	-----	2.27E-02
EU-152	Not Detected	-----	8.11E-02
EU-154	Not Detected	-----	9.82E-02
EU-155	Not Detected	-----	1.25E-01
FE-59	Not Detected	-----	5.94E-02
HG-203	Not Detected	-----	2.49E-02
I-129	Not Detected	-----	0.00E+00
I-131	Not Detected	-----	3.21E-02
K-40	1.09E+01	7.39E-01	-----
MN-54	Not Detected	-----	2.93E-02
MN-56	Short Half-Life	-----	-----
NA-22	Not Detected	-----	2.89E-02
NA-24	Not Detected	-----	6.54E-01
RU-106	Not Detected	-----	1.75E-01
SB-124	Not Detected	-----	2.32E-02
SB-125	Not Detected	-----	6.59E-02
SN-113	Not Detected	-----	3.27E-02
SR-85	Not Detected	-----	2.35E-02
TA-182	Not Detected	-----	1.85E-01
TL-201	Not Detected	-----	4.03E-01
XE-133	Not Detected	-----	1.18E-01
Y-88	Not Detected	-----	2.80E-02
ZN-65	Not Detected	-----	6.19E-02
ZR-95	Not Detected	-----	5.09E-02

 * SNL Radiation Sample Diagnostic Program (7715)/881 18-MAR-93 13:01:38 *

 N.DURAND_92004694-1

Operator: W. Cole 3/18/93 Reviewed by [Signature] 3/22/93

 *
 Data File : 93009502.DAT * Sample Quantity: 774.000 GRAM
 Acquire Date: 18-MAR-93 12:10:40 * Efficiency File: SMAR1.EFF
 Sample Date: 15-MAR-93 12:00:00 * Library File: RSDP.LIB
 Sample Type: SOLID *

 *
 Preset Live Time: 3000.0 sec * FWHM at 1332 KeV : 2.8 KeV
 Elapsed Live Time: 3000.0 sec * Peak Search Sensitivity: 4.0
 Elapsed Real Time: 3000.0 sec * Gaussian Assymetry : 10.0 %

 *
 Detector : DET1 * Fit Iterations : 20.
 Calib Date : 13-JAN-93 10:41:56 * Energy Tolerance: 2.0 KeV
 KeV/Channel: .5008: * Half Life Ratio : 8.0
 Offset : -1.4574 * Abundance Limit : 50.00 %

[Summary Report -- SNL (7715) -- version 1.1]

Nuclide	Activity (pCi /GRAM)	2-sigma Error	MDA (pCi /GRAM)
U-238	Not Detected	-----	5.83E-01
TH-234	Not Detected	-----	5.85E-01
U-234	Not Detected	-----	9.53E+00
RA-226	3.97E-01	7.85E-02	-----
PB-214	5.18E-01	7.79E-02	-----
BI-214	4.09E-01	8.08E-02	-----
PB-210	Not Detected	-----	0.00E+00
TH-232	5.71E-01	1.22E-01	-----
RA-228	5.71E-01	1.22E-01	-----
AC-228	5.71E-01	1.22E-01	-----
TH-228	5.69E-01	5.02E-02	-----
RA-224	5.92E-01	5.74E-01	-----
PB-212	5.92E-01	5.22E-02	-----
BI-212	Not Detected	-----	4.51E-01
TL-208	4.50E-01	1.14E-01	-----
U-235	Not Detected	-----	2.17E-01
TH-231	Not Detected	-----	3.68E-01
AC-227	Not Detected	-----	1.45E+00
TH-227	Not Detected	-----	2.57E-01
AM-241	Not Detected	-----	1.64E-01
AM-243	Not Detected	-----	3.99E+00
NP-237	Not Detected	-----	2.30E-01
TH-229	Not Detected	-----	1.08E-01
BE-7	Not Detected	-----	1.70E-01
BA-133	Not Detected	-----	2.99E-02
BI-207	Not Detected	-----	2.55E-02
CD-109	Not Detected	-----	8.06E-01
CE-139	Not Detected	-----	2.57E-02
CE-144	Not Detected	-----	1.91E-01
CM-243	Not Detected	-----	1.03E-01

CO-57	Not Detected	-----	2.59E-02
CO-58	Not Detected	-----	2.34E-02
CO-60	Not Detected	-----	2.77E-02
CR-51	Not Detected	-----	2.01E-01
CS-134	Not Detected	-----	2.29E-02
CS-137	Not Detected	-----	2.34E-02
EU-152	Not Detected	-----	7.74E-02
EU-154	Not Detected	-----	9.83E-02
EU-155	Not Detected	-----	1.16E-01
FE-59	Not Detected	-----	5.23E-02
HG-203	Not Detected	-----	2.76E-02
I-129	Not Detected	-----	0.00E+00
I-131	Not Detected	-----	2.79E-02
K-40	1.03E+01	7.12E-01	-----
MN-54	Not Detected	-----	2.51E-02
MN-56	Short Half-Life	-----	-----
NA-22	Not Detected	-----	2.88E-02
NA-24	Not Detected	-----	6.28E-01
RU-106	Not Detected	-----	2.29E-01
SB-124	Not Detected	-----	2.28E-02
SB-125	Not Detected	-----	6.42E-02
SN-113	Not Detected	-----	2.94E-02
SR-85	Not Detected	-----	2.00E-02
TA-182	Not Detected	-----	1.77E-01
TL-201	Not Detected	-----	4.19E-01
XE-133	Not Detected	-----	1.09E-01
Y-88	Not Detected	-----	2.90E-02
ZN-65	Not Detected	-----	5.36E-02
ZR-95	Not Detected	-----	4.50E-02

 * SNL Radiation Sample Diagnostic Program (7715)/881 18-MAR-93 13:54:44 *

 N.DURAND_92004696-1

Operator: Shungu Cole 3/18/93 Reviewed by [Signature] 3/22/93

 *
 Data File : 93009503.DAT * Sample Quantity: 753.000 GRAM
 Acquire Date: 18-MAR-93 13:03:33 * Efficiency File: SMAR1.EFF
 Sample Date: 15-MAR-93 12:00:00 * Library File: RSDP.LIB
 Sample Type: SOLID *

 *
 Preset Live Time: 3000.0 sec * FWHM at 1332 KeV : 2.8 KeV
 Elapsed Live Time: 3000.0 sec * Peak Search Sensitivity: 4.0
 Elapsed Real Time: 3000.0 sec * Gaussian Assymetry : 10.0 %

 *
 Detector : DET1 * Fit Iterations : 20.
 Calib Date : 13-JAN-93 10:41:56 * Energy Tolerance: 2.0 KeV
 KeV/Channel: .5008: * Half Life Ratio : 8.0
 Offset : -1.4574 * Abundance Limit : 50.00 %

[Summary Report -- SNL (7715) -- version 1.1]

Nuclide	Activity (pCi /GRAM)	2-sigma Error	MDA (pCi /GRAM)
U-238	Not Detected	-----	5.45E-01
TH-234	Not Detected	-----	5.46E-01
U-234	Not Detected	-----	9.04E+00
RA-226	4.20E-01	9.03E-02	-----
PB-214	4.68E-01	8.94E-02	-----
BI-214	4.33E-01	9.30E-02	-----
PB-210	Not Detected	-----	0.00E+00
TH-232	5.43E-01	1.64E-01	-----
RA-228	5.43E-01	1.64E-01	-----
AC-228	5.43E-01	1.64E-01	-----
TH-228	5.77E-01	5.66E-02	-----
RA-224	6.38E-01	6.41E-01	-----
PB-212	6.00E-01	5.89E-02	-----
BI-212	6.37E-01	4.58E-01	-----
TL-208	4.16E-01	9.01E-02	-----
U-235	Not Detected	-----	2.17E-01
TH-231	5.55E-01	3.50E-01	-----
AC-227	Not Detected	-----	1.43E+00
TH-227	Not Detected	-----	2.48E-01
AM-241	Not Detected	-----	1.60E-01
AM-243	Not Detected	-----	3.84E+00
NP-237	Not Detected	-----	2.29E-01
TH-229	Not Detected	-----	1.07E-01
BE-7	Not Detected	-----	2.06E-01
BA-133	Not Detected	-----	3.03E-02
BI-207	Not Detected	-----	2.82E-02
CD-109	Not Detected	-----	8.00E-01
CE-139	Not Detected	-----	2.35E-02
CE-144	Not Detected	-----	1.94E-01
CM-243	Not Detected	-----	1.04E-01

CO-57	Not Detected	-----	2.45E-02
CO-58	Not Detected	-----	2.29E-02
CO-60	Not Detected	-----	2.76E-02
CR-51	Not Detected	-----	2.11E-01
CS-134	Not Detected	-----	2.09E-02
CS-137	Not Detected	-----	2.55E-02
EU-152	Not Detected	-----	7.33E-02
EU-154	Not Detected	-----	1.08E-01
EU-155	Not Detected	-----	1.19E-01
FE-59	Not Detected	-----	4.55E-02
HG-203	Not Detected	-----	2.83E-02
I-129	Not Detected	-----	0.00E+00
I-131	Not Detected	-----	3.15E-02
K-40	1.00E+01	7.24E-01	-----
MN-54	Not Detected	-----	2.88E-02
MN-56	Short Half-Life	-----	-----
NA-22	Not Detected	-----	2.51E-02
NA-24	Not Detected	-----	5.65E-01
RU-106	Not Detected	-----	1.76E-01
SB-124	Not Detected	-----	2.18E-02
SB-125	Not Detected	-----	6.71E-02
SN-113	Not Detected	-----	2.99E-02
SR-85	Not Detected	-----	2.20E-02
TA-182	Not Detected	-----	1.68E-01
TL-201	Not Detected	-----	4.07E-01
XE-133	Not Detected	-----	1.06E-01
Y-88	Not Detected	-----	3.23E-02
ZN-65	Not Detected	-----	6.32E-02
ZR-95	Not Detected	-----	4.75E-02

 * SNL Radiation Sample Diagnostic Program (7715)/881 18-MAR-93 14:47:38 *

 N.DURAND_92004698-1

Operator: Spencer Cole 3/18/93 Reviewed by JA 3/22/93

 *
 Data File : 93009504.DAT * Sample Quantity: 820.000 GRAM
 Acquire Date: 18-MAR-93 13:56:39 * Efficiency File: SMAR1.EFF
 Sample Date: 15-MAR-93 12:00:00 * Library File: RSDP.LIB
 Sample Type: SOLID *

 *
 Preset Live Time: 3000.0 sec * FWHM at 1332 KeV : 2.8 KeV
 Elapsed Live Time: 3000.0 sec * Peak Search Sensitivity: 4.0
 Elapsed Real Time: 3000.0 sec * Gaussian Assymetry : 10.0 %

 *
 Detector : DET1 * Fit Iterations : 20.
 Calib Date : 13-JAN-93 10:41:56 * Energy Tolerance: 2.0 KeV
 KeV/Channel: .5008: * Half Life Ratio : 8.0
 Offset : -1.4574 * Abundance Limit : 50.00 %

[Summary Report -- SNL (7715) -- version 1.1]

Nuclide	Activity (pCi /GRAM)	2-sigma Error	MDA (pCi /GRAM)
U-238	Not Detected	-----	5.57E-01
TH-234	Not Detected	-----	5.59E-01
U-234	Not Detected	-----	9.09E+00
RA-226	4.18E-01	7.96E-02	-----
PB-214	5.44E-01	9.06E-02	-----
BI-214	4.31E-01	8.20E-02	-----
PB-210	Not Detected	-----	0.00E+00
TH-232	6.15E-01	1.19E-01	-----
RA-228	6.15E-01	1.19E-01	-----
AC-228	6.15E-01	1.19E-01	-----
TH-228	5.57E-01	4.78E-02	-----
RA-224	7.23E-01	6.20E-01	-----
PB-212	5.79E-01	4.97E-02	-----
BI-212	Not Detected	-----	4.09E-01
TL-208	5.19E-01	9.75E-02	-----
U-235	Not Detected	-----	2.18E-01
TH-231	Not Detected	-----	3.53E-01
AC-227	Not Detected	-----	1.42E+00
TH-227	Not Detected	-----	2.54E-01
AM-241	Not Detected	-----	1.66E-01
AM-243	Not Detected	-----	3.76E+00
NP-237	Not Detected	-----	2.28E-01
TH-229	Not Detected	-----	1.05E-01
BE-7	Not Detected	-----	1.67E-01
BA-133	Not Detected	-----	2.77E-02
BI-207	Not Detected	-----	2.54E-02
CD-109	Not Detected	-----	7.71E-01
CE-139	Not Detected	-----	2.40E-02
CE-144	Not Detected	-----	1.88E-01
CM-243	Not Detected	-----	1.00E-01

CO-57	Not Detected	-----	2.51E-02
CO-58	Not Detected	-----	2.05E-02
CO-60	Not Detected	-----	3.17E-02
CR-51	Not Detected	-----	1.96E-01
CS-134	Not Detected	-----	1.89E-02
CS-137	Not Detected	-----	2.21E-02
EU-152	Not Detected	-----	7.51E-02
EU-154	Not Detected	-----	9.72E-02
EU-155	Not Detected	-----	1.15E-01
FE-59	Not Detected	-----	4.75E-02
HG-203	Not Detected	-----	2.55E-02
I-129	Not Detected	-----	0.00E+00
I-131	Not Detected	-----	2.83E-02
K-40	9.71E+00	6.84E-01	-----
MN-54	Not Detected	-----	2.46E-02
MN-56	Short Half-Life	-----	-----
NA-22	Not Detected	-----	2.35E-02
NA-24	Not Detected	-----	4.41E-01
RU-106	Not Detected	-----	1.99E-01
SB-124	Not Detected	-----	1.91E-02
SB-125	Not Detected	-----	6.02E-02
SN-113	Not Detected	-----	3.15E-02
SR-85	Not Detected	-----	2.02E-02
TA-182	Not Detected	-----	1.89E-01
TL-201	Not Detected	-----	3.92E-01
XE-133	Not Detected	-----	1.17E-01
Y-88	Not Detected	-----	2.62E-02
ZN-65	Not Detected	-----	5.34E-02
ZR-95	Not Detected	-----	4.13E-02

 * SNL Radiation Sample Diagnostic Program (7715)/881 18-MAR-93 15:40:31 *

 N.DURAND_92004700-1

Operator: George Cole 3/22/93 Reviewed by [Signature] 3/22/93

 *
 Data File : 93009505.DAT * Sample Quantity: 711.000 GRAM
 Acquire Date: 18-MAR-93 14:49:33 * Efficiency File: SMAR1.EFF
 Sample Date: 15-MAR-93 12:00:00 * Library File: RSDP.LIB
 Sample Type: SOLID *

 *
 Preset Live Time: 3000.0 sec * FWHM at 1332 KeV : 2.8 KeV
 Elapsed Live Time: 3000.0 sec * Peak Search Sensitivity: 4.0
 Elapsed Real Time: 3000.0 sec * Gaussian Assymetry : 10.0 %

 *
 Detector : DET1 * Fit Iterations : 20.
 Calib Date : 13-JAN-93 10:41:56 * Energy Tolerance: 2.0 KeV
 KeV/Channel: .5008: * Half Life Ratio : 8.0
 Offset : -1.4574 * Abundance Limit : 50.00 %

[Summary Report -- SNL (7715) -- version 1.1]

Nuclide	Activity (pCi /GRAM)	2-sigma Error	MDA (pCi /GRAM)
U-238	Not Detected	-----	5.82E-01
TH-234	Not Detected	-----	5.84E-01
U-234	Not Detected	-----	9.56E+00
RA-226	3.27E-01	6.77E-02	-----
PB-214	3.98E-01	9.53E-02	-----
BI-214	3.37E-01	6.97E-02	-----
PB-210	Not Detected	-----	0.00E+00
TH-232	5.15E-01	1.27E-01	-----
RA-228	5.15E-01	1.27E-01	-----
AC-228	5.15E-01	1.27E-01	-----
TH-228	5.79E-01	5.86E-02	-----
RA-224	8.15E-01	6.58E-01	-----
PB-212	6.02E-01	6.09E-02	-----
BI-212	Not Detected	-----	5.29E-01
TL-208	4.22E-01	1.16E-01	-----
U-235	Not Detected	-----	2.16E-01
TH-231	Not Detected	-----	3.70E-01
AC-227	Not Detected	-----	1.47E+00
TH-227	Not Detected	-----	2.73E-01
AM-241	Not Detected	-----	1.66E-01
AM-243	Not Detected	-----	3.97E+00
NP-237	Not Detected	-----	2.24E-01
TH-229	Not Detected	-----	1.08E-01
BE-7	Not Detected	-----	1.82E-01
BA-133	Not Detected	-----	2.95E-02
BI-207	Not Detected	-----	2.74E-02
CD-109	Not Detected	-----	8.33E-01
CE-139	Not Detected	-----	2.65E-02
CE-144	Not Detected	-----	1.98E-01
CM-243	Not Detected	-----	1.10E-01

CO-57	Not Detected	-----	2.51E-02
CO-58	Not Detected	-----	2.67E-02
CO-60	Not Detected	-----	4.03E-02
CR-51	Not Detected	-----	2.14E-01
CS-134	Not Detected	-----	2.03E-02
CS-137	Not Detected	-----	2.39E-02
EU-152	Not Detected	-----	7.50E-02
EU-154	Not Detected	-----	1.02E-01
EU-155	Not Detected	-----	1.19E-01
FE-59	Not Detected	-----	5.08E-02
HG-203	Not Detected	-----	2.73E-02
I-129	Not Detected	-----	0.00E+00
I-131	Not Detected	-----	3.32E-02
K-40	1.01E+01	7.95E-01	-----
MN-54	Not Detected	-----	2.73E-02
MN-56	Short Half-Life	-----	-----
NA-22	Not Detected	-----	3.08E-02
NA-24	Not Detected	-----	7.72E-01
RU-106	Not Detected	-----	2.07E-01
SB-124	Not Detected	-----	2.27E-02
SB-125	Not Detected	-----	7.27E-02
SN-113	Not Detected	-----	3.19E-02
SR-85	Not Detected	-----	2.17E-02
TA-182	Not Detected	-----	2.21E-01
TL-201	Not Detected	-----	4.41E-01
XE-133	Not Detected	-----	1.23E-01
Y-88	Not Detected	-----	3.26E-02
ZN-65	Not Detected	-----	5.84E-02
ZR-95	Not Detected	-----	4.63E-02

 * SNL Radiation Sample Diagnostic Program (7715)/881 18-MAR-93 15:52:58 *

 LAB_CONTROL_SAMPLE_(CG134)

Operator: Yung Col 3/22/93 Reviewed by JR 3/22/93

 *
 Data File : 93009515.DAT * Sample Quantity: 500.000 ML
 Acquire Date: 18-MAR-93 15:42:26 * Efficiency File: WMAR1.EFF
 Sample Date: 01-NOV-90 05:00:00 * Library File: RSDP.LIB
 Sample Type: LIQUID *

 *
 Preset Live Time: 600.0 sec * FWHM at 1332 KeV : 2.8 KeV
 Elapsed Live Time: 600.0 sec * Peak Search Sensitivity: 4.0
 Elapsed Real Time: 606.0 sec * Gaussian Assymetry : 10.0 %

 *
 Detector : DET1 * Fit Iterations : 20.
 Calib Date : 13-JAN-93 10:41:56 * Energy Tolerance: 2.0 KeV
 KeV/Channel: .5008; * Half Life Ratio : 8.0
 Offset : -1.4574 * Abundance Limit : 50.00 %

[Summary Report -- SNL (7715) -- version 1.1]

Nuclide	Activity (pCi /ML)	2-sigma Error	MDA (pCi /ML)
U-238	Not Detected	-----	5.02E+00
TH-234	Not Detected	-----	5.04E+00
U-234	Not Detected	-----	1.75E+02
RA-226	Not Detected	-----	7.86E-01
PB-214	Not Detected	-----	1.00E+00
BI-214	Not Detected	-----	8.09E-01
PB-210	Not Detected	-----	0.00E+00
TH-232	Not Detected	-----	2.77E+00
RA-228	Not Detected	-----	2.77E+00
AC-228	Not Detected	-----	2.77E+00
TH-228	Not Detected	-----	1.84E+00
RA-224	Not Detected	-----	2.13E+01
PB-212	Not Detected	-----	1.91E+00
BI-212	Not Detected	-----	1.47E+01
TL-208	Not Detected	-----	2.95E+00
U-235	Not Detected	-----	2.90E+00
TH-231	Not Detected	-----	4.28E+00
AC-227	Not Detected	-----	2.22E+01
TH-227	Not Detected	-----	3.36E+00
AM-241	1.76E+02	3.43E+00	-----
AM-243	Not Detected	-----	5.07E+01
NP-237	Not Detected	-----	3.96E+00
TH-229	Not Detected	-----	1.40E+00
BE-7	Short Half-Life	-----	-----
BA-133	Not Detected	-----	6.60E-01
BI-207	Not Detected	-----	4.00E-01
CD-109	6.75E+02	4.67E+01	-----
CE-139	3.51E+01	2.42E+01	-----
CE-144	Not Detected	-----	2.15E+01
CM-243	Not Detected	-----	1.38E+00

CO-57	2.56E+01	3.15E+00	-----
CO-58	Short Half-Life	-----	-----
CO-60	1.39E+02	2.56E+00	-----
CR-51	Short Half-Life	-----	-----
CS-134	Not Detected	-----	8.38E-01
CS-137	1.29E+02	1.88E+00	-----
EU-152	Not Detected	-----	1.62E+00
EU-154	Not Detected	-----	2.45E+00
EU-155	Not Detected	-----	2.06E+00
FE-59	Short Half-Life	-----	-----
HG-203	Short Half-Life	-----	-----
I-129	Not Detected	-----	0.00E+00
I-131	Short Half-Life	-----	-----
K-40	Not Detected	-----	2.15E+00
MN-54	Not Detected	-----	3.95E+00
MN-56	Short Half-Life	-----	-----
NA-22	Not Detected	-----	5.90E-01
NA-24	Short Half-Life	-----	-----
RU-106	Not Detected	-----	2.07E+01
SB-124	Short Half-Life	-----	-----
SB-125	Not Detected	-----	2.58E+00
SN-113	Not Detected	-----	1.17E+02
SR-85	Short Half-Life	-----	-----
TA-182	Not Detected	-----	5.40E+02
TL-201	Short Half-Life	-----	-----
XE-133	Short Half-Life	-----	-----
Y-88	Short Half-Life	-----	-----
ZN-65	Not Detected	-----	1.59E+01
ZR-95	Short Half-Life	-----	-----

[Lab Control Sample Report

-- SNL (7715) --

version 1.0]

Source ID : CG-134
Source Type : Mixed Gamma
Source Date : November 1, 1990

Nuclide	Known (pCi/mL)	Observed (pCi/mL)	%Recovery	Lower Limit	Upper Limit	Status
AM-241	173	176	101.4	80.0	120.0	Pass
CO-60	156	139	88.8	80.0	120.0	Pass
CS-137	138	129	93.2	80.0	120.0	Pass

Quality Control Data for Efficiency Check

This QC follows the observed counts per second (cps) for a selected line.

Date	AM-241 (60 KeV)	CS-137 (662 KeV)	CO-60 (1173 KeV)	CO-60 (1332 KeV)
02/23/93	51.30	109.00	76.60	68.20
02/24/93	51.60	111.40	83.30	75.00
03/03/93	52.20	110.50	82.50	74.30
03/04/93	52.20	111.50	81.90	74.10
03/05/93	52.40	111.50	82.40	74.00
03/08/93	52.30	111.50	81.90	73.40
03/09/93	52.90	111.50	82.60	74.20
03/10/93	52.50	110.50	82.30	74.50
03/11/93	52.60	111.60	82.30	73.60
03/12/93	53.40	111.60	83.30	74.50
03/15/93	52.30	109.60	83.20	74.60
03/16/93	51.30	110.60	82.90	74.30
03/17/93	53.20	110.60	83.60	74.10
03/18/93	52.50	111.60	82.10	74.10
Average	52.34	110.93	82.21	73.78
3-S STD	1.87	2.49	5.11	4.96
3-S STD	3.57	2.24	6.22	6.73

Quality Control Data for Energy Calibration Check

This QC follows the observed position (channel number) for a selected line.

Date	AM-241 (60 KeV)	CS-137 (662 KeV)	CO-60 (1173 KeV)	CO-60 (1332 KeV)
02/23/93	120.63	1323.64	2345.45	2663.63
02/24/93	120.32	1322.94	2344.71	2662.87
03/03/93	120.41	1324.37	2346.92	2665.34
03/04/93	120.45	1324.16	2346.51	2664.89
03/05/93	120.46	1324.11	2346.24	2664.53
03/08/93	120.46	1323.95	2346.05	2664.31
03/09/93	120.30	1323.20	2345.18	2663.42
03/10/93	120.41	1323.90	2346.11	2664.40
03/11/93	120.36	1323.55	2345.55	2663.76
03/12/93	120.19	1323.15	2345.23	2663.51
03/15/93	120.10	1323.23	2345.40	2663.69
03/16/93	120.06	1323.20	2345.37	2663.66
03/17/93	120.05	1323.24	2345.41	2663.71
03/18/93	120.40	1323.89	2346.08	2664.37
Average	120.33	1323.61	2345.73	2664.01
3-S STD	0.51	1.36	1.80	1.97
%3-S STD	0.43	0.10	0.08	0.07

Quality Control Data for FWHM Check

This QC follows the observed FWHM (KeV) for a selected line.

Date	AM-241 (60 KeV)	CS-137 (662 KeV)	CO-60 (1173 KeV)	CO-60 (1332 KeV)
02/23/93	1.22	1.63	1.94	2.00
02/24/93	1.10	1.48	1.74	1.88
03/03/93	1.24	1.61	1.87	1.96
03/04/93	1.19	1.58	1.88	1.97
03/05/93	1.32	1.66	1.98	2.08
03/08/93	1.31	1.66	1.94	2.06
03/09/93	1.12	1.50	1.78	1.87
03/10/93	1.22	1.60	1.85	1.98
03/11/93	1.17	1.54	1.85	1.92
03/12/93	1.12	1.47	1.80	1.88
03/15/93	1.05	1.49	1.81	1.89
03/16/93	1.05	1.48	1.83	1.90
03/17/93	1.07	1.49	1.81	1.87
03/18/93	1.25	1.61	1.90	2.01
Average	1.17	1.56	1.86	1.95
3-S STD	0.27	0.21	0.20	0.21
±3-S STD	23.23	13.78	10.94	10.98

 * SNL Radiation Sample Diagnostic Program (7715)/881 19-MAR-93 16:06:06 *

 N.DURAND_92004702-1

Operator: Y. Gumpel Cole 3/22/93 Reviewed by JF 3/22/93

 *
 Data File : 93009506.DAT * Sample Quantity: 837.000 GRAM
 Acquire Date: 19-MAR-93 15:15:11 * Efficiency File: SMAR1.EFF
 Sample Date: 16-MAR-93 12:00:00 * Library File: RSDP.LIB
 Sample Type: SOLID *

 *
 Preset Live Time: 3000.0 sec * FWHM at 1332 KeV : 2.8 KeV
 Elapsed Live Time: 3000.0 sec * Peak Search Sensitivity: 4.0
 Elapsed Real Time: 3000.0 sec * Gaussian Assymetry : 10.0 %

 *
 Detector : DET1 * Fit Iterations : 20.
 Calib Date : 13-JAN-93 10:41:56 * Energy Tolerance: 2.0 KeV
 KeV/Channel: .5008 * Half Life Ratio : 8.0
 Offset: -1.4574 * Abundance Limit : 50.00 %

[Summary Report -- SNL (7715) -- version 1.1]

Nuclide	Activity (pCi /GRAM)	2-sigma Error	MDA (pCi /GRAM)
U-238	1.40E+00	6.08E-01	-----
TH-234	1.41E+00	6.09E-01	-----
U-234	Not Detected	-----	8.66E+00
RA-226	3.85E-01	7.02E-02	-----
PB-214	4.86E-01	8.13E-02	-----
BI-214	3.97E-01	7.22E-02	-----
PB-210	2.93E+00	3.24E+00	-----
TH-232	5.20E-01	1.40E-01	-----
RA-228	5.20E-01	1.40E-01	-----
AC-228	5.20E-01	1.40E-01	-----
TH-228	4.94E-01	4.81E-02	-----
RA-224	Not Detected	-----	7.29E-01
PB-212	5.14E-01	5.00E-02	-----
BI-212	Not Detected	-----	4.64E-01
TL-208	4.00E-01	9.95E-02	-----
U-235	Not Detected	-----	2.16E-01
TH-231	Not Detected	-----	3.37E-01
AC-227	Not Detected	-----	1.39E+00
TH-227	Not Detected	-----	2.14E-01
AM-241	Not Detected	-----	1.45E-01
AM-243	Not Detected	-----	3.76E+00
NP-237	Not Detected	-----	2.14E-01
TH-229	Not Detected	-----	9.91E-02
BE-7	Not Detected	-----	1.86E-01
BA-133	Not Detected	-----	2.73E-02
BI-207	Not Detected	-----	2.44E-02
CD-109	Not Detected	-----	7.52E-01
CE-139	Not Detected	-----	2.42E-02
CE-144	Not Detected	-----	1.86E-01
CM-243	Not Detected	-----	9.78E-02

CO-57	Not Detected	-----	2.33E-02
CO-58	Not Significant	-----	-----
CO-60	Not Detected	-----	3.04E-02
CR-51	Not Detected	-----	1.90E-01
CS-134	Not Detected	-----	2.06E-02
CS-137	Not Detected	-----	2.43E-02
EU-152	Not Detected	-----	6.96E-02
EU-154	Not Detected	-----	1.03E-01
EU-155	Not Detected	-----	1.13E-01
FE-59	Not Detected	-----	5.20E-02
HG-203	Not Detected	-----	2.40E-02
I-129	Not Detected	-----	0.00E+00
I-131	Not Detected	-----	2.92E-02
K-40	1.12E+01	7.35E-01	-----
MN-54	Not Detected	-----	2.55E-02
MN-56	Short Half-Life	-----	-----
NA-22	2.87E-02	2.11E-02	-----
NA-24	Not Detected	-----	6.49E-01
RU-106	Not Detected	-----	1.88E-01
SB-124	Not Detected	-----	1.98E-02
SB-125	Not Detected	-----	5.83E-02
SN-113	Not Detected	-----	2.80E-02
SR-85	Not Detected	-----	1.99E-02
TA-182	Not Detected	-----	1.66E-01
TL-201	Not Detected	-----	3.91E-01
XE-133	Not Detected	-----	1.17E-01
Y-88	Not Detected	-----	2.60E-02
ZN-65	Not Detected	-----	5.10E-02
ZR-95	Not Detected	-----	4.67E-02

 * SNL Radiation Sample Diagnostic Program (7715)/881 19-MAR-93 16:59:13 *

 N.DURAND_92004704-1

Operator: George Cole 3/22/93 Reviewed by [Signature] 3/22/93

 *
 Data File : 93009507.DAT * Sample Quantity: 807.000 GRAM
 Acquire Date: 19-MAR-93 16:08:01 * Efficiency File: SMAR1.EFF
 Sample Date: 16-MAR-93 12:00:00 * Library File: RSDP.LIB
 Sample Type: SOLID *

 *
 Preset Live Time: 3000.0 sec * FWHM at 1332.KeV : 2.8 KeV
 Elapsed Live Time: 3000.0 sec * Peak Search Sensitivity: 4.0
 Elapsed Real Time: 3000.0 sec * Gaussian Assymetry : 10.0 %

 *
 Detector : DET1 * Fit Iterations : 20.
 Calib Date : 13-JAN-93 10:41:56 * Energy Tolerance: 2.0 KeV
 KeV/Channel: .5008: * Half Life Ratio : 8.0
 Offset : -1.4574 * Abundance Limit : 50.00 %

[Summary Report -- SNL (7715) -- version 1.1]

Nuclide	Activity (pCi /GRAM)	2-sigma Error	MDA (pCi /GRAM)
U-238	9.63E-01	5.16E-01	-----
TH-234	9.65E-01	5.17E-01	-----
U-234	Not Detected	-----	9.30E+00
RA-226	3.73E-01	7.53E-02	-----
PB-214	5.22E-01	8.33E-02	-----
BI-214	3.84E-01	7.76E-02	-----
PB-210	Not Detected	-----	0.00E+00
TH-232	5.19E-01	1.41E-01	-----
RA-228	5.19E-01	1.41E-01	-----
AC-228	5.19E-01	1.41E-01	-----
TH-228	4.30E-01	6.38E-02	-----
RA-224	Not Detected	-----	7.37E-01
PB-212	4.47E-01	6.63E-02	-----
BI-212	Not Detected	-----	3.98E-01
TL-208	4.62E-01	9.69E-02	-----
U-235	Not Detected	-----	2.14E-01
TH-231	Not Detected	-----	3.37E-01
AC-227	Not Detected	-----	1.29E+00
TH-227	Not Detected	-----	2.15E-01
AM-241	Not Detected	-----	1.54E-01
AM-243	Not Detected	-----	3.88E+00
NP-237	Not Detected	-----	2.19E-01
TH-229	Not Detected	-----	9.85E-02
BE-7	Not Detected	-----	1.86E-01
BA-133	Not Detected	-----	2.82E-02
BI-207	Not Significant	-----	-----
CD-109	Not Detected	-----	7.84E-01
CE-139	Not Detected	-----	2.26E-02
CE-144	Not Detected	-----	1.89E-01
CM-243	Not Detected	-----	9.42E-02

CO-57	Not Detected	-----	2.47E-02
CO-58	Not Detected	-----	2.05E-02
CO-60	Not Detected	-----	2.69E-02
CR-51	Not Detected	-----	1.98E-01
CS-134	Not Detected	-----	1.92E-02
CS-137	Not Detected	-----	2.13E-02
EU-152	Not Detected	-----	7.40E-02
EU-154	Not Detected	-----	1.10E-01
EU-155	Not Detected	-----	1.11E-01
FE-59	Not Detected	-----	4.83E-02
HG-203	Not Detected	-----	2.68E-02
I-129	Not Detected	-----	0.00E+00
I-131	Not Detected	-----	2.79E-02
K-40	8.07E+00	6.38E-01	-----
MN-54	Not Detected	-----	2.50E-02
MN-56	Short Half-Life	-----	-----
NA-22	Not Detected	-----	2.89E-02
NA-24	Not Detected	-----	7.23E-01
RU-106	Not Detected	-----	1.80E-01
SB-124	Not Detected	-----	2.02E-02
SB-125	Not Detected	-----	5.86E-02
SN-113	Not Detected	-----	2.79E-02
SR-85	Not Detected	-----	2.18E-02
TA-182	Not Detected	-----	1.62E-01
TL-201	Not Detected	-----	3.93E-01
XE-133	Not Detected	-----	1.12E-01
Y-88	Not Detected	-----	2.87E-02
ZN-65	Not Detected	-----	5.50E-02
ZR-95	Not Detected	-----	4.40E-02

 * SNL Radiation Sample Diagnostic Program (7715)/881 19-MAR-93 17:52:10 *

 N.DURAND_92004707-1

Operator: Spencer Cole 3/22/93 Reviewed by [Signature] 3/22/93

 *
 Data File : 93009508.DAT * Sample Quantity: 881.000 GRAM
 Acquire Date: 19-MAR-93 17:01:07 * Efficiency File: SMAR1.BFF
 Sample Date: 16-MAR-93 12:00:00 * Library File: RSDP.LIB
 Sample Type: SOLID *

 *
 Preset Live Time: 3000.0 sec * FWHM at 1332 KeV : 2.8 KeV
 Elapsed Live Time: 3000.0 sec * Peak Search Sensitivity: 4.0
 Elapsed Real Time: 3001.0 sec * Gaussian Assymetry : 10.0 %

 *
 Detector : DET1 * Fit Iterations : 20.
 Calib Date : 13-JAN-93 10:41:56 * Energy Tolerance: 2.0 KeV
 KeV/Channel: .5008 * Half Life Ratio : 8.0
 Offset : -1.4574 * Abundance Limit : 50.00 %

[Summary Report -- SNL (7715) -- version 1.1]

Nuclide	Activity (pCi /GRAM)	2-sigma Error	MDA (pCi /GRAM)
U-238	9.78E-01	3.96E-01	-----
TH-234	9.80E-01	3.97E-01	-----
U-234	Not Detected	-----	9.21E+00
RA-226	4.84E-01	6.88E-02	-----
PB-214	6.02E-01	7.11E-02	-----
BI-214	4.98E-01	7.09E-02	-----
PB-210	Not Detected	-----	0.00E+00
TH-232	7.36E-01	1.33E-01	-----
RA-228	7.36E-01	1.33E-01	-----
AC-228	7.36E-01	1.33E-01	-----
TH-228	5.95E-01	4.85E-02	-----
RA-224	1.05E+00	7.94E-01	-----
PB-212	6.19E-01	5.05E-02	-----
BI-212	8.61E-01	4.11E-01	-----
TL-208	5.43E-01	1.02E-01	-----
U-235	Not Detected	-----	2.16E-01
TH-231	Not Detected	-----	3.68E-01
AC-227	Not Detected	-----	1.39E+00
TH-227	Not Detected	-----	2.23E-01
AM-241	Not Detected	-----	1.64E-01
AM-243	Not Detected	-----	3.70E+00
NP-237	Not Detected	-----	2.25E-01
TH-229	Not Detected	-----	1.02E-01
BE-7	Not Detected	-----	1.73E-01
BA-133	Not Detected	-----	2.75E-02
BI-207	Not Detected	-----	2.37E-02
CD-109	Not Detected	-----	8.37E-01
CE-139	Not Detected	-----	2.53E-02
CE-144	Not Detected	-----	1.95E-01
CM-243	Not Detected	-----	1.02E-01

CO-57	Not Detected	-----	2.45E-02
CO-58	Not Detected	-----	2.27E-02
CO-60	Not Detected	-----	2.89E-02
CR-51	Not Detected	-----	2.02E-01
CS-134	Not Detected	-----	2.03E-02
CS-137	Not Detected	-----	2.29E-02
EU-152	Not Detected	-----	7.31E-02
EU-154	Not Detected	-----	1.04E-01
EU-155	Not Detected	-----	1.19E-01
FE-59	Not Detected	-----	4.49E-02
HG-203	Not Significant	-----	-----
I-129	Not Detected	-----	0.00E+00
I-131	Not Detected	-----	2.98E-02
K-40	1.03E+01	6.93E-01	-----
MN-54	Not Detected	-----	2.42E-02
MN-56	Short Half-Life	-----	-----
NA-22	Not Detected	-----	2.68E-02
NA-24	Not Detected	-----	6.90E-01
RU-106	Not Detected	-----	2.10E-01
SB-124	Not Detected	-----	2.07E-02
SB-125	Not Detected	-----	5.74E-02
SN-113	Not Detected	-----	2.95E-02
SR-85	Not Detected	-----	1.75E-02
TA-182	Not Detected	-----	1.75E-01
TL-201	Not Detected	-----	4.14E-01
XE-133	Not Detected	-----	1.16E-01
Y-88	Not Detected	-----	2.86E-02
ZN-65	Not Detected	-----	4.44E-02
ZR-95	Not Detected	-----	4.63E-02

 * SNL Radiation Sample Diagnostic Program (7715)/881 19-MAR-93 18:44:56 *

 N.DURAND_92004711-1

Operator: George Cole 3/22/93 Reviewed by JF 3/22/93

 *
 Data File : 93009509.DAT * Sample Quantity: 732.000 GRAM
 Acquire Date: 19-MAR-93 17:54:05 * Efficiency File: SMAR1.EFF
 Sample Date: 16-MAR-93 12:00:00 * Library File: RSDP.LIB
 Sample Type: SOLID *

 *
 Preset Live Time: 3000.0 sec * FWHM at 1332 KeV : 2.8 KeV
 Elapsed Live Time: 3000.0 sec * Peak Search Sensitivity: 4.0
 Elapsed Real Time: 3000.0 sec * Gaussian Assymetry : 10.0 %

 *
 Detector : DET1 * Fit Iterations : 20.
 Calib Date : 13-JAN-93 10:41:56 * Energy Tolerance: 2.0 KeV
 KeV/Channel: .5008; * Half Life Ratio : 8.0
 Offset : -1.4574 * Abundance Limit : 50.00 %

[Summary Report -- SNL (7715) -- version 1.1]

Nuclide	Activity (pCi /GRAM)	2-sigma Error	MDA (pCi /GRAM)
U-238	Not Detected	-----	5.96E-01
TH-234	Not Detected	-----	5.98E-01
U-234	Not Detected	-----	1.01E+01
RA-226	3.26E-01	7.16E-02	-----
PB-214	4.30E-01	8.29E-02	-----
BI-214	3.36E-01	7.37E-02	-----
PB-210	Not Detected	-----	0.00E+00
TH-232	6.32E-01	1.58E-01	-----
RA-228	6.32E-01	1.58E-01	-----
AC-228	6.32E-01	1.58E-01	-----
TH-228	5.75E-01	5.49E-02	-----
RA-224	Not Detected	-----	8.05E-01
PB-212	Not Detected	-----	1.12E-01
BI-212	Not Detected	-----	4.77E-01
TL-208	4.56E-01	1.16E-01	-----
U-235	Not Detected	-----	2.23E-01
TH-231	3.13E-01	3.28E-01	-----
AC-227	Not Detected	-----	1.60E+00
TH-227	Not Detected	-----	2.42E-01
AM-241	Not Detected	-----	1.64E-01
AM-243	Not Detected	-----	4.01E+00
NP-237	Not Detected	-----	2.34E-01
TH-229	Not Detected	-----	1.07E-01
BE-7	Not Detected	-----	2.04E-01
BA-133	Not Detected	-----	2.86E-02
BI-207	Not Detected	-----	2.97E-02
CD-109	Not Detected	-----	8.63E-01
CE-139	Not Detected	-----	2.66E-02
CE-144	Not Detected	-----	2.08E-01
CM-243	Not Detected	-----	1.12E-01

CO-57	Not Detected	-----	2.76E-02
CO-58	Not Detected	-----	2.54E-02
CO-60	Not Detected	-----	3.01E-02
CR-51	Not Detected	-----	2.24E-01
CS-134	Not Detected	-----	2.05E-02
CS-137	Not Detected	-----	2.19E-02
EU-152	Not Detected	-----	8.26E-02
EU-154	Not Detected	-----	1.05E-01
EU-155	Not Detected	-----	1.24E-01
FE-59	Not Detected	-----	5.02E-02
HG-203	Not Detected	-----	2.70E-02
I-129	Not Detected	-----	0.00E+00
I-131	Not Detected	-----	3.26E-02
K-40	1.13E+01	7.67E-01	-----
MN-54	Not Detected	-----	3.09E-02
MN-56	Short Half-Life	-----	-----
NA-22	Not Detected	-----	3.04E-02
NA-24	Not Detected	-----	9.14E-01
RU-106	Not Detected	-----	1.95E-01
SB-124	Not Detected	-----	2.30E-02
SB-125	Not Detected	-----	6.29E-02
SN-113	Not Detected	-----	3.47E-02
SR-85	Not Detected	-----	2.38E-02
TA-182	Not Detected	-----	2.33E-01
TL-201	Not Detected	-----	4.51E-01
XE-133	Not Detected	-----	1.24E-01
Y-88	Not Detected	-----	3.04E-02
ZN-65	Not Detected	-----	5.91E-02
ZR-95	Not Detected	-----	5.19E-02

 * SNL Radiation Sample Diagnostic Program (7715)/881 19-MAR-93 19:37:57 *

 N.DURAND_92004714-1

Operator: George Cole 3/22/93 Reviewed by JF 3/22/93

 *
 Data File : 93009510.DAT * Sample Quantity: 822.000 GRAM
 Acquire Date: 19-MAR-93 18:46:51 * Efficiency File: SMAR1.BFF
 Sample Date: 16-MAR-93 12:00:00 * Library File: RSDP.LIB
 Sample Type: SOLID *

 *
 Preset Live Time: 3000.0 sec * FWHM at 1332 KeV : 2.8 KeV
 Elapsed Live Time: 3000.0 sec * Peak Search Sensitivity: 4.0
 Elapsed Real Time: 3001.0 sec * Gaussian Assymetry : 10.0 %

 *
 Detector : DET1 * Fit Iterations : 20.
 Calib Date : 13-JAN-93 10:41:56 * Energy Tolerance: 2.0 KeV
 KeV/Channel: .5008: * Half Life Ratio : 8.0
 Offset : -1.4574 * Abundance Limit : 50.00 %

[Summary Report -- SNL (7715) -- version 1.1]

Nuclide	Activity (pCi /GRAM)	2-sigma Error	MDA (pCi /GRAM)
U-238	Not Detected	-----	5.76E-01
TH-234	Not Detected	-----	5.77E-01
U-234	Not Detected	-----	9.57E+00
RA-226	4.42E-01	8.87E-02	-----
PB-214	6.33E-01	8.28E-02	-----
BI-214	4.55E-01	9.14E-02	-----
PB-210	Not Detected	-----	0.00E+00
TH-232	8.48E-01	1.86E-01	-----
RA-228	8.48E-01	1.86E-01	-----
AC-228	8.48E-01	1.86E-01	-----
TH-228	7.56E-01	5.81E-02	-----
RA-224	8.59E-01	6.90E-01	-----
PB-212	7.86E-01	6.03E-02	-----
BI-212	Not Detected	-----	4.97E-01
TL-208	6.34E-01	9.87E-02	-----
U-235	Not Detected	-----	2.29E-01
TH-231	Not Detected	-----	3.73E-01
AC-227	Not Detected	-----	1.41E+00
TH-227	Not Detected	-----	2.50E-01
AM-241	Not Detected	-----	1.67E-01
AM-243	Not Detected	-----	4.04E+00
NP-237	Not Significant	-----	-----
TH-229	Not Detected	-----	1.13E-01
BE-7	Not Detected	-----	2.05E-01
BA-133	Not Detected	-----	2.80E-02
BI-207	Not Detected	-----	2.74E-02
CD-109	Not Detected	-----	8.48E-01
CE-139	Not Detected	-----	2.44E-02
CE-144	1.77E-01	1.58E-01	-----
CM-243	Not Detected	-----	1.06E-01

92004714-1

CO-57	Not Detected	-----	2.63E-02
CO-58	Not Detected	-----	2.05E-02
CO-60	Not Detected	-----	3.52E-02
CR-51	Not Detected	-----	1.95E-01
CS-134	Not Detected	-----	2.19E-02
CS-137	Not Detected	-----	2.05E-02
EU-152	Not Detected	-----	7.86E-02
EU-154	Not Detected	-----	9.80E-02
EU-155	Not Detected	-----	1.19E-01
FE-59	Not Detected	-----	5.01E-02
HG-203	Not Detected	-----	2.71E-02
I-129	Not Detected	-----	0.00E+00
I-131	Not Detected	-----	3.22E-02
K-40	1.07E+01	7.24E-01	-----
MN-54	Not Detected	-----	2.89E-02
MN-56	Short Half-Life	-----	-----
NA-22	Not Detected	-----	2.62E-02
NA-24	4.37E-01	4.56E-01	-----
RU-106	Not Detected	-----	1.81E-01
SB-124	Not Detected	-----	2.10E-02
SB-125	Not Detected	-----	5.90E-02
SN-113	Not Detected	-----	3.11E-02
SR-85	Not Detected	-----	2.08E-02
TA-182	Not Detected	-----	1.87E-01
TL-201	Not Detected	-----	4.08E-01
XE-133	Not Detected	-----	1.28E-01
Y-88	Not Detected	-----	2.59E-02
ZN-65	Not Detected	-----	6.22E-02
ZR-95	Not Detected	-----	4.96E-02

 * SNL Radiation Sample Diagnostic Program (7715)/881 19-MAR-93 20:30:50 *

 N.DURAND_92004716-1

Operator: Spencer Cole 3/22/93 Reviewed by [Signature] 3/22/93

 *
 Data File : 93009511.DAT * Sample Quantity: 811.000 GRAM
 Acquire Date: 19-MAR-93 19:39:51 * Efficiency File: SMAR1.EFF
 Sample Date: 17-MAR-93 12:00:00 * Library File: RSDP.LIB
 Sample Type: SOLID *

 *
 Preset Live Time: 3000.0 sec * FWHM at 1332 KeV : 2.8 KeV
 Elapsed Live Time: 3000.0 sec * Peak Search Sensitivity: 4.0
 Elapsed Real Time: 3000.0 sec * Gaussian Assymetry : 10.0 %

 *
 Detector : DET1 * Fit Iterations : 20
 Calib Date : 13-JAN-93 10:41:56 * Energy Tolerance: 2.0 KeV
 KeV/Channel: .5008: * Half Life Ratio : 8.0
 Offset : -1.4574 * Abundance Limit : 50.00 %

{Summary Report -- SNL (7715) -- version 1.1}

Nuclide	Activity (pCi /GRAM)	2-sigma Error	MDA (pCi /GRAM)
U-238	Not Detected	-----	5.31E-01
TH-234	Not Detected	-----	5.32E-01
U-234	Not Detected	-----	9.04E+00
RA-226	3.37E-01	7.16E-02	-----
PB-214	4.21E-01	7.38E-02	-----
BI-214	3.47E-01	7.38E-02	-----
PB-210	Not Detected	-----	0.00E+00
TH-232	6.59E-01	1.34E-01	-----
RA-228	6.59E-01	1.34E-01	-----
AC-228	6.59E-01	1.34E-01	-----
TH-228	5.56E-01	5.04E-02	-----
RA-224	Not Significant	-----	-----
PB-212	5.78E-01	5.24E-02	-----
BI-212	Not Detected	-----	4.37E-01
TL-208	4.67E-01	1.01E-01	-----
U-235	Not Detected	-----	2.02E-01
TH-231	Not Detected	-----	3.49E-01
AC-227	Not Detected	-----	1.39E+00
TH-227	Not Detected	-----	2.32E-01
AM-241	Not Detected	-----	1.60E-01
AM-243	Not Detected	-----	3.59E+00
NP-237	Not Significant	-----	-----
TH-229	Not Detected	-----	1.01E-01
BE-7	Not Detected	-----	1.88E-01
BA-133	Not Detected	-----	2.68E-02
BI-207	Not Detected	-----	2.49E-02
CD-109	Not Detected	-----	7.68E-01
CE-139	Not Detected	-----	2.40E-02
CE-144	Not Detected	-----	1.82E-01
CM-243	Not Detected	-----	9.59E-02

CO-57	Not Detected	-----	2.34E-02
CO-58	1.69E-02	1.68E-02	-----
CO-60	Not Detected	-----	3.00E-02
CR-51	Not Detected	-----	2.02E-01
CS-134	Not Detected	-----	1.87E-02
CS-137	Not Detected	-----	2.17E-02
EU-152	Not Detected	-----	7.02E-02
EU-154	Not Detected	-----	1.05E-01
EU-155	Not Detected	-----	1.10E-01
FE-59	Not Detected	-----	4.74E-02
HG-203	Not Detected	-----	2.43E-02
I-129	Not Detected	-----	0.00E+00
I-131	Not Detected	-----	2.58E-02
K-40	1.06E+01	7.35E-01	-----
MN-54	Not Detected	-----	2.67E-02
MN-56	Short Half-Life	-----	-----
NA-22	Not Detected	-----	2.52E-02
NA-24	Not Detected	-----	2.88E-01
RU-106	Not Detected	-----	1.89E-01
SB-124	Not Detected	-----	2.04E-02
SB-125	Not Detected	-----	6.02E-02
SN-113	Not Detected	-----	3.13E-02
SR-85	Not Detected	-----	1.84E-02
TA-182	Not Detected	-----	1.73E-01
TL-201	Not Detected	-----	3.11E-01
XE-133	Not Detected	-----	9.72E-02
Y-88	Not Detected	-----	2.79E-02
ZN-65	Not Detected	-----	5.79E-02
ZR-95	Not Detected	-----	4.49E-02

 * SNL Radiation Sample Diagnostic Program (7715)/881 19-MAR-93 21:23:56 *

 N.DURAND_92004718-1

Operator: Schump/Cole 3/22/93 Reviewed by JF 7/22/93

 *
 Data File : 93009512.DAT * Sample Quantity: 730.000 GRAM
 Acquire Date: 19-MAR-93 20:32:45 * Efficiency File: SMAR1.EFF
 Sample Date: 17-MAR-93 12:00:00 * Library File: RSDP.LIB
 Sample Type: SOLID *

 *
 Preset Live Time: 3000.0 sec * FWHM at 1332 KeV : 2.8 KeV
 Elapsed Live Time: 3000.0 sec * Peak Search Sensitivity: 4.0
 Elapsed Real Time: 3000.0 sec * Gaussian Assymetry : 10.0 %

 *
 Detector : DET1 * Fit Iterations : 20.
 Calib Date : 13-JAN-93 10:41:56 * Energy Tolerance: 2.0 KeV
 KeV/Channel: .5008: * Half Life Ratio : 8.0
 Offset : -1.4574 * Abundance Limit : 50.00 %

[Summary Report -- SNL (7715) -- version 1.1]

Nuclide	Activity (pCi /GRAM)	2-sigma Error	MDA (pCi /GRAM)
U-238	Not Detected	-----	6.20E-01
TH-234	Not Detected	-----	6.22E-01
U-234	Not Detected	-----	9.75E+00
RA-226	4.89E-01	7.67E-02	-----
PB-214	5.86E-01	8.03E-02	-----
BI-214	5.03E-01	7.90E-02	-----
PB-210	Not Detected	-----	0.00E+00
TH-232	6.25E-01	1.60E-01	-----
RA-228	6.25E-01	1.60E-01	-----
AC-228	6.25E-01	1.60E-01	-----
TH-228	6.87E-01	5.87E-02	-----
RA-224	1.37E+00	8.11E-01	-----
PB-212	7.14E-01	6.10E-02	-----
BI-212	Not Detected	-----	5.15E-01
TL-208	6.85E-01	1.31E-01	-----
U-235	Not Detected	-----	2.35E-01
TH-231	5.94E-01	2.98E-01	-----
AC-227	Not Detected	-----	1.54E+00
TH-227	Not Detected	-----	2.65E-01
AM-241	Not Detected	-----	1.77E-01
AM-243	Not Detected	-----	4.10E+00
NP-237	Not Detected	-----	2.50E-01
TH-229	Not Detected	-----	1.13E-01
BE-7	Not Detected	-----	2.02E-01
BA-133	Not Detected	-----	3.12E-02
BI-207	Not Detected	-----	2.89E-02
CD-109	Not Detected	-----	8.61E-01
CE-139	Not Detected	-----	2.75E-02
CE-144	Not Detected	-----	2.12E-01
CM-243	Not Detected	-----	1.15E-01

CO-57	Not Detected	-----	2.69E-02
CO-58	Not Detected	-----	2.55E-02
CO-60	Not Detected	-----	3.30E-02
CR-51	Not Detected	-----	2.25E-01
CS-134	Not Detected	-----	2.29E-02
CS-137	Not Detected	-----	2.70E-02
EU-152	Not Detected	-----	8.05E-02
EU-154	Not Detected	-----	1.20E-01
EU-155	Not Detected	-----	1.29E-01
FE-59	Not Detected	-----	6.02E-02
HG-203	Not Detected	-----	2.76E-02
I-129	Not Detected	-----	0.00E+00
I-131	Not Detected	-----	2.93E-02
K-40	1.02E+01	7.50E-01	-----
MN-54	Not Detected	-----	2.99E-02
MN-56	Short Half-Life	-----	-----
NA-22	Not Detected	-----	3.14E-02
NA-24	Not Detected	-----	3.04E-01
RU-106	Not Detected	-----	2.24E-01
SB-124	Not Detected	-----	2.50E-02
SB-125	Not Detected	-----	6.64E-02
SN-113	Not Detected	-----	3.25E-02
SR-85	Not Detected	-----	2.14E-02
TA-182	Not Detected	-----	2.00E-01
TL-201	Not Detected	-----	3.86E-01
XE-133	Not Detected	-----	1.15E-01
Y-88	Not Detected	-----	2.68E-02
ZN-65	Not Detected	-----	5.99E-02
ZR-95	Not Detected	-----	5.27E-02

 * SNL Radiation Sample Diagnostic Program (7715)/881 19-MAR-93 22:16:50 *

 N.DURAND_92004721-1

Operator: George Cole 3/22/93 Reviewed by JF 3/22/93

 *
 Data File : 93009513.DAT * Sample Quantity: 961.000 GRAM
 Acquire Date: 19-MAR-93 21:25:51 * Efficiency File: SMAR1.EFF
 Sample Date: 17-MAR-93 12:00:00 * Library File: RSDP.LIB
 Sample Type: SOLID *

 *
 Preset Live Time: 3000.0 sec * FWHM at 1332 KeV : 2.8 KeV
 Elapsed Live Time: 3000.0 sec * Peak Search Sensitivity: 4.0
 Elapsed Real Time: 3001.0 sec * Gaussian Assymetry : 10.0 %

 *
 Detector : DET1 * Fit Iterations : 20.
 Calib Date : 13-JAN-93 10:41:56 * Energy Tolerance: 2.0 KeV
 KeV/Channel : .5008: * Half Life Ratio : 8.0
 Offset : -1.4574 * Abundance Limit : 50.00 %

[Summary Report -- SNL (7715) -- version 1.1]

Nuclide	Activity (pCi /GRAM)	2-sigma Error	MDA (pCi /GRAM)
U-238	1.36E+00	5.32E-01	-----
TH-234	1.36E+00	5.33E-01	-----
U-234	Not Detected	-----	8.56E+00
RA-226	4.61E-01	7.26E-02	-----
PB-214	5.72E-01	7.21E-02	-----
BI-214	4.75E-01	7.47E-02	-----
PB-210	Not Detected	-----	0.00E+00
TH-232	5.99E-01	1.20E-01	-----
RA-228	5.99E-01	1.20E-01	-----
AC-228	5.99E-01	1.20E-01	-----
TH-228	5.45E-01	4.69E-02	-----
RA-224	5.34E-01	5.24E-01	-----
PB-212	5.67E-01	4.87E-02	-----
BI-212	Not Detected	-----	4.56E-01
TL-208	5.17E-01	1.02E-01	-----
U-235	Not Detected	-----	1.94E-01
TH-231	Not Detected	-----	3.44E-01
AC-227	Not Detected	-----	1.35E+00
TH-227	Not Detected	-----	2.08E-01
AM-241	Not Detected	-----	1.47E-01
AM-243	Not Detected	-----	3.72E+00
NP-237	Not Detected	-----	2.17E-01
TH-229	Not Detected	-----	9.50E-02
BE-7	Not Detected	-----	1.56E-01
BA-133	Not Detected	-----	2.65E-02
BI-207	Not Detected	-----	2.20E-02
CD-109	Not Detected	-----	7.80E-01
CE-139	Not Detected	-----	2.42E-02
CE-144	Not Detected	-----	1.75E-01
CM-243	Not Detected	-----	9.97E-02

CO-57	Not Detected	-----	2.30E-02
CO-58	Not Detected	-----	2.35E-02
CO-60	Not Detected	-----	2.86E-02
CR-51	Not Detected	-----	1.93E-01
CS-134	Not Detected	-----	2.05E-02
CS-137	Not Detected	-----	2.03E-02
EU-152	Not Detected	-----	6.89E-02
EU-154	Not Detected	-----	9.41E-02
EU-155	Not Detected	-----	1.11E-01
FE-59	Not Detected	-----	5.00E-02
HG-203	Not Detected	-----	2.32E-02
I-129	Not Detected	-----	0.00E+00
I-131	Not Detected	-----	2.78E-02
K-40	1.33E+01	7.40E-01	-----
MN-54	Not Detected	-----	2.45E-02
MN-56	Short Half-Life	-----	-----
NA-22	Not Detected	-----	2.46E-02
NA-24	Not Detected	-----	3.04E-01
RU-106	Not Detected	-----	1.78E-01
SB-124	Not Detected	-----	2.04E-02
SB-125	Not Detected	-----	5.32E-02
SN-113	Not Detected	-----	2.80E-02
SR-85	Not Detected	-----	1.94E-02
TA-182	Not Detected	-----	2.01E-01
TL-201	Not Detected	-----	3.19E-01
XE-133	Not Detected	-----	1.03E-01
Y-88	Not Detected	-----	2.84E-02
ZN-65	Not Detected	-----	5.10E-02
ZR-95	Not Detected	-----	3.98E-02

 * SNL Radiation Sample Diagnostic Program (7715)/881 19-MAR-93 23:09:37 *

 N.DURAND_92004722-1

Operator: James Cole 3/22/93 Reviewed by JA 3/22/93

 *
 Data File : 93009514.DAT * Sample Quantity: 795.000 GRAM
 Acquire Date: 19-MAR-93 22:18:45 * Efficiency File: SMAR1.BFF
 Sample Date: 17-MAR-93 12:00:00 * Library File: RSDP.LIB
 Sample Type: SOLID *

 *
 Preset Live Time: 3000.0 sec * FWHM at 1332 KeV : 2.8 KeV
 Elapsed Live Time: 3000.0 sec * Peak Search Sensitivity: 4.0
 Elapsed Real Time: 3001.0 sec * Gaussian Assymetry : 10.0 %

 *
 Detector : DET1 * Fit Iterations : 20.
 Calib Date : 13-JAN-93 10:41:56 * Energy Tolerance: 2.0 KeV
 KeV/Channel: .5008: * Half Life Ratio : 8.0
 Offset : -1.4574 * Abundance Limit : 50.00 %

[Summary Report -- SNL (7715) -- version 1.1]

Nuclide	Activity (pCi /GRAM)	2-sigma Error	MDA (pCi /GRAM)
U-238	Not Detected	-----	5.53E-01
TH-234	Not Detected	-----	5.55E-01
U-234	Not Detected	-----	9.51E+00
RA-226	3.72E-01	6.76E-02	-----
PB-214	4.60E-01	7.48E-02	-----
BI-214	3.84E-01	6.96E-02	-----
PB-210	Not Detected	-----	0.00E+00
TH-232	6.14E-01	1.56E-01	-----
RA-228	6.14E-01	1.56E-01	-----
AC-228	6.14E-01	1.56E-01	-----
TH-228	5.26E-01	5.32E-02	-----
RA-224	Not Detected	-----	7.83E-01
PB-212	5.47E-01	5.53E-02	-----
BI-212	Not Detected	-----	4.57E-01
TL-208	4.99E-01	1.19E-01	-----
U-235	Not Detected	-----	2.26E-01
TH-231	Not Detected	-----	3.56E-01
AC-227	Not Detected	-----	1.50E+00
TH-227	Not Detected	-----	2.40E-01
AM-241	Not Detected	-----	1.66E-01
AM-243	Not Detected	-----	3.83E+00
NP-237	Not Detected	-----	2.31E-01
TH-229	Not Detected	-----	1.04E-01
BE-7	Not Detected	-----	1.91E-01
BA-133	Not Detected	-----	2.94E-02
BI-207	Not Detected	-----	2.76E-02
CD-109	Not Detected	-----	8.15E-01
CE-139	Not Detected	-----	2.61E-02
CE-144	Not Detected	-----	1.98E-01
CM-243	Not Detected	-----	1.09E-01

CO-57	Not Detected	-----	2.62E-02
CO-58	Not Detected	-----	2.62E-02
CO-60	Not Detected	-----	3.42E-02
CR-51	Not Detected	-----	2.10E-01
CS-134	Not Detected	-----	2.26E-02
CS-137	Not Detected	-----	2.28E-02
EU-152	Not Detected	-----	7.84E-02
EU-154	Not Detected	-----	8.45E-02
EU-155	Not Detected	-----	1.22E-01
FE-59	Not Detected	-----	6.04E-02
HG-203	Not Detected	-----	2.70E-02
I-129	Not Detected	-----	0.00E+00
I-131	Not Detected	-----	2.77E-02
K-40	1.38E+01	8.85E-01	-----
MN-54	Not Detected	-----	2.99E-02
MN-56	Short Half-Life	-----	-----
NA-22	Not Detected	-----	2.88E-02
NA-24	Not Detected	-----	3.32E-01
RU-106	Not Detected	-----	2.04E-01
SB-124	Not Detected	-----	2.25E-02
SB-125	Not Detected	-----	6.36E-02
SN-113	Not Detected	-----	2.84E-02
SR-85	Not Detected	-----	2.16E-02
TA-182	Not Detected	-----	2.03E-01
TL-201	Not Detected	-----	3.57E-01
XE-133	Not Detected	-----	1.16E-01
Y-88	Not Detected	-----	3.34E-02
ZN-65	Not Detected	-----	6.17E-02
ZR-95	Not Detected	-----	4.66E-02

 * SNL Radiation Sample Diagnostic Program (7715)/881 19-MAR-93 23:22:08 *

 LAB_CONTROL_SAMPLE_(CG134)

Operator: George Cole 3/22/93 Reviewed by JR 3/22/93

*
 Data File : 93009515.DAT * Sample Quantity: 500.000 ML
 Acquire Date: 19-MAR-93 23:11:32 * Efficiency File: WMAR1.EFF
 Sample Date: 01-NOV-90 05:00:00 * Library File: RSDP.LIB
 Sample Type: LIQUID *

*
 Preset Live Time: 600.0 sec * FWHM at 1332 KeV : 2.8 KeV
 Elapsed Live Time: 600.0 sec * Peak Search Sensitivity: 4.0
 Elapsed Real Time: 606.0 sec * Gaussian Assymetry : 10.0 %

*
 Detector : DET1 * Fit Iterations : 20.
 Calib Date : 13-JAN-93 10:41:56 * Energy Tolerance: 2.0 KeV
 KeV/Channel : .5008 * Half Life Ratio : 8.0
 Offset : -1.4574 * Abundance Limit : 50.00 %

[Summary Report -- SNL (7715) -- version 1.1]

Nuclide	Activity (pCi /ML)	2-sigma Error	MDA (pCi /ML)
U-238	Not Detected	-----	5.09E+00
TH-234	Not Detected	-----	5.11E+00
U-234	8.90E+02	1.54E+02	-----
RA-226	Not Detected	-----	7.96E-01
PB-214	Not Detected	-----	9.94E-01
BI-214	Not Detected	-----	8.20E-01
PB-210	Not Detected	-----	0.00E+00
TH-232	Not Detected	-----	2.86E+00
RA-228	Not Detected	-----	2.86E+00
AC-228	Not Detected	-----	2.86E+00
TH-228	Not Detected	-----	1.81E+00
RA-224	Not Detected	-----	2.18E+01
PB-212	Not Detected	-----	1.89E+00
BI-212	Not Detected	-----	1.42E+01
TL-208	Not Detected	-----	2.70E+00
U-235	Not Detected	-----	2.80E+00
TH-231	Not Detected	-----	4.28E+00
AC-227	Not Detected	-----	2.17E+01
TH-227	Not Detected	-----	3.18E+00
AM-241	1.71E+02	3.55E+00	-----
AM-243	Not Detected	-----	5.20E+01
NP-237	Not Detected	-----	3.71E+00
TH-229	Not Detected	-----	1.41E+00
BE-7	Short Half-Life	-----	-----
BA-133	Not Detected	-----	6.41E-01
BI-207	Not Detected	-----	4.02E-01
CD-109	7.61E+02	5.59E+01	-----
CE-139	5.40E+01	2.69E+01	-----
CE-144	Not Detected	-----	2.18E+01
CM-243	Not Detected	-----	1.36E+00

CO-57	2.20E+01	3.81E+00	-----
CO-58	Short Half-Life	-----	-----
CO-60	1.38E+02	2.56E+00	-----
CR-51	Short Half-Life	-----	-----
CS-134	Not Detected	-----	8.14E-01
CS-137	1.27E+02	1.88E+00	-----
EU-152	Not Detected	-----	1.58E+00
EU-154	Not Detected	-----	2.55E+00
EU-155	Not Detected	-----	2.03E+00
FE-59	Short Half-Life	-----	-----
HG-203	Short Half-Life	-----	-----
I-129	Not Detected	-----	0.00E+00
I-131	Short Half-Life	-----	-----
K-40	Not Detected	-----	2.02E+00
MN-54	Not Detected	-----	3.86E+00
MN-56	Short Half-Life	-----	-----
NA-22	Not Detected	-----	6.15E-01
NA-24	Short Half-Life	-----	-----
RU-106	Not Detected	-----	1.88E+01
SB-124	Short Half-Life	-----	-----
SB-125	Not Detected	-----	2.62E+00
SN-113	Not Detected	-----	1.26E+02
SR-85	Short Half-Life	-----	-----
TA-182	Not Detected	-----	5.34E+02
TL-201	Short Half-Life	-----	-----
XE-133	Short Half-Life	-----	-----
Y-88	Short Half-Life	-----	-----
ZN-65	Not Detected	-----	1.58E+01
ZR-95	Short Half-Life	-----	-----

[Lab Control Sample Report

-- SNL (7715) --

version 1.0]

Source ID : CG-134
Source Type : Mixed Gamma
Source Date : November 1, 1990

Nuclide	Known (pCi/mL)	Observed (pCi/mL)	%Recovery	Lower Limit	Upper Limit	Status
AM-241	173	171	98.6	80.0	120.0	Pass
CO-60	156	138	88.2	80.0	120.0	Pass
CS-137	138	127	92.0	80.0	120.0	Pass

Quality Control Data for Efficiency Check

This QC follows the observed counts per second (cps) for a selected line.

Date	AM-241 (60 KeV)	CS-137 (662 KeV)	CO-60 (1173 KeV)	CO-60 (1332 KeV)
02/23/93	51.30	109.00	76.60	68.20
02/24/93	51.60	111.40	83.30	75.00
03/03/93	52.20	110.50	82.50	74.30
03/04/93	52.20	111.50	81.90	74.10
03/05/93	52.40	111.50	82.40	74.00
03/08/93	52.30	111.50	81.90	73.40
03/09/93	52.90	111.50	82.60	74.20
03/10/93	52.50	110.50	82.30	74.50
03/11/93	52.60	111.60	82.30	73.60
03/12/93	53.40	111.60	83.30	74.50
03/15/93	52.30	109.60	83.20	74.60
03/16/93	51.30	110.60	82.90	74.30
03/17/93	53.20	110.60	83.60	74.10
03/18/93	52.50	111.60	82.10	74.10
03/19/93	53.50	112.60	83.00	73.70
Average	52.41	111.04	82.26	73.77
3-S STD	2.02	2.73	4.96	4.78
%3-S STD	3.84	2.45	6.03	6.48

Quality Control Data for Energy Calibration Check

This QC follows the observed position (channel number) for a selected line.

Date	AM-241 (60 KeV)	CS-137 (662 KeV)	CO-60 (1173 KeV)	CO-60 (1332 KeV)
02/23/93	120.63	1323.64	2345.45	2663.63
02/24/93	120.32	1322.94	2344.71	2662.87
03/03/93	120.41	1324.37	2346.92	2665.34
03/04/93	120.45	1324.16	2346.51	2664.89
03/05/93	120.46	1324.11	2346.24	2664.53
03/08/93	120.46	1323.95	2346.05	2664.31
03/09/93	120.30	1323.20	2345.18	2663.42
03/10/93	120.41	1323.90	2346.11	2664.40
03/11/93	120.36	1323.55	2345.55	2663.76
03/12/93	120.19	1323.15	2345.23	2663.51
03/15/93	120.10	1323.23	2345.40	2663.69
03/16/93	120.06	1323.20	2345.37	2663.66
03/17/93	120.05	1323.24	2345.41	2663.71
03/18/93	120.40	1323.89	2346.08	2664.37
03/19/93	119.99	1323.16	2345.32	2663.58
Average	120.31	1323.58	2345.70	2663.98
3-S STD	0.56	1.36	1.77	1.93
%3-S STD	0.47	0.10	0.08	0.07

Quality Control Data for FWHM Check

This QC follows the observed FWHM (KeV) for a selected line.

Date	AM-241 (60 KeV)	CS-137 (662 KeV)	CO-60 (1173 KeV)	CO-60 (1332 KeV)
02/23/93	1.22	1.63	1.94	2.00
02/24/93	1.10	1.48	1.74	1.88
03/03/93	1.24	1.61	1.87	1.96
03/04/93	1.19	1.58	1.88	1.97
03/05/93	1.32	1.66	1.98	2.08
03/08/93	1.31	1.66	1.94	2.06
03/09/93	1.12	1.50	1.78	1.87
03/10/93	1.22	1.60	1.85	1.98
03/11/93	1.17	1.54	1.85	1.92
03/12/93	1.12	1.47	1.80	1.88
03/15/93	1.05	1.49	1.81	1.89
03/16/93	1.05	1.48	1.83	1.90
03/17/93	1.07	1.49	1.81	1.87
03/18/93	1.25	1.61	1.90	2.01
03/19/93	1.05	1.49	1.81	1.88
Average	1.17	1.55	1.85	1.94
3-S STD	0.28	0.21	0.20	0.21
%3-S STD	23.99	13.73	10.73	10.94

 ***** 21-MAR-93 11:31:29 *****

QC_CHECK_BY _____

SPECTRAL FILE NAME: QC032193.DAT
 SAMPLE DATE: 01-AUG-92 12:00:00
 SAMPLE IDENTIFICATION: QC032193
 TYPE OF SAMPLE: MIXED GAMMA
 SAMPLE QUANTITY: 1.000000 UNITS: SAMPLE
 SAMPLE GEOMETRY: CHECK
 EFFICIENCY FILE NAME: DEFAULT.EFF

 *
 ACQUIRE DATE: 21-MAR-93 11:21:00 * FWHM(1332) 2.793
 PRESET TIME(LIVE): 600. SEC * SENSITIVITY: 4.000
 ELAPSED REAL TIME: 624. SEC * SHAPE PARAMETER : 10.0 %
 ELAPSED LIVE TIME: 600. SEC * NBR ITERATIONS: 20.
 *

 *
 DETECTOR: DET1 * LIBRARY:RSDP.LIB
 CALIB DATE: 13-JAN-93 10:41:56 * ENERGY TOLERANCE: 2.000 KEV
 KEV/CHNL: .5008971 * HALF LIFE RATIO: 8.00
 OFFSET: -1.4573810 KEV * ABUNDANCE LIMIT: 50.00%
 *

ENERGY WINDOW 37.61 TO 2002.13

PK	IT	ENERGY	AREA	BKGND	FWHM	CHANNEL	LEFT	PW	CTS/SEC	%ERR	FIT
1	0	48.68	356.	8411.	1.12	100.09	97	8	5.94E-01	44.7	
2	0	58.89	31438.	12209.	1.25	120.47	113	14	5.24E+01	.9	
3	0	87.51	26645.	8958.	1.26	177.62	171	14	4.44E+01	1.0	
4	0	121.62	22541.	7242.	1.24	245.71	239	14	3.76E+01	1.0	
5	0	136.02	2736.	4678.	1.44	274.46	269	10	4.56E+00	5.1	
6	0	165.45	12286.	6235.	1.30	333.22	327	13	2.05E+01	1.6	
7	0	254.79	630.	3775.	1.53	511.58	508	9	1.05E+00	18.0	
8	0	278.79	1318.	4183.	1.36	559.49	554	11	2.20E+00	9.9	
9	0	310.50	210.	3902.	1.22	622.80	617	11	3.49E-01	59.1	
10	0	391.36	15303.	5446.	1.48	784.24	777	15	2.55E+01	1.3	
11	0	513.72	5737.	4115.	1.62	1028.51	1022	14	9.56E+00	2.7	
12	0	661.40	65852.	4567.	1.61	1323.34	1314	18	1.10E+02	.5	
13	0	897.84	17881.	4513.	1.81	1795.37	1785	19	2.98E+01	1.2	
14	0	979.72	120.	963.	1.37	1958.85	1957	5	2.00E-01	40.5	
15	0	1077.32	183.	1923.	1.33	2153.70	2149	11	3.06E-01	47.7	
16	0	1173.16	45253.	2405.	1.87	2345.03	2335	20	7.54E+01	.5	
17	0	1281.74	92.	257.	1.61	2561.81	2559	7	1.53E-01	32.4	
18	0	1332.52	41246.	1187.	1.99	2663.17	2655	19	6.87E+01	.5	
19	0	1835.08	10324.	579.	2.74	3666.51	3654	27	1.72E+01	1.1	

PEAK SEARCH COMPLETED (REV 15.8 - ND PC VERSION MAR 90)

Detector ID: DET

Number of data points in file: 15

Date	60 KeV	662 KeV	1173 KeV	1332 KeV
3- 5-1993	120.46	1324.11	2346.24	2664.53
3- 8-1993	120.46	1323.95	2346.05	2664.31
3- 9-1993	120.30	1323.20	2345.18	2663.42
3-10-1993	120.41	1323.90	2346.11	2664.40
3-11-1993	120.36	1323.55	2345.55	2663.76
3-12-1993	120.19	1323.15	2345.23	2663.51
3-15-1993	120.10	1323.23	2345.40	2663.69
3-16-1993	120.06	1323.20	2345.37	2663.66
3-17-1993	120.05	1323.24	2345.41	2663.71
3-18-1993	120.40	1323.89	2346.08	2664.37
3-19-1993	119.99	1323.16	2345.32	2663.58
Average =	120.31	1323.58	2345.70	2663.98
3S error =	0.56	1.36	1.77	1.93
3-21-1993	120.47	1323.34	2345.03	2663.17
QC Status:	Pass	Pass	Pass	Pass

File updated.

Detector ID: DET
Number of data points in file: 15

Date	60 KeV	662 KeV	1173 KeV	1332 KeV
3- 5-1993	1.32	1.66	1.98	2.08
3- 8-1993	1.31	1.66	1.94	2.06
3- 9-1993	1.12	1.50	1.78	1.87
3-10-1993	1.22	1.60	1.85	1.98
3-11-1993	1.17	1.54	1.85	1.92
3-12-1993	1.12	1.47	1.80	1.88
3-15-1993	1.05	1.49	1.81	1.89
3-16-1993	1.05	1.48	1.83	1.90
3-17-1993	1.07	1.49	1.81	1.87
3-18-1993	1.25	1.61	1.90	2.01
3-19-1993	1.05	1.49	1.81	1.88
Average =	1.17	1.55	1.85	1.94
3S error =	0.28	0.21	0.20	0.21
3-21-1993	1.25	1.61	1.87	1.99
QC Status:	Pass	Pass	Pass	Pass

File updated.

Detector ID: DET
 Number of data points in file: 15
 CO-60 and CS-137 decay corrected to 01-AUG-92

Date	60 KeV	662 KeV	1173 KeV	1332 KeV
3- 5-1993	52.4	111.5	82.4	74.0
3- 8-1993	52.3	111.5	81.9	73.4
3- 9-1993	52.9	111.5	82.6	74.2
3-10-1993	52.5	110.5	82.3	74.5
3-11-1993	52.6	111.6	82.3	73.6
3-12-1993	53.4	111.6	83.3	74.5
3-15-1993	52.3	109.6	83.2	74.6
3-16-1993	51.3	110.6	82.9	74.3
3-17-1993	53.2	110.6	83.6	74.1
3-18-1993	52.5	111.6	82.1	74.1
3-19-1993	53.5	112.6	83.0	73.7
Average =	52.4	111.0	82.3	73.8
3S error =	2.0	2.7	5.0	4.8
3-21-1993	52.4	111.6	82.0	74.8
QC Status:	Pass	Pass	Pass	Pass

File updated.

ACKNOWLEDGEMENT OF SAMPLE RECEIPT

TMA/Eberline Albuquerque lab has received samples
to be analyzed as follows:

1 - 2 - SOILS FOR ISOTOPIC URANIUM, ISOTOPIC THORIUM,
PLUTONIUM, TRITIUM

---60 DAY T. A. T.---

THIS IS A LEVEL II PACKAGE
SEND EXTRA COPY OF INVOICE TO MARK LYON AT I. T. CORP.

We received the samples 03/22/93
Our projected completion date is 05/21/93
Samples have been assigned to work order 93-03-244

Please contact PRODUCTION CONTROL at (505) 345-3461 with any
changes or questions involving the analysis to be performed.

The invoice will be mailed to the address below:

SANDIA NATIONAL LABORATORY
SUPPLIER SERVICE
P. O. BOX 5130
ALBUQUERQUE, NM 87185-5130
Attention ACCOUNTS PAYABLE
Under purchase order: 12-0841B

The report will be mailed to the address below:

MARK LYON (PROJECT CHEMIST)
I T CORP.
5301 CENTRAL N E SUITE 700
ALBUQUERQUE, NM 87108
Attention MARK LYON 262-8800

RECEIVED

MAR 25 1993

IT CORP.-ALBUQUERQUE

MLL 301455.81.02

Please contact ADMINISTRATIVE SUPPORT at (505) 345-3461 with any
changes or questions involving address information.

11/3/24/93





TMA

Thermo Analytical Inc.

TMA/Eberline Albuquerque Laboratory
7021 Pan American Hwy. NE
Albuquerque, NM 87109
(505) 345-3461 • FAX# (505) 781-5416

**Sandia National Labs Analytics Package
Document Inventory**

SDG 9303244

This is a level II package.

		pages
<input checked="" type="checkbox"/>	Case Narrative	CN <u>1</u> thru CN <u>2</u>
<input checked="" type="checkbox"/>	DVD Report	<u>1</u> thru <u>41</u>
<input checked="" type="checkbox"/>	LC, DA Report	<u>42</u> thru <u>43</u>
<input checked="" type="checkbox"/>	NTS Report	<u>44</u> thru <u>50</u>
<input checked="" type="checkbox"/>	Chains of Custody	<u>51</u> thru <u>56</u>

Data Review by:

Thomas P. [Signature]

Date:

5/17/93

QC Review by:

Kathy Bunnham

Date:

5/19/93

Case Narrative

Case Narrative
SDG 9303244

Sample Receipt

Two soil samples were received in good condition on 22 March 1993 for analysis using standard procedures. Totals for this set are as follows:

Analysis	Requested	Reported
Plutonium	2	2
Uranium	2	2
Thorium	2	2
Tritium	2	2

Analysis for the SDG is complete.

Data Review

At present we are unable to report the Critical Levels (L_C) and Decision Amounts (DA) through the DVD report. They are tabulated in a separate report. A third report contains the forms requested for the Nevada Test Site.

Plutonium

Evaluation of the quality control samples shows that the spike result agrees with its known and the replicates agree. The blank is nominal.

The reported results are unremarkable.

Uranium

Evaluation of the quality control samples shows that the ^{234}U and ^{238}U spike results agree with their knowns and the ^{235}U result is outside the three sigma range. The replicates agree and the blank is positive but not out of the range of natural background levels for Uranium in soil.

The reported results are unremarkable.

Thorium

Evaluation of the quality control samples shows that the spike result agrees with its known and the replicates agree. The blank is nominal.

The reported results are unremarkable.

Tritium

Evaluation of the quality control samples shows that the blank is nominal, the spike result agrees with its known and the replicates agree.

The reported results are unremarkable.



DVD Report

T M A / E B E R L I N E
SANDIA NATIONAL LABS, 9303244

SDG 9303244
Contact Shaun Bloom

Client Sandia National Labs
Contract 12-0841B

S U M M A R Y D A T A S E C T I O N

T A B L E O F C O N T E N T S	
About this section	1
Sample Summaries	3
Prep Batch Summary	5
Work Summary	6
Reagent Blanks	8
Lab Control Samples	11
Replicates	14
Data Sheets	18
Result Summaries	20
Method Summaries	24
Report Guides	28

Lab id TMAE
Protocol Sandia SOW
Version 12-0841B
Form DVD-TOC
Version 2.23
Report date 05/16/93

TMA/EBERLINE

SANDIA NATIONAL LABS, 9303244

SDG 9303244
Contact Shaun Bloom**REPORT GUIDE**Client Sandia National Labs
Contract 12-0841B**ABOUT THE DATA SUMMARY SECTION**

The Data Summary Section of a Data Package has all data, in several useful orders, necessary for first level, routine review of the data package for a Sample Delivery Group (SDG). This section follows the Data Package Narrative, which has an overview of the data package and a discussion of special problems. It is followed by the Raw Data Section, which has full details.

The Data Summary Section has several groups of reports:

SAMPLE SUMMARIES

The Sample Summary Reports (variously titled LAB, SAMPLE, DEPARTMENT and QC SUMMARY to reflect the sort order) show all samples, including QC samples, reported in one SDG. These reports cross-reference client and lab sample identifiers.

PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches (lab groupings reflecting how work was organized) relevant to the reported SDG with information necessary to check the completeness and consistency of the SDG.

WORK SUMMARY

The Work Summary Report shows all samples and work done on them relevant to the reported SDG.

REAGENT BLANKS

The Reagent Blank Reports, one for each Reagent Blank relevant to the SDG, show all results and primary supporting information for the blanks.

LAB CONTROL SAMPLES

The Lab Control Sample Reports, one for each Lab Control Sample relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

REPORT GUIDES

Page 1

SUMMARY DATA SECTION

Page 1

Lab id TMAE
Protocol Sandia SOW
Version 12-0841B
Form DVD-RG
Version 2.23
Report date 05/16/93

SDG 9303244
Contact Shaun Bloom

GUIDE, cont.

Client Sandia National Labs
Contract 12-0841B

ABOUT THE DATA SUMMARY SECTION

REPLICATES

The Replicate Reports, one for each Replicate and Original sample pair relevant to the SDG, show all results, differences and primary supporting information for these QC samples.

MATRIX SPIKES

The Matrix Spike Reports, one for each Spiked and Original sample pair relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

DATA SHEETS

The Data Sheet Reports, one for each client sample in the SDG; show all results and primary supporting information for these samples.

RESULT SUMMARIES

The Result Summary Reports, one for each test used in the SDG, show all results and QC for one parameter on one page. (A test is a short code for the method used to do certain work to the client's specification.)

METHOD SUMMARIES

The Method Summary Reports, one for each test used in the SDG, show performance data for each method on one page.

REPORT GUIDES

The Report Guides, one for each of the above groups of reports, have documentation on how to read the associated reports.

TMA/EBERLINE
SANDIA NATIONAL LABS, 9303244

SDG 9303244
Contact Shaun Bloom

Client Sandia National Labs
Contract 12-0841B

LAB SUMMARY

LAB SAMPLE ID	DEPARTMENT SAMPLE ID	CLIENT SAMPLE ID	MATRIX	CHAIN OF CUSTODY	COLLECTED	RECEIVED	SAMPLE WT/VOL	BASIS WT/VOL	Z MOIST
9303244-01		ER92004709-1	SOIL	6076	03/16/93	03/22/93	1230 GM		7.0
9303244-02		ER92004291-1	SOIL	6076	03/17/93	03/22/93	1360 GM		14.4
9303252-01		Replicate (9303244-02)	SOIL		03/17/93		1360 GM		
9303252-02		Reagent Blank	SOIL						
9303252-03		Lab Control Sample	SOIL						
9303254-01		Replicate (9303254-02)	SOIL						
9303254-02		Reagent Blank	SOIL						
9303254-03		Lab Control Sample	SOIL						
9303313-01		Replicate (9303284-03)	SOIL		03/22/93		2007 GM		
9303313-02		Reagent Blank	SOIL						
9303313-03		Lab Control Sample	SOIL						

Lab id TMAE
Protocol Sandia SOW
Version 12-0841B
Form DVD-LS
Version 2.23
Report date 05/16/93

TMA/EBERLINE
SANDIA NATIONAL LABS, 9303244

SDG 9303244
Contact Sheun Bloom

Client Sandia National Labs
Contract 12-0841B

QC SUMMARY

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	LEVEL	COLLECTED	RECEIVED	LAB SAMPLE ID	DEPARTMENT SAMPLE ID
9303244	6076	ER92004291-1	SOIL		03/17/93	03/22/93	9303244-02	
		ER92004709-1	SOIL		03/16/93	03/22/93	9303244-01	
		Reagent Blank	SOIL				9303252-02	
		Reagent Blank	SOIL				9303254-02	
		Lab Control Sample	SOIL				9303252-03	
		Lab Control Sample	SOIL				9303254-03	
		Replicate (9303244-02)	SOIL		03/17/93		9303252-01	
	Replicate (9303254-02)	SOIL				9303254-01		
9303284		Reagent Blank	SOIL				9303313-02	
		Lab Control Sample	SOIL				9303313-03	
		Replicate (9303284-03)	SOIL		03/22/93		9303313-01	

Lab id TMAE
Protocol Sandia SOW
Version 12-0841B
Form DVD-QS
Version 2.23
Report date 05/16/93

TMA/EBERLINE

SANDIA NATIONAL LABS, 9303244

SDG 9303244
 Contact Shaun Bloom

Client Sandia National Labs
 Contract 12-0841B

PREP BATCH SUMMARY

TEST MATRIX	METHOD	PREPARATION BATCH	PREP ERROR	CLIENT	PLANCHETS ANALYZED			QUALIFIERS
					RE	BLANK	LCS	
Alpha Spectroscopy								
PU	SOIL	Plutonium in soil/sed	9303313	0.0	2	1	1	1/0/1
TH	SOIL	Thorium in soil/sed	9303252	0.0	2	1	1	1/1
U	SOIL	Uranium in soil/sed	9303313	0.0	2	1	1	1/1
Liquid Scintillation								
H3	SOIL	Tritium in soil.	9303254	6.5	2	1	1	1/0/1

Blank, LCS, Replicate and Spike planchets are those in the same preparation batch as some Client sample.
 In counts like 'a/b/c', 'a' = QC planchets, 'b' = Originals in this SDG, 'c' = Originals in other SDGs.

Lab id TMAE
 Protocol Sandia SOW
 Version 12-0841B
 Form DVD-PBS
 Version 2.23
 Report date 05/16/93

TMA/EBERLINE
SANDIA NATIONAL LABS, 9303244

SDG 9303244
Contact Shaun Bloom

Client Sandia National Labs
Contract 12-0841B

LAB WORK SUMMARY

LAB SAMPLE COLLECTED RECEIVED	CLIENT SAMPLE ID MATRIX CUSTODY	PLANCHET	TEST	SUF-FIX	PREPARED	ANALYZED	METHOD
9303244-01 03/16/93 03/22/93	ER92004709-1 SOIL 6076		H3		04/07/93	04/09/93	Tritium in soil.
			PU		04/21/93	04/21/93	Plutonium in soil/sed
			TH		04/25/93	04/25/93	Thorium in soil/sed
			U		04/26/93	04/26/93	Uranium in soil/sed
9303244-02 03/17/93 03/22/93	ER92004291-1 SOIL 6076		H3		04/07/93	04/09/93	Tritium in soil.
			PU		04/21/93	04/21/93	Plutonium in soil/sed
			TH		04/25/93	04/25/93	Thorium in soil/sed
			U		04/26/93	04/26/93	Uranium in soil/sed
9303252-01 03/17/93 03/22/93	Replicate (9303244-02) SOIL 6076		TH		04/25/93	04/25/93	Thorium in soil/sed
9303252-02	Reagent Blank SOIL		TH		04/25/93	04/25/93	Thorium in soil/sed
9303252-03	Lab Control Sample SOIL		TH		04/25/93	04/25/93	Thorium in soil/sed
9303254-01	Replicate (9303254-02) SOIL		H3		04/07/93	04/09/93	Tritium in soil.
9303254-02	Reagent Blank SOIL		H3		04/07/93	04/09/93	Tritium in soil.
9303254-03	Lab Control Sample SOIL		H3		04/07/93	04/09/93	Tritium in soil.
9303313-01 03/22/93 03/23/93	Replicate (9303284-03) SOIL		PU		04/21/93	04/21/93	Plutonium in soil/sed
			U		04/26/93	04/26/93	Uranium in soil/sed
9303313-02	Reagent Blank SOIL		PU		04/21/93	04/21/93	Plutonium in soil/sed
			U		04/27/93	04/26/93	Uranium in soil/sed
9303313-03	Lab Control Sample SOIL		PU		04/21/93	04/21/93	Plutonium in soil/sed
			U		04/27/93	04/26/93	Uranium in soil/sed

Lab id TMAE
Protocol Sandia SON
Version 12-0841B
Form DVD-LWS
Version 2.23
Report date 05/16/93

TMA/EBERLINE

SANDIA NATIONAL LABS, 9303244

SPG 9303244
 Contact Shaun Bloom

Client Sandia National Labs
 Contract 12-0841B

WORK SUMMARY, cont.

LAB SAMPLE COLLECTED RECEIVED	CLIENT SAMPLE ID MATRIX CUSTODY	PLANCHET	TEST	SUF- FIX	PREPARED	ANALYZED	METHOD
-------------------------------	---------------------------------	----------	------	----------	----------	----------	--------

COUNTS OF TESTS BY SAMPLE TYPE								
TEST	METHOD	REFERENCE	CLIENT	RE	BLANK	LCS	REP SPIKE	TOTALS
HS	Tritium in soil.	EPA-600 906.0	2	1	1	1		5
PU	Plutonium in soil/sed	EPA-600 7-79-081	2	1	1	1		5
TH	Thorium in soil/sed	LANL Vol III ER 200 p1-9	2	1	1	1		5
U	Uranium in soil/sed	HASL-300 27th Ed. 4.5 p252-255	2	1	1	1		5
TOTALS			8	4	4	4		20

TMA/EBERLINE
SANDIA NATIONAL LABS, 9303244

9303252-02

Reagent Blank

REAGENT BLANK

SDG <u>9303244</u>	Client <u>Sandia National Labs</u>
Contact <u>Shaun Bloom</u>	Contract <u>12-0841B</u>
Lab sample id <u>9303252-02</u>	Matrix <u>SOIL</u>
Dept sample id _____	Material _____

PARAMETER	CAS NO	RESULT pCi/g	2σ ERR (TOTAL)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Thorium 230	14269-63-7	0.000	0.001	0.006	0.000	0	TH
Thorium 232	7440-29-1	0.000	0.010	0.023	0.000	0	TH

Lab id <u>INAE</u>
Protocol <u>Sandia SOW</u>
Version <u>12-0841B</u>
Form <u>DVD-DS</u>
Version <u>2.23</u>
Report date <u>05/16/93</u>

TMA/EBERLINE
SANDIA NATIONAL LABS, 9303244

9303254-02

Reagent Blank

REAGENT BLANK

SDG <u>9303244</u>	Client <u>Sandia National Labs</u>
Contact <u>Shaun Bloom</u>	Contract <u>12-0841B</u>
Lab sample id <u>9303254-02</u>	Matrix <u>SOIL</u>
Dept sample id _____	Material _____

PARAMETER	CAS NO	RESULT pci/g	2 σ ERR (TOTAL)	MDA pci/g	RDL pci/g	QUALI- FIERS	TEST
Tritium (pci/L)	10028-17-8	150	230	370		U	H3

Lab id <u>IMAE</u>
Protocol <u>Sandia SOM</u>
Version <u>12-0841B</u>
Form <u>DVD-DS</u>
Version <u>2.23</u>
Report date <u>05/16/93</u>

TMA/EBERLINE
SANDIA NATIONAL LABS, 9303244

9303313-02

Reagent Blank

REAGENT BLANK

SDG <u>9303244</u>	Client <u>Sandia National Labs</u>
Contact <u>Shaun Bloom</u>	Contract <u>12-0841B</u>
Lab sample id <u>9303313-02</u>	Matrix <u>SOIL</u>
Dept sample id _____	Material _____

PARAMETER	CAS NO	RESULT pci/g	2σ ERR (TOTAL)	MDA pci/g	RDL pci/g	QUALI- FIERS	TEST
Plutonium 238	13981-16-3	0.002	0.006	0.010		U	PV
Plutonium 239/240	14119-33-6	0.002	0.001	0.010		U	PV
Uranium 233/234	13966-29-5	0.094	0.054	0.023			U
Uranium 235	15117-96-1	0.004	0.014	0.023		U	U
Uranium 238	7440-60-1	0.060	0.042	0.009			U

REAGENT BLANKS
Page 3
SUMMARY DATA SECTION
Page 10

Lab id <u>TMAE</u>
Protocol <u>Sandia SDW</u>
Version <u>12-0841B</u>
Form <u>DVD-DS</u>
Version <u>2.23</u>
Report date <u>05/16/93</u>

9303252-03

TMA/EBERLINE
SANDIA NATIONAL LABS, 9303244

Lab Control Sample

LAB CONTROL SAMPLE

SDG <u>9303244</u>	Client <u>Sandia National Labs</u>
Contact <u>Shaun Bloom</u>	Contract <u>12-0841B</u>
Lab sample id <u>9303252-03</u>	Matrix <u>SOIL</u>
Dept sample id _____	Material _____

PARAMETER	RESULT pCi/g	2σ ERR (TOTAL)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LNTS (TOTAL)	PROTOCOL LIMITS
Thorium 230	2.4	0.26	0.012			TH	2.62	0.11	92	84-116	
Thorium 232	0.002	0.008	0.012		U	TH					

TMA/EBERLINE
SANDIA NATIONAL LABS, 9303244

9303254-03

Lab Control Sample

LAB CONTROL SAMPLE

SDG <u>9303244</u>	Client <u>Sandia National Labs</u>
Contact <u>Shaun Bloom</u>	Contract <u>12-0841B</u>
Lab sample id <u>9303254-03</u>	Matrix <u>SOIL</u>
Dept sample id _____	Material _____

PARAMETER	RESULT pci/g	2σ ERR (TOTAL)	MDA pci/g	RDL pci/g	QUALI- FIERS	TEST	ADDED pci/g	2σ ERR pci/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Tritium (pci/L)	26000	2000	440			H3	24200	580	107	87-113	

Lab id TMAE
Protocol Sandia SOW
Version 12-0841B
Form DVD-LCS
Version 2.23
Report date 05/16/93

9303313-03

TMA/EBERLINE
SANDIA NATIONAL LABS, 9303244

Lab Control Sample

LAB CONTROL SAMPLE

SDG 9303244 Client Sandia National Labs
 Contact Shaun Bloom Contract 12-0841B
 Lab sample id 9303313-03 Matrix SOIL
 Dept sample id _____ Material _____

PARAMETER	RESULT pci/g	2σ ERR (TOTAL)	MDA pci/g	RDL pci/g	QUALI- FIERS	TEST	ADDED pci/g	2σ ERR pci/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Plutonium 238	0.007	0.010	0.004			PU					
Plutonium 239/240	1.8	0.25	0.010			PU	1.82	0.13	99	76-124	
Uranium 233/234	6.0	1.1	0.092		B	U	5.37	0.39	113	67-134	
Uranium 235	0.65	0.24	0.11			U	0.265	0.019	245	-38-238	
Uranium 238	6.2	1.1	0.075			U	5.31	0.39	117	66-134	

Lab id TMAE
 Protocol Sandia SOV
 Version 12-0841B
 Form DVD-LCS
 Version 2.23
 Report date 05/16/93

TMA/EBERLINE
SANDIA NATIONAL LABS, 9303244

9303252-01

ER92004291-1

REPLICATE

SDG <u>9303244</u>		Client <u>Sandia National Labs</u>
Contact <u>Shaun Bloom</u>		Contract <u>12-0841B</u>
REPLICATE	ORIGINAL	
Lab sample id <u>9303252-01</u>	Lab sample id <u>9303244-02</u>	Client sample id <u>ER92004291-1</u>
Dept sample id _____	Dept sample id _____	Matrix <u>SOIL</u>
	Received <u>03/22/93</u>	Collected/Amount <u>03/17/93 1360 GR</u>
	% moisture <u>14.4</u>	Chain of custody id <u>6076</u>

PARAMETER	REPLICATE pci/g	2σ ERR (TOTAL)	MDA pci/g	RDL pci/g	QUALI- FIERS	TEST	ORIGINAL pci/g	2σ ERR (TOTAL)	MDA pci/g	QUALI- FIERS	RPD %	3σ PROT TOT LIMIT
Thorium 230	1.1	0.19	0.006			TH	1.1	0.16	0.010		6	33
Thorium 232	0.92	0.16	0.006			TH	0.75	0.13	0.010		20	37

TMA/EBERLINE

SANDIA NATIONAL LABS, 9303244

9303313-01

ER92004291-1

REPLICATE

SDG <u>9303244</u>	Client <u>Sandia National Labs</u>
Contact <u>Shaun Bloom</u>	Contract <u>12-0841B</u>
REPLICATE	ORIGINAL
Lab sample id <u>9303313-01</u>	Lab sample id <u>9303244-02</u>
Dept sample id _____	Dept sample id _____
	Received <u>03/22/93</u>
	X moisture <u>14.4</u>
	Client sample id <u>ER92004291-1</u>
	Matrix <u>SOIL</u>
	Collected/Amount <u>03/17/93 1360 GM</u>
	Chain of custody id <u>6076</u>

PARAMETER	REPLICATE pci/g	2σ ERR (TOTAL)	MDA pci/g	RDL pci/g	QUALI- FIERS	TEST	ORIGINAL pci/g	2σ ERR (TOTAL)	MDA pci/g	QUALI- FIERS	RPD %	3σ PROT TOT LIMIT
Uranium 233/234	1.6	0.23	0.025		B	U	1.8	0.22	0.011	B	12	28
Uranium 235	0.055	0.036	0.028		B	U	0.058	0.030	0.011	B	5	124
Uranium 238	1.4	0.21	0.025		B	U	1.4	0.18	0.005	B	0	29

REPLICATES
Page 2
SUMMARY DATA SECTION
Page 15

Lab id <u>TMAE</u>
Protocol <u>Sandia SOV</u>
Version <u>12-0841B</u>
Form <u>DVD-REP</u>
Version <u>2.23</u>
Report date <u>05/16/93</u>

TMA/EBERLINE
SANDIA NATIONAL LABS, 9303244

9303254-01

9303254-02

REPLICATE

SDG <u>9303244</u>		Client <u>Sandia National Labs</u>
Contact <u>Shaun Bloom</u>		Contract <u>12-0841B</u>
REPLICATE.	ORIGINAL	
Lab sample id <u>9303254-01</u>	Lab sample id <u>9303254-02</u>	Client sample id _____
Dept sample id _____	Dept sample id _____	Matrix <u>SOIL</u>
	Received _____	Collected _____
		Chain of custody id _____

PARAMETER	REPLICATE pci/g	2σ ERR (TOTAL)	MDA pci/g	RDL pci/g	QUALI- FIERS	TEST	ORIGINAL pci/g	2σ ERR (TOTAL)	MDA pci/g	QUALI- FIERS	RPD %	3σ PROT TOT LIMIT
Tritium (pci/L)	310	250	360		U	HS	150	230	370	U		

Lab id <u>TMAE</u>
Protocol <u>Sandia SOU</u>
Version <u>12-0841B</u>
Form <u>DVD-REP</u>
Version <u>2.23</u>
Report date <u>05/16/93</u>

TMA/EBERLINE
SANDIA NATIONAL LABS, 9303244

9303313-01

ER92004631-4

REPLICATE

SDG <u>9303244</u>	Client <u>Sandia National Labs</u>
Contact <u>Shaun Bloom</u>	Contract <u>12-0841B</u>
REPLICATE	ORIGINAL
Lab sample id <u>9303313-01</u>	Lab sample id <u>9303284-03</u>
Dept sample id _____	Dept sample id _____
	Received <u>03/23/93</u>
	Client sample id <u>ER92004631-4</u>
	Matrix <u>SOIL</u>
	Collected/Amount <u>03/22/93 2007 GM</u>
	Chain of custody id _____

PARAMETER	REPLICATE pci/g	2σ ERR (TOTAL)	MDA pci/g	RDL pci/g	QUALI- FIERS	TEST	ORIGINAL pci/g	2σ ERR (TOTAL)	MDA pci/g	QUALI- FIERS	RPD %	3σ PROT TOT LIMIT
Plutonium 238	0.003	0.001	0.012		U	PU	0.002	0.006	0.009	U		
Plutonium 239/240	0.002	0.008	0.010		U	PU	0.008	0.012	0.015	U		

Lab id <u>TMAE</u>
Protocol <u>Sandia SOI</u>
Version <u>12-0841B</u>
Form <u>DVD-REP</u>
Version <u>2.23</u>
Report date <u>05/16/93</u>

TMA / EBERLINE
SANDIA NATIONAL LABS, 9303244

9303244-01

ER92004709-1

DATA SHEET

SDG <u>9303244</u>	Client <u>Sandia National Labs</u>
Contact <u>Shaun Bloom</u>	Contract <u>12-0841B</u>
Lab sample id <u>9303244-01</u>	Client sample id <u>ER92004709-1</u>
Dept sample id _____	Matrix <u>SOIL</u>
Received <u>03/22/93</u>	Collected/Amount <u>03/16/93 1230 GM</u>
X moisture <u>7.0</u>	Chain of custody id <u>6076</u>

PARAMETER	CAS NO	RESULT pci/g	2σ ERR (TOTAL)	MDA pci/g	RDL pci/g	QUALIFIERS	TEST
Plutonium 238	13981-16-3	0	0.006	0.013		U	PU
Plutonium 239/240	14119-33-6	0.006	0.010	0.004			PU
Uranium 233/234	13966-29-5	1.3	0.18	0.005		B	U
Uranium 235	15117-96-1	0.032	0.050	0.005			U
Uranium 238	7440-60-1	1.3	0.19	0.005		B	U
Thorium 230	14269-63-7	1.2	0.16	0.004			TH
Thorium 232	7440-29-1	1.0	0.15	0.009			TH
Tritium (pci/l)	10028-17-8	250	240	380		U	H3

Lab id <u>TMAE</u>
Protocol <u>Sandia SOU</u>
Version <u>12-0841B</u>
Form <u>DVD-DS</u>
Version <u>2.23</u>
Report date <u>05/16/93</u>

TMA / EBERLINE
SANDIA NATIONAL LABS, 9303244

9303244-02

ER92004291-1

DATA SHEET

SD6 <u>9303244</u>	Client <u>Sandia National Labs</u>
Contact <u>Shaun Bloom</u>	Contract <u>12-0841B</u>
Lab sample id <u>9303244-02</u>	Client sample id <u>ER92004291-1</u>
Dept sample id _____	Matrix <u>SOIL</u>
Received <u>03/22/93</u>	Collected/Amount <u>03/17/93 1360 GM</u>
% moisture <u>14.4</u>	Chain of custody id <u>6076</u>

PARAMETER	CAS NO	RESULT pCi/g	2σ ERR (TOTAL)	MDA pCi/g	NDL pCi/g	QUALIFIERS	TEST
Plutonium 238	13981-16-3	0	0.001	0.005		U	PU
Plutonium 239/240	14119-33-6	0.003	0.001	0.015		U	PU
Uranium 233/234	13966-29-5	1.8	0.22	0.011		B	U
Uranium 235	15117-96-1	0.058	0.030	0.011			U
Uranium 238	7440-60-1	1.4	0.18	0.005		B	U
Thorium 230	14269-63-7	1.1	0.16	0.010			TH
Thorium 232	7440-29-1	0.75	0.13	0.010			TH
Tritium (pCi/l)	10028-17-8	860	250	400		U	H3

Lab id <u>TMAE</u>
Protocol <u>Sandia SOW</u>
Version <u>12-0841B</u>
Form <u>DVD-DS</u>
Version <u>2.23</u>
Report date <u>05/16/93</u>

TMA/EBERLINE
SANDIA NATIONAL LABS, 9303244

Test PU Matrix SOIL
SDG 9303244
Contact Shaun Bloom

Client Sandia National Labs
Contract 12-0841B

LAB RESULT SUMMARY
PLUTONIUM IN SOIL/SED
ALPHA SPECTROSCOPY

LAB	SUF-		Plutonium	Plutonium	
SAMPLE ID	FIX	PLANCHET	CLIENT SAMPLE ID	238	239/240
Preparation batch		9303313	Prep error 0.0 %		
9303244-01			ER92004709-1	U	0.006
9303244-02			ER92004291-1	U	U
9303313-01			Replicate (9303284-03)	U	- U
9303313-02			Reagent Blank	U	U
9303313-03			Lab Control Sample	No data	ok
Nominal values and limits from method RDLs (pci/g)					

Lab id TMAE
Protocol Sandia SOW
Version 12-0841B
Form DVD-LRS
Version 2.23
Report date 05/16/93

TMA/EBERLINE
SANDIA NATIONAL LABS, 9303244

Test JH Matrix SOIL
SDG 9303244
Contact Shaun Bloom

Client Sandia National Labs
Contract 12-0841B

LAB RESULT SUMMARY
THORIUM IN SOIL/SED
ALPHA SPECTROSCOPY

LAB	SUF-			Thorium 230	Thorium 232
SAMPLE ID	FIX	PLANCHET	CLIENT SAMPLE ID		
Preparation batch	9303252		Prep error 0.0 %		
9303244-01			ER92004709-1	1.2	1.0
9303244-02			ER92004291-1	1.1	0.75
9303252-01			Replicate (9303244-02)	ok	ok
9303252-02			Reagent Blank	U	U
9303252-03			Lab Control Sample	ok	No data U

Nominal values and limits from method RDLs (pci/g)

Lab id TMAE
Protocol Sandia SON
Version 12-0841B
Form DVD-LRS
Version 2.23
Report date 05/16/93

TMA/EBERLINE
SANDIA NATIONAL LABS, 9303244

Client Sandia National Labs
Contract 12-0841B

Test U Matrix SOIL
SDG 9303244
Contact Shaun Bloom

LAB RESULT SUMMARY
URANIUM IN SOIL/SED
ALPHA SPECTROSCOPY

LAB SAMPLE ID	SUF- FIX PLANCHET	CLIENT SAMPLE ID	1: Uranium	2: Uranium	3: Uranium	RESULT RATIOS (%)				
			233/234	235	238	1+3	2+	2+3	2+	
Preparation batch 9303313		Prep error 0.0 %								
9303244-01		ER92004709-1	1.3	0.032	1.3	100	19	2	4	
9303244-02		ER92004291-1	1.8	0.058	1.4	129	22	4	2	
9303313-01		Replicate (9303244-02)	ok	ok	ok	114	23	4	3	
9303313-02		Reagent Blank	0.094	U	0.060	157	142	7	24	
9303313-03		Lab Control Sample	ok	HIGH	ok	97	25	10	4	
Nominal values and limits from method RDLs (pCi/g)						100			4	
						Averages 114			4	

Lab id TMAE
Protocol Sandia SON
Version 12-0841B
Form DVD-LRS
Version 2.23
Report date 05/16/93

TMA/EBERLINE

SANDIA NATIONAL LABS, 9303244

Test H3 Matrix SOIL
SDG 9303244
Contact Shaun Bloom

Client Sandia National Labs
Contract 12-0841B

LAB RESULT SUMMARY

TRITIUM IN SOIL
LIQUID SCINTILLATION

LAB	SUF-		Tritium	
SAMPLE ID	FIX	PLANCHET	CLIENT SAMPLE ID	(pCi/l)
Preparation batch	9303254		Prep error 6.5 %	
9303244-01			ER92004709-1	U
9303244-02			ER92004291-1	U
9303254-01			Replicate (9303254-02)	U
9303254-02			Reagent Blank	U
9303254-03			Lab Control Sample	ok

Nominal values and limits from method RDLs (pCi/l)

Lab id TMAE
Protocol Sandia SOW
Version 12-0841B
Form DVD-LRS
Version 2.23
Report date 05/16/93

TMA/EBERLINE
SANDIA NATIONAL LABS, 9303244

Test PU Matrix SOIL
SDG 9303244
Contact Sheun Bloom

Client Sandia National Labs
Contract 12-0841B

LAB METHOD SUMMARY
PLUTONIUM IN SOIL/SED
ALPHA SPECTROSCOPY

LAB	RAW	SUF-		MAX MDA	ALIQVOT	RESID	YIELD	COUNT	FWH	DAYS		ANAL-			
SAMPLE ID	TEST	FIX	PLANCHET	CLIENT SAMPLE ID	pci/g	Gram	mg	X	min	keV	HELD	PREPARED	YZED	DETECTOR	
Preparation batch 9303313			Prep error 0.0 %												
9303244-01				ER92004709-1	0.013	1.00		80	420	34	36	04/21/93	04/21	C1	
9303244-02				ER92004291-1	0.015	1.00		73	420	53	35	04/21/93	04/21	C2	
9303313-01				Replicate (9303284-03)	0.014	1.00		72	420	58	30	04/21/93	04/21	C6	
9303313-02				Reagent Blank	0.010	1.00		76	420	52		04/21/93	04/21	C7	
9303313-03				Lab Control Sample	0.010	1.00		76	420	70		04/21/93	04/21	C8	
Nominal values and limits from method						1.00	-	20-105	420	100					

PROCEDURES	REFERENCE	EPA-600 7-79-081
PRP-01S	Preparation of soil/sediment.	
PU-07S	Isotopic plutonium in soil	

AVERAGES ± 2 SD	MDA	0.012 ± 0.005
FOR 5 SAMPLES	YIELD	75 ± 6
	FWHM	53 ± 26

Lab id TMAE
Protocol Sandia SOW
Version 12-0841B
Form DVD-LHS
Version 2.23
Report date 05/16/93

TMA/EBERLINE
SANDIA NATIONAL LABS, 9303244

Client Sandia National Labs
Contract 12-0841B

Test TH Matrix SOIL
SDG 9303244
Contact Shaun Bloom

LAB METHOD SUMMARY
THORIUM IN SOIL/SED
ALPHA SPECTROSCOPY

LAB	RAW	SUF-		MAX MDA	ALIQ	RESID	YIELD	COUNT	FWHM	DAYS		ANAL-				
SAMPLE ID	TEST	FIX	PLANCHET	CLIENT	SAMPLE ID	pci/g	Gram	mg	X	min	keV	HELD	PREPARED	YZED	DETECTOR	
Preparation batch 9303252			Prep error 0.0 %													
9303244-01				ER92004709-1		0.009	1.00		80	420	38	40	04/25/93	04/25	A2	
9303244-02				ER92004291-1		0.010	1.00		75	420	32	39	04/25/93	04/25	A4	
9303252-01				Replicate (9303244-02)		0.006	1.00		51	420	29	39	04/25/93	04/25	A5	
9303252-02				Reagent Blank		0.023	1.00		60	420	32		04/25/93	04/25	A6	
9303252-03				Lab Control Sample		0.012	1.00		78	420	31		04/25/93	04/25	A7	

Nominal values and limits from method 1.00 - 30-105 420 100

PROCEDURES	REFERENCE	LANL Vol III ER 200 p1-9
PRP-01S	Preparation of soil/sediment.	
TH-07S	Isotopic thorium in soil.	

AVERAGES ± 2 SD	MDA	0.012 ± 0.013
FOR 5 SAMPLES	YIELD	69 ± 25
	FWHM	32 ± 6.7

Lab id TMAE
Protocol Sandia SOW
Version 12-0841B
Form DVD-LMS
Version 2.23
Report date 05/16/93

TMA/EBERLINE
SANDIA NATIONAL LABS, 9303244

Test U Matrix SOIL
SDG 9303244
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Client Sandia National Labs
Contract 12-0841B

LAB METHOD SUMMARY

URANIUM IN SOIL/SED
ALPHA SPECTROSCOPY

LAB	RAW	SUF-		MAX MDA	ALLOQUOT	RESID	YIELD	COUNT	FWHM	DAYS	ANAL-					
SAMPLE ID	TEST	FIX	PLANCHET	CLIENT	SAMPLE ID	pCi/g	Gran	mg	%	min	keV	HELD	PREPARED	YZED	DETECTOR	
Preparation batch 9303313			Prep error 0.0 %													
9303244-01				ER92004709-1		0.005	1.00		75	420	50	41	04/26/93	04/26	B4	
9303244-02				ER92004291-1		0.011	1.00		81	420	82	40	04/26/93	04/26	B6	
9303313-01				Replicate (9303244-02)		0.028	1.00		76	420	30	40	04/26/93	04/26	B7	
9303313-02				Reagent Blank		0.023	1.00		40	420	35		04/27/93	04/26	B6	
9303313-03				Lab Control Sample		0.11	1.00		20	420	73		04/27/93	04/26	B7	
Nominal values and limits from method						1.00	-	30-105	420	100						

PROCEDURES: REFERENCE HASL-300 27th Ed. 4.5 p252-255
PRP-01S Preparation of soil/sediment.
U-10S Isotopic uranium in soil.

AVERAGES ± 2 SD MDA 0.035 ± 0.085
FOR 5 SAMPLES YIELD 58 ± 54
FWHM 54 ± 46

Lab id TMAE
Protocol Sandia SOW
Version 12-0841B
Form DVD-LMS
Version 2.23
Report date 05/16/93

TMA/EBERLINE
SANDIA NATIONAL LABS, 9303244

Test H3 Matrix SOIL
SDG 9303244
Contact Shaun Bloom

Client Sandia National Labs
Contract 12-0841B

LAB METHOD SUMMARY
TRITIUM IN SOIL
LIQUID SCINTILLATION

LAB	RAW	SUF-		MDA	ALIQOT	RESID	YIELD	COUNT	FWHM	DAYS	ANAL-				
SAMPLE ID	TEST	FIX	PLANCHET	CLIENT SAMPLE ID	pCi/l	Liter	mg	%	min	keV	HELD	PREPARED	YZED	DETECTOR	
Preparation batch 9303254			Prep error 6.5 %												
9303244-01				ER92004709-1	380	0.0100		23	30		24	04/07/93	04/09	LSC	
9303244-02				ER92004291-1	400	0.0100		22	30		23	04/07/93	04/09	LSC	
9303254-01				Replicate (9303254-02)	380	0.0100		22	30			04/07/93	04/09	LSC	
9303254-02				Reagent Blank	370	0.0100		23	30			04/07/93	04/09	LSC	
9303254-03				Lab Control Sample	440	0.0100		23	30			04/07/93	04/09	LSC	
Nominal values and limits from method					0.0100	-	-		30						

PROCEDURES REFERENCE EPA-600 906.0
H-06S Tritium by distillation in soil

AVERAGES ± 2 SD MDA 390 ± 56
FOR 5 SAMPLES YIELD 23 ± 1
FWHM _____ ± _____

Lab id TMAE
Protocol Sandia SOM
Version 12-0841B
Form DVD-LMS
Version 2.23
Report date 05/16/93

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SANDIA NATIONAL LABS, 9303244

SDG 9303244
Contact Shaun Bloom

Client Sandia National Labs
Contract 12-0841B

REPORT GUIDE

SAMPLE SUMMARY

The Sample Summary Reports (variously titled LAB, SAMPLE, DEPARTMENT and QC SUMMARY to reflect the sort order) show all samples, including QC samples, reported in one Sample Delivery Group (SDG).

The following notes apply to this report:

- * LAB SAMPLE ID is the lab's primary identification for a sample.
- * DEPARTMENT SAMPLE ID is an alternate lab id, for example one assigned by a radiochemistry department in a lab.
- * CLIENT SAMPLE ID is the client's primary identification for a sample. It includes any sample preparation done by the client that is necessary to identify the sample.
- * QC BATCH is a lab assigned code that groups samples to be processed and QCed together. These samples should have similar matrices.

QC BATCH is not necessarily the same as SDG, which reflects samples received and reported together.
- * All Lab Control Samples, Reagent Blanks, Replicates and Matrix Spikes are shown that QC any of the samples. Due to possible reanalyses, not all results for all these QC samples may be relevant to the SDG. The Lab Control Sample, Reagent Blank, Replicate, Matrix Spike and Result Summary Reports detail these relationships.

Lab id TMAE
Protocol Sandia SOW
Version 12-0841B
Form DVD-RG
Version 2.23
Report date 05/16/93

SDG 9303244
Contact Shaun Bloom

REPORT GUIDE

Client Sandia National Labs
Contract 12-0841B

PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches in one Sample Delivery Group (SDG) with information necessary to check the completeness and consistency of the SDG.

The following notes apply to this report:

- * The preparation batches are shown in the same order as the Report and Method Summary Reports are printed.
- * Only analyses of planchets relevant to the SDG are counted.
- * Each preparation batch should have at least one Reagent Blank and LCS in it to validate other results.
- * The QUALIFIERS shown are all qualifiers other than U, J and B that occur on any analysis in the preparation batch. The Result Summary Report has these qualifiers on a per sample basis.

These qualifiers should be reviewed as follows:

- X Some data has been manually entered or modified. Transcription errors are possible.
- P One or more results are 'preliminary'. The data is not ready for final reporting.
- 2 There were two or more results for one parameter on one planchet imported at one time. The results in DVD may not be the same as on the raw data sheets.

Other lab defined qualifiers may occur. In general, these should be addressed in the SDG narrative.

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SDG 9303244
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Client Sandia National Labs
Contract 12-0841B

REPORT GUIDE

WORK SUMMARY

The Work Summary Report shows all samples, including QC samples, and all relevant analyses in one Sample Delivery Group (SDG).

The following notes apply to this report:

- * TEST is a code for the method used to measure related parameters. Results and related information for each parameter are on the Data Sheet Report. In special cases, a test code used in the summary data section is not the same as in associated raw data. In this case, both codes are shown on the Work Summary.
- * SUFFIX is the lab's code to distinguish multiple analyses (recounts, reworks, reanalyses) of a fraction of the sample. The suffix indicates which result is being reported. An empty suffix normally identifies the first attempt to analyze the sample.
- * The LAB SAMPLE ID, TEST and SUFFIX uniquely identify all supporting data for a result. The Method Summary Report for each TEST has method performance data, such as yield, for each lab sample id and suffix and procedures used in the method.
- * PLANCHET is an alternate lab identifier for work done for one test. It, combined with the TEST and SUFFIX, may be the best link to raw data.
- * For QC samples, only analyses that directly QC some regular sample are shown. The Lab Control Sample, Reagent Blank, Replicate, Matrix Spike and Result Summary Reports detail these relationships.

Lab id TMAE
Protocol Sandia SOV
Version 12-0841B
Form DVD-R6
Version 2.23
Report date 05/16/93

TMA/EBERLINE

SANDIA NATIONAL LABS, 9303244

SDG 9303244
Contact Shaun Bloom

REPORT GUIDE

Client Sandia National Labs
Contract 12-0841B

DATA SHEET

The Data Sheet Report shows all results and primary supporting information for one client sample or Reagent Blank. This report corresponds to both the CLP Inorganics and Organics Data Sheet.

The following notes apply to this report:

- * TEST is a code for the method used to measure a parameter. If the TEST is empty, no data is available; the parameter was not analyzed for.
- * The LAB SAMPLE ID and TEST uniquely identify work within the Summary Data Section of a Data Package. The Work Summary and Method Summary Reports further identify raw data that underlies this work.

The Method Summary Report for each TEST has method performance data, such as yield, for each Lab Sample ID and a list of procedures used in the method.
- * ERRORS can be labeled TOTAL or COUNT. TOTAL implies a preparation (non-counting method) error has been added (as sum of squares) to the counting error denoted by COUNT. The preparation errors, which may vary by preparation batch, are shown on the Method Summary Report.
- * A RESULT can be 'N.R.' (Not Reported). This means the lab did this work but chooses not to report it now, possibly because it was reported at another time.
- * When reporting a Reagent Blank a RESULT can be 'N.A.' (Not Applicable). This means there is no reported client sample work in the same preparation batch as the Blank's result. This is likely to occur when the Reagent Blank is associated with reanalyses of selected work for a few samples in the SDG.

The following qualifiers are defined by the DVD system:

- U The RESULT is less than the MDA (Minimum Detectable Activity). If the MDA is blank, the ERROR is used as the limit.

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SDG 9303244
Contact Shaun Bloom

GUIDE, cont.

Client Sandia National Labs
Contract 12-0841B

DATA SHEET

- J The RESULT is less than the RDL (Required Detection Limit) and no U qualifier is assigned.
- B Some Reagent Blank that QC's this sample had a non-U result and, after correcting for possibly different aliquots, that result is greater than or equal to the MDA for this sample.

For each sample result, all Reagent Blank results in the same preparation batch are compared. The Result Summary Report documents this and other QC relationships.
- L Some Lab Control Sample that QC's this sample had a low recovery. The lab can disable assignment of this qualifier.
- H Similar to 'L' except the recovery was high.
- P The RESULT is 'preliminary'.
- X Some data necessary to compute the RESULT, ERROR or MDA was manually entered or modified.
- 2 There were two or more results available for this parameter. The reported result may not be the same as in the raw data.

Other qualifiers are lab defined. Definitions should be in the SDG narrative.

The following values are underlined to indicate possible problems:

- * An MDA is underlined if it is bigger than its RDL.
- * An ERROR is underlined if the 2 sigma counting error is bigger than both the MDA and the RESULT, implying that the MDA may not be a good estimate of the 'real' minimum detectable activity.
- * A negative RESULT is underlined if it is less than the negative of its 2 sigma counting ERROR.

Lab id TMAE
Protocol Sandia SOW
Version 12-0841B
Form DVD-RG
Version 2.23
Report date 05/16/93

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SG 9303244
Contact Shaun Bloor

REPORT GUIDE

Client Sandia National Labs
Contract 12-0841B

LAB CONTROL SAMPLE

The Lab Control Sample Report shows all results, recoveries and primary supporting information for one Lab Control Sample.

The following notes apply to this report:

- * All fields in common with the Data Sheet Report have similar usage. Refer to its Report Guide for details.
- * Amounts ADDED are the lab's estimate of the actual amount spiked into this sample with their ERROR an estimate of the error of this amount.

An amount is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

- * REC (Recovery) is RESULT divided by ADDED expressed as a percent.
- * The first, computed limits for the recovery reflect:
 1. The error of RESULT, including that introduced by rounding the result prior to printing.

If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.
 2. The error of ADDED.
 3. A lab specified, per parameter bias. The bias changes the center of the computed limit range.
- * The second limits are protocol defined upper and lower QC limits for the recovery.
- * The recovery is underlined (out of spec) if it is outside either of these ranges.

REPLICATE

The Replicate Report shows all results, differences and primary supporting information for one Replicate and associated Original sample.

The following notes apply to this report:

- * All fields in common with the Data Sheet Report have similar usage. This applies both to the Replicate and Original sample data. Refer to the Data Sheet Report Guide for details.

If the Replicate has data for a TEST and the lab did not do this test to the Original, the Original's RESULTS are underlined.

- * The RPD (Relative Percent Difference) is the absolute value of the difference of the RESULTS divided by their average expressed as a percent.

If both RESULTS are less than their MDAs, no RPD is computed and a '-' is printed.

For a parameter, if the lab did work for both samples but has data for only one, the MDA from the sample with data is used as the other's result in the RPD.

- * The first, computed limit is the (quadratic) sum of the errors of the results divided by the average result as a percent, hence the relative error of the difference rather than the error of the relative difference. The errors including that introduced by rounding the RESULTS prior to printing.

If this limit is labeled TOT, it includes the preparation error in the RESULTS. If labeled CNT, it does not.

This value reported for this limit is at most 999.

- * The second limit for the RPD is the larger of:

1. A fixed percentage specified in the protocol.
2. A protocol factor (typically 2) times the average MDA as

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SANDIA NATIONAL LABS, 9303244

Sds 9303244
Contact Shaun Bloom

Client Sandia National Labs
Contract 12-0841B

GUIDE, cont.

REPLICATE

a percent of the average result. This limit applies when the results are close to the MDAs.

* The RPD is underlined (out of spec) if it is greater than either limit.

Lab id TMAE
Protocol Sandia SOW
Version 12-0841B
Form DVD-R6
Version 2.23
Report date 05/16/93

TMA/EBERLINE

SANDIA NATIONAL LABS, 9303244

SDG 9303244
Contact Shaun Bloom

REPORT GUIDE

Client Sandia National Labs
Contract 12-0841B

MATRIX SPIKE

The Matrix Spike Report shows all results, recoveries and primary supporting information for one Matrix Spike and associated Original sample.

The following notes apply to this report:

- * All fields in common with the Data Sheet Report have similar usage. This applies both to the Spiked and Original sample data. Refer to the Data Sheet Report Guide for details.

If the Spike has data for a TEST and the lab did not do this test to the Original, the Original's RESULTS are underlined.
- * Amounts ADDED are the lab's estimate of the actual amount spiked into the Spike sample with their ERROR an estimate of the error of this amount.

An amount is underlined if its ratio to the corresponding RDL is outside protocol specified limits.
- * REC (Recovery) is the Spike RESULT minus the Original RESULT divided by ADDED expressed as a percent.
- * The first, computed limits for the recovery reflect:
 1. The errors of the RESULTS, including that introduced by rounding them prior to printing.

If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.
 2. The error of ADDED.
 3. A lab specified, per parameter bias. The bias changes the center of the computed limit range.
- * The second limits are protocol defined upper and lower QC limits for the recovery.

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Client Sandia National Labs
Contract 12-0841B

GUIDE, cont.

MATRIX SPIKE

These limits are left blank if the Original RESULT is more than a protocol defined factor (typically 4) times ADDED. This is a way of accounting for that when the spike is small compared to the amount in the original sample, the recovery is unreliable.

* The recovery is underlined (out of spec) if it is outside either of these ranges.

Lab id TMAE
Protocol Sandia SOV
Version 12-0841B
Form DVD-RG
Version 2.23
Report date 05/16/93

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REPORT GUIDE

Client Sandia National Labs
Contract 12-0841B

RESULT SUMMARY

The Result Summary Report shows up to four results measured using one method. There is one report for each TEST, as used on the Data Sheet Report. The corresponding Method Summary Report has method performance data.

The following notes apply to this report:

- * Each per method report is subdivided into sections, one for each preparation batch. A preparation batch should be work done over a restricted period of time by a small group of people in a defined area of the lab.

There should be Lab Control Sample and Reagent Blank results in each preparation batch since this close correspondence makes the QC meaningful. Depending on Lab policy, Replicates need not occur in each batch since they QC sample dependencies such as matrix effects.

- * If a result is less than both its MDA and RDL, it is replaced by just 'U' on this report. If it is greater than or equal to the RDL but less than the MDA, the result is shown with a 'U' flag.

The J and X flags are as on the data sheet.

- * Non-U results for Reagent Blanks are underlined to indicate possible contamination of other samples in the preparation batch. The Reagent Blank Report has supporting data.
- * Lab Control Sample and Matrix Spike results are shown as: ok, No data, LOW or HIGH, with the last two underlined. 'No data' means no amount ADDED was specified. 'LOW' and 'HIGH' correspond to when the recovery is underlined on the Lab Control Sample or Matrix Spike Report. See it for supporting data.
- * Replicate sample results are shown as: ok, No data, or OUT, with the last two underlined. 'No data' means there was no original sample data found for this replicate. 'OUT' corresponds to when the RPD is underlined on the Replicate Report. See it for supporting data.

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Client Sandia National Labs
Contract 12-0841B

GUIDE, CONT.

RESULT SUMMARY

For some methods, ratios as percentages and error estimates for them are computed for pairs of results. A ratio column header like '1+3' means the ratio of the first result column and the third result column.

The error estimate for a ratio reflects the errors of RESULTS, including errors introduced by rounding the RESULTS prior to printing and the preparation error if one is shown for the preparation batch.

The preparation error is included once, not once for each result, since preparation errors for the results should be highly correlated.

The ratio is underlined (out of spec) if the absolute value of its difference from a nominal value is greater than its error estimate.

Average ratios are computed. These do not include ratios from Lab Control Sample, Reagent Blank or Matrix Spike results since their matrices are not necessarily similar to normal sample's.

For Gross Alpha or Gross Beta results, there may be a column showing the sum of other Alpha or Beta emitters. This sum includes all relevant results in the DVD database, whether reported or not. Results in the sum are weighted by a particles/decay value specified by the lab for each relevant parameter. Results less than their MDA are not included. No sums are computed for QC Samples since their various planchets may not be physically related.

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REPORT GUIDE

Client Sandia National Labs
Contract 12-0841B

METHOD SUMMARY

The Method Summary Report shows performance data for one method. There is one report for each TEST, as used on the Data Sheet Report.

The following notes apply to this report:

- * Each per method report is subdivided into sections, one for each preparation batch. A preparation batch should be work done over a restricted period of time by a small group of people in a defined area of the lab.

There should be Lab Control Sample and Reagent Blank results in each preparation batch since this close correspondence makes the QC meaningful. Depending on lab policy, Replicates need not occur in each batch since they QC sample dependencies such as matrix effects.

- * The RAW TEST column shows the test code used in the raw data to identify a particular analysis if it is different than the test code in the header of the report. This occurs in special cases due to method specific details about how the lab labels work.

The Lab Sample or Planchet ID combined with the (Raw) Test code and Suffix uniquely identify the raw data for each analysis.

- * If the MDA column is labeled 'MAX MDA', there was more than one result measured by the reported method and the MDA shown is the largest MDA. If not all these results have the same RDL, the MAX MDA reflects only those results with RDL equal to the smallest one.

MDAs are underlined if greater than the RDL; the smallest RDL if there is more than one.

- * Aliquots are underlined if less than a nominal value specified for the method.

- * Residues are underlined if outside a range specified for the method.

Lab id TMAE
Protocol Sandia SDW
Version 12-0841B
Form DVD-RG
Version 2.23
Report date 05/16/93

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SD6 9303244
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Client Sandia National Labs
Contract 12-0841B

GUIDE, cont.

METHOD SUMMARY

- * Yields, which may be a gravimetric yield, chemical recovery or detector efficiency depending on the method, are underlined if outside a range specified for the method.
- * Count times are underlined if less than a nominal value specified for the method.
- * Resolutions (as FWHM; Full Width at Half Max) are underlined if greater than a method specified limit.
- * Days Held are underlined if greater than a holding time specified in the protocol.
- * Analysis dates are underlined if before their sample's preparation date.

REPORT GUIDES
Page 14
SUMMARY DATA SECTION
Page 41

Lab id TMAE
Protocol Sandia SOW
Version 12-0841B
Form DVP-RG
Version 2.23
Report date 05/16/93

LC, DA Report

Sandia National Laboratories
Decision Amounts
SDG 9303244

Client ID	Lab ID	Analyte	Aliquot <i>gram</i>	Time <i>min</i>	Yield <i>frac</i>	Eff <i>overall</i>	Blank <i>cpm</i>	Lc <i>counts</i>	DA <i>pCi/g</i>
ER92004709-1	930324401	U-234	1	420	0.75	0.36	0.03	8	0.03
		U-235	1	420	0.75	0.36	0.00	2	0.01
		U-238	1	420	0.75	0.36	0.02	7	0.03
		Th-230	1	420	0.80	0.35	0.00	0	0.00
		Th-232	1	420	0.80	0.35	0.00	0	0.00
		Pu-238	1	420	0.80	0.42	0.00	0	0.00
		Pu-239	1	420	0.80	0.42	0.00	0	0.00
		H-3 (pCi/l)	0.01	30	1.00	0.23	5.20	29	194.21
ER92004291-1	930324402	U-234	1	420	0.81	0.36	0.03	8	0.03
		U-235	1	420	0.81	0.36	0.00	2	0.01
		U-238	1	420	0.81	0.36	0.02	7	0.02
		Th-230	1	420	0.75	0.34	0.00	0	0.00
		Th-232	1	420	0.75	0.34	0.00	0	0.00
		Pu-238	1	420	0.73	0.41	0.00	0	0.00
		Pu-239	1	420	0.73	0.41	0.00	0	0.00
		H-3 (pCi/l)	0.01	30	1.00	0.22	5.20	29	201.37

NTS Report

Addendum F

ADDENDUM F

**PLATES SHOWING THE STORM WATER DRAIN SYSTEM AND THE SANITARY
SEWER SYSTEM**

**The images in Addendum F are too large to scan.
They can be viewed in the hard copy document
in the Administrative Record at NMED Hazardous
Waste Bureau in Santa Fe or at Zimmerman
Library.**

Addendum G

ADDENDUM G

**SOLID WASTE MANAGEMENT UNIT 96—TA-I STORM DRAIN SYSTEM,
AUGUST/SEPTEMBER 1998 SUPPLEMENTAL INVESTIGATION—
FIELD REPORT(SNL/NM MARCH 2003).**

**Solid Waste Management Unit 96—TA-I Storm Drain System
August/September 1998 Supplemental Investigation—
Field Report March 2003**

Introduction

Additional soil sampling was determined to be necessary for several Solid Waste Management Unit (SWMU) 96 outfall locations in and around Technical Area (TA)-I at Sandia National Laboratories, New Mexico (SNL/NM). The necessity of further sampling was based on:

- The results of the original RCRA Facility Investigation (RFI) surface soil sampling (SNL/NM May 1997),
- Written response from the New Mexico Environment Department (NMED)/ Hazardous and Radioactive Materials Bureau (HRMB) in the form of Technical Comments on the SNL SWMUs 96 Proposal for NFA (NMED March 1998 and SNL/NM June 1998).
- Discussions in meetings with personnel from NMED/HRMB, and
- Impending construction activities (by SNL/NM Facilities) within or near SWMU 96 outfall areas.

Five outfall areas associated with the storm drain system at TA-I (Figure 1) required further investigations before construction activities could begin. During the original field investigation conducted in the summer of 1995, five surface soil samples were collected at each outfall location (SNL/NM May 1997). The Supplemental Investigation required collecting soil samples both vertically and horizontally from the original sample locations at the five outfall areas (Figures 2 through 6). The field investigation was started on August 15, 1998 and completed September 8, 1998. This field report is limited to describing activities associated with the collection of samples. The analytical results and significance of these results are not discussed in the report but instead will be presented in the Response to NMED's Technical Comments (NMED March 1998) that is currently being prepared.

Investigation

The drilling program was conducted with a truck mounted Geoprobe™ drill rig. A total of twenty-five boreholes (TI096-GP-060 through TI096-GP-084) were drilled, five boreholes at each outfall location (Figure 2 through 6). Table 1 identifies borehole numbers associated with each outfall, and Table 2 summarizes the samples collected by Analysis Request—Chain of Custody (ARCOC) number.

Sample specifications are provided in Table 3, including sample identification, date, time, sample depth, and analyses requested. Duplicate samples were collected at soil borehole numbers TI096-GP-085 through TI096-GP-089.

The placement of the boreholes for the supplemental investigation was based on the original 1995 RFI surface sample locations (SNL/NM May 1997). Three boreholes (at each outfall location) coincided with the three original (1995) surface sample locations closest to the outfalls. The two remaining boreholes were drilled 20 to 30 feet downgradient (one upgradient) from the first three boreholes (Figures 2 through 6).

Soil samples were collected using the Geoprobe® rig equipped with a 2.5-inch outside diameter by 24-inch long core sampler, which was lined with a cellulose butyrate (CAB) sleeve. Samples were collected approximately every 5 feet bgs to a maximum depth of 20 feet. Upon removal of the CAB sleeve from the core sampler, one 6-inch section was cut from the sleeve. This section was sealed and prepared for shipment to the off-site laboratory for VOC analysis. The remaining soil was thoroughly mixed, placed in appropriate containers, and prepared for shipment to the off-site laboratory for SVOC, Target Analyte List (TAL) metal, PCBs, isotopic uranium, isotopic plutonium, and tritium analyses. An additional container of soil was sent to the on-site Radiation Protection Sample Diagnostics (RPSD) laboratory for gamma

Table 1. August/September 1998 Supplemental Investigation Borehole Summary

Outfall Locations	Borehole Numbers
East of T-City (near the NE corner of 14 th Street and Harding Blvd.	TI096-GP-060 TI096-GP-061 TI096-GP-062 TI096-GP-063 TI096-GP-064
NW corner of M and 14 th Streets	TI096-GP-065 TI096-GP-066 TI096-GP-067 TI096-GP-068 TI096-GP-069
SE corner of 9 th Street and Harding Blvd.	TI096-GP-070 TI096-GP-071 TI096-GP-072 TI096-GP-073 TI096-GP-074
NW corner of 20 th Street and Harding Blvd.	TI096-GP-075 TI096-GP-076 TI096-GP-077 TI096-GP-078 TI096-GP-079
SW of Building 897	TI096-GP-080 TI096-GP-081 TI096-GP-082 TI096-GP-083 TI096-GP-084

Table 2. August/September 1998 SWMU 96 Supplemental Investigation Sampling Summary

ARCOC Number	Laboratory	Ship Date	Number of Samples	Analytes
600829	GEL	17 SEP 98	6	Iso-U/Pu
			6	PCBs
			6	SVOCs
			6	TAL Metals
			6	Tritium
			6	VOCs
			1	VOCs (TB)
600830	GEL	17 SEP 98	14	Iso-U/Pu
			14	PCBs
			14	SVOCs
			14	TAL Metals
			14	Tritium
			14	VOCs
			1	VOCs (TB)

Table 2. August/September 1998 SWMU 96 Supplemental Investigation Sampling Summary

ARCO Number	Laboratory	Ship Date	Number of Samples	Analytes
600831	GEL	19 SEP 98	12	Iso-U/Pu
			12	PCBs
			12	SVOCs
			12	TAL Metals
			12	Tritium
			12	VOCs
			1	Iso-U/Pu (EB)
			1	PCBs (EB)
			1	SVOCs (EB)
			1	TAL Metals (EB)
			1	Tritium (EB)
1	VOCs (EB)			
1	VOCs (TB)			
600832	GEL	22 SEP 98	10	Iso-U/Pu
			10	PCBs
			10	SVOCs
			10	TAL Metals
			10	Tritium
			10	VOCs
			0	VOCs (TB)
600833	RPSD	16 SEP 98	20	Gamma Spec
600838	GEL	8 OCT 98	17	Iso-U/Pu
			17	PCBs
			17	SVOCs
			17	TAL Metals
			17	Tritium
			17	VOCs
			1	Iso-U/Pu (EB)
			1	PCBs (EB)
			1	SVOCs (EB)
			1	TAL Metals (EB)
			1	Tritium (EB)
1	VOCs (EB)			
1	VOCs (TB)			
600840	GEL	8 OCT 98	5	Iso-U/Pu
			5	PCBs
			5	SVOCs
			5	TAL Metals
			5	Tritium
			5	VOCs
			1	Iso-U/Pu (EB)
			1	PCBs (EB)
			1	SVOCs (EB)
			1	TAL Metals (EB)
			1	Tritium (EB)
1	VOCs (EB)			
1	VOCs (TB)			

Table 2. August/September 1998 SWMU 96 Supplemental Investigation Sampling Summary

ARCOC Number	Laboratory	Ship Date	Number of Samples	Analytes
600841	RPSD	21 SEP 98	23 1	Gamma Spec Gamma Spec (EB)
600842	GEL	30 SEP 98	12 12 12 12 12 12 1	Iso-U/Pu PCBs SVOCs TAL Metals Tritium VOCs VOCs (TB)
600843	GEL	02 OCT 98	6 6 6 6 6 6 1	Iso-U/Pu PCBs SVOCs TAL Metals Tritium VOCs VOCs (TB)
600844	RPSD	02 OCT 98	20	Gamma Spec
600845	GEL	02 OCT 98	14 14 14 14 14 14 1	Iso-U/Pu PCBs SVOCs TAL Metals Tritium VOCs VOCs (TB)
600846	GEL	05 OCT 98	10 10 10 10 10 10 1	Iso-U/Pu PCBs SVOCs TAL Metals Tritium VOCs VOCs (TB)
600852	RPSD	07 OCT 98	22 2	Gamma Spec Gamma Spec (EB)
601040	RPSD	08 OCT 98	6 1	Gamma Spec Gamma Spec (EB)
601096	GEL	09 OCT 98	6 6 6 6 6 6 6 1 1 1 1 1 1 1 1	Iso-U/Pu PCBs SVOCs TAL Metals Tritium VOCs VOCs (TB) Iso-U/Pu (EB) PCBs (EB) SVOCs (EB) TAL Metals (EB) Tritium (EB) VOCs (EB) VOCs (TB)

Notes:

ARCOC = Analysis Request and Chain of Custody.
 EB = Equipment blank.

GEL	=	General Engineering Laboratories (Charleston, SC).
Iso-U/Pu	=	Isotopic uranium and plutonium.
PCBs	=	Polychlorinated biphenyls.
RPSD	=	Radiation Protection Sample Diagnostics.
SVOCs	=	Semivolatile organic compounds.
TAL	=	Target Analyte List.
TB	=	Trip blank.
VOCs	=	Volatile organic compounds.

spectroscopy analyses. Usually two sampling stabs with the Geoprobe® were required to collect enough soil for these analyses. One hundred and thirteen samples were collected (including duplicates) and sent to GEL laboratory for VOC, SVOC, TAL metal, PCB, isotopic uranium and plutonium, and tritium analyses (Table 3). Ninety-one samples were sent to the SNL/NM RPSD laboratory for gamma spectroscopy analyses (Table 3).

After the samples were collected, Environmental Geographic Information System (EGIS) personnel surveyed the soil borehole locations with a global positioning system (GPS). The GPS data include northing and easting coordinates for each borehole, whereas elevations were estimated from topographic coverage (electronic data) in EGIS.

Three types of field QC samples were shipped for analysis: field duplicates, equipment rinsate blanks and trip blanks (Table 3). Additional soils were collected for matrix spike/matrix spike duplicate analyses by the analytical laboratory. The five field duplicate samples collected were analyzed for the same parameters as their corresponding samples. The samples were collected by drilling approximately 2 feet away from the corresponding sample location and the same depth interval was sampled. Four equipment rinsate blank samples were collected by pouring de-ionized water over the decontaminated sampling equipment. For each shipment that contained VOC analytical samples, a trip blank sample was also submitted. For this supplemental investigation, eight trip blanks accompanied the sample containers to the field and back to the laboratory.

Soil samples sent to GEL Laboratory were analyzed by the following approved EPA methods: Method 8260 for VOCs, Method 8070 for SVOCs, Method 8080 for PCBs, Method 6010 for metals, and Method 7471 for mercury. For the radionuclide samples, GEL used EPIA-011 for isotopic uranium, EPIA-012 for isotopic plutonium, and EPA 906.0 for tritium. In addition, the gamma spectroscopy were analyzed by SLN/NM approved analytical procedures by the on-site laboratory.

References

New Mexico Environment Department (NMED), March 1998. NMED Technical Comments: SNL SWMUs 96, 187, 226; Proposals for NFA, 7th Round, May 1997." Letter from Robert S. Dinwiddie, NMED to Michael Zamorski, U.S. Department of Energy Albuquerque Operations Office, Santa Fe, New Mexico. March 17, 1998

Sandia National Laboratories/New Mexico (SNL/NM), May 1997. "Proposal for Risk-Based No Further Action Environmental Restoration Site 96, Storm Drain System, Operable Unit 1302" Environmental Restoration Project, Sandia National Laboratories, New Mexico. May 1997.

Sandia National Laboratories/New Mexico (SNL/NM), June 1998. "Environmental Restoration Project Responses to NMED Technical Comments on No Further Action Proposals Dated May 1997." Environmental Restoration Project, Sandia National Laboratories, New Mexico. June 1998.

TABLE 3. August/September 1998 SWMU 96 Supplemental Investigation Sample Specifications

SWMU 96					ON-SITE LAB ANALYSES	OFF-SITE LAB ANALYSES						
ARCO/SMO Sample Number	DATE/TIME Date and Time the sample was collected	ER SAMPLE ID See Figures for Locations (Coordinates available through EGIS) T1096-	Sample Type	Sample Depth (ft)	GAMMA SPEC	VOCs (9240)	SVOCs (9270)	TAL METALS	PCB	ISOTOPIC URANIUM	ISOTOPIC PLUTONIUM	TRITIUM
600829/ 042775-001	9/15/98-0950	GP-060-005-S	Soil	3		X						
600829/ 042775-002	9/15/98-0950	GP-060-005-S	Soil	3			X	X	X	X	X	
600829/ 042775-003	9/15/98-0950	GP-060-005-S	Soil	3								X
600829/ 042776-001	9/15/98-1032	GP-060-010-S	Soil	8		X						
600829/ 042776-002	9/15/98-1032	GP-060-010-S	Soil	8			X	X	X	X	X	
600829/ 042776-003	9/15/98-1032	GP-060-010-S	Soil	8								X
600829/ 042779-001	9/15/98-1050	GP-061-005-S	Soil	3		X						
600829/ 042779-002	9/15/98-1050	GP-061-005-S	Soil	3			X	X	X	X	X	
600829/ 042779-003	9/15/98-1050	GP-061-005-S	Soil	3								X
600829/ 042780-001	9/15/98-1109	GP-061-010-S	Soil	8		X						
600829/ 042780-002	9/15/98-1109	GP-061-010-S	Soil	8			X	X	X	X	X	
600829/ 042780-003	9/15/98-1109	GP-061-010-S	Soil	8								X
600829/ 042781-001	9/15/98-1140	GP-061-015-S	Soil	13		X						
600829/ 042781-002	9/15/98-1140	GP-061-015-S	Soil	13			X	X	X	X	X	
600829/ 042781-003	9/15/98-1140	GP-061-015-S	Soil	13								X
600829/ 042782-001	9/15/98-1224	GP-061-020-S	Soil	18		X						
600829/ 042782-002	9/15/98-1224	GP-061-020-S	Soil	18			X	X	X	X	X	
600829/ 042782-003	9/15/98-1224	GP-061-020-S	Soil	18								X
600830/ 042783-001	9/15/98-1421	GP-062-005-S	Soil	3		X						
600830/ 042783-002	9/15/98-1421	GP-062-005-S	Soil	3			X	X	X	X	X	
600830/ 042783-003	9/15/98-1421	GP-062-005-S	Soil	3								X
600830/ 042784-001	9/15/98-1423	GP-062-010-S	Soil	8		X						
600830/ 042784-002	9/15/98-1423	GP-062-010-S	Soil	8			X	X	X	X	X	
600830/ 042784-003	9/15/98-1423	GP-062-010-S	Soil	8								X
600830/ 042785-001	9/15/98-1434	GP-062-015-S	Soil	13		X						
600830/ 042785-002	9/15/98-1434	GP-062-015-S	Soil	13			X	X	X	X	X	
600830/ 042785-003	9/15/98-1434	GP-062-015-S	Soil	13								X
600830/ 042786-001	9/15/98-1519	GP-062-020-S	Soil	18		X						
600830/ 042786-002	9/15/98-1519	GP-062-020-S	Soil	18			X	X	X	X	X	
600830/ 042786-003	9/15/98-1519	GP-062-020-S	Soil	18								X
600830/ 042787-001	9/16/98-0902	GP-063-001-S	Soil	0		X						
600830/ 042787-002	9/16/98-0902	GP-063-001-S	Soil	0			X	X	X	X	X	
600830/ 042787-003	9/16/98-0902	GP-063-001-S	Soil	0								X
600830/ 042788-001	9/16/98-0940	GP-063-005-S	Soil	3		X						
600830/ 042788-002	9/16/98-0940	GP-063-005-S	Soil	3			X	X	X	X	X	
600830/ 042788-003	9/16/98-0940	GP-063-005-S	Soil	3								X
600830/ 042789-001	9/16/98-0947	GP-063-010-S	Soil	8		X						
600830/ 042789-002	9/16/98-0947	GP-063-010-S	Soil	8			X	X	X	X	X	
600830/ 042789-003	9/16/98-0947	GP-063-010-S	Soil	8								X

TABLE 3. August/September 1998 SWMU 96 Supplemental Investigation Sample Specifications

SWMU 96					ON-SITE LAB ANALYSES	OFF-SITE LAB ANALYSES						
ARCO/SMO Sample Number	DATE/TIME Date and Time the sample was collected	ER SAMPLE ID See Figures for Locations (Coordinates available through EGIS) T1096-	Sample Type	Sample Depth (ft)	GAMMA SPEC	VOCs (8240)	SVOCs (8270)	TAL METALS	PCB	ISOTOPIC URANIUM	ISOTOPIC PLUTONIUM	TRITIUM
600830/042790-001	9/16/98-1015	GP-063-015-S	Soil	13		X						
600830/042790-002	9/16/98-1015	GP-063-015-S	Soil	13			X	X	X	X	X	
600830/042790-003	9/16/98-1015	GP-063-015-S	Soil	13								X
600830/042791-001	9/16/98-1105	GP-063-020-S	Soil	18		X						
600830/042791-002	9/16/98-1105	GP-063-020-S	Soil	18			X	X	X	X	X	
600830/042791-003	9/16/98-1105	GP-063-020-S	Soil	18								X
600830/042792-001	9/16/98-1130	GP-064-001-S	Soil	0		X						
600830/042792-002	9/16/98-1130	GP-064-001-S	Soil	0			X	X	X	X	X	
600830/042792-003	9/16/98-1130	GP-064-001-S	Soil	0								X
600830/042793-001	9/16/98-1320	GP-064-005-S	Soil	3		X						
600830/042793-002	9/16/98-1320	GP-064-005-S	Soil	3			X	X	X	X	X	
600830/042793-003	9/16/98-1320	GP-064-005-S	Soil	3								X
600830/042794-001	9/16/98-1337	GP-064-010-S	Soil	8		X						
600830/042794-002	9/16/98-1337	GP-064-010-S	Soil	8			X	X	X	X	X	
600830/042794-003	9/16/98-1337	GP-064-010-S	Soil	8								X
600830/042797-001	9/16/98-1354	GP-064-015-S	Soil	13		X						
600830/042797-002	9/16/98-1354	GP-064-015-S	Soil	13			X	X	X	X	X	
600830/042797-003	9/16/98-1354	GP-064-015-S	Soil	13								X
600830/042798-001	9/16/98-1430	GP-064-020-S	Soil	18		X						
600830/042798-002	9/16/98-1430	GP-064-020-S	Soil	18			X	X	X	X	X	
600830/042798-003	9/16/98-1430	GP-064-020-S	Soil	18								X
600831/042799-001	9/17/98-1037	GP-065-005-S	Soil	3		X						
600831/042799-002	9/17/98-1037	GP-065-005-S	Soil	3			X	X	X	X	X	
600831/042799-003	9/17/98-1037	GP-065-005-S	Soil	3								X
600831/042800-001	9/17/98-1054	GP-065-010-S	Soil	8		X						
600831/042800-002	9/17/98-1054	GP-065-010-S	Soil	8			X	X	X	X	X	
600831/042800-003	9/17/98-1054	GP-065-010-S	Soil	8								X
600831/042801-001	9/17/98-1115	GP-065-015-S	Soil	13		X						
600831/042801-002	9/17/98-1115	GP-065-015-S	Soil	13			X	X	X	X	X	
600831/042801-003	9/17/98-1115	GP-065-015-S	Soil	13								X
600831/042802-001	9/17/98-1143	GP-065-020-S	Soil	18		X						
600831/042802-002	9/17/98-1143	GP-065-020-S	Soil	18			X	X	X	X	X	
600831/042802-003	9/17/98-1143	GP-065-020-S	Soil	18								X
600831/042803-001	9/18/98-0935	GP-066-005-S	Soil	3		X						
600831/042803-002	9/18/98-0935	GP-066-005-S	Soil	3			X	X	X	X	X	
600831/042803-003	9/18/98-0935	GP-066-005-S	Soil	3								X
600831/042804-001	9/18/98-0945	GP-066-010-S	Soil	8		X						
600831/042804-002	9/18/98-0945	GP-066-010-S	Soil	8			X	X	X	X	X	
600831/042804-003	9/18/98-0945	GP-066-010-S	Soil	8								X

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SWMU 96					ON-SITE LAB ANALYSES	OFF-SITE LAB ANALYSES						
ARCOC/SMO Sample Number	DATE/TIME Date and Time the sample was collected	ER SAMPLE ID See Figures for Locations (Coordinates available through EGIS) T1096-	Sample Type	Sample Depth (ft)	GAMMA SPEC	VOCs (8240)	SVOCs (8270)	TAL METALS	PCB	ISOTOPIC URANIUM	ISOTOPIC PLUTONIUM	TRITIUM
600831/042805-001	9/18/98-0952	GP-066-015-S	Soil	13		X						
600831/042805-002	9/18/98-0952	GP-066-015-S	Soil	13			X	X	X	X	X	
600831/042805-003	9/18/98-0952	GP-066-015-S	Soil	13								X
600831/042806-001	9/18/98-1013	GP-066-020-S	Soil	18		X						
600831/042806-002	9/18/98-1013	GP-066-020-S	Soil	18			X	X	X	X	X	
600831/042806-003	9/18/98-1013	GP-066-020-S	Soil	18								X
600831/042807-001	9/18/98-1110	GP-067-005-S	Soil	3		X						
600831/042807-002	9/18/98-1110	GP-067-005-S	Soil	3			X	X	X	X	X	
600831/042807-003	9/18/98-1110	GP-067-005-S	Soil	3								X
600831/042808-001	9/18/98-1118	GP-067-010-S	Soil	8		X						
600831/042808-002	9/18/98-1118	GP-067-010-S	Soil	8			X	X	X	X	X	
600831/042808-003	9/18/98-1118	GP-067-010-S	Soil	8								X
600831/042809-001	9/18/98-1125	GP-067-015-S	Soil	13		X						
600831/042809-002	9/18/98-1125	GP-067-015-S	Soil	13			X	X	X	X	X	
600831/042809-003	9/18/98-1125	GP-067-015-S	Soil	13								X
600831/042810-001	9/18/98-1148	GP-067-020-S	Soil	18		X						
600831/042810-002	9/18/98-1148	GP-067-020-S	Soil	18			X	X	X	X	X	
600831/042810-003	9/18/98-1148	GP-067-020-S	Soil	18								X
600832/042811-001	9/21/98-0850	GP-068-001-S	Soil	0		X						
600832/042811-002	9/21/98-0850	GP-068-001-S	Soil	0			X	X	X	X	X	
600832/042811-003	9/21/98-0850	GP-068-001-S	Soil	0								X
600832/042812-001	9/21/98-0921	GP-068-005-S	Soil	3		X						
600832/042812-002	9/21/98-0921	GP-068-005-S	Soil	3			X	X	X	X	X	
600832/042812-003	9/21/98-0921	GP-068-005-S	Soil	3								X
600832/042813-001	9/21/98-0928	GP-068-010-S	Soil	8		X						
600832/042813-002	9/21/98-0928	GP-068-010-S	Soil	8			X	X	X	X	X	
600832/042813-003	9/21/98-0928	GP-068-010-S	Soil	8								X
600832/042814-001	9/21/98-0940	GP-068-015-S	Soil	13		X						
600832/042814-002	9/21/98-0940	GP-068-015-S	Soil	13			X	X	X	X	X	
600832/042814-003	9/21/98-0940	GP-068-015-S	Soil	13								X
600832/042815-001	9/21/98-0950	GP-068-020-S	Soil	18		X						
600832/042815-002	9/21/98-0950	GP-068-020-S	Soil	18			X	X	X	X	X	
600832/042815-003	9/21/98-0950	GP-068-020-S	Soil	18								X
600832/042816-001	9/21/98-1054	GP-069-001-S	Soil	0		X						
600832/042816-002	9/21/98-1054	GP-069-001-S	Soil	0			X	X	X	X	X	
600832/042816-003	9/21/98-1054	GP-069-001-S	Soil	0								X
600832/042817-001	9/21/98-1107	GP-069-005-S	Soil	3		X						
600832/042817-002	9/21/98-1107	GP-069-005-S	Soil	3			X	X	X	X	X	
600832/042817-003	9/21/98-1107	GP-069-005-S	Soil	3								X

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600832/042818-001	9/21/98-1113	GP-069-010-S	Soil	8		X						
600832/042818-002	9/21/98-1113	GP-069-010-S	Soil	8			X	X	X	X	X	
600832/042818-003	9/21/98-1113	GP-069-010-S	Soil	8								X
600832/042819-001	9/21/98-1121	GP-069-015-S	Soil	13		X						
600832/042819-002	9/21/98-1121	GP-069-015-S	Soil	13			X	X	X	X	X	
600832/042819-003	9/21/98-1121	GP-069-015-S	Soil	13								X
600832/042820-001	9/21/98-1140	GP-069-020-S	Soil	18		X						
600832/042820-002	9/21/98-1140	GP-069-020-S	Soil	18			X	X	X	X	X	
600832/042820-003	9/21/98-1140	GP-069-020-S	Soil	18								X
600833/042775-004	9/15/98-0950	GP-060-005-S	Soil	3	X							
600833/042776-004	9/15/98-1032	GP-060-010-S	Soil	8	X							
600833/042779-004	9/15/98-1050	GP-061-005-S	Soil	3	X							
600833/042780-004	9/15/98-1109	GP-061-010-S	Soil	8	X							
600833/042781-004	9/15/98-1140	GP-061-015-S	Soil	13	X							
600833/042782-004	9/15/98-1224	GP-061-020-S	Soil	18	X							
600833/042783-004	9/15/98-1421	GP-062-005-S	Soil	3	X							
600833/042784-004	9/15/98-1423	GP-062-010-S	Soil	8	X							
600833/042785-004	9/15/98-1434	GP-062-015-S	Soil	13	X							
600833/042786-004	9/15/98-1519	GP-062-020-S	Soil	18	X							
600833/042787-004	9/16/98-0902	GP-063-001-S	Soil	0	X							
600833/042788-004	9/16/98-0940	GP-063-005-S	Soil	3	X							
600833/042789-004	9/16/98-0947	GP-063-010-S	Soil	8	X							
600833/042790-004	9/16/98-1015	GP-063-015-S	Soil	13	X							
600833/042791-004	9/16/98-1105	GP-063-020-S	Soil	18	X							
600833/042792-004	9/16/98-1130	GP-064-001-S	Soil	0	X							
600833/042793-004	9/16/98-1320	GP-064-005-S	Soil	3	X							
600833/042794-004	9/16/98-1337	GP-064-010-S	Soil	8	X							
600833/042797-004	9/16/98-1354	GP-064-015-S	Soil	13	X							
600833/042798-004	9/16/98-1430	GP-064-020-S	Soil	18	X							
600838/042837-001	10/5/98-0934	GP-080-005-S	Soil	3		X						
600838/042837-002	10/5/98-0934	GP-080-005-S	Soil	3			X	X	X	X	X	
600838/042837-003	10/5/98-0934	GP-080-005-S	Soil	3								X
600838/042838-001	10/5/98-0937	GP-080-010-S	Soil	8		X						
600838/042838-002	10/5/98-0937	GP-080-010-S	Soil	8			X	X	X	X	X	
600838/042838-003	10/5/98-0937	GP-080-010-S	Soil	8								X
600838/042839-001	10/5/98-1011	GP-080-015-S	Soil	13		X						
600838/042839-002	10/5/98-1011	GP-080-015-S	Soil	13			X	X	X	X	X	
600838/042839-003	10/5/98-1011	GP-080-015-S	Soil	13								X
600838/042840-001	10/5/98-1020	GP-080-020-S	Soil	18		X						

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600838/ 042840-002	10/5/98-1020	GP-080-020-S	Soil	18			X	X	X	X	X	
600838/ 042840-003	10/5/98-1020	GP-080-020-S	Soil	18								X
600838/ 042841-001	10/5/98-1105	GP-081-005-S	Soil	3		X						
600838/ 042841-002	10/5/98-1105	GP-081-005-S	Soil	3			X	X	X	X	X	
600838/ 042841-003	10/5/98-1105	GP-081-005-S	Soil	3								X
600838/ 042842-001	10/5/98-1110	GP-081-010-S	Soil	8		X						
600838/ 042842-002	10/5/98-1110	GP-081-010-S	Soil	8			X	X	X	X	X	
600838/ 042842-003	10/5/98-1110	GP-081-010-S	Soil	8								X
600838/ 042843-001	10/5/98-1127	GP-081-015-S	Soil	13		X						
600838/ 042843-002	10/5/98-1127	GP-081-015-S	Soil	13			X	X	X	X	X	
600838/ 042843-003	10/5/98-1127	GP-081-015-S	Soil	13								X
600838/ 042844-001	10/5/98-1149	GP-081-020-S	Soil	18		X						
600838/ 042844-002	10/5/98-1149	GP-081-020-S	Soil	18			X	X	X	X	X	
600838/ 042844-003	10/5/98-1149	GP-081-020-S	Soil	18								X
600838/ 042845-001	10/7/98-0906	GP-082-005-S	Soil	3		X						
600838/ 042845-002	10/7/98-0906	GP-082-005-S	Soil	3			X	X	X	X	X	
600838/ 042845-003	10/7/98-0906	GP-082-005-S	Soil	3								X
600838/ 042846-001	10/7/98-0911	GP-082-010-S	Soil	8		X						
600838/ 042846-002	10/7/98-0911	GP-082-010-S	Soil	8			X	X	X	X	X	
600838/ 042846-003	10/7/98-0911	GP-082-010-S	Soil	8								X
600838/ 042847-001	10/7/98-0925	GP-082-015-S	Soil	13		X						
600838/ 042847-002	10/7/98-0925	GP-082-015-S	Soil	13			X	X	X	X	X	
600838/ 042847-003	10/7/98-0925	GP-082-015-S	Soil	13								X
600838/ 042848-001	10/7/98-0933	GP-082-020-S	Soil	18		X						
600838/ 042848-002	10/7/98-0933	GP-082-020-S	Soil	18			X	X	X	X	X	
600838/ 042848-003	10/7/98-0933	GP-082-020-S	Soil	18								X
600838/ 042849-001	10/7/98-0959	GP-083-001-S	Soil	0		X						
600838/ 042849-002	10/7/98-0959	GP-083-001-S	Soil	0			X	X	X	X	X	
600838/ 042849-003	10/7/98-0959	GP-083-001-S	Soil	0								X
600838/ 042850-001	10/7/98-1027	GP-083-005-S	Soil	3		X						
600838/ 042850-002	10/7/98-1027	GP-083-005-S	Soil	3			X	X	X	X	X	
600838/ 042850-003	10/7/98-1027	GP-083-005-S	Soil	3								X
600838/ 042851-001	10/7/98-1031	GP-083-010-S	Soil	8		X						
600838/ 042851-002	10/7/98-1031	GP-083-010-S	Soil	8			X	X	X	X	X	
600838/ 042851-003	10/7/98-1031	GP-083-010-S	Soil	8								X
600838/ 042852-001	10/7/98-1036	GP-083-015-S	Soil	13		X						
600838/ 042852-002	10/7/98-1036	GP-083-015-S	Soil	13			X	X	X	X	X	
600838/ 042852-003	10/7/98-1036	GP-083-015-S	Soil	13								X
600838/ 042853-001	10/7/98-1055	GP-083-020-S	Soil	18		X						

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600838/042853-002	10/7/98-1055	GP-083-020-S	Soil	18			X	X	X	X	X	
600838/042853-003	10/7/98-1055	GP-083-020-S	Soil	18								X
600840/042854-001	10/7/98-0959	GP-084-001-S	Soil	0		X						
600840/042854-002	10/7/98-0959	GP-084-001-S	Soil	0			X	X	X	X	X	
600840/042854-003	10/7/98-0959	GP-084-001-S	Soil	0								X
600840/042855-001	10/7/98-1135	GP-084-005-S	Soil	3		X						
600840/042855-002	10/7/98-1135	GP-084-005-S	Soil	3			X	X	X	X	X	
600840/042855-003	10/7/98-1135	GP-084-005-S	Soil	3								X
600840/042856-001	10/7/98-1138	GP-084-010-S	Soil	8		X						
600840/042856-002	10/7/98-1138	GP-084-010-S	Soil	8			X	X	X	X	X	
600840/042856-003	10/7/98-1138	GP-084-010-S	Soil	8								X
600840/042857-001	10/7/98-1153	GP-084-015-S	Soil	13		X						
600840/042857-002	10/7/98-1153	GP-084-015-S	Soil	13			X	X	X	X	X	
600840/042857-003	10/7/98-1153	GP-084-015-S	Soil	13								X
600840/042858-001	10/7/98-1201	GP-084-020-S	Soil	18		X						
600840/042858-002	10/7/98-1201	GP-084-020-S	Soil	18			X	X	X	X	X	
600840/042858-003	10/7/98-1201	GP-084-020-S	Soil	18								X
600841/042799-004	9/17/98-1037	GP-065-005-S	Soil	3	X							
600841/042800-004	9/17/98-1054	GP-065-010-S	Soil	8	X							
600841/042801-004	9/17/98-1115	GP-065-015-S	Soil	13	X							
600841/042802-004	9/17/98-1143	GP-065-020-S	Soil	18	X							
600841/042803-004	9/18/98-0935	GP-066-005-S	Soil	3	X							
600841/042804-004	9/18/98-0945	GP-066-010-S	Soil	8	X							
600841/042805-004	9/18/98-0952	GP-066-015-S	Soil	13	X							
600841/042806-004	9/18/98-1013	GP-066-020-S	Soil	18	X							
600841/042807-004	9/18/98-1110	GP-067-005-S	Soil	3	X							
600841/042808-004	9/18/98-1118	GP-067-010-S	Soil	8	X							
600841/042809-004	9/18/98-1125	GP-067-015-S	Soil	13	X							
600841/042810-004	9/18/98-1148	GP-067-020-S	Soil	18	X							
600841/042811-004	9/21/98-0850	GP-068-001-S	Soil	0	X							
600841/042812-004	9/21/98-0921	GP-068-005-S	Soil	3	X							
600841/042813-004	9/21/98-0928	GP-068-010-S	Soil	8	X							
600841/042814-004	9/21/98-0940	GP-068-015-S	Soil	13	X							
600841/042815-004	9/21/98-0950	GP-068-020-S	Soil	18	X							
600841/042816-004	9/21/98-1054	GP-069-001-S	Soil	0	X							
600841/042817-004	9/21/98-1107	GP-069-005-S	Soil	3	X							
600841/042818-004	9/21/98-1113	GP-069-010-S	Soil	8	X							
600841/042819-004	9/21/98-1121	GP-069-015-S	Soil	13	X							
600841/042820-004	9/21/98-1140	GP-069-020-S	Soil	18	X							

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600842/ 042821-001	9/29/98-0916	GP-070-005-S	Soil	3		X						
600842/ 042821-002	9/29/98-0916	GP-070-005-S	Soil	3			X	X	X	X	X	
600842/ 042821-003	9/29/98-0916	GP-070-005-S	Soil	3								X
600842/ 042822-001	9/29/98-0923	GP-070-010-S	Soil	8		X						
600842/ 042822-002	9/29/98-0923	GP-070-010-S	Soil	8			X	X	X	X	X	
600842/ 042822-003	9/29/98-0923	GP-070-010-S	Soil	8								X
600842/ 042823-001	9/29/98-0930	GP-070-015-S	Soil	13		X						
600842/ 042823-002	9/29/98-0930	GP-070-015-S	Soil	13			X	X	X	X	X	
600842/ 042823-003	9/29/98-0930	GP-070-015-S	Soil	13								X
600842/ 042824-001	9/29/98-0954	GP-070-020-S	Soil	18		X						
600842/ 042824-002	9/29/98-0954	GP-070-020-S	Soil	18			X	X	X	X	X	
600842/ 042824-003	9/29/98-0954	GP-070-020-S	Soil	18								X
600842/ 042825-001	9/29/98-1031	GP-071-005-S	Soil	3		X						
600842/ 042825-002	9/29/98-1031	GP-071-005-S	Soil	3			X	X	X	X	X	
600842/ 042825-003	9/29/98-1031	GP-071-005-S	Soil	3								X
600842/ 042826-001	9/29/98-1039	GP-071-010-S	Soil	8		X						
600842/ 042826-002	9/29/98-1039	GP-071-010-S	Soil	8			X	X	X	X	X	
600842/ 042826-003	9/29/98-1039	GP-071-010-S	Soil	8								X
600842/ 042827-001	9/29/98-1049	GP-071-015-S	Soil	13		X						
600842/ 042827-002	9/29/98-1049	GP-071-015-S	Soil	13			X	X	X	X	X	
600842/ 042827-003	9/29/98-1049	GP-071-015-S	Soil	13								X
600842/ 042828-001	9/29/98-1111	GP-071-020-S	Soil	18		X						
600842/ 042828-002	9/29/98-1111	GP-071-020-S	Soil	18			X	X	X	X	X	
600842/ 042828-003	9/29/98-1111	GP-071-020-S	Soil	18								X
600842/ 042829-001	9/29/98-1225	GP-072-005-S	Soil	3		X						
600842/ 042829-002	9/29/98-1225	GP-072-005-S	Soil	3			X	X	X	X	X	
600842/ 042829-003	9/29/98-1225	GP-072-005-S	Soil	3								X
600842/ 042830-001	9/29/98-1237	GP-072-010-S	Soil	8		X						
600842/ 042830-002	9/29/98-1237	GP-072-010-S	Soil	8			X	X	X	X	X	
600842/ 042830-003	9/29/98-1237	GP-072-010-S	Soil	8								X
600842/ 042831-001	9/29/98-1239	GP-072-015-S	Soil	13		X						
600842/ 042831-002	9/29/98-1239	GP-072-015-S	Soil	13			X	X	X	X	X	
600842/ 042831-003	9/29/98-1239	GP-072-015-S	Soil	13								X
600842/ 042832-001	9/29/98-1257	GP-072-020-S	Soil	18		X						
600842/ 042832-002	9/29/98-1257	GP-072-020-S	Soil	18			X	X	X	X	X	
600842/ 042832-003	9/29/98-1257	GP-072-020-S	Soil	18								X
600843/ 042833-001	9/29/98-1330	GP-073-001-S	Soil	0		X						
600843/ 042833-002	9/29/98-1330	GP-073-001-S	Soil	0			X	X	X	X	X	
600843/ 042833-003	9/29/98-1330	GP-073-001-S	Soil	0								X

TABLE 3. August/September 1998 SWMU 96 Supplemental Investigation Sample Specifications

SWMU 96					ON-SITE LAB ANALYSES	OFF-SITE LAB ANALYSES						
ARCO/SMO Sample Number	DATE/TIME Date and Time the sample was collected	ER SAMPLE ID See Figures for Locations (Coordinates available through EGIS) T1096-	Sample Type	Sample Depth (ft)	GAMMA SPEC	VOCs (B240)	SVOCs (B270)	TAL METALS	PCB	ISOTOPIC URANIUM	ISOTOPIC PLUTONIUM	TRITIUM
600843/ 042834-001	9/29/98-1405	GP-073-005-S	Soil	3		X						
600843/ 042834-002	9/29/98-1405	GP-073-005-S	Soil	3			X	X	X	X	X	
600843/ 042834-003	9/29/98-1405	GP-073-005-S	Soil	3								X
600843/ 042835-001	9/29/98-1410	GP-073-010-S	Soil	8		X						
600843/ 042835-002	9/29/98-1410	GP-073-010-S	Soil	8			X	X	X	X	X	
600843/ 042835-003	9/29/98-1410	GP-073-010-S	Soil	8								X
600843/ 042836-001	9/29/98-1418	GP-073-015-S	Soil	13		X						
600843/ 042836-002	9/29/98-1418	GP-073-015-S	Soil	13			X	X	X	X	X	
600843/ 042836-003	9/29/98-1418	GP-073-015-S	Soil	13								X
600843/ 042859-001	9/29/98-1436	GP-073-020-S	Soil	18		X						
600843/ 042859-002	9/29/98-1436	GP-073-020-S	Soil	18			X	X	X	X	X	
600843/ 042859-003	9/29/98-1436	GP-073-020-S	Soil	18								X
600843/ 042860-001	9/29/98-1340	GP-074-001-S	Soil	0		X						
600843/ 042860-002	9/29/98-1340	GP-074-001-S	Soil	0			X	X	X	X	X	
600843/ 042860-003	9/29/98-1340	GP-074-001-S	Soil	0								X
600844/ 042821-004	9/29/98-0916	GP-070-005-S	Soil	3	X							
600844/ 042822-004	9/29/98-0923	GP-070-010-S	Soil	8	X							
600844/ 042823-004	9/29/98-0930	GP-070-015-S	Soil	13	X							
600844/ 042824-004	9/29/98-0954	GP-070-020-S	Soil	18	X							
600844/ 042825-004	9/29/98-1031	GP-071-005-S	Soil	3	X							
600844/ 042826-004	9/29/98-1039	GP-071-010-S	Soil	8	X							
600844/ 042827-004	9/29/98-1049	GP-071-015-S	Soil	13	X							
600844/ 042828-004	9/29/98-1111	GP-071-020-S	Soil	18	X							
600844/ 042829-004	9/29/98-1225	GP-072-005-S	Soil	3	X							
600844/ 042830-004	9/29/98-1237	GP-072-010-S	Soil	8	X							
600844/ 042831-004	9/29/98-1239	GP-072-015-S	Soil	13	X							
600844/ 042832-004	9/29/98-1257	GP-072-020-S	Soil	18	X							
600844/ 042833-004	9/29/98-1330	GP-073-001-S	Soil	0	X							
600844/ 042834-004	9/29/98-1405	GP-073-005-S	Soil	3	X							
600844/ 042835-004	9/29/98-1410	GP-073-010-S	Soil	8	X							
600844/ 042836-004	9/29/98-1418	GP-073-015-S	Soil	13	X							
600844/ 042859-004	9/29/98-1436	GP-073-020-S	Soil	18	X							
600844/ 042860-004	9/29/98-1340	GP-074-001-S	Soil	0	X							
600845/ 042865-001	10/1/98-0908	GP-075-005-S	Soil	3		X						
600845/ 042865-002	10/1/98-0908	GP-075-005-S	Soil	3			X	X	X	X	X	
600845/ 042865-003	10/1/98-0908	GP-075-005-S	Soil	3								X
600845/ 042866-001	10/1/98-0917	GP-075-010-S	Soil	8		X						
600845/ 042866-002	10/1/98-0917	GP-075-010-S	Soil	8			X	X	X	X	X	
600845/ 042866-003	10/1/98-0917	GP-075-010-S	Soil	8								X

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SWMU 96					ON-SITE LAB ANALYSES	OFF-SITE LAB ANALYSES						
ARCO/SMO Sample Number	DATE/TIME Date and Time the sample was collected	ER SAMPLE ID See Figures for Locations (Coordinates available through EGIS) T1096-	Sample Type	Sample Depth (ft)	GAMMA SPEC	VOCs (8240)	SVOCs (8270)	TAL METALS	PCB	ISOTOPIC URANIUM	ISOTOPIC PLUTONIUM	TRITIUM
600845/ 042867-001	10/1/98-0926	GP-075-015-S	Soil	13		X						
600845/ 042867-002	10/1/98-0926	GP-075-015-S	Soil	13			X	X	X	X	X	
600845/ 042867-003	10/1/98-0926	GP-075-015-S	Soil	13								X
600845/ 042868-001	10/1/98-0933	GP-075-020-S	Soil	18		X						
600845/ 042868-002	10/1/98-0933	GP-075-020-S	Soil	18			X	X	X	X	X	
600845/ 042868-003	10/1/98-0933	GP-075-020-S	Soil	18								X
600845/ 042869-001	10/1/98-1039	GP-076-005-S	Soil	3		X						
600845/ 042869-002	10/1/98-1039	GP-076-005-S	Soil	3			X	X	X	X	X	
600845/ 042869-003	10/1/98-1039	GP-076-005-S	Soil	3								X
600845/ 042870-001	10/1/98-1044	GP-076-010-S	Soil	8		X						
600845/ 042870-002	10/1/98-1044	GP-076-010-S	Soil	8			X	X	X	X	X	
600845/ 042870-003	10/1/98-1044	GP-076-010-S	Soil	8								X
600845/ 042871-001	10/1/98-1050	GP-076-015-S	Soil	13		X						
600845/ 042871-002	10/1/98-1050	GP-076-015-S	Soil	13			X	X	X	X	X	
600845/ 042871-003	10/1/98-1050	GP-076-015-S	Soil	13								X
600845/ 042872-001	10/1/98-1105	GP-076-020-S	Soil	18		X						
600845/ 042872-002	10/1/98-1105	GP-076-020-S	Soil	18			X	X	X	X	X	
600845/ 042872-003	10/1/98-1105	GP-076-020-S	Soil	18								X
600845/ 042873-001	10/1/98-1216	GP-077-005-S	Soil	3		X						
600845/ 042873-002	10/1/98-1216	GP-077-005-S	Soil	3			X	X	X	X	X	
600845/ 042873-003	10/1/98-1216	GP-077-005-S	Soil	3								X
600845/ 042874-001	10/1/98-1222	GP-077-010-S	Soil	8		X						
600845/ 042874-002	10/1/98-1222	GP-077-010-S	Soil	8			X	X	X	X	X	
600845/ 042874-003	10/1/98-1222	GP-077-010-S	Soil	8								X
600845/ 042875-001	10/1/98-1227	GP-077-015-S	Soil	13		X						
600845/ 042875-002	10/1/98-1227	GP-077-015-S	Soil	13			X	X	X	X	X	
600845/ 042875-003	10/1/98-1227	GP-077-015-S	Soil	13								X
600845/ 042876-001	10/1/98-1241	GP-077-020-S	Soil	18		X						
600845/ 042876-002	10/1/98-1241	GP-077-020-S	Soil	18			X	X	X	X	X	
600845/ 042876-003	10/1/98-1241	GP-077-020-S	Soil	18								X
600846/ 042877-001	10/1/98-1339	GP-078-001-S	Soil	0		X						
600846/ 042877-002	10/1/98-1339	GP-078-001-S	Soil	0			X	X	X	X	X	
600846/ 042877-003	10/1/98-1339	GP-078-001-S	Soil	0								X
600846/ 042878-001	10/2/98-1025	GP-078-005-S	Soil	3		X						
600846/ 042878-002	10/2/98-1025	GP-078-005-S	Soil	3			X	X	X	X	X	
600846/ 042878-003	10/2/98-1025	GP-078-005-S	Soil	3								X
600846/ 042879-001	10/2/98-1031	GP-078-010-S	Soil	8		X						
600846/ 042879-002	10/2/98-1031	GP-078-010-S	Soil	8			X	X	X	X	X	
600846/ 042879-003	10/2/98-1031	GP-078-010-S	Soil	8								X

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SWMU 96					ON-SITE LAB ANALYSES	OFF-SITE LAB ANALYSES						
ARCO/SO Sample Number	DATE/TIME Date and Time the sample was collected	ER SAMPLE ID See Figures for Locations (Coordinates available through EGIS) T1096-	Sample Type	Sample Depth (ft)	GAMMA SPEC	VOCs (8240)	SVOCs (8270)	TAL METALS	PCB	ISOTOPIC URANIUM	ISOTOPIC PLUTONIUM	TRITIUM
600846/ 042880-001	10/2/98-1038	GP-078-015-S	Soil	13		X						
600846/ 042880-002	10/2/98-1038	GP-078-015-S	Soil	13			X	X	X	X	X	
600846/ 042880-003	10/2/98-1038	GP-078-015-S	Soil	13								X
600846/ 042881-001	10/2/98-1053	GP-078-020-S	Soil	18		X						
600846/ 042881-002	10/2/98-1053	GP-078-020-S	Soil	18			X	X	X	X	X	
600846/ 042881-003	10/2/98-1053	GP-078-020-S	Soil	18								X
600846/ 042882-001	10/1/98-1352	GP-079-001-S	Soil	0		X						
600846/ 042882-002	10/1/98-1352	GP-079-001-S	Soil	0			X	X	X	X	X	
600846/ 042882-003	10/1/98-1352	GP-079-001-S	Soil	0								X
600846/ 042883-001	10/2/98-1136	GP-079-005-S	Soil	3		X						
600846/ 042883-002	10/2/98-1136	GP-079-005-S	Soil	3			X	X	X	X	X	
600846/ 042883-003	10/2/98-1136	GP-079-005-S	Soil	3								X
600846/ 042884-001	10/2/98-1140	GP-079-010-S	Soil	8		X						
600846/ 042884-002	10/2/98-1140	GP-079-010-S	Soil	8			X	X	X	X	X	
600846/ 042884-003	10/2/98-1140	GP-079-010-S	Soil	8								X
600846/ 042885-001	10/2/98-1153	GP-079-015-S	Soil	13		X						
600846/ 042885-002	10/2/98-1153	GP-079-015-S	Soil	13			X	X	X	X	X	
600846/ 042885-003	10/2/98-1153	GP-079-015-S	Soil	13								X
600846/ 042886-001	10/2/98-1201	GP-079-020-S	Soil	18		X						
600846/ 042886-002	10/2/98-1201	GP-079-020-S	Soil	18			X	X	X	X	X	
600846/ 042886-003	10/2/98-1201	GP-079-020-S	Soil	18								X
600852/ 042837-004	10/5/98-0934	GP-080-005-S	Soil	3	X							
600852/ 042838-004	10/5/98-0937	GP-080-010-S	Soil	8	X							
600852/ 042839-004	10/5/98-1011	GP-080-015-S	Soil	13	X							
600852/ 042840-004	10/5/98-1020	GP-080-020-S	Soil	18	X							
600852/ 042841-004	10/5/98-1105	GP-081-005-S	Soil	3	X							
600852/ 042842-004	10/5/98-1110	GP-081-010-S	Soil	8	X							
600852/ 042843-004	10/5/98-1127	GP-081-015-S	Soil	13	X							
600852/ 042844-004	10/5/98-1149	GP-081-020-S	Soil	18	X							
600852/ 042845-004	10/7/98-0906	GP-082-005-S	Soil	3	X							
600852/ 042846-004	10/7/98-0911	GP-082-010-S	Soil	8	X							
600852/ 042847-004	10/7/98-0925	GP-082-015-S	Soil	13	X							
600852/ 042848-004	10/7/98-0933	GP-082-020-S	Soil	18	X							
600852/ 042849-004	10/7/98-0959	GP-083-001-S	Soil	0	X							
600852/ 042850-004	10/7/98-1027	GP-083-005-S	Soil	3	X							
600852/ 042851-004	10/7/98-1031	GP-083-010-S	Soil	8	X							
600852/ 042852-004	10/7/98-1036	GP-083-015-S	Soil	13	X							
600852/ 042853-004	10/7/98-1055	GP-083-020-S	Soil	18	X							
600852/ 042854-004	10/7/98-0959	GP-084-001-S	Soil	0	X							

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600852/042855-004	10/7/98-1135	GP-084-005-S	Soil	3	X							
600852/042856-004	10/7/98-1138	GP-084-010-S	Soil	8	X							
600852/042857-004	10/7/98-1153	GP-084-015-S	Soil	13	X							
600852/042858-004	10/7/98-1201	GP-084-020-S	Soil	18	X							
601040/042861-004	10/8/98-0902	GP-074-005-S	Soil	3	X							
601040/042862-004	10/8/98-0907	GP-074-010-S	Soil	8	X							
601040/042863-004	10/8/98-0917	GP-074-015-S	Soil	13	X							
601040/042864-004	10/8/98-0946	GP-074-020-S	Soil	18	X							
601096/042861-001	10/8/98-0902	GP-074-005-S	Soil	3		X						
601096/042861-002	10/8/98-0902	GP-074-005-S	Soil	3			X	X	X	X	X	
601096/042861-003	10/8/98-0902	GP-074-005-S	Soil	3								X
601096/042862-001	10/8/98-0907	GP-074-010-S	Soil	8		X						
601096/042862-002	10/8/98-0907	GP-074-010-S	Soil	8			X	X	X	X	X	
601096/042862-003	10/8/98-0907	GP-074-010-S	Soil	8								X
601096/042863-001	10/8/98-0917	GP-074-015-S	Soil	13		X						
601096/042863-002	10/8/98-0917	GP-074-015-S	Soil	13			X	X	X	X	X	
601096/042863-003	10/8/98-0917	GP-074-015-S	Soil	13								X
601096/042864-001	10/8/98-0946	GP-074-020-S	Soil	18		X						
601096/042864-002	10/8/98-0946	GP-074-020-S	Soil	18			X	X	X	X	X	
601096/042864-003	10/8/98-0946	GP-074-020-S	Soil	18								X
Duplicate Samples:												
600831/042887-001	9/18/98-0854	GP-085-005-S	Dup of GP-065-005	3		X						
600831/042887-002	9/18/98-0854	GP-085-005-S	Dup of GP-065-005	3			X	X	X	X	X	
600831/042887-003	9/18/98-0854	GP-085-005-S	Dup of GP-065-005	3								X
600841/042887-004	9/18/98-0854	GP-085-005-S	Dup of GP-065-005	3	X							
600844/042888-004	10/1/98-1311	GP-086-010-S	Dup of GP-077-010	8	X							
600844/042889-004	10/1/98-1339	GP-087-001-S	Dup of GP-078-001	0	X							
600845/042888-001	10/1/98-1311	GP-086-010-S	Dup of GP-077-010	8		X						
600845/042888-002	10/1/98-1311	GP-086-010-S	Dup of GP-077-010	8			X	X	X	X	X	
600845/042888-003	10/1/98-1311	GP-086-010-S	Dup of GP-077-010	8								X
600845/042889-001	10/1/98-1339	GP-087-001-S	Dup of GP-078-001	0		X						
600845/042889-002	10/1/98-1339	GP-087-001-S	Dup of GP-078-001	0			X	X	X	X	X	
600845/042889-003	10/1/98-1339	GP-087-001-S	Dup of GP-078-001	0								X
601040/042890-004	10/8/98-1025	GP-088-005-S	Dup of GP-074-005	3	X							
601040/042891-004	10/8/98-1029	GP-089-010-S	Dup of GP-074-010	8	X							
601096/042890-001	10/8/98-1025	GP-088-005-S	Dup of GP-074-005	3		X						
601096/042890-002	10/8/98-1025	GP-088-005-S	Dup of GP-074-005	3			X	X	X	X	X	
601096/042890-003	10/8/98-1025	GP-088-005-S	Dup of GP-074-005	3								X
601096/042891-001	10/8/98-1029	GP-089-010-S	Dup of GP-074-010	8		X						

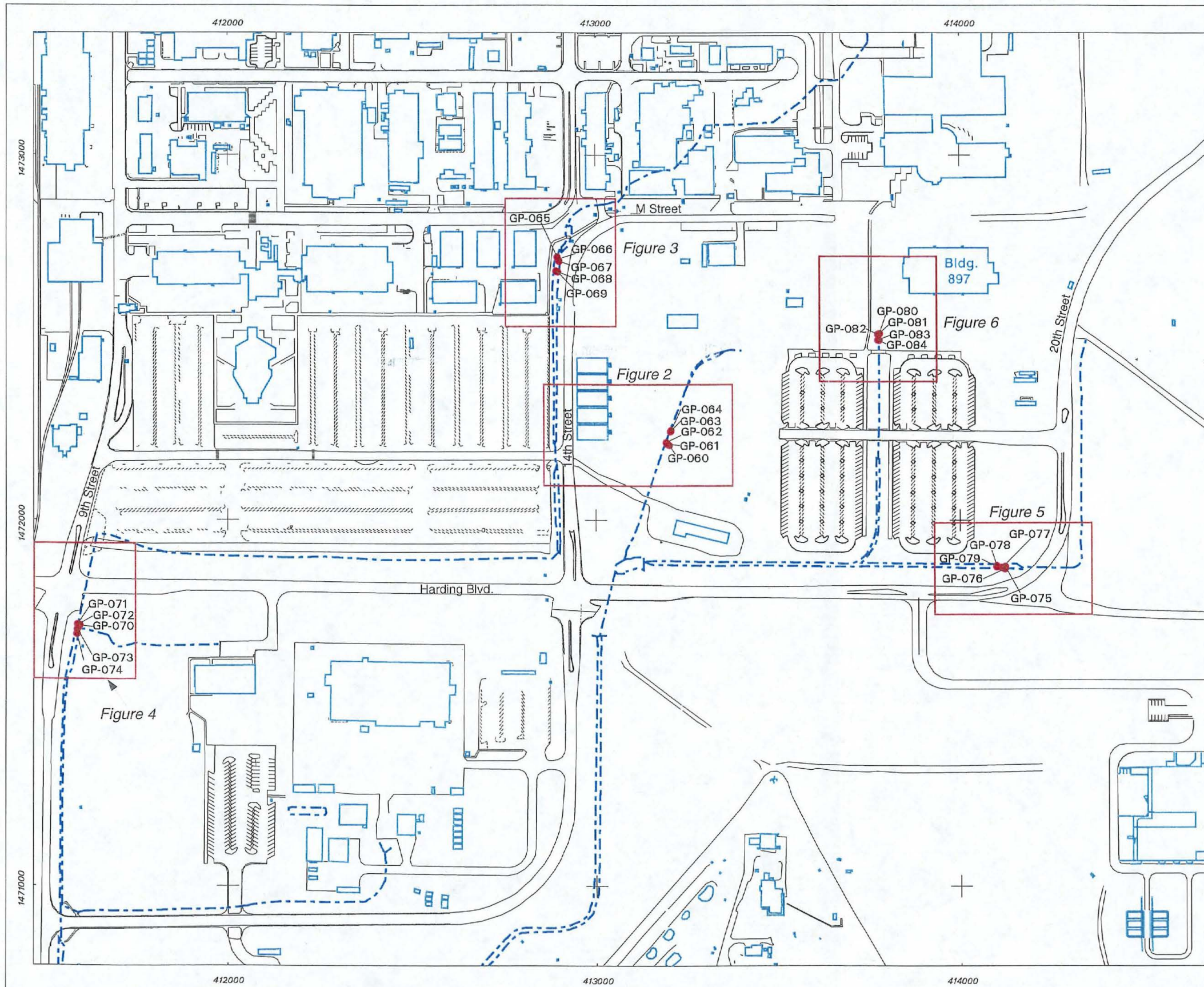
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SWMU 96					ON-SITE LAB ANALYSES	OFF-SITE LAB ANALYSES						
ARCO/SMO Sample Number	DATE/TIME Date and Time the sample was collected	ER SAMPLE ID See Figures for Locations (Coordinates available through EGIS) T1096-	Sample Type	Sample Depth (ft)	GAMMA SPEC	VOCs (B240)	SVOCs (B270)	TAL METALS	PCB	ISOTOPIC URANIUM	ISOTOPIC PLUTONIUM	TRITIUM
601096/ 042891-002	10/8/98-1029	GP-089-010-S	Dup of GP-074-010	8			X	X	X	X	X	
601096/ 042891-003	10/8/98-1029	GP-089-010-S	Dup of GP-074-010	8								X
Equipment Blanks:												
600831/ 042893-001	9/17/98-0915	EB-006-000-W	Equipment Blank	NA		X						
600831/ 042893-002	9/17/98-0915	EB-006-000-W	Equipment Blank	NA			X					
600831/ 042893-003	9/17/98-0915	EB-006-000-W	Equipment Blank	NA								X
600831/ 042893-004	9/17/98-0915	EB-006-000-W	Equipment Blank	NA					X			
600831/ 042893-005	9/17/98-0915	EB-006-000-W	Equipment Blank	NA				X				
600831/ 042893-006	9/17/98-0915	EB-006-000-W	Equipment Blank	NA						X	X	
600838/ 042896-001	10/5/98-1309	EB-009-000-W	Equipment Blank	NA		X						
600838/ 042896-002	10/5/98-1309	EB-009-000-W	Equipment Blank	NA			X					
600838/ 042896-003	10/5/98-1309	EB-009-000-W	Equipment Blank	NA					X			
600838/ 042896-004	10/5/98-1309	EB-009-000-W	Equipment Blank	NA				X				
600838/ 042896-005	10/5/98-1309	EB-009-000-W	Equipment Blank	NA								X
600838/ 042896-006	10/5/98-1309	EB-009-000-W	Equipment Blank	NA						X	X	
600840/ 042897-001	10/8/98-1330	EB-010-000-W	Equipment Blank	NA		X						
600840/ 042897-002	10/8/98-1330	EB-010-000-W	Equipment Blank	NA			X					
600840/ 042897-003	10/8/98-1330	EB-010-000-W	Equipment Blank	NA					X			
600840/ 042897-004	10/8/98-1330	EB-010-000-W	Equipment Blank	NA				X				
600840/ 042897-005	10/8/98-1330	EB-010-000-W	Equipment Blank	NA								X
600840/ 042897-006	10/8/98-1330	EB-010-000-W	Equipment Blank	NA						X	X	
600841/ 042893-007	9/17/98-0915	EB-006-000-W	Equipment Blank	NA	X							
600852/ 042896-007	10/5/98-1309	EB-009-000-W	Equipment Blank	NA	X							
600852/ 042897-007	10/8/98-1330	EB-010-000-W	Equipment Blank	NA	X							
601040/ 042898-007	10/8/98-1053	EB-011-000-W	Equipment Blank	NA	X							
601096/ 042898-001	10/8/98-1053	EB-011-000-W	Equipment Blank	NA		X						
601096/ 042898-002	10/8/98-1053	EB-011-000-W	Equipment Blank	NA			X					
601096/ 042898-003	10/8/98-1053	EB-011-000-W	Equipment Blank	NA					X			
601096/ 042898-004	10/8/98-1053	EB-011-000-W	Equipment Blank	NA				X				
601096/ 042898-005	10/8/98-1053	EB-011-000-W	Equipment Blank	NA								X
601096/ 042898-006	10/8/98-1053	EB-011-000-W	Equipment Blank	NA						X	X	
Trip Blanks:												
600829/ 042997-007	9/4/98-1500	TB-021-000-W	Trip Blank	NA		X						
600830/ 042996-007	9/4/98-1500	TB-021-000-W	Trip Blank	NA		X						
600831/ 042998-007	9/4/98-1500	TB-021-000-W	Trip Blank	NA		X						
600838/ 043303-001	10/8/98-0800	TB-030-000-W	Trip Blank	NA		X						
600840/ 043302-001	10/8/98-0800	TB-029-000-W	Trip Blank	NA		X						
600842/ 043283-001	9/30/98-1000	TB-023-000-W	Trip Blank	NA		X						
0843/ 043295-001	10/2/98-0800	TB-024-000-W	Blank	NA		X						

TABLE 3. August/September 1998 SWMU 96 Supplemental Investigation Sample Specifications

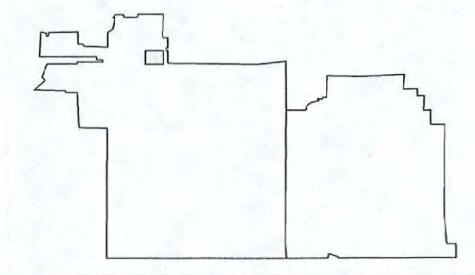
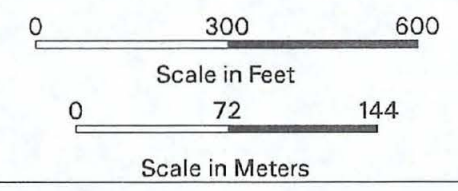
SWMU 96					ON-SITE LAB ANALYSES	OFF-SITE LAB ANALYSES						
ARCOG/SMO Sample Number	DATE/TIME Date and Time the sample was collected	ER SAMPLE ID See Figures for Locations (Coordinates available through EGIS) T1096-	Sample Type	Sample Depth (ft)	GAMMA SPEC	VOCs (8240)	SVOCs (8270)	TAL METALS	PCB	ISOTOPIC URANIUM	ISOTOPIC PLUTONIUM	TRITIUM
600845/ 043296-001	10/2/98-0800	TB-025-000-W	Trip Blank	NA								
600846/ 043297-001	10/2/98-1300	TB-026-000-W	Trip Blank	NA		X						
601096/ 043305-001	10/8/98-1412	TB-031-000-S	Trip Blank	NA		X						

- Notes:
- ARCOG = Analysis Request and Chain of Custody.
 - EB = Equipment blank.
 - EGIS = Environmental Geographic Information System.
 - ft = Foot or feet.
 - GEL = General Engineering Laboratories (Charleston, SC).
 - GP = Geoprobe™.
 - ID = Identification.
 - Iso-U/Pu = Isotopic uranium and plutonium.
 - PCBs = Polychlorinated biphenyls.
 - RPSD = Radiation Protection Sample Diagnostics.
 - SMO = Sample Management Office.
 - SVOCs = Semivolatile organic compounds.
 - SWMU = Solid Waste Management Unit.
 - T1 = Technical Area I.
 - TAL = Target Analyte List.
 - TB = Trip blank.
 - VOCs = Volatile organic compounds.



Legend

- Soil Borehole Location
- Roadway
- - - Drainage
- Building



Sandia National Laboratories, New Mexico
Environmental Geographic Information System

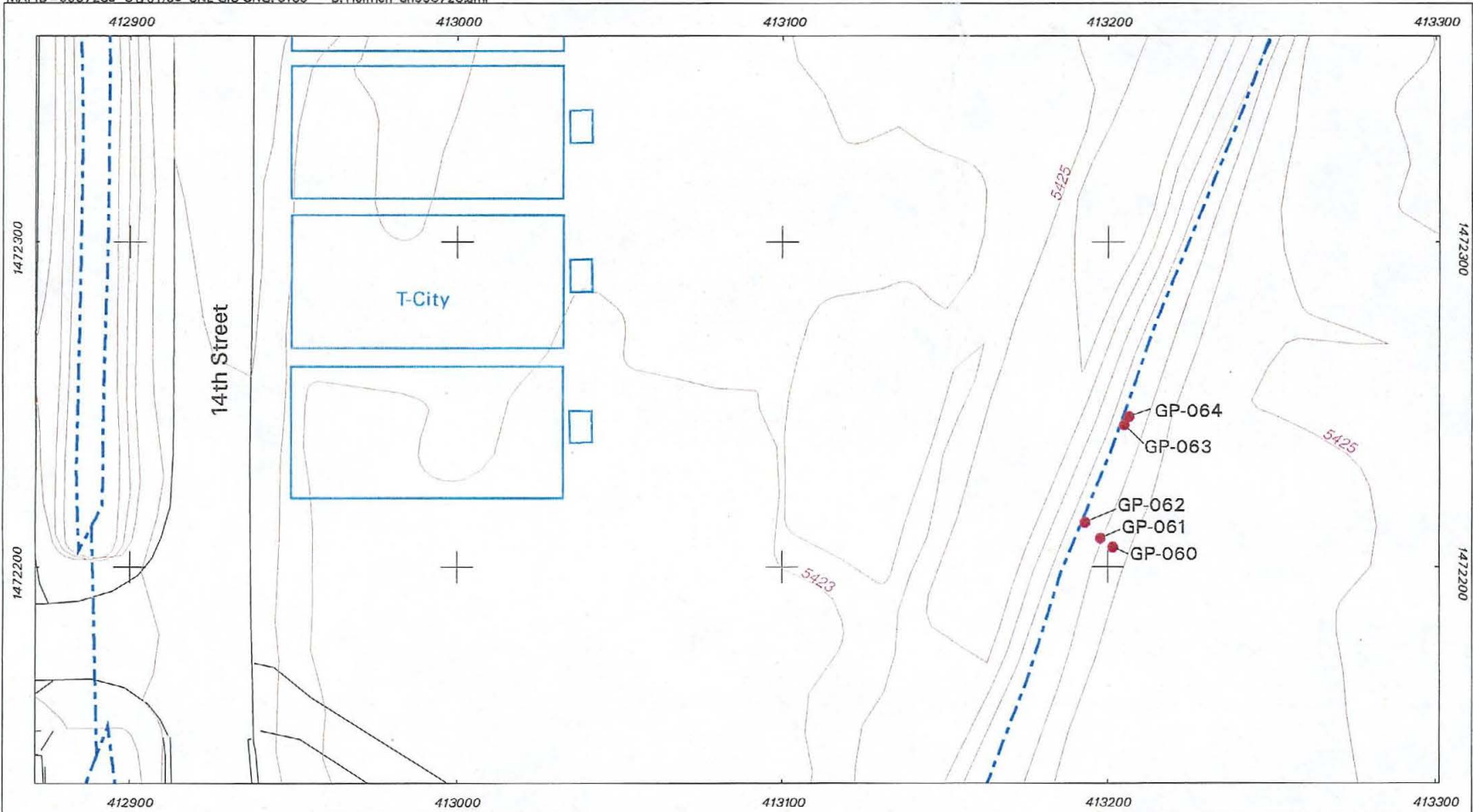
Figure 1
TA-I Supplemental Sample
Locations at SWMU 96
Storm Drain Outfall Areas



Transverse Mercator Projection, New Mexico State Plane Coordinate System,
Central Zone, 1927 North American Horizontal Datum,
1929 North American Vertical Datum



	1:3600	MAPID=990722a
Unclassified		SNL GIS ORG. 6135
DHelfrich	dh990722.aml	05/04/03



Legend

-  Soil Borehole Location
-  Road
-  1 Foot Contour
-  Drainage
-  Building

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

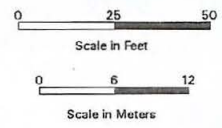
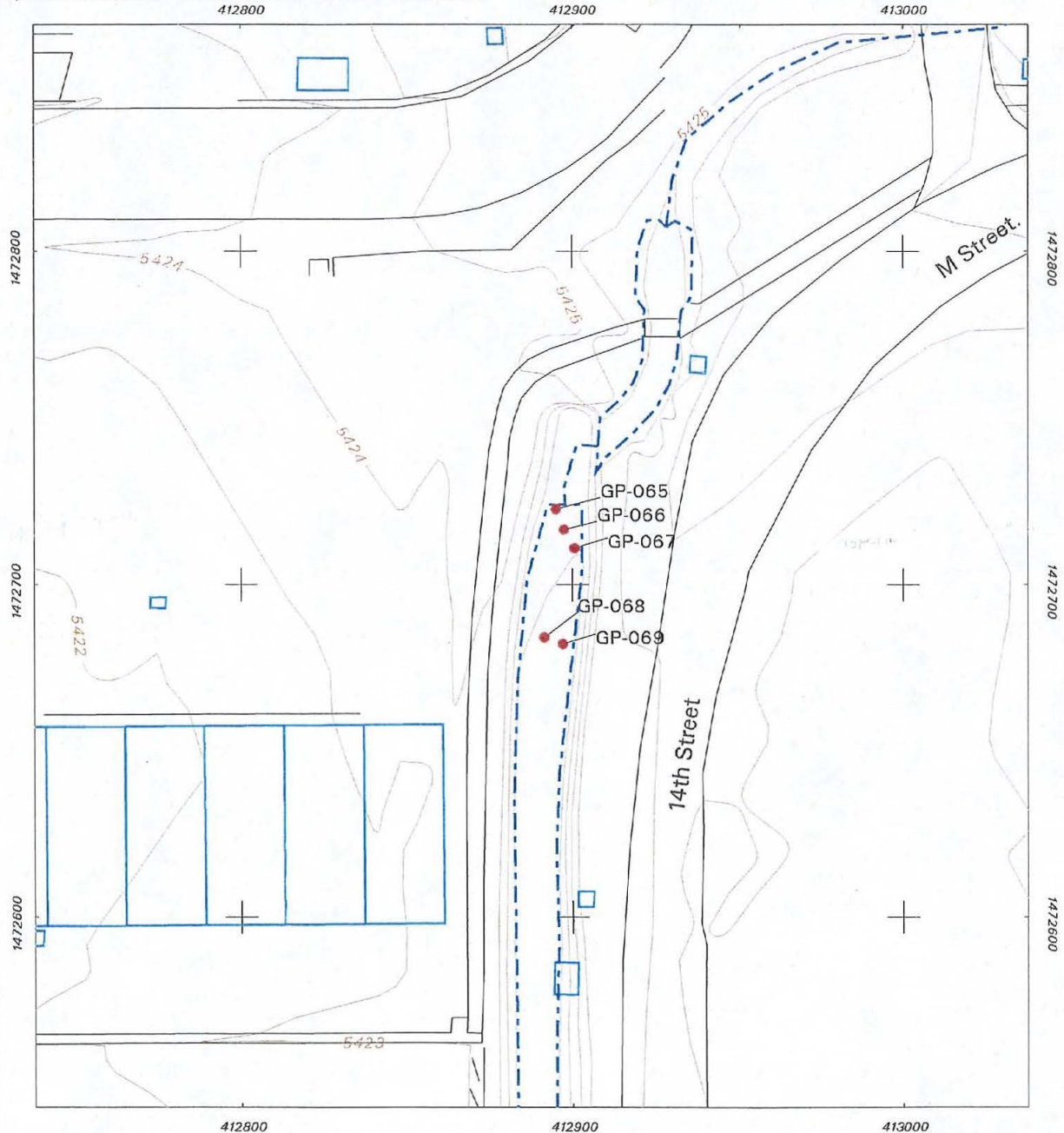


Figure 2
SWMU 96, Storm Drain Outfalls,
East of T-City, Supplemental
Sample Locations

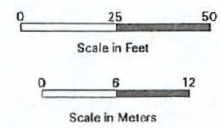


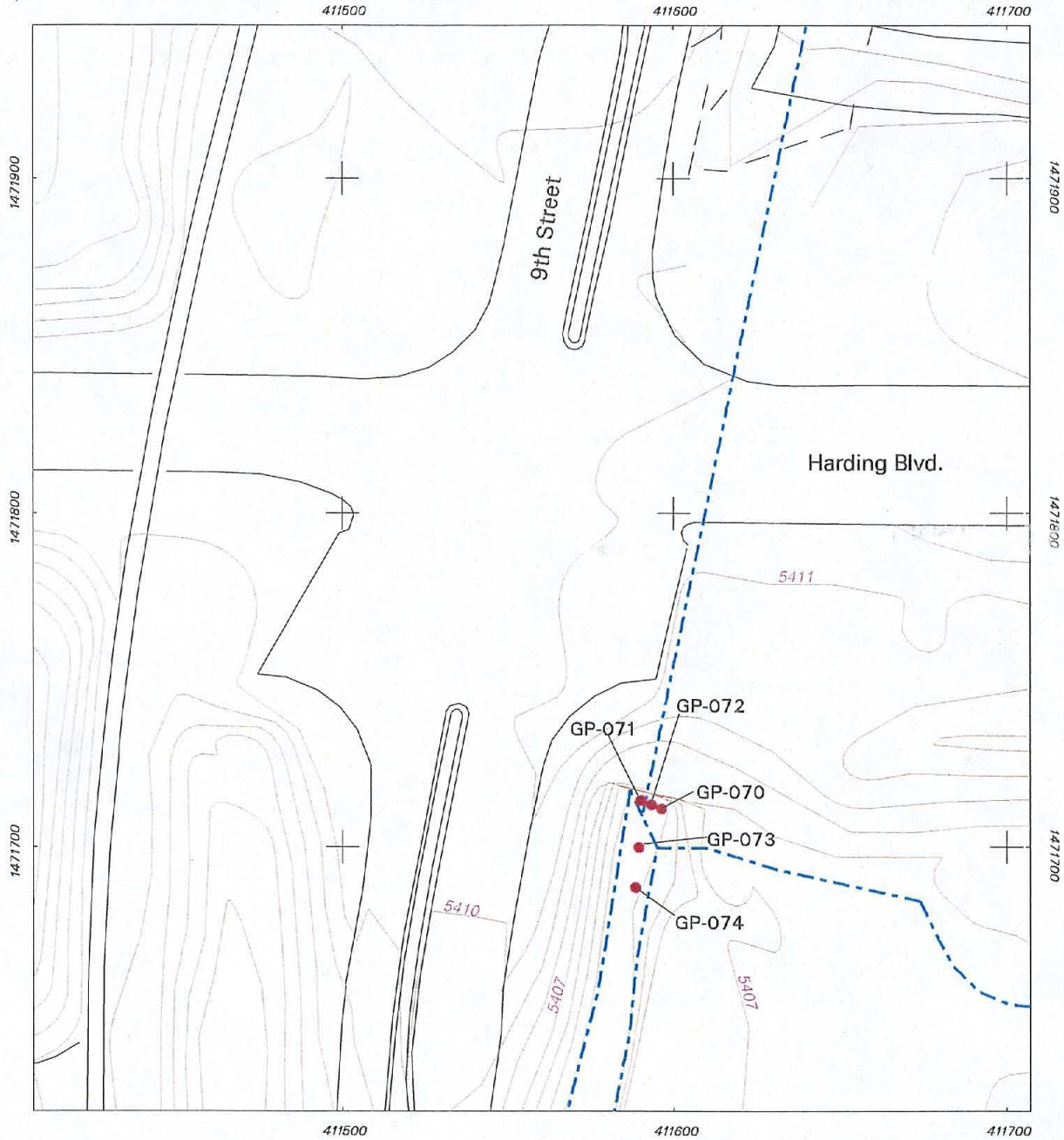


Legend

-  Soil Borehole Location
-  Road
-  1 Foot Contour
-  Drainage
-  Building

Figure 3
SWMU 96, Storm Drain Outfalls,
NW Corner of M & 14th Streets
Supplemental Sample Locations





Legend

- Soil Borehole Location
- Road
- 1 Foot Contour
- - - Drainage

Figure 4
SWMU 96, Storm Drain Outfalls,
SE Corner of 9th Street & Harding Blvd.,
Supplemental Sample Locations

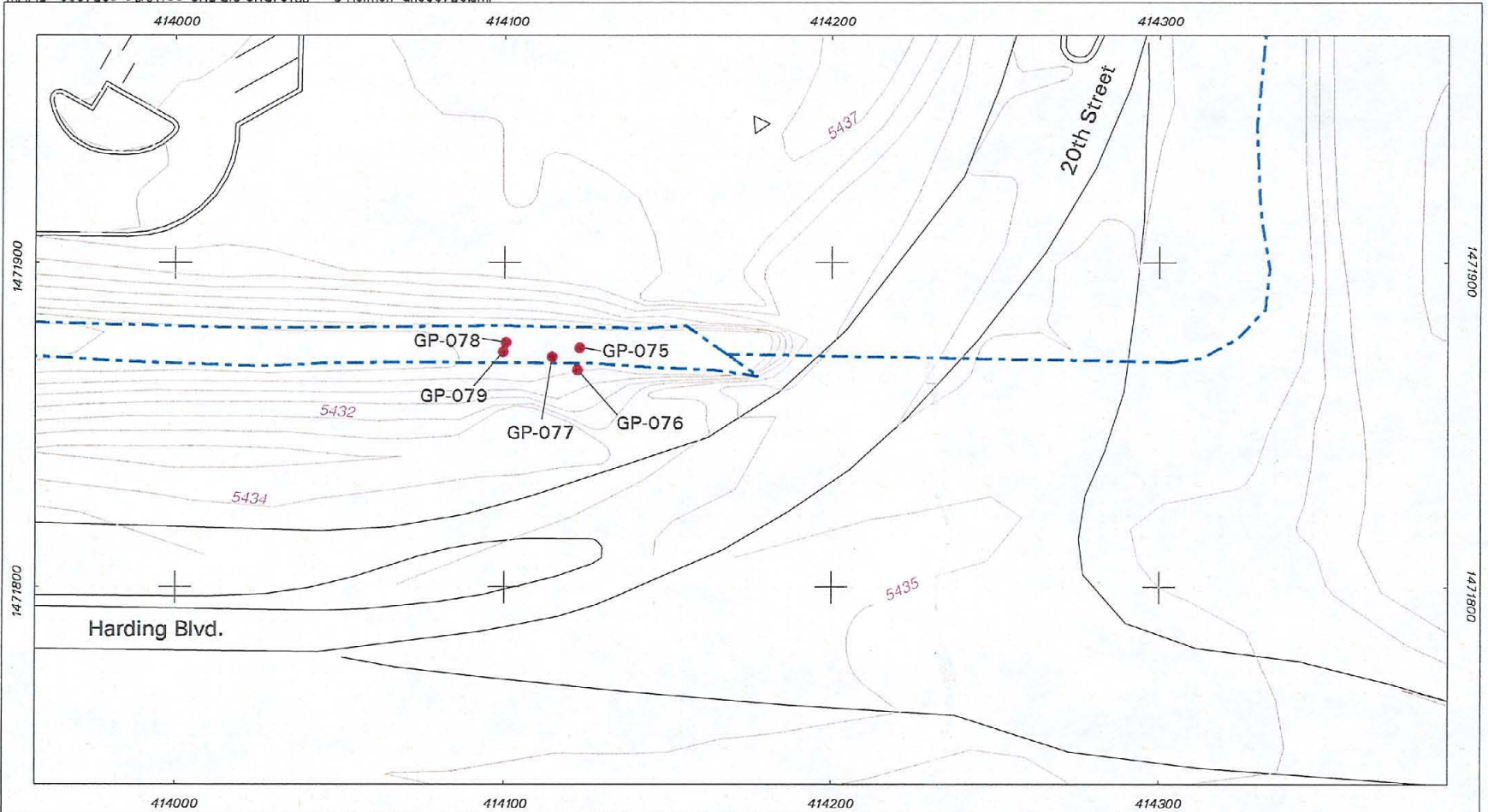
0 25 50

Scale in Feet

0 6 12

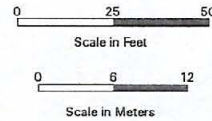
Scale in Meters





Legend

-  Soil Borehole Location
-  Road
-  1 Foot Contour
-  Drainage



Sandia National Laboratories, New Mexico
Environmental Geographic Information System

Figure 5
SWMU 96, Storm Drain Outfalls,
20th St. and Harding Blvd.,
Supplemental Sample Locations



ADDENDUM H

**ANALYTICAL DATA TABLES FOR SWMU 96/
METHOD DETECTION LIMIT TABLES FOR ALL SWMUS**

Table H1-1
 SWMUs 96, 187, and 226
 Summary of Metals Analytical Detection Limits,
 1998 and 2002 Supplemental Investigations

Analyte	Method Detection Limit (mg/kg)
Aluminum	0.121-0.05
Antimony	0.00394-0.191
Arsenic	0.193-0.269
Barium	0.0275-0.0654
Beryllium	0.00026-0.576
Cadmium	0.024-0.0469
Chromium	0.151-0.428
Cobalt	0.00069-0.0176
Copper	0.00104-0.067
Lead	0.268-0.334
Mercury	0.00085-0.00438
Nickel	0.032-0.0807
Selenium	0.151-0.265
Silver	0.0843-0.113
Thallium	0.00308-0.221
Vanadium	0.0059-0.027
Zinc	0.005-0.185

mg/kg = Milligram(s) per kilogram.
 SWMU = Solid Waste Management Unit.

Table H1-2
SWMUs 96, 187, and 226
Summary of PCB Analytical Detection Limits,
1998 and 2002 Supplemental Investigations

Analyte	Method Detection Limit ($\mu\text{g}/\text{kg}$)
Aroclor-1016	1
Aroclor-1221	2.82
Aroclor-1232	1.67
Aroclor-1242	1.67
Aroclor-1248	1
Aroclor-1254	0.5
Aroclor-1260	1

$\mu\text{g}/\text{kg}$ = Microgram(s) per kilogram.

PCB = Polychlorinated biphenyl.

SWMU = Solid Waste Management Unit.

Table H1-3
 SWMUs 96, 187, and 226
 Summary of SVOC Analytical Detection Limits,
 1998 and 2002 Supplemental Investigations

Analyte	Method Detection Limit (µg/kg)
Acenaphthene	4-8
Acenaphthylene	3.67-16.7
Anthracene	4.67-16.7
Benzo(a)anthracene	6-16.7
Benzo(a)pyrene	2-16.7
Benzo(b)fluoranthene	2.33-16.7
Benzo(g,h,i)perylene	5-16.7
Benzo(k)fluoranthene	5-16.7
4-Bromophenyl phenyl ether	4.67-34
Butylbenzyl phthalate	12.7-28.7
Carbazole	5-16.7
4-Chlorobenzenamine	59-167
bis(2-Chloroethoxy)methane	6-12.3
bis(2-Chloroethyl)ether	6.67-37.3
bis-Chloroisopropyl ether	11-37.2
4-Chloro-3-methylphenol	36.7-167
2-Chloronaphthalene	3.67-13.7
2-Chlorophenol	5-15.3
4-Chlorophenyl phenyl ether	3.33-19.7
Chrysene	6.33-16.7
o-Cresol	26-47.7
Di-n-butyl phthalate	20.7-24
Di-n-octyl phthalate	9-30.3
Dibenz(a,h)anthracene	2.67-16.7
Dibenzofuran	2.67-17
1,2-Dichlorobenzene	4.33-10
1,3-Dichlorobenzene	3.33-11.3
1,4-Dichlorobenzene	6-15.7
3,3'-Dichlorobenzidine	143-167
2,4-Dichlorophenol	8-20.7
Diethylphthalate	17.7-19.7
2,4-Dimethylphenol	72-167
Dimethylphthalate	11.7-18.3
Dinitro-o-cresol	16-167
2,4-Dinitrophenol	15-167
2,4-Dinitrotoluene	5-25.3
2,6-Dinitrotoluene	3-33.3
Diphenyl amine	7-22.3
bis(2-Ethylhexyl) phthalate	7-30
Fluoranthene	3.33-16.7
Fluorene	3-4
Hexachlorobenzene	4.67-20

Refer to footnotes at end of table.

Table H1-3 (Concluded)
 SWMUs 96, 187, and 226
 Summary of SVOC Analytical Detection Limits,
 1998 and 2002 Supplemental Investigations

Analyte	Method Detection Limit ($\mu\text{g}/\text{kg}$)
Hexachlorobutadiene	6.67-12.7
Hexachlorocyclopentadiene	33-167
Hexachloroethane	4.33-22
Indeno(1,2,3-cd)pyrene	6.67-16.7
Isophorone	2.33-16
2-Methylnaphthalene	4-16.7
4-Methylphenol	5.67-33.3
Naphthalene	3.33-16.7
2-Nitroaniline	81-167
3-Nitroaniline	86.7-167
4-Nitroaniline	37-84
Nitro-benzene	20.3-36.7
2-Nitrophenol	17-46.3
4-Nitrophenol	21-167
n-Nitrosodipropylamine	22.7-33
Pentachlorophenol	61-167
Phenanthrene	4-16.7
Phenol	3.67-12.7
Pyrene	8.67-16.7
1,2,4-Trichlorobenzene	4.67-12.7
2,4,5-Trichlorophenol	17.3-42.3
2,4,6-Trichlorophenol	24.7-27.3

$\mu\text{g}/\text{kg}$ = Microgram(s) per kilogram.

SVOC = Semivolatile organic compound.

SWMU = Solid Waste Management Unit.

Table H1-4
 SWMUs 96, 187, and 226
 Summary of VOC Analytical Detection Limits,
 1998 and 2002 Supplemental Investigations

Analyte	Method Detection Limit ($\mu\text{g}/\text{kg}$)
Acetone	3.52
Benzene	0.45
Bromodichloromethane	0.49
Bromoform	0.49
Bromomethane	0.5
2-Butanone	3.74
Carbon disulfide	2.36
Carbon tetrachloride	0.49
Chlorobenzene	0.41
Chloroethane	0.81
Chloroform	0.52
Chloromethane	0.37
Dibromochloromethane	0.5
1,1-Dichloroethane	0.47
1,2-Dichloroethane	0.43
1,1-Dichloroethene	0.5
cis-1,2-Dichloroethene	0.47
trans-1,2-Dichloroethene	0.53
1,2-Dichloropropane	0.48
cis-1,3-Dichloropropene	0.43
trans-1,3-Dichloropropene	0.25
Ethyl benzene	0.38
2-Hexanone	3.77
Methylene chloride	1.35
4-Methyl-2-pentanone	4.03
Styrene	0.39
Tetrachloroethene	0.38
Toluene	0.34
1,1,1-Trichloroethane	0.53
1,1,2-Trichloroethane	0.54
1,1,2,2-Tetrachloroethane	0.91
Trichloroethene	0.45
Vinyl acetate	1.78
Vinyl chloride	0.56
Xylene	1.08

$\mu\text{g}/\text{kg}$ = Microgram(s) per kilogram.
 VOC = Volatile organic compound.
 SWMU = Solid Waste Management Unit.

Table H2-1
SWMU 96, Summary of Metals Analytical Results,
Soil Samples Collected 1998

Sample Attributes			Metals (EPA Method 6010/7060/7421/7470/7471/7740/6010A/7196/7470/7471/SW846 ^a) (mg/kg)					
Record Number ^b	ER Sample ID	Sample Depth (ft)	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium
600829	T1096-GP-060-005-S	5	5,710	ND (0.191)	2.29	97.7	0.322 J (0.5)	0.0767 J (0.5)
600829	T1096-GP-060-010-S	10	6,840	ND (0.191)	2.57	199	0.343 J (0.496)	0.15 J (0.496)
600829	T1096-GP-061-005-S	5	5,250	ND (0.191)	2.11	73.1	0.265 J (0.501)	ND (0.019)
600829	T1096-GP-061-010-S	10	9,840	ND (0.191)	3.47	189	0.482 J (0.528)	0.118 J (0.528)
600829	T1096-GP-061-015-S	15	9,080	ND (0.191)	3.35	155	0.467 J (0.591)	0.111 J (0.591)
600829	T1096-GP-061-020-S	20	5,930	ND (0.191)	2.23	130	0.325 J (0.473)	0.0538 J (0.473)
600830	T1096-GP-062-005-S	5	5,710	ND (0.191)	2.1	97.3	0.314 J (0.51)	0.0988 J (0.51)
600830	T1096-GP-062-010-S	10	10,800	ND (0.191)	3.01	166	0.517	0.131 J (0.511)
600830	T1096-GP-062-015-S	15	6,360	ND (0.191)	2.26	115	0.326 J (0.488)	0.0899 J (0.488)
600830	T1096-GP-062-020-S	20	8,540	ND (0.191)	2.79	133	0.395 J (0.538)	0.112 J (0.538)
600830	T1096-GP-063-001-S	1	9,000	ND (0.191)	3.26	155	0.334 J (0.489)	0.173 J (0.489)
600830	T1096-GP-063-005-S	5	5,490	ND (0.191)	1.88	77.4	0.292 J (0.482)	0.0823 J (0.482)
600830	T1096-GP-063-010-S	10	6,740	ND (0.191)	3.02	143	0.35 J (0.511)	14
600830	T1096-GP-063-015-S	15	8,260	ND (0.191)	2.64	107	0.412 J (0.507)	0.0757 J (0.507)
600830	T1096-GP-063-020-S	20	8,780	ND (0.191)	2.7	141	0.448 J (0.538)	0.0802 J (0.538)
600830	T1096-GP-064-001-S	1	7,250	ND (0.191)	2.61	111	0.359 J (0.493)	0.178 J (0.493)
600830	T1096-GP-064-005-S	5	6,740	ND (0.191)	2.45	124	0.374 J (0.511)	0.0722 J (0.511)
600830	T1096-GP-064-010-S	10	6,070	ND (0.191)	2.06	98.7	0.313 J (0.487)	0.0437 J (0.487)
600830	T1096-GP-064-015-S	15	7,330	ND (0.191)	2.63	139	0.397 J (0.532)	0.0486 J (0.532)
600830	T1096-GP-064-020-S	20	8,690	ND (0.191)	2.33	124	0.426 J (0.553)	0.0602 J (0.553)
600831	T1096-GP-065-005-S	5	7,050	ND (0.191)	2.45	90.5	0.334 J (0.543)	ND (0.019)
600831	T1096-GP-065-010-S	10	8,970	ND (0.191)	3.16	183	0.479 J (0.552)	ND (0.019)
600831	T1096-GP-065-015-S	15	8,140	ND (0.191)	2.77	146	0.453 J (0.534)	ND (0.019)
600831	T1096-GP-065-020-S	20	12,800	ND (0.191)	3.57	153	0.604	ND (0.019)
600831	T1096-GP-066-005-S	5	9,460	ND (0.191)	3.33	197	0.449 J (0.514)	0.0611 J (0.514)
600831	T1096-GP-066-010-S	10	4,820	ND (0.191)	1.76	91.4	0.293 J (0.512)	ND (0.019)
600831	T1096-GP-066-015-S	15	5,220	ND (0.191)	2.57	119	0.311 J (0.521)	0.0569 J (0.521)
600831	T1096-GP-066-020-S	20	8,930	ND (0.191)	2.52	138	0.434 J (0.538)	ND (0.019)
600831	T1096-GP-067-005-S	5	10,800	ND (0.191)	3.67	153	0.514	ND (0.019)
600831	T1096-GP-067-010-S	10	10,400	ND (0.191)	3.77	204	0.547	ND (0.019)
Background Concentration			69,957	3.9	4.4	200	0.80	<1

Refer to footnotes at end of table.

Table H2-1 (Continued)
 SWMU 96, Summary of Metals Analytical Results,
 Soil Samples Collected 1998

Sample Attributes			Metals (EPA Method 6010/7060/7421/7470/7471/7740/6010A/7196/7470/7471/SW846 ^a) (mg/kg)					
Record Number ^b	ER Sample ID	Sample Depth (ft)	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium
600831	T1096-GP-067-015-S	15	6,110	ND (0.191)	2.16	83.9	0.347 J (0.521)	ND (0.019)
600831	T1096-GP-067-020-S	20	10,300	ND (0.191)	3.07	158	0.493 J (0.519)	ND (0.019)
600831	T1096-GP-085-005-SD	5	6,160	ND (0.191)	2.21	103	0.309 J (0.532)	ND (0.019)
600832	T1096-GP-068-001-S	1	6,400	ND (0.191)	3.58	293	0.321 J (0.555)	ND (0.019)
600832	T1096-GP-068-005-S	5	6,880	ND (0.191)	2.71	156	0.383 J (0.524)	ND (0.019)
600832	T1096-GP-068-010-S	10	8,320	ND (0.191)	3.28	169	0.533	ND (0.019)
600832	T1096-GP-068-015-S	15	6,070	ND (0.191)	2.27	209	0.385 J (0.534)	ND (0.019)
600832	T1096-GP-068-020-S	20	9,460	ND (0.191)	2.73	240	0.501 J (0.514)	ND (0.019)
600832	T1096-GP-069-001-S	1	6,610	ND (0.191)	3.92	309	0.285 J (0.551)	ND (0.019)
600832	T1096-GP-069-005-S	5	7,130	ND (0.191)	2.34	68.8	0.369 J (0.512)	ND (0.019)
600832	T1096-GP-069-010-S	10	9,520	ND (0.191)	3.16	157	0.56	ND (0.019)
600832	T1096-GP-069-015-S	15	5,840	ND (0.191)	2.4	127	0.353 J (0.519)	ND (0.019)
600832	T1096-GP-069-020-S	20	7,700	ND (0.191)	2.35	166	0.425 J (0.539)	ND (0.019)
600838	T1096-GP-080-005-S	5	7,710	0.898 J (1.05)	1.85	151	0.384 J (0.524)	0.04 J (0.524)
600838	T1096-GP-080-010-S	10	6,420	0.582 J (1.04)	3.17	151	0.376 J (0.518)	ND (0.019)
600838	T1096-GP-080-015-S	15	4,340	ND (0.191)	1.14 J (1.22)	130	0.233 J (0.487)	ND (0.019)
600838	T1096-GP-080-020-S	20	4,280	0.559 J (1.04)	1.38	76.3	0.232 J (0.521)	ND (0.019)
600838	T1096-GP-081-005-S	5	10,400	0.717 J (1.12)	2.96	123	0.511 J (0.56)	ND (0.019)
600838	T1096-GP-081-010-S	10	5,620	ND (0.191)	1.41	89.5	0.307 J (0.527)	ND (0.019)
600838	T1096-GP-081-015-S	15	5,450	0.486 J (1.08)	2.27	82.3	0.29 J (0.538)	ND (0.019)
600838	T1096-GP-081-020-S	20	3,640	ND (0.191)	1.54	57.8	0.232 J (0.506)	0.0601 J (0.506)
600838	T1096-GP-082-005-S	5	9,990	0.656 J (1.15)	3.42	137	0.506 J (0.576)	ND (0.019)
600838	T1096-GP-082-010-S	10	8,950	0.65 J (1.13)	3.52	181	0.478 J (0.563)	ND (0.019)
600838	T1096-GP-082-015-S	15	5,020	0.708 J (1.01)	1.43	162	0.253 J (0.506)	ND (0.019)
600838	T1096-GP-082-020-S	20	3,820	0.531 J (0.965)	1.3	50.4	0.231 J (0.482)	0.114 J (0.482)
600838	T1096-GP-083-001-S	1	5,620	ND (0.191)	2.41	214	0.303 J (0.521)	0.0795 J (0.521)
600838	T1096-GP-083-005-S	5	6,770	0.684 J (1.05)	1.23 J (1.32)	110	0.341 J (0.527)	ND (0.019)
600838	T1096-GP-083-010-S	10	5,960	0.672 J (1.05)	2.18	128	0.314 J (0.523)	0.0418 J (0.523)
600838	T1096-GP-083-015-S	15	3,870	0.509 J (1.05)	1.92	50.8	0.233 J (0.527)	ND (0.019)
Background Concentration			69,957	3.9	4.4	200	0.80	<1

Refer to footnotes at end of table.

Table H2-1 (Continued)
 SWMU 96, Summary of Metals Analytical Results,
 Soil Samples Collected 1998

Sample Attributes			Metals (EPA Method 6010/7060/7421/7470/7471/7740/6010A/7196/7470/7471/SW846 ^a) (mg/kg)					
Record Number ^b	ER Sample ID	Sample Depth (ft)	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium
600838	T1096-GP-083-020-S	20	5,190	ND (0.191)	1.7	51	0.321 J (0.483)	ND (0.019)
600840	T1096-GP-084-001-S	1	6,200	ND (0.191)	3.86	292	0.332 J (0.533)	0.0886 J (0.533)
600840	T1096-GP-084-005-S	5	5,930	0.706 J (1)	1.39	122	0.284 J (0.502)	ND (0.019)
600840	T1096-GP-084-010-S	10	4,750	ND (0.191)	1.18 J (1.25)	85.8	0.257 J (0.501)	0.0464 J (0.501)
600840	T1096-GP-084-015-S	15	5,110	0.589 J (1.02)	ND (0.228)	79.5	0.266 J (0.511)	ND (0.019)
600840	T1096-GP-084-020-S	20	8,720	0.549 J (1.03)	2.23	148	0.478 J (0.515)	0.0406 J (0.515)
600842	T1096-GP-070-005-S	5	6,960	ND (0.191)	2.47	135	0.369 J (0.539)	ND (0.019)
600842	T1096-GP-070-010-S	10	8,560	ND (0.191)	3.32	146	0.459 J (0.567)	ND (0.019)
600842	T1096-GP-070-015-S	15	3,810	ND (0.191)	0.861	71.3	0.22 J (0.506)	ND (0.019)
600842	T1096-GP-070-020-S	20	8,780	ND (0.191)	2.86	158	0.448 J (0.551)	ND (0.019)
600842	T1096-GP-071-005-S	5	7,470	0.468 J (1.02)	2.63	191	0.395 J (0.511)	ND (0.019)
600842	T1096-GP-071-010-S	10	7,590	ND (0.191)	2.37	118	0.404 J (0.522)	ND (0.019)
600842	T1096-GP-071-015-S	15	4,980	ND (0.191)	2.27	118	0.286 J (0.506)	ND (0.019)
600842	T1096-GP-071-020-S	20	5,420	ND (0.191)	2.11	74.4	0.289 J (0.483)	ND (0.019)
600842	T1096-GP-072-005-S	5	9,970	ND (0.191)	3.56	295	0.494 J (0.547)	ND (0.019)
600842	T1096-GP-072-010-S	10	9,140	ND (0.191)	3.92	181	0.528 J (0.531)	ND (0.019)
600842	T1096-GP-072-015-S	15	4,680	0.505 J (0.984)	1.32	73.7	0.264 J (0.492)	ND (0.019)
600842	T1096-GP-072-020-S	20	4,350	ND (0.191)	1.75	65.5	0.272 J (0.501)	ND (0.019)
600843	T1096-GP-073-001-S	1	6,140	ND (0.191)	3.35	244	0.314 J (0.514)	0.737
600843	T1096-GP-073-005-S	5	9,750	ND (0.191)	3.47	162	0.498 J (0.556)	ND (0.019)
600843	T1096-GP-073-010-S	10	9,260	ND (0.191)	3.02	150	0.457 J (0.523)	0.255 J (0.523)
600843	T1096-GP-073-015-S	15	8,940	ND (0.191)	3	160	0.505 J (0.547)	ND (0.019)
600843	T1096-GP-073-020-S	20	7,240	ND (0.191)	2.44	265	0.393 J (0.503)	ND (0.019)
600843	T1096-GP-074-001-S	1	7,620	ND (0.191)	4.11	270	0.376 J (0.509)	0.613
600845	T1096-GP-075-005-S	5	4,720	ND (0.191)	1.18	75.9	0.288 J (0.491)	ND (0.019)
600845	T1096-GP-075-010-S	10	9,890	ND (0.191)	2.62	188	0.508	ND (0.019)
600845	T1096-GP-075-015-S	15	10,800	ND (0.191)	3.06	107	0.606	ND (0.019)
600845	T1096-GP-075-020-S	20	10,700	ND (0.191)	2.92	301	0.577	ND (0.019)
600845	T1096-GP-076-005-S	5	5,640	ND (0.191)	1.47	136	0.279 J (0.482)	ND (0.019)
600845	T1096-GP-076-010-S	10	9,160	ND (0.191)	2.42	92.6	0.461 J (0.538)	ND (0.019)
Background Concentration			69,957	3.9	4.4	200	0.80	<1

Refer to footnotes at end of table.

Table H2-1 (Continued)
 SWMU 96, Summary of Metals Analytical Results,
 Soil Samples Collected 1998

Sample Attributes			Metals (EPA Method 6010/7060/7421/7470/7471/7740/6010A/7196/7470/7471/SW846 ^a) (mg/kg)					
Record Number ^b	ER Sample ID	Sample Depth (ft)	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium
600845	T1096-GP-076-015-S	15	9,470	ND (0.191)	3.23	146	0.522 J (0.54)	ND (0.019)
600845	T1096-GP-076-020-S	20	8,730	ND (0.191)	2.66	133	0.477 J (0.556)	ND (0.019)
600845	T1096-GP-077-005-S	5	4,550	ND (0.191)	1.03	65	0.258 J (0.464)	ND (0.019)
600845	T1096-GP-077-010-S	10	9,150	ND (0.191)	2.1	137	0.437 J (0.484)	ND (0.019)
600845	T1096-GP-077-015-S	15	9,010	ND (0.191)	2.97	188	0.503 J (0.539)	ND (0.019)
600845	T1096-GP-077-020-S	20	8,300	ND (0.191)	2.92	157	0.444 J (0.527)	ND (0.019)
600845	T1096-GP-086-010-SD	10	8,250	ND (0.191)	2.09	101	0.42 J (0.521)	ND (0.019)
600845	T1096-GP-087-001-SD	1	3,520	ND (0.191)	2.21	303	0.251 J (0.5)	ND (0.019)
600846	T1096-GP-078-001-S	1	4,230	ND (0.191)	2.63	163	0.296 J (0.521)	ND (0.019)
600846	T1096-GP-078-005-S	5	5,550	ND (0.191)	1.52	76.9	0.314 J (0.5)	ND (0.019)
600846	T1096-GP-078-010-S	10	7,100	ND (0.191)	2.08	148	0.406 J (0.506)	ND (0.019)
600846	T1096-GP-078-015-S	15	8,390	ND (0.191)	2.65	137	0.441 J (0.497)	ND (0.019)
600846	T1096-GP-078-020-S	20	8,990	ND (0.191)	3.34	192	0.514 J (0.514)	ND (0.019)
600846	T1096-GP-079-001-S	1	7,750	ND (0.191)	5.09	431	0.384 J (0.55)	ND (0.019)
600846	T1096-GP-079-005-S	5	6,500	ND (0.191)	2.07	114	0.358 J (0.496)	ND (0.019)
600846	T1096-GP-079-010-S	10	6,020	ND (0.191)	1.88	87.5	0.393 J (0.488)	ND (0.019)
600846	T1096-GP-079-015-S	15	8,260	ND (0.191)	2.95	159	0.483 J (0.535)	ND (0.019)
600846	T1096-GP-079-020-S	20	9,490	ND (0.191)	3.42	159	0.546	ND (0.019)
601096	T1096-GP-074-005	5	9,960	ND (0.191)	4.49	162	0.523 J (0.526)	ND (0.019)
601096	T1096-GP-074-010	10	12,200	ND (0.191)	5.24	171	0.676	ND (0.019)
601096	T1096-GP-074-015	15	8,420	ND (0.191)	3.91	92.5	0.459 J (0.545)	ND (0.019)
601096	T1096-GP-074-020	20	5,700	ND (0.191)	1.94	65.6	0.299 J (0.502)	ND (0.019)
601096	T1096-GP-088-005	5	8,610	ND (0.191)	3.81	156	0.451 J (0.519)	ND (0.019)
601096	T1096-GP-089-010	10	10,400	0.418 J (1.06)	3.89	155	0.586	ND (0.019)
Background Concentration			69,957	3.9	4.4	200	0.80	<1
Quality Assurance/Quality Control Samples (mg/L)								
600831	T1096-EB-006-000-W	0	0.135	ND (0.00394)	ND (0.00451)	0.0164	ND (0.00026)	ND (0.00044)
600838	T1096-EB-009-000-W	0	0.0421 J (0.05)	ND (0.00394)	ND (0.00451)	0.00215 J (0.005)	ND (0.00026)	ND (0.00044)
600840	T1096-EB-010-000-W	0	0.0536	ND (0.00394)	ND (0.00451)	0.00407 J (0.005)	ND (0.00026)	ND (0.00044)
600849	T1096-EB-007-000-W	0	0.0252 J (0.05)	ND (0.00394)	ND (0.00451)	0.00584	ND (0.00026)	ND (0.00044)
601096	T1096-EB-011-000	0	ND (0.0121)	ND (0.00394)	ND (0.00451)	0.00095 J (0.005)	ND (0.00026)	ND (0.00044)

Refer to footnotes at end of table.

Table H2-1 (Continued)
 SWMU 96, Summary of Metals Analytical Results,
 Soil Samples Collected 1998

Sample Attributes			Metals (EPA Method 6010/7060/7421/7470/7471/7740/6010A/7196/7470/7471/SW846 ^a) (mg/kg)					
Record Number ^b	ER Sample ID	Sample Depth (ft)	Chromium	Manganese	Cobalt	Copper	Lead	Mercury
600829	T1096-GP-060-005-S	5	8.3	224	5.68	9.17	5.74	ND (0.00225)
600829	T1096-GP-060-010-S	10	12	250	6	9.68	4.74	ND (0.00225)
600829	T1096-GP-061-005-S	5	7.6	232	3.98	8.02	3.87	ND (0.00225)
600829	T1096-GP-061-010-S	10	12.8	309	6.27	12.1	7.2	ND (0.00225)
600829	T1096-GP-061-015-S	15	13.3	343	6.68	13.7	10.6	ND (0.00225)
600829	T1096-GP-061-020-S	20	15.7	240	4.55	9.73	4.92	ND (0.00225)
600830	T1096-GP-062-005-S	5	6.86	220	4.98	9.78	4.53	0.0038 J (0.0323)
600830	T1096-GP-062-010-S	10	13.2	321	5.99	10.9	7.24	0.0122 J (0.035)
600830	T1096-GP-062-015-S	15	9.17	226	4.41	9.19	4.69	0.00435 J (0.0344)
600830	T1096-GP-062-020-S	20	13.9	254	5.45	14.2	5.91	ND (0.00225)
600830	T1096-GP-063-001-S	1	9.37	221	5.7	14.2	8.44	0.0384
600830	T1096-GP-063-005-S	5	7.01	183	3.46	7.11	4.09	ND (0.00225)
600830	T1096-GP-063-010-S	10	12.1	485	5.1	12.3	6.26	0.00383 J (0.0322)
600830	T1096-GP-063-015-S	15	10	223	4.46	9.24	5.36	ND (0.00225)
600830	T1096-GP-063-020-S	20	9.74	266	5.59	9.28	6.05	ND (0.00225)
600830	T1096-GP-064-001-S	1	7.2	226	4.39	11.5	7.27	0.0238 J (0.0322)
600830	T1096-GP-064-005-S	5	8.91	228	5.07	8.79	6.3	ND (0.00225)
600830	T1096-GP-064-010-S	10	9.38	226	4.52	9.41	4.61	ND (0.00225)
600830	T1096-GP-064-015-S	15	9.85	256	5.38	9.22	5.81	ND (0.00225)
600830	T1096-GP-064-020-S	20	13.1	258	5.33	9.41	5.61	ND (0.00225)
600831	T1096-GP-065-005-S	5	6.44	160	3.44	5.03	5.13	ND (0.00225)
600831	T1096-GP-065-010-S	10	8.1	240	4.98	8.55	6.9	0.347
600831	T1096-GP-065-015-S	15	7.95	255	5.11	9.26	6.38	ND (0.00225)
600831	T1096-GP-065-020-S	20	11.3	309	6.16	11.2	8.16	0.0232 J (0.0368)
600831	T1096-GP-066-005-S	5	8.84	300	4.82	7.14	6.73	ND (0.00225)
600831	T1096-GP-066-010-S	10	4.94	180	3.17	5.72	3.78	ND (0.00225)
600831	T1096-GP-066-015-S	15	6.89	282	3.97	9.07	5.46	ND (0.00225)
600831	T1096-GP-066-020-S	20	10	257	5.18	9.26	5.91	ND (0.00225)
600831	T1096-GP-067-005-S	5	9.59	276	5.67	8.66	7.59	ND (0.00225)
600831	T1096-GP-067-010-S	10	10.8	286	6.13	11.1	7.49	ND (0.00225)
Background Concentration			12.8	831	7.1	17	11.2	<0.1

Refer to footnotes at end of table.

Table H2-1 (Continued)
 SWMU 96, Summary of Metals Analytical Results,
 Soil Samples Collected 1998

Sample Attributes			Metals (EPA Method 6010/7060/7421/7470/7471/7740/6010A/7196/7470/7471/SW846 ^a) (mg/kg)					
Record Number ^b	ER Sample ID	Sample Depth (ft)	Chromium	Manganese	Cobalt	Copper	Lead	Mercury
600831	T1096-GP-067-015-S	15	6.24	209	4.05	8.23	4.92	ND (0.00225)
600831	T1096-GP-067-020-S	20	10.4	283	5.75	10.1	7.08	0.00799 J (0.0342)
600831	T1096-GP-085-005-SD	5	5.54	120	2.87	4.11	3.91	ND (0.00225)
600832	T1096-GP-068-001-S	1	7.86	147	3.6	13.1	17.5	ND (0.00225)
600832	T1096-GP-068-005-S	5	5.78	258	4.33	7.4	5.9	ND (0.00225)
600832	T1096-GP-068-010-S	10	10.6	291	5.88	10.5	7.49	ND (0.00225)
600832	T1096-GP-068-015-S	15	5.6	318	4.29	7.61	5.31	ND (0.00225)
600832	T1096-GP-068-020-S	20	8.91	275	5.32	9.15	6.93	ND (0.00225)
600832	T1096-GP-069-001-S	1	8.8	152	4.47	11.8	9.12	0.00881 J (0.0356)
600832	T1096-GP-069-005-S	5	6.3	229	4.21	7.32	5.25	ND (0.00225)
600832	T1096-GP-069-010-S	10	9.53	273	5.72	9.97	7.49	ND (0.00225)
600832	T1096-GP-069-015-S	15	5.62	210	3.96	6.93	5.5	ND (0.00225)
600832	T1096-GP-069-020-S	20	7.56	250	4.99	7.9	6.48	ND (0.00225)
600838	T1096-GP-080-005-S	5	7.13	208	4.69	7	6.28	0.0142 J (0.0342)
600838	T1096-GP-080-010-S	10	6.79	273	4.76	8.63	6.28	0.0157 J (0.0346)
600838	T1096-GP-080-015-S	15	5.77	211	3.41	9.72	3.41	0.0129 J (0.0344)
600838	T1096-GP-080-020-S	20	8.27	210	3.25	5.76	3.65	0.0138 J (0.0355)
600838	T1096-GP-081-005-S	5	9.53	331	6.83	11.6	8.2	0.0181 J (0.0314)
600838	T1096-GP-081-010-S	10	5.55	210	4.02	7.78	5.26	0.0177 J (0.0349)
600838	T1096-GP-081-015-S	15	4.9	187	3.65	10.3	4.33	0.0157 J (0.035)
600838	T1096-GP-081-020-S	20	6.57	183	2.46	5.2	4.32	0.0129 J (0.0284)
600838	T1096-GP-082-005-S	5	9.11	267	5.99	9.36	7.5	0.0219 J (0.0352)
600838	T1096-GP-082-010-S	10	8.12	270	5.93	9.13	7.66	0.0167 J (0.0353)
600838	T1096-GP-082-015-S	15	4.82	234	3.92	10.9	4.02	0.00928 J (0.034)
600838	T1096-GP-082-020-S	20	5.08	190	2.84	5.45	3.92	0.0115 J (0.0286)
600838	T1096-GP-083-001-S	1	4.7	150	3	7.07	20.3	0.013 J (0.037)
600838	T1096-GP-083-005-S	5	4.87	225	4.2	6.62	5	0.0136 J (0.0315)
600838	T1096-GP-083-010-S	10	6.13	237	4.22	11	5.4	0.0112 J (0.0361)
600838	T1096-GP-083-015-S	15	4.74	215	3.11	8.21	4.05	0.00401 J (0.0334)
600838	T1096-GP-083-020-S	20	5.42	186	3.27	6.3	4.67	0.00794 J (0.0287)
Background Concentration			12.8	831	7.1	17	11.2	<0.1

Refer to footnotes at end of table.

Table H2-1 (Continued)
 SWMU 96, Summary of Metals Analytical Results,
 Soil Samples Collected 1998

Sample Attributes			Metals (EPA Method 6010/7060/7421/7470/7471/7740/6010A/7196/7470/7471/SW846 ^a) (mg/kg)					
Record Number ^b	ER Sample ID	Sample Depth (ft)	Chromium	Manganese	Cobalt	Copper	Lead	Mercury
600840	T1096-GP-084-001-S	1	5.49	148	3.48	9.94	33	ND (0.00225)
600840	T1096-GP-084-005-S	5	4.66	205	3.93	7.24	4.49	ND (0.00225)
600840	T1096-GP-084-010-S	10	5.73	185	3.47	5.88	3.62	ND (0.00225)
600840	T1096-GP-084-015-S	15	10.4	316	3.69	7.31	4.38	ND (0.00225)
600840	T1096-GP-084-020-S	20	7.9	265	5.28	8.35	6.96	ND (0.00225)
600842	T1096-GP-070-005-S	5	8.25	193	4.01	6.68	6.78	0.0173 J (0.0302)
600842	T1096-GP-070-010-S	10	8.68	270	5.64	13.3	7.08	0.01 J (0.0339)
600842	T1096-GP-070-015-S	15	4.7	182	3.71	5.58	3.45	0.0127 J (0.0328)
600842	T1096-GP-070-020-S	20	8.09	251	5.3	8.23	6.46	0.00267 J (0.0362)
600842	T1096-GP-071-005-S	5	8.35	188	3.34	7.84	6.11	0.00552 J (0.0345)
600842	T1096-GP-071-010-S	10	7.13	268	4.77	7.6	5.91	ND (0.00225)
600842	T1096-GP-071-015-S	15	6.68	237	4.02	7.39	5.81	0.00756 J (0.0285)
600842	T1096-GP-071-020-S	20	11	188	4.39	9.31	5.66	0.00852 J (0.0282)
600842	T1096-GP-072-005-S	5	10.5	306	5.67	8	7.48	0.0106 J (0.0301)
600842	T1096-GP-072-010-S	10	10.1	281	6.03	9.85	7.67	0.0152 J (0.0361)
600842	T1096-GP-072-015-S	15	4.92	210	3.28	5.84	4.12	ND (0.00225)
600842	T1096-GP-072-020-S	20	5.26	387	3.8	8.15	4.2	0.0139 J (0.0267)
600843	T1096-GP-073-001-S	1	20.1	151	3.88	20.2	51.2	0.03 J (0.0314)
600843	T1096-GP-073-005-S	5	8.71	278	5.4	8.48	7.06	ND (0.00225)
600843	T1096-GP-073-010-S	10	8.33	293	5.31	9.34	6.96	ND (0.00225)
600843	T1096-GP-073-015-S	15	9.41	284	5.55	9.79	7.67	0.00519 J (0.029)
600843	T1096-GP-073-020-S	20	9.56	208	4.53	8.35	5.65	ND (0.00225)
600843	T1096-GP-074-001-S	1	12.1	159	4.15	17.7	18.6	0.0267 J (0.0317)
600845	T1096-GP-075-005-S	5	3.82	200	3.13	6.57	3.95	ND (0.00225)
600845	T1096-GP-075-010-S	10	9.09	317	6.02	11.2	7.65	ND (0.00225)
600845	T1096-GP-075-015-S	15	11.8	328	6.24	11.6	8.25	0.00483 J (0.0335)
600845	T1096-GP-075-020-S	20	10.9	316	6.09	11.4	8.03	0.00523 J (0.0326)
600845	T1096-GP-076-005-S	5	5.05	215	3.73	9.91	3.87	ND (0.00225)
600845	T1096-GP-076-010-S	10	12	258	5.31	10.2	7	ND (0.00225)
600845	T1096-GP-076-015-S	15	10.1	333	6.21	11.3	8.11	ND (0.00225)
Background Concentration			12.8	831	7.1	17	11.2	<0.1

Refer to footnotes at end of table.

Table H2-1 (Continued)
 SWMU 96, Summary of Metals Analytical Results,
 Soil Samples Collected 1998

Sample Attributes			Metals (EPA Method 6010/7060/7421/7470/7471/7740/6010A/7196/7470/7471/SW846 ^a) (mg/kg)					
Record Number ^b	ER Sample ID	Sample Depth (ft)	Chromium	Manganese	Cobalt	Copper	Lead	Mercury
600845	T1096-GP-076-020-S	20	9.35	263	4.92	9.27	6.72	ND (0.00225)
600845	T1096-GP-077-005-S	5	4.03	174	3.47	7.3	3.76	ND (0.00225)
600845	T1096-GP-077-010-S	10	11.5	307	6.33	14.2	6.35	ND (0.00225)
600845	T1096-GP-077-015-S	15	10.2	304	5.79	10.9	7.53	ND (0.00225)
600845	T1096-GP-077-020-S	20	9.21	305	5.66	10.3	7.35	ND (0.00225)
600845	T1096-GP-086-010-SD	10	10.1	277	4.88	9.4	6.03	ND (0.00225)
600845	T1096-GP-087-001-SD	1	3.23	113	2.34	4.12	6.91	ND (0.00225)
600846	T1096-GP-078-001-S	1	4.76	151	3.34	5.18	4.54	0.00589 J (0.0267)
600846	T1096-GP-078-005-S	5	10.1	256	4.85	8.6	4.4	0.00271 J (0.0282)
600846	T1096-GP-078-010-S	10	10.3	379	4.51	9.05	5.59	ND (0.00225)
600846	T1096-GP-078-015-S	15	10.8	305	5.98	9.59	6.47	0.00407 J (0.028)
600846	T1096-GP-078-020-S	20	10.2	368	5.86	10.2	7.65	0.0272 J (0.0359)
600846	T1096-GP-079-001-S	1	7.09	173	4.88	6.13	6.64	0.0255 J (0.029)
600846	T1096-GP-079-005-S	5	12.1	281	5.35	8.98	5.67	0.0225 J (0.0344)
600846	T1096-GP-079-010-S	10	8.92	201	3.91	8.56	5.73	0.0166 J (0.0296)
600846	T1096-GP-079-015-S	15	11.1	275	5.33	9.7	7.65	0.0243 J (0.0346)
600846	T1096-GP-079-020-S	20	9.96	306	6.22	10.7	8.01	0.0286 J (0.0304)
601096	T1096-GP-074-005	5	11.3	286	5.94	8.41	7.67	ND (0.00225)
601096	T1096-GP-074-010	10	29.6	399	8.37	18.9	12.2	0.0127 JH (0.0381)
601096	T1096-GP-074-015	15	10.5	237	5.66	9.34	6.99	0.0113 JH (0.0329)
601096	T1096-GP-074-020	20	7.26	202	4.26	6.63	5.08	ND (0.00225)
601096	T1096-GP-088-005	5	9.54	256	5.44	7.73	7.85	0.00254 JH (0.0354)
601096	T1096-GP-089-010	10	11.4	306	6.82	10.9	8.8	0.00344 JH (0.0304)
Background Concentration			12.8	831	7.1	17	11.2	<0.1
Quality Assurance/Quality Control Samples (mg/L)								
600831	T1096-EB-006-000-W	0	0.00216 J (0.005)	ND (0.00069)	ND (0.00069)	ND (0.00104)	ND (0.00159)	ND (0.00004)
600838	T1096-EB-009-000-W	0	0.00171 J (0.005)	ND (0.00069)	ND (0.00069)	ND (0.00104)	ND (0.00159)	ND (0.00004)
600840	T1096-EB-010-000-W	0	0.00136 J (0.005)	ND (0.00069)	ND (0.00069)	0.00236 J (0.005)	0.00197 J (0.005)	ND (0.00004)
600849	T1096-EB-007-000-W	0	ND (0.00056)	ND (0.00069)	ND (0.00069)	0.00147 J (0.005)	ND (0.00159)	ND (0.00004)
601096	T1096-EB-011-000	0	0.00082 J (0.005)	ND (0.00069)	ND (0.00069)	ND (0.00104)	ND (0.00159)	ND (0.00004)

Refer to footnotes at end of table.

Table H2-1 (Continued)
 SWMU 96, Summary of Metals Analytical Results,
 Soil Samples Collected 1998

Sample Attributes			Metals (EPA Method 6010/7060/7421/7470/7471/7740/6010A/7196/7470/7471/SW846 ^a) (mg/kg)					
Record Number ^b	ER Sample ID	Sample Depth (ft)	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
600829	T1096-GP-060-005-S	5	6.2	ND (0.135)	ND (0.031)	0.695 J (1)	28	26.1
600829	T1096-GP-060-010-S	10	7.16	ND (0.135)	ND (0.031)	0.621 J (0.991)	25.8	26.8
600829	T1096-GP-061-005-S	5	7.06	ND (0.135)	ND (0.031)	0.461 J (1)	23.4	24.4
600829	T1096-GP-061-010-S	10	9.81	ND (0.135)	ND (0.031)	0.779 J (1.06)	30	37.4
600829	T1096-GP-061-015-S	15	9.9	0.406 J (0.591)	ND (0.031)	0.662 J (1.18)	33.3	105
600829	T1096-GP-061-020-S	20	6.6	0.358 J (0.473)	ND (0.031)	1.12	27.5	30.2
600830	T1096-GP-062-005-S	5	5.65	ND (0.135)	ND (0.031)	0.853 J (1.02)	27.7	27.1
600830	T1096-GP-062-010-S	10	10.2	ND (0.135)	ND (0.031)	0.493 J (1.02)	30.7	37.2
600830	T1096-GP-062-015-S	15	6.46	ND (0.135)	ND (0.031)	ND (0.221)	24.7	29.7
600830	T1096-GP-062-020-S	20	8.5	ND (0.135)	ND (0.031)	0.619 J (1.08)	28.1	32.7
600830	T1096-GP-063-001-S	1	8.57	ND (0.135)	0.0644 J (0.489)	ND (0.221)	31.7	40.6
600830	T1096-GP-063-005-S	5	5.58	ND (0.135)	ND (0.031)	0.493 J (0.965)	22.4	22.6
600830	T1096-GP-063-010-S	10	9.45	ND (0.135)	ND (0.031)	0.887 J (1.02)	28.1	105
600830	T1096-GP-063-015-S	15	8.04	ND (0.135)	ND (0.031)	ND (0.221)	23.2	29.7
600830	T1096-GP-063-020-S	20	8.42	ND (0.135)	ND (0.031)	ND (0.221)	25.6	34.4
600830	T1096-GP-064-001-S	1	6.68	ND (0.135)	0.248 J (0.493)	ND (0.221)	23.1	30.8
600830	T1096-GP-064-005-S	5	6.52	ND (0.135)	ND (0.031)	0.555 J (1.02)	28.8	28.4
600830	T1096-GP-064-010-S	10	6.74	ND (0.135)	ND (0.031)	0.49 J (0.974)	23.4	28.9
600830	T1096-GP-064-015-S	15	7.9	ND (0.135)	ND (0.031)	0.486 J (1.06)	25	31.3
600830	T1096-GP-064-020-S	20	9.01	ND (0.135)	ND (0.031)	0.692 J (1.11)	26.8	32.1
600831	T1096-GP-065-005-S	5	5.59	ND (0.135)	ND (0.031)	0.537 J (1.09)	21.7	24.7
600831	T1096-GP-065-010-S	10	8.79	ND (0.135)	ND (0.031)	0.767 J (1.1)	22.2	31.6
600831	T1096-GP-065-015-S	15	8.58	ND (0.135)	ND (0.031)	0.638 J (1.07)	21.7	36.1
600831	T1096-GP-065-020-S	20	10.8	ND (0.135)	ND (0.031)	0.942 J (1.09)	28.5	40.2
600831	T1096-GP-066-005-S	5	8.02	ND (0.135)	ND (0.031)	1.24	30.6	30.3
600831	T1096-GP-066-010-S	10	4.98	ND (0.135)	ND (0.031)	0.938 J (1.02)	14.1	20.4
600831	T1096-GP-066-015-S	15	6.13	ND (0.135)	ND (0.031)	0.855 J (1.04)	19.4	28.5
600831	T1096-GP-066-020-S	20	8.17	0.397 J (0.538)	ND (0.031)	0.982 J (1.08)	22.9	32.1
600831	T1096-GP-067-005-S	5	9.23	ND (0.135)	ND (0.031)	0.561 J (0.997)	35.5	34.9
600831	T1096-GP-067-010-S	10	10.5	0.323 J (0.525)	ND (0.031)	0.606 J (1.05)	25.5	38.1
Background Concentration			25.4	<1	<1	<1.1	33	76

Refer to footnotes at end of table.

Table H2-1 (Continued)
 SWMU 96, Summary of Metals Analytical Results,
 Soil Samples Collected 1998

Sample Attributes			Metals (EPA Method 6010/7060/7421/7470/7471/7740/6010A/7196/7470/7471/SW846 ^a) (mg/kg)					
Record Number ^b	ER Sample ID	Sample Depth (ft)	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
600831	T1096-GP-067-015-S	15	6.09	ND (0.135)	ND (0.031)	0.801 J (1.04)	17.8	29.3
600831	T1096-GP-067-020-S	20	9.31	ND (0.135)	ND (0.031)	0.616 J (1.04)	25	33.3
600831	T1096-GP-085-005-SD	5	4.95	ND (0.135)	ND (0.031)	0.624 J (1.06)	18.6	19.2
600832	T1096-GP-068-001-S	1	6.29	0.607	1.04	ND (0.221)	23.8	50.7
600832	T1096-GP-068-005-S	5	7.1	0.473 J (0.524)	0.233 J (0.524)	ND (0.221)	21.7	32.2
600832	T1096-GP-068-010-S	10	11	0.591	0.232 J (0.525)	ND (0.221)	20.9	38.9
600832	T1096-GP-068-015-S	15	7.25	0.505 J (0.534)	0.281 J (0.534)	ND (0.221)	15.6	32.8
600832	T1096-GP-068-020-S	20	9.23	0.377 J (0.514)	0.303 J (0.514)	ND (0.221)	21.5	33.7
600832	T1096-GP-069-001-S	1	7.48	ND (0.135)	0.953	ND (0.221)	26.7	35.5
600832	T1096-GP-069-005-S	5	6.99	0.373 J (0.512)	0.253 J (0.512)	ND (0.221)	22	30.4
600832	T1096-GP-069-010-S	10	11.2	0.625	0.233 J (0.515)	ND (0.221)	20.3	37.7
600832	T1096-GP-069-015-S	15	6.77	ND (0.135)	0.235 J (0.519)	ND (0.221)	13.8	26.8
600832	T1096-GP-069-020-S	20	8.16	0.712	0.277 J (0.539)	ND (0.221)	19.5	31.5
600838	T1096-GP-080-005-S	5	7.08	ND (0.135)	0.166 J (0.524)	ND (0.221)	21.7	30
600838	T1096-GP-080-010-S	10	7.56	0.372 J (0.518)	0.145 J (0.518)	ND (0.221)	18.8	31
600838	T1096-GP-080-015-S	15	5.24	0.276 J (0.487)	ND (0.031)	ND (0.221)	12.6	22.4
600838	T1096-GP-080-020-S	20	4.92	ND (0.135)	0.125 J (0.521)	ND (0.221)	12.3	24.4
600838	T1096-GP-081-005-S	5	10.6	ND (0.135)	0.139 J (0.56)	ND (0.221)	26.9	43.7
600838	T1096-GP-081-010-S	10	6.45	0.457 J (0.527)	0.205 J (0.527)	ND (0.221)	16	28.5
600838	T1096-GP-081-015-S	15	5.83	ND (0.135)	0.16 J (0.538)	ND (0.221)	14.1	23.7
600838	T1096-GP-081-020-S	20	4.43	ND (0.135)	0.0791 J (0.506)	ND (0.221)	11.3	19.6
600838	T1096-GP-082-005-S	5	9.37	ND (0.135)	0.156 J (0.576)	ND (0.221)	25	38.9
600838	T1096-GP-082-010-S	10	9.75	ND (0.135)	0.121 J (0.563)	ND (0.221)	23.1	36.2
600838	T1096-GP-082-015-S	15	5.21	ND (0.135)	0.19 J (0.506)	ND (0.221)	14.5	26.1
600838	T1096-GP-082-020-S	20	4.35	ND (0.135)	0.147 J (0.482)	ND (0.221)	12.1	18
600838	T1096-GP-083-001-S	1	5.26	ND (0.135)	0.159 J (0.521)	ND (0.221)	17.5	30.6
600838	T1096-GP-083-005-S	5	5.93	ND (0.135)	0.071 J (0.527)	ND (0.221)	20.7	32
600838	T1096-GP-083-010-S	10	6.54	ND (0.135)	0.245 J (0.523)	ND (0.221)	17.4	27
600838	T1096-GP-083-015-S	15	4.36	0.321 J (0.527)	0.118 J (0.527)	ND (0.221)	13.1	21.6
600838	T1096-GP-083-020-S	20	4.93	0.343 J (0.483)	0.102 J (0.483)	ND (0.221)	13.4	19.6
Background Concentration			25.4	<1	<1	<1.1	33	76

Refer to footnotes at end of table.

Table H2-1 (Continued)
 SWMU 96, Summary of Metals Analytical Results,
 Soil Samples Collected 1998

Sample Attributes			Metals (EPA Method 6010/7060/7421/7470/7471/7740/6010A/7196/7470/7471/SW846 ^a) (mg/kg)					
Record Number ^b	ER Sample ID	Sample Depth (ft)	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
600840	T1096-GP-084-001-S	1	6.11	ND (0.135)	0.221 J (0.533)	ND (0.221)	19.8	38.2
600840	T1096-GP-084-005-S	5	5.71	ND (0.135)	0.114 J (0.502)	ND (0.221)	19.6	25.7
600840	T1096-GP-084-010-S	10	5.02	ND (0.135)	0.145 J (0.501)	ND (0.221)	14.7	24.7
600840	T1096-GP-084-015-S	15	6.06	ND (0.135)	0.0705 J (0.511)	ND (0.221)	15.3	26.1
600840	T1096-GP-084-020-S	20	9.11	0.503 J (0.515)	0.169 J (0.515)	ND (0.221)	18.6	30.9
600842	T1096-GP-070-005-S	5	6.18	ND (0.135)	1.1	ND (0.221)	19.4	31.7
600842	T1096-GP-070-010-S	10	9.44	0.508 J (0.567)	0.639	ND (0.221)	21.5	35.6
600842	T1096-GP-070-015-S	15	4.36	0.795	0.1 J (0.506)	ND (0.221)	14.3	22
600842	T1096-GP-070-020-S	20	8.42	ND (0.135)	ND (0.031)	ND (0.221)	25.2	33.7
600842	T1096-GP-071-005-S	5	6.31	0.45 J (0.511)	0.998	ND (0.221)	22.5	32.1
600842	T1096-GP-071-010-S	10	7.55	0.423 J (0.522)	ND (0.031)	ND (0.221)	21.8	34.7
600842	T1096-GP-071-015-S	15	5.33	0.347 J (0.506)	0.294 J (0.506)	ND (0.221)	18.2	29.6
600842	T1096-GP-071-020-S	20	5.79	0.515	0.3 J (0.483)	ND (0.221)	22.4	30
600842	T1096-GP-072-005-S	5	9.25	ND (0.135)	0.145 J (0.547)	ND (0.221)	29.2	37.2
600842	T1096-GP-072-010-S	10	10.7	ND (0.135)	0.148 J (0.531)	ND (0.221)	24.1	39.7
600842	T1096-GP-072-015-S	15	5.2	ND (0.135)	0.0607 J (0.492)	ND (0.221)	13.2	22.8
600842	T1096-GP-072-020-S	20	5.45	0.356 J (0.501)	0.111 J (0.501)	ND (0.221)	15.2	22.8
600843	T1096-GP-073-001-S	1	6.87	ND (0.135)	11.8	0.567 J (1.03)	20	96.2
600843	T1096-GP-073-005-S	5	9.53	ND (0.135)	ND (0.031)	0.525 J (1.11)	27.8	36.3
600843	T1096-GP-073-010-S	10	8.82	ND (0.135)	0.0629 J (0.523)	0.551 J (1.05)	24.8	38
600843	T1096-GP-073-015-S	15	9.83	ND (0.135)	ND (0.031)	0.55 J (1.09)	23.3	36.6
600843	T1096-GP-073-020-S	20	7.01	ND (0.135)	ND (0.031)	0.784 J (1.01)	24	28.2
600843	T1096-GP-074-001-S	1	7.16	ND (0.135)	14.9	0.95 J (1.02)	25.5	89.2
600845	T1096-GP-075-005-S	5	4.48	ND (0.135)	ND (0.031)	0.556 J (0.983)	16.3	25.6
600845	T1096-GP-075-010-S	10	10	ND (0.135)	ND (0.031)	0.48 J (1.01)	24.2	41.6
600845	T1096-GP-075-015-S	15	12	ND (0.135)	ND (0.031)	ND (0.221)	22.8	40.7
600845	T1096-GP-075-020-S	20	11.4	ND (0.135)	ND (0.031)	0.554 J (1.04)	23.2	39.4
600845	T1096-GP-076-005-S	5	5.38	ND (0.135)	ND (0.031)	0.751 J (0.965)	18.5	29.7
600845	T1096-GP-076-010-S	10	8.98	ND (0.135)	ND (0.031)	0.788 J (1.08)	25.8	33.9
600845	T1096-GP-076-015-S	15	11.3	ND (0.135)	ND (0.031)	0.692 J (1.08)	22.9	42
Background Concentration			25.4	<1	<1	<1.1	33	76

Refer to footnotes at end of table.

Table H2-1 (Continued)
 SWMU 96, Summary of Metals Analytical Results,
 Soil Samples Collected 1998

Sample Attributes			Metals (EPA Method 6010/7060/7421/7470/7471/7740/6010A/7196/7470/7471/SW846 ^a) (mg/kg)					
Record Number ^b	ER Sample ID	Sample Depth (ft)	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
600845	T1096-GP-076-020-S	20	9.32	ND (0.135)	ND (0.031)	0.501 J (1.11)	20.6	34.7
600845	T1096-GP-077-005-S	5	4.58	ND (0.135)	ND (0.031)	ND (0.221)	17.5	24.6
600845	T1096-GP-077-010-S	10	9.53	ND (0.135)	ND (0.031)	0.674 J (0.967)	25.3	40.1
600845	T1096-GP-077-015-S	15	10.7	ND (0.135)	ND (0.031)	0.583 J (1.08)	22.3	39.8
600845	T1096-GP-077-020-S	20	9.53	ND (0.135)	ND (0.031)	0.49 J (1.05)	22.9	40.7
600845	T1096-GP-086-010-SD	10	8.07	ND (0.135)	ND (0.031)	1.04 J (1.04)	23.1	34.8
600845	T1096-GP-087-001-SD	1	3.4	ND (0.135)	ND (0.031)	0.932 J (1)	16.1	16.4
600846	T1096-GP-078-001-S	1	4.95	ND (0.135)	ND (0.031)	0.732 J (1.04)	22.2	21.2
600846	T1096-GP-078-005-S	5	5.88	0.473 J (0.5)	ND (0.031)	0.678 J (1)	21.1	28.6
600846	T1096-GP-078-010-S	10	7.04	0.385 J (0.506)	ND (0.031)	0.953 J (1.01)	20.5	32.5
600846	T1096-GP-078-015-S	15	9.33	0.402 J (0.497)	ND (0.031)	0.951 J (0.993)	23.7	41.4
600846	T1096-GP-078-020-S	20	10.8	0.435 J (0.514)	ND (0.031)	1.12	22.1	39.7
600846	T1096-GP-079-001-S	1	8.25	ND (0.135)	ND (0.031)	1.63	28.6	26.5
600846	T1096-GP-079-005-S	5	6.88	0.574	ND (0.031)	1.5	28.1	36.5
600846	T1096-GP-079-010-S	10	6.33	0.377 J (0.488)	ND (0.031)	0.52 J (0.976)	19.1	26.6
600846	T1096-GP-079-015-S	15	9.29	0.391 J (0.535)	ND (0.031)	0.789 J (1.07)	23.7	35.8
600846	T1096-GP-079-020-S	20	11.4	0.483 J (0.534)	ND (0.031)	0.542 J (1.07)	23.3	41.2
601096	T1096-GP-074-005	5	11.1	0.39 J (0.526)	0.477 J (0.526)	ND (0.221)	32.6	38.8
601096	T1096-GP-074-010	10	14.5	1.21	4.38	ND (0.221)	31.5	71
601096	T1096-GP-074-015	15	9.25	0.707	0.285 J (0.545)	ND (0.221)	24	34.7
601096	T1096-GP-074-020	20	6.26	0.509	0.143 J (0.502)	ND (0.221)	18.9	27.8
601096	T1096-GP-088-005	5	9.38	0.494 J (0.519)	0.488 J (0.519)	ND (0.221)	28.8	37
601096	T1096-GP-089-010	10	11.7	0.615	0.454 J (0.529)	ND (0.221)	26.8	44.8
Background Concentration			25.4	<1	<1	<1.1	33	76
Quality Assurance/Quality Control Samples (mg/L)								
600831	T1096-EB-006-000-W	0	0.0016 J (0.005)	0.0029 J (0.005)	ND (0.00073)	ND (0.00308)	ND (0.00059)	0.0122
600838	T1096-EB-009-000-W	0	ND (0.00129)	0.00496 J (0.005)	0.00081 J (0.005)	ND (0.00308)	ND (0.00059)	0.0018 J (0.005)
600840	T1096-EB-010-000-W	0	0.00131 J (0.005)	0.00345 J (0.005)	0.00124 J (0.005)	ND (0.00308)	ND (0.00059)	0.00797
600849	T1096-EB-007-000-W	0	ND (0.00129)	ND (0.00271)	ND (0.00073)	ND (0.00308)	ND (0.00059)	0.0073
601096	T1096-EB-011-000	0	ND (0.00129)	ND (0.00271)	ND (0.00073)	0.00334 J (0.01)	ND (0.00059)	0.00317 J (0.005)

Refer to footnotes at end of table.

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H-17

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Table H2-1 (Concluded)
SWMU 96, Summary of Metals Analytical Results,
Soil Samples Collected 1998

Note: **Bold** indicates values that exceed background screening levels.

^aEPA November 1986.

^bAnalysis request/chain-of-custody record.

EB = Equipment blank.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
GP = Geoprobe.
H = The hold time was exceeded for the associated sample analysis.
ID = Identification.
J () = The reported value is greater than or equal to the MDL but is less than the PQL, shown in parentheses.
MDL = Method detection limit.
mg/kg = Milligram(s) per kilogram.
mg/L = Milligram(s) per liter.
ND () = Not detected above the MDL, shown in parentheses.
PQL = Practical quantitation limit.
S = Soil Sample.
SD = Sample Duplicate.
SWMU = Solid Waste Management Unit.
T1 = Technical Area 1.
W = Water Sample.

Table H2-2
SWMU 96. Summary of PCB Analytical Results—Detections Only,
Soil Samples Collected 1998

Sample Attributes			(EPA Method 8080/SW846 ^a) (µg/kg)		
Record Number ^b	ER Sample ID	Sample Depth (ft)	Aroclor-1248	Aroclor-1254	Aroclor-1260
600831	T1096-GP-065-005-S	5	ND (1.5)	ND (1.5)	4.4
600831	T1096-GP-067-005-S	5	ND (1.5)	ND (1.5)	2.1 J (3.62)
600832	T1096-GP-068-001-S	1	ND (1.5)	92	160
600832	T1096-GP-069-001-S	1	ND (1.5)	74	110
600840	T1096-GP-084-001-S	1	ND (1.5)	ND (1.5)	71
600842	T1096-GP-072-010-S	10	34	ND (1.5)	ND (1.5)
601096	T1096-GP-074-010	10	ND (1.5)	20	ND (1.5)

Note: **Bold** indicates values that exceed background screening levels.

^aEPA November 1986.

^bAnalysis request/chain-of-custody record.

EPA = U.S. Environmental Protection Agency.

ER = Environmental Restoration.

ft = Foot (feet).

GP = Geoprobe.

ID = Identification.

J () = The reported value is greater than or equal to the MDL but is less than the PQL, shown in parentheses.

MDL = Method detection limit.

µg/kg = Microgram(s) per kilogram.

ND () = Not detected above the MDL, shown in parentheses.

PCB = Polychlorinated biphenyl.

PQL = Practical quantitation limit.

S = Soil Sample.

SWMU = Solid Waste Management Unit.

T1 = Technical Area 1.

Table H2-3
SWMU 96, Summary of SVOC Analytical Results—Detections Only,
Soil Samples Collected 1998

Sample Attributes			SVOCs (EPA Method 8270/8270/SW846 ^a) (µg/kg)				
Record Number ^b	ER Sample ID	Sample Depth (ft)	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(ghi)perylene	Chrysene
600842	T1096-GP-070-005-S	5	ND (10)	ND (10)	ND (10)	ND (10)	63 J (360)
600842	T1096-GP-071-020-S	20	170 J (345)	210 J (345)	170 J (345)	88 J (345)	190 J (345)
600843	T1096-GP-073-001-S	1	ND (10)	ND (10)	930 J (1,470)	ND (10)	780 J (1,470)
600843	T1096-GP-074-001-S	1	800 J (1,470)	1,000 J (1,470)	1,300 J (1,470)	730 J (1,470)	1,100 J (1,470)

Record Number ^b	ER Sample ID	Sample Depth (ft)	Fluoranthene	Indeno(1,2,3-cd)pyrene	Phenanthrene	Pyrene
600842	T1096-GP-070-005-S	5	120 J (360)	ND (10)	ND (10)	120 J (360)
600842	T1096-GP-071-020-S	20	380	100 J (345)	170 J (345)	360
600843	T1096-GP-073-001-S	1	1,700	ND (10)	1,100 J (1,470)	1,400 J (1,470)
600843	T1096-GP-074-001-S	1	1,700	ND (10)	ND (10)	1,400 J (1,470)

Note: **Bold** indicates values that exceed background screening levels.

^aEPA November 1986.

^bAnalysis request/chain-of-custody record.

EPA = U.S. Environmental Protection Agency.

ER = Environmental Restoration.

ft = Foot (feet).

GP = Geoprobe.

ID = Identification.

J () = The reported value is greater than or equal to the MDL but is less than the PQL, shown in parentheses.

MDL = Method detection limit.

µg/kg = Microgram(s) per kilogram.

ND () = Not detected above the MDL, shown in parentheses.

PQL = Practical quantitation limit.

S = Soil Sample.

SVOC = Semivolatile organic compound.

SWMU = Solid Waste Management Unit.

T1 = Technical Area 1.

Table H2-4
SWMU 96, Summary of VOC Analytical Results—Detections Only,
Soil Samples Collected 1998

Sample Attributes			VOCs (EPA Method 8240/8240/8260/SW846 ^a) (µg/kg)				
Record Number ^b	ER Sample ID	Sample Depth (ft)	2-Butanone	Carbon disulfide	Chloroform	Methylene chloride	Tetrachloro-ethene
600829	T1096-GP-060-005-S	5	ND (2.1)	ND (2.2)	0.53 J (1.01)	ND (0.25)	ND (0.23)
600829	T1096-GP-061-005-S	5	ND (2.1)	ND (2.2)	0.66 J (1.04)	ND (0.25)	ND (0.23)
600829	T1096-GP-061-010-S	10	ND (2.1)	ND (2.2)	ND (0.24)	ND (0.25)	ND (0.23)
600829	T1096-GP-061-015-S	15	ND (2.1)	ND (2.2)	0.57 J (1.08)	ND (0.25)	ND (0.23)
600829	T1096-GP-061-020-S	20	ND (2.1)	0.64 JB (5.18)	0.59 J (1.04)	ND (0.25)	ND (0.23)
600830	T1096-GP-062-010-S	10	ND (2.1)	ND (2.2)	ND (0.24)	ND (0.25)	ND (0.23)
600830	T1096-GP-062-015-S	15	ND (2.1)	ND (2.2)	ND (0.24)	ND (0.25)	ND (0.23)
600830	T1096-GP-062-020-S	20	ND (2.1)	ND (2.2)	0.64 J (1.08)	ND (0.25)	ND (0.23)
600830	T1096-GP-063-001-S	1	ND (2.1)	ND (2.2)	0.56 J (1.08)	ND (0.25)	ND (0.23)
600830	T1096-GP-063-005-S	5	ND (2.1)	ND (2.2)	0.65 J (1.04)	ND (0.25)	ND (0.23)
600830	T1096-GP-063-010-S	10	ND (2.1)	ND (2.2)	ND (0.24)	4.4 J (5.3)	ND (0.23)
600830	T1096-GP-063-015-S	15	ND (2.1)	ND (2.2)	ND (0.24)	ND (0.25)	ND (0.23)
600830	T1096-GP-064-001-S	1	ND (2.1)	ND (2.2)	ND (0.24)	2.7 J (5.28)	ND (0.23)
600830	T1096-GP-064-005-S	5	ND (2.1)	ND (2.2)	ND (0.24)	3.4 J (5.17)	ND (0.23)
600830	T1096-GP-064-010-S	10	ND (2.1)	ND (2.2)	ND (0.24)	3.2 J (5.21)	ND (0.23)
600830	T1096-GP-064-015-S	15	ND (2.1)	ND (2.2)	ND (0.24)	3.2 J (5.38)	ND (0.23)
600830	T1096-GP-064-020-S	20	ND (2.1)	ND (2.2)	ND (0.24)	2.6 J (5.7)	ND (0.23)
600831	T1096-GP-065-010-S	10	ND (2.1)	ND (2.2)	2.2 B	ND (0.25)	ND (0.23)
600831	T1096-GP-065-015-S	15	ND (2.1)	ND (2.2)	2.8 B	ND (0.25)	ND (0.23)
600831	T1096-GP-065-020-S	20	ND (2.1)	ND (2.2)	2.6 B	ND (0.25)	ND (0.23)
600831	T1096-GP-066-005-S	5	ND (2.1)	ND (2.2)	2.6 B	ND (0.25)	ND (0.23)
600831	T1096-GP-066-010-S	10	ND (2.1)	ND (2.2)	2.5 B	ND (0.25)	ND (0.23)
600831	T1096-GP-066-015-S	15	ND (2.1)	ND (2.2)	2.7 B	ND (0.25)	ND (0.23)
600831	T1096-GP-066-020-S	20	ND (2.1)	ND (2.2)	2.2 B	ND (0.25)	ND (0.23)
600831	T1096-GP-067-005-S	2	ND (2.1)	ND (2.2)	2.7 B	ND (0.25)	ND (0.23)
600831	T1096-GP-067-010-S	10	ND (2.1)	ND (2.2)	2.3 B	ND (0.25)	ND (0.23)
600831	T1096-GP-067-015-S	15	ND (2.1)	ND (2.2)	1.4 B	ND (0.25)	ND (0.23)

Refer to footnotes at end of table.

Table H2-4 (Continued)
 SWMU 96, Summary of VOC Analytical Results—Detections Only,
 Soil Samples Collected 1998

Sample Attributes			VOCs (EPA Method 8240/8240/8260/SW846 ^a) (µg/kg)				
Record Number ^b	ER Sample ID	Sample Depth (ft)	2-Butanone	Carbon disulfide	Chloroform	Methylene chloride	Tetrachloro-ethene
600831	T1096-GP-067-020-S	20	ND (2.1)	ND (2.2)	1.6 B	ND (0.25)	ND (0.23)
600831	T1096-GP-085-005-SD	5	ND (2.1)	ND (2.2)	2.5 B	ND (0.25)	ND (0.23)
600832	T1096-GP-068-001-S	1	ND (2.1)	ND (2.2)	ND (0.24)	ND (0.25)	ND (0.23)
600832	T1096-GP-068-005-S	5	ND (2.1)	ND (2.2)	ND (0.24)	1.8 JB (5.56)	ND (0.23)
600832	T1096-GP-068-010-S	10	ND (2.1)	ND (2.2)	ND (0.24)	ND (0.25)	ND (0.23)
600832	T1096-GP-068-015-S	15	ND (2.1)	ND (2.2)	ND (0.24)	ND (0.25)	ND (0.23)
600832	T1096-GP-068-020-S	20	ND (2.1)	ND (2.2)	ND (0.24)	ND (0.25)	ND (0.23)
600832	T1096-GP-069-001-S	1	ND (2.1)	ND (2.2)	ND (0.24)	2.1 JB (5.62)	ND (0.23)
600832	T1096-GP-069-010-S	10	ND (2.1)	ND (2.2)	ND (0.24)	ND (0.25)	1.4
600832	T1096-GP-069-020-S	20	ND (2.1)	ND (2.2)	ND (0.24)	1.7 JB (5.56)	ND (0.23)
600838	T1096-GP-081-015-S	15	ND (2.1)	ND (2.2)	ND (0.24)	ND (0.25)	ND (0.23)
600838	T1096-GP-081-020-S	20	ND (2.1)	ND (2.2)	ND (0.24)	7.6 HB	ND (0.23)
600838	T1096-GP-082-005-S	5	ND (2.1)	ND (2.2)	ND (0.24)	8.2 B	3.1
600838	T1096-GP-082-010-S	10	ND (2.1)	ND (2.2)	ND (0.24)	11 B	ND (0.23)
600838	T1096-GP-082-015-S	15	ND (2.1)	ND (2.2)	ND (0.24)	7.8 B	ND (0.23)
600838	T1096-GP-082-020-S	20	ND (2.1)	ND (2.2)	ND (0.24)	6.7 B	ND (0.23)
600838	T1096-GP-083-001-S	1	ND (2.1)	ND (2.2)	ND (0.24)	7.2 B	ND (0.23)
600838	T1096-GP-083-005-S	5	ND (2.1)	ND (2.2)	ND (0.24)	11 B	ND (0.23)
600838	T1096-GP-083-010-S	10	ND (2.1)	ND (2.2)	ND (0.24)	6.4 HB	ND (0.23)
600838	T1096-GP-083-020-S	20	ND (2.1)	ND (2.2)	ND (0.24)	10 B	ND (0.23)
600840	T1096-GP-084-001-S	1	ND (2.1)	ND (2.2)	ND (0.24)	9.7 B	ND (0.23)
600840	T1096-GP-084-005-S	5	ND (2.1)	ND (2.2)	ND (0.24)	8.6 B	ND (0.23)
600840	T1096-GP-084-010-S	10	ND (2.1)	ND (2.2)	ND (0.24)	5.3 JB (5.37)	ND (0.23)
600840	T1096-GP-084-015-S	15	ND (2.1)	ND (2.2)	ND (0.24)	7.5 B	ND (0.23)
600840	T1096-GP-084-020-S	20	ND (2.1)	ND (2.2)	ND (0.24)	8.1 B	15
600842	T1096-GP-070-005-S	5	ND (2.1)	ND (2.2)	ND (0.24)	3.3 JB (5.49)	ND (0.23)
600842	T1096-GP-070-010-S	10	ND (2.1)	ND (2.2)	ND (0.24)	5.5 JHB (5.95)	ND (0.23)

Refer to footnotes at end of table.

Table H2-4 (Continued)
 SWMU 96, Summary of VOC Analytical Results—Detections Only,
 Soil Samples Collected 1998

Sample Attributes			VOCs (EPA Method 8240/8240/8260/SW846 ^a) (µg/kg)				
Record Number ^b	ER Sample ID	Sample Depth (ft)	2-Butanone	Carbon disulfide	Chloroform	Methylene chloride	Tetrachloro-ethene
600842	T1096-GP-071-010-S	10	ND (2.1)	ND (2.2)	ND (0.24)	3.8 JB (5.38)	ND (0.23)
600842	T1096-GP-071-015-S	15	ND (2.1)	ND (2.2)	ND (0.24)	3.2 JB (5.21)	ND (0.23)
600842	T1096-GP-071-020-S	20	ND (2.1)	ND (2.2)	ND (0.24)	3.7 JB (5.26)	ND (0.23)
600842	T1096-GP-072-005-S	5	ND (2.1)	ND (2.2)	ND (0.24)	2.7 JB (5.75)	ND (0.23)
600842	T1096-GP-072-010-S	10	ND (2.1)	ND (2.2)	ND (0.24)	4 JB (5.68)	ND (0.23)
600842	T1096-GP-072-015-S	15	ND (2.1)	ND (2.2)	ND (0.24)	4.3 JB (5.26)	ND (0.23)
600842	T1096-GP-072-020-S	20	ND (2.1)	ND (2.2)	ND (0.24)	3.8 JB (5.26)	ND (0.23)
600843	T1096-GP-073-001-S	1	ND (2.1)	ND (2.2)	ND (0.24)	2.6 JB (5.49)	ND (0.23)
600843	T1096-GP-073-005-S	5	ND (2.1)	ND (2.2)	ND (0.24)	2.7 JB (5.56)	ND (0.23)
600843	T1096-GP-073-010-S	10	ND (2.1)	ND (2.2)	ND (0.24)	1.9 JB (5.49)	ND (0.23)
600843	T1096-GP-073-015-S	15	ND (2.1)	ND (2.2)	ND (0.24)	2.3 JB (5.75)	ND (0.23)
600843	T1096-GP-073-020-S	20	ND (2.1)	ND (2.2)	ND (0.24)	1.6 JB (5.43)	ND (0.23)
600843	T1096-GP-074-001-S	1	ND (2.1)	ND (2.2)	ND (0.24)	2.7 JHB (5.49)	ND (0.23)
600845	T1096-GP-075-005-S	5	ND (2.1)	ND (2.2)	ND (0.24)	3.4 JB (5.21)	ND (0.23)
600845	T1096-GP-075-010-S	10	ND (2.1)	ND (2.2)	ND (0.24)	4.3 JB (5.56)	ND (0.23)
600845	T1096-GP-075-015-S	15	ND (2.1)	ND (2.2)	ND (0.24)	4.4 JB (5.26)	ND (0.23)
600845	T1096-GP-075-020-S	20	ND (2.1)	ND (2.2)	ND (0.24)	4 JB (5.68)	ND (0.23)
600845	T1096-GP-076-005-S	5	ND (2.1)	ND (2.2)	ND (0.24)	2.8 JB (5.21)	ND (0.23)
600845	T1096-GP-076-010-S	10	ND (2.1)	ND (2.2)	ND (0.24)	3.1 JB (5.38)	ND (0.23)
600845	T1096-GP-076-015-S	15	ND (2.1)	ND (2.2)	ND (0.24)	2.4 JB (5.88)	ND (0.23)
600845	T1096-GP-076-020-S	20	ND (2.1)	ND (2.2)	ND (0.24)	4.4 JB (5.62)	ND (0.23)
600845	T1096-GP-077-005-S	5	ND (2.1)	ND (2.2)	ND (0.24)	1.8 JB (5.1)	ND (0.23)
600845	T1096-GP-077-010-S	10	ND (2.1)	ND (2.2)	ND (0.24)	3.4 JB (5.32)	ND (0.23)
600845	T1096-GP-077-015-S	15	ND (2.1)	ND (2.2)	ND (0.24)	3.1 JB (5.56)	ND (0.23)
600845	T1096-GP-077-020-S	20	ND (2.1)	ND (2.2)	ND (0.24)	2.3 JB (5.38)	ND (0.23)
600846	T1096-GP-078-001-S	1	ND (2.1)	ND (2.2)	ND (0.24)	2.3 J (5.26)	ND (0.23)
600846	T1096-GP-078-005-S	5	ND (2.1)	ND (2.2)	ND (0.24)	1.5 J (5.15)	ND (0.23)

Refer to footnotes at end of table.

Table H2-4 (Continued)
 SWMU 96, Summary of VOC Analytical Results—Detections Only,
 Soil Samples Collected 1998

Sample Attributes			VOCs (EPA Method 8240/8240/8260/SW846 ^a) (µg/kg)				
Record Number ^b	ER Sample ID	Sample Depth (ft)	2-Butanone	Carbon disulfide	Chloroform	Methylene chloride	Tetrachloroethene
600846	T1096-GP-078-010-S	10	ND (2.1)	ND (2.2)	ND (0.24)	4 J (5.26)	ND (0.23)
600846	T1096-GP-078-015-S	15	ND (2.1)	ND (2.2)	ND (0.24)	5 J (5.26)	ND (0.23)
600846	T1096-GP-078-020-S	20	ND (2.1)	ND (2.2)	ND (0.24)	5 J (5.49)	ND (0.23)
600846	T1096-GP-079-001-S	1	ND (2.1)	ND (2.2)	ND (0.24)	2.2 J (5.56)	ND (0.23)
600846	T1096-GP-079-005-S	5	ND (2.1)	ND (2.2)	ND (0.24)	7.7	ND (0.23)
600846	T1096-GP-079-010-S	10	ND (2.1)	ND (2.2)	ND (0.24)	14	ND (0.23)
600846	T1096-GP-079-015-S	15	ND (2.1)	ND (2.2)	ND (0.24)	10	ND (0.23)
600846	T1096-GP-079-020-S	20	ND (2.1)	ND (2.2)	ND (0.24)	9.7	ND (0.23)
601096	T1096-GP-074-005	5	ND (2.1)	ND (2.2)	ND (0.24)	9.6 B	ND (0.23)
601096	T1096-GP-074-010	10	ND (2.1)	ND (2.2)	ND (0.24)	11 B	ND (0.23)
601096	T1096-GP-074-015	15	8.1	ND (2.2)	ND (0.24)	12 B	ND (0.23)
601096	T1096-GP-074-020	20	ND (2.1)	ND (2.2)	ND (0.24)	12 B	ND (0.23)
601096	T1096-GP-088-005	5	ND (2.1)	ND (2.2)	ND (0.24)	9 B	ND (0.23)
601096	T1096-GP-089-010	10	ND (2.1)	ND (2.2)	ND (0.24)	7.5 HB	ND (0.23)
Quality Assurance/Quality Control Samples (mg/L)							
600831	T1096-EB-006-000-W	0	ND (5.9)	NA	NA	ND (1.2)	0.88 J (1)
600840	T1096-EB-010-000-W	0	ND (5.9)	NA	NA	3.3 JB (5)	ND (0.7)
601096	T1096-EB-011-000	0	ND (5.9)	NA	NA	2.5 JB (5)	ND (0.7)
600831	T1096-TB-021-000-W	0	23 H	NA	NA	1.3 JHB (5)	ND (0.7)
600838	T1096-TB-030-000-W	0	ND (5.9)	NA	NA	5.1 B	ND (0.7)
600840	T1096-TB-029-000-W	0	ND (5.9)	NA	NA	4.1 JB (5)	ND (0.7)
600842	T1096-TB-023-000-W	0	ND (5.9)	NA	NA	4.2 JB (5)	ND (0.7)
600849	T1096-TB-022-000-W	0	8.2 J (10)	NA	NA	ND (1.2)	ND (0.7)
601096	T1096-TB-031-000-W	0	ND (5.9)	NA	NA	5.4 B	2.5

Refer to footnotes at end of table.

Table H2-4 (Continued)
 SWMU 96, Summary of VOC Analytical Results—Detections Only,
 Soil Samples Collected 1998

Sample Attributes			VOCs (EPA Method 8240/8240/8260/SW846 ^a) (µg/kg)			
Record Number ^b	ER Sample ID	Sample Depth (ft)	Toluene	Trichloroethene	Xylene	cis-1,2-Dichloroethene
600829	T1096-GP-060-005-S	5	ND (0.22)	ND (0.27)	ND (0.62)	ND (0.25)
600829	T1096-GP-061-005-S	5	2.5	ND (0.27)	ND (0.62)	ND (0.25)
600829	T1096-GP-061-010-S	10	1.6	ND (0.27)	ND (0.62)	ND (0.25)
600829	T1096-GP-061-015-S	15	ND (0.22)	ND (0.27)	ND (0.62)	ND (0.25)
600829	T1096-GP-061-020-S	20	2.2	ND (0.27)	ND (0.62)	ND (0.25)
600830	T1096-GP-062-010-S	10	4.2	ND (0.27)	ND (0.62)	ND (0.25)
600830	T1096-GP-062-015-S	15	2.8	ND (0.27)	ND (0.62)	ND (0.25)
600830	T1096-GP-062-020-S	20	15	ND (0.27)	ND (0.62)	ND (0.25)
600830	T1096-GP-063-001-S	1	ND (0.22)	ND (0.27)	ND (0.62)	ND (0.25)
600830	T1096-GP-063-005-S	5	ND (0.22)	ND (0.27)	ND (0.62)	ND (0.25)
600830	T1096-GP-063-010-S	10	2.2	ND (0.27)	ND (0.62)	ND (0.25)
600830	T1096-GP-063-015-S	15	1.7	ND (0.27)	ND (0.62)	ND (0.25)
600830	T1096-GP-064-001-S	1	ND (0.22)	ND (0.27)	ND (0.62)	ND (0.25)
600830	T1096-GP-064-005-S	5	1.9	ND (0.27)	ND (0.62)	ND (0.25)
600830	T1096-GP-064-010-S	10	ND (0.22)	ND (0.27)	ND (0.62)	ND (0.25)
600830	T1096-GP-064-015-S	15	ND (0.22)	ND (0.27)	ND (0.62)	ND (0.25)
600830	T1096-GP-064-020-S	20	ND (0.22)	ND (0.27)	ND (0.62)	ND (0.25)
600831	T1096-GP-065-010-S	10	1.3	ND (0.27)	ND (0.62)	ND (0.25)
600831	T1096-GP-065-015-S	15	ND (0.22)	ND (0.27)	ND (0.62)	ND (0.25)
600831	T1096-GP-065-020-S	20	ND (0.22)	ND (0.27)	ND (0.62)	ND (0.25)
600831	T1096-GP-066-005-S	5	ND (0.22)	ND (0.27)	ND (0.62)	ND (0.25)
600831	T1096-GP-066-010-S	10	ND (0.22)	ND (0.27)	ND (0.62)	ND (0.25)
600831	T1096-GP-066-015-S	15	1.2	ND (0.27)	ND (0.62)	ND (0.25)
600831	T1096-GP-066-020-S	20	3.3	ND (0.27)	ND (0.62)	ND (0.25)
600831	T1096-GP-067-005-S	2	ND (0.22)	ND (0.27)	ND (0.62)	ND (0.25)
600831	T1096-GP-067-010-S	10	ND (0.22)	ND (0.27)	ND (0.62)	ND (0.25)
600831	T1096-GP-067-015-S	15	ND (0.22)	ND (0.27)	ND (0.62)	ND (0.25)

Refer to footnotes at end of table.

Table H2-4 (Continued)
 SWMU 96, Summary of VOC Analytical Results—Detections Only,
 Soil Samples Collected 1998

Sample Attributes			VOCs (EPA Method 8240/8240/8260/SW846 ^a) (µg/kg)			
Record Number ^b	ER Sample ID	Sample Depth (ft)	Toluene	Trichloroethene	Xylene	cis-1,2-Dichloroethene
600831	T1096-GP-067-020-S	20	1	ND (0.27)	ND (0.62)	ND (0.25)
600831	T1096-GP-085-005-SD	5	ND (0.22)	ND (0.27)	ND (0.62)	ND (0.25)
600832	T1096-GP-068-001-S	1	1.4 B	ND (0.27)	ND (0.62)	ND (0.25)
600832	T1096-GP-068-005-S	5	1.7 B	ND (0.27)	ND (0.62)	ND (0.25)
600832	T1096-GP-068-010-S	10	5.3 B	ND (0.27)	ND (0.62)	ND (0.25)
600832	T1096-GP-068-015-S	15	6.4 B	ND (0.27)	ND (0.62)	ND (0.25)
600832	T1096-GP-068-020-S	20	1.5 B	ND (0.27)	ND (0.62)	ND (0.25)
600832	T1096-GP-069-001-S	1	1.3 B	ND (0.27)	ND (0.62)	ND (0.25)
600832	T1096-GP-069-010-S	10	1.2 B	ND (0.27)	ND (0.62)	ND (0.25)
600832	T1096-GP-069-020-S	20	7.9 B	ND (0.27)	ND (0.62)	ND (0.25)
600838	T1096-GP-081-015-S	15	ND (0.22)	ND (0.27)	0.77 J (2.17)	ND (0.25)
600838	T1096-GP-081-020-S	20	ND (0.22)	ND (0.27)	ND (0.62)	ND (0.25)
600838	T1096-GP-082-005-S	5	ND (0.22)	2.1	ND (0.62)	ND (0.25)
600838	T1096-GP-082-010-S	10	ND (0.22)	ND (0.27)	ND (0.62)	ND (0.25)
600838	T1096-GP-082-015-S	15	ND (0.22)	ND (0.27)	ND (0.62)	ND (0.25)
600838	T1096-GP-082-020-S	20	ND (0.22)	ND (0.27)	ND (0.62)	ND (0.25)
600838	T1096-GP-083-001-S	1	ND (0.22)	ND (0.27)	ND (0.62)	ND (0.25)
600838	T1096-GP-083-005-S	5	1.7	ND (0.27)	ND (0.62)	ND (0.25)
600838	T1096-GP-083-010-S	10	1 JH (1.09)	ND (0.27)	ND (0.62)	ND (0.25)
600838	T1096-GP-083-020-S	20	ND (0.22)	ND (0.27)	ND (0.62)	ND (0.25)
600840	T1096-GP-084-001-S	1	ND (0.22)	ND (0.27)	ND (0.62)	ND (0.25)
600840	T1096-GP-084-005-S	5	ND (0.22)	ND (0.27)	ND (0.62)	ND (0.25)
600840	T1096-GP-084-010-S	10	1 J (1.07)	ND (0.27)	ND (0.62)	ND (0.25)
600840	T1096-GP-084-015-S	15	ND (0.22)	ND (0.27)	ND (0.62)	ND (0.25)
600840	T1096-GP-084-020-S	20	ND (0.22)	5.7	ND (0.62)	1.5
600842	T1096-GP-070-005-S	5	ND (0.22)	ND (0.27)	ND (0.62)	ND (0.25)
600842	T1096-GP-070-010-S	10	ND (0.22)	ND (0.27)	ND (0.62)	ND (0.25)

Refer to footnotes at end of table.

Table H2-4 (Continued)
 SWMU 96, Summary of VOC Analytical Results—Detections Only,
 Soil Samples Collected 1998

Sample Attributes			VOCs (EPA Method 8240/8240/8260/SW846 ^a) (µg/kg)			
Record Number ^b	ER Sample ID	Sample Depth (ft)	Toluene	Trichloroethene	Xylene	cis-1,2-Dichloroethene
600842	T1096-GP-071-010-S	10	ND (0.22)	ND (0.27)	ND (0.62)	ND (0.25)
600842	T1096-GP-071-015-S	15	1.2	ND (0.27)	ND (0.62)	ND (0.25)
600842	T1096-GP-071-020-S	20	2	ND (0.27)	ND (0.62)	ND (0.25)
600842	T1096-GP-072-005-S	5	ND (0.22)	ND (0.27)	ND (0.62)	ND (0.25)
600842	T1096-GP-072-010-S	10	ND (0.22)	ND (0.27)	ND (0.62)	ND (0.25)
600842	T1096-GP-072-015-S	15	ND (0.22)	ND (0.27)	ND (0.62)	ND (0.25)
600842	T1096-GP-072-020-S	20	3.2	ND (0.27)	ND (0.62)	ND (0.25)
600843	T1096-GP-073-001-S	1	ND (0.22)	ND (0.27)	ND (0.62)	ND (0.25)
600843	T1096-GP-073-005-S	5	1 J (1.11)	ND (0.27)	ND (0.62)	ND (0.25)
600843	T1096-GP-073-010-S	10	ND (0.22)	ND (0.27)	ND (0.62)	ND (0.25)
600843	T1096-GP-073-015-S	15	2.7	ND (0.27)	ND (0.62)	ND (0.25)
600843	T1096-GP-073-020-S	20	ND (0.22)	ND (0.27)	ND (0.62)	ND (0.25)
600843	T1096-GP-074-001-S	1	ND (0.22)	ND (0.27)	ND (0.62)	ND (0.25)
600845	T1096-GP-075-005-S	5	ND (0.22)	ND (0.27)	ND (0.62)	ND (0.25)
600845	T1096-GP-075-010-S	10	1.3	ND (0.27)	ND (0.62)	ND (0.25)
600845	T1096-GP-075-015-S	15	ND (0.22)	ND (0.27)	ND (0.62)	ND (0.25)
600845	T1096-GP-075-020-S	20	3.1	ND (0.27)	ND (0.62)	ND (0.25)
600845	T1096-GP-076-005-S	5	ND (0.22)	ND (0.27)	ND (0.62)	ND (0.25)
600845	T1096-GP-076-010-S	10	ND (0.22)	ND (0.27)	ND (0.62)	ND (0.25)
600845	T1096-GP-076-015-S	15	ND (0.22)	ND (0.27)	ND (0.62)	ND (0.25)
600845	T1096-GP-076-020-S	20	2.4	ND (0.27)	ND (0.62)	ND (0.25)
600845	T1096-GP-077-005-S	5	ND (0.22)	ND (0.27)	ND (0.62)	ND (0.25)
600845	T1096-GP-077-010-S	10	ND (0.22)	ND (0.27)	ND (0.62)	ND (0.25)
600845	T1096-GP-077-015-S	15	1.5	ND (0.27)	ND (0.62)	ND (0.25)
600845	T1096-GP-077-020-S	20	ND (0.22)	ND (0.27)	ND (0.62)	ND (0.25)
600846	T1096-GP-078-001-S	1	ND (0.22)	ND (0.27)	ND (0.62)	ND (0.25)
600846	T1096-GP-078-005-S	5	1.6	ND (0.27)	ND (0.62)	ND (0.25)

Refer to footnotes at end of table.

Table H2-4 (Continued)
 SWMU 96, Summary of VOC Analytical Results—Detections Only,
 Soil Samples Collected 1998

Sample Attributes			VOCs (EPA Method 8240/8240/8260/SW846 ^a) (µg/kg)			
Record Number ^b	ER Sample ID	Sample Depth (ft)	Toluene	Trichloroethene	Xylene	cis-1,2-Dichloroethene
600846	T1096-GP-078-010-S	10	2.1	ND (0.27)	ND (0.62)	ND (0.25)
600846	T1096-GP-078-015-S	15	5.4	ND (0.27)	ND (0.62)	ND (0.25)
600846	T1096-GP-078-020-S	20	20	ND (0.27)	ND (0.62)	ND (0.25)
600846	T1096-GP-079-001-S	1	ND (0.22)	ND (0.27)	ND (0.62)	ND (0.25)
600846	T1096-GP-079-005-S	5	2.9	ND (0.27)	ND (0.62)	ND (0.25)
600846	T1096-GP-079-010-S	10	20	ND (0.27)	ND (0.62)	ND (0.25)
600846	T1096-GP-079-015-S	15	6.9	ND (0.27)	ND (0.62)	ND (0.25)
600846	T1096-GP-079-020-S	20	1.7	ND (0.27)	ND (0.62)	ND (0.25)
601096	T1096-GP-074-005	5	ND (0.22)	ND (0.27)	ND (0.62)	ND (0.25)
601096	T1096-GP-074-010	10	ND (0.22)	ND (0.27)	ND (0.62)	ND (0.25)
601096	T1096-GP-074-015	15	1.2	ND (0.27)	ND (0.62)	ND (0.25)
601096	T1096-GP-074-020	20	ND (0.22)	ND (0.27)	ND (0.62)	ND (0.25)
601096	T1096-GP-088-005	5	ND (0.22)	ND (0.27)	ND (0.62)	ND (0.25)
601096	T1096-GP-089-010	10	ND (0.22)	ND (0.27)	ND (0.62)	ND (0.25)
Quality Assurance/Quality Control Samples (mg/L)						
600831	T1096-EB-006-000-W	0	ND (0.5)	NA	2.3	NA
600840	T1096-EB-010-000-W	0	ND (0.5)	NA	ND (1.1)	NA
601096	T1096-EB-011-000	0	ND (0.5)	NA	ND (1.1)	NA
600831	T1096-TB-021-000-W	0	0.51 JH (1)	NA	ND (1.1)	NA
600838	T1096-TB-030-000-W	0	ND (0.5)	NA	ND (1.1)	NA
600840	T1096-TB-029-000-W	0	ND (0.5)	NA	ND (1.1)	NA
600842	T1096-TB-023-000-W	0	ND (0.5)	NA	ND (1.1)	NA
600849	T1096-TB-022-000-W	0	ND (0.5)	NA	ND (1.1)	NA
601096	T1096-TB-031-000-W	0	ND (0.5)	NA	ND (1.1)	NA

Refer to footnotes at end of table.

Table H2-4 (Concluded)
SWMU 96, Summary of VOC Analytical Results—Detections Only,
Soil Samples Collected 1998

Note: **Bold** indicates values that exceed background screening levels.

^aEPA November 1986.

^bAnalysis request/chain-of-custody record.

- B = Analyte detected in associated blank.
- EB = Equipment blank.
- EPA = U.S. Environmental Protection Agency.
- ER = Environmental Restoration.
- ft = Foot (feet).
- GP = Geoprobe.
- H = The hold time was exceeded for the associated sample analysis.
- ID = Identification.
- J () = The reported value is greater than or equal to the MDL but is less than the PQL, shown in parentheses.
- µg/kg = Microgram(s) per kilogram.
- mg/L = Milligram(s) per liter.
- ND () = Not detected above the MDL, shown in parentheses.
- PQL = Practical quantitation limit.
- S = Soil Sample.
- SD = Sample Duplicate.
- SWMU = Solid Waste Management Unit.
- T1 = Technical Area 1.
- TB = Trip blank.
- VOC = Volatile organic compound.
- W = Water Sample.

Table H2-5a
SWMU 96, Summary of Radiochemistry Analytical Results,
1998 Supplemental Investigation

Sample Attributes			Activity (pCi/g) Plutonium-238	
Record Number ^a	ER Sample ID	Sample Depth (ft)	Result	Error ^b
600829	T1096-GP-060-010-S	10	0.0193	0.0168
600829	T1096-GP-061-020-S	20	0.0708	0.0399
600830	T1096-GP-064-001-S	1	0.0813	0.118
600830	T1096-GP-064-015-S	15	0.0135	0.0156
600830	T1096-GP-064-020-S	20	0.0131	0.0152
600831	T1096-GP-065-010-S	10	0.0189	0.0191
600831	T1096-GP-066-005-S	5	0.0167	0.0202
600831	T1096-GP-067-005-S	5	0.0279	0.0233
600832	T1096-GP-069-015-S	15	0.012	0.0139
600842	T1096-GP-072-020-S	20	0.0229	0.0262
600846	T1096-GP-078-001-S	1	0.0221	0.0178
600846	T1096-GP-079-001-S	1	0.19	0.0616
600846	T1096-GP-078-015-S	15	0.0517	0.0274
600846	T1096-GP-079-015-S	15	0.112	0.0445
600846	T1096-GP-079-020-S	20	0.0663	0.0397
600838	T1096-GP-080-010-S	10	0.0671	0.0294
600838	T1096-GP-080-020-S	20	0.00932	0.0108
600838	T1096-GP-083-005-S	5	0.0326	0.0187
600840	T1096-GP-084-001-S	1	0.0102	0.0135
600840	T1096-GP-084-005-S	5	0.00903	0.012
601096	T1096-GP-074-020	20	0.155	0.0455
600849	T1096-EB-007-000-W	0	0.0477	0.042
Background Activity—North Area ^c		NA	NA	NA

^aAnalysis request/chain-of-custody record.

^bTwo standard deviations about the mean detected activity.

^cDinwiddie September 1997.

EB = Equipment Blank.

ER = Environmental Restoration.

ft = Foot (feet).

GP = Geoprobe.

ID = Identification.

NA = Not applicable.

pCi/g = Picocuries per gram.

S = Soil Sample.

SWMU = Solid Waste Management Unit.

T1 = Technical Area 1.

W = Water Sample.

Table H2-5b
 SWMU 96, Summary of Radiochemistry Analytical Results,
 1998 Supplemental Investigation

Record Number ^a	Sample Attributes		Activity (pCi/g) Plutonium-239/240	
	ER Sample ID	Sample Depth (ft)	Result	Error ^b
600829	T1096-GP-060-005-S	5	0.0323	0.0233
600829	T1096-GP-061-020-S	20	0.213	0.0644
600830	T1096-GP-062-005-S	5	0.0335	0.0635
600830	T1096-GP-062-015-S	15	0.0222	0.0259
600830	T1096-GP-063-001-S	1	0.18	0.0687
600830	T1096-GP-063-005-S	5	0.0926	0.0506
600830	T1096-GP-064-005-S	5	0.0171	0.0346
600830	T1096-GP-064-020-S	20	0.00653	0.00977
600831	T1096-GP-065-005-S	5	0.00856	0.0173
600831	T1096-GP-066-015-S	15	0.00829	0.0146
600831	T1096-GP-066-020-S	20	0.0183	0.0166
600831	T1096-GP-067-005-S	5	0.0131	0.0155
600831	T1096-GP-067-015-S	15	0.0136	0.014
600832	T1096-GP-069-005-S	5	0.00624	0.00887
600842	T1096-GP-071-005-S	5	0.0139	0.0115
600842	T1096-GP-071-015-S	15	0.0114	0.0103
600842	T1096-GP-072-010-S	10	0.0307	0.0192
600842	T1096-GP-072-020-S	20	0.0181	0.0154
600843	T1096-GP-073-005-S	5	0.0137	0.016
600845	T1096-GP-075-005-S	5	0.0332	0.0258
600845	T1096-GP-077-010-S	10	0.00953	0.0133
600846	T1096-GP-078-001-S	1	0.01	0.0107
600846	T1096-GP-079-001-S	1	0.105	0.0425
600846	T1096-GP-078-010-S	10	0.0298	0.0193
600846	T1096-GP-079-015-S	15	0.115	0.0409
600846	T1096-GP-079-020-S	20	0.0199	0.0189
600838	T1096-GP-080-010-S	10	0.0262	0.0178
600838	T1096-GP-080-020-S	20	0.031	0.0201
600838	T1096-GP-081-020-S	20	0.00585	0.0083
600838	T1096-GP-082-015-S	15	0.00563	0.00654
600838	T1096-GP-083-005-S	5	0.0157	0.0131
600838	T1096-GP-083-020-S	20	0.00808	0.00955
600840	T1096-GP-084-005-S	5	0.0045	0.00792
601096	T1096-GP-074-015	15	0.0182	0.014
601096	T1096-GP-074-020	20	0.0453	0.0228
600831	T1096-EB-006-000-W	0	0.0534	0.0315
600849	T1096-EB-007-000-W	0	0.0253	0.0272
601096	T1096-EB-011-000	0	0.0258	0.0329

Refer to footnotes at end of table.

Table H2-5b (Concluded)
SWMU 96, Summary of Radiochemistry Analytical Results,
1998 Supplemental Investigation

^aAnalysis request/chain-of-custody record.

^bTwo standard deviations about the mean detected activity.

EB = Equipment Blank.

ER = Environmental Restoration.

ft = Foot (feet).

GP = Geoprobe.

ID = Identification.

pCi/g = Picocuries per gram.

S = Soil Sample.

SWMU = Solid Waste Management Unit.

T1 = Technical Area 1.

W = Water Sample.

Table H2-5c
SWMU 96, Summary of Radiochemistry Analytical Results,
1998 Supplemental Investigation

Sample Attributes			Activity (pCi/g) Tritium	
Record Number ^a	ER Sample ID	Sample Depth (ft)	Result	Error ^b
600830	T1096-GP-062-010-S	10	0.0109	0.00975
600830	T1096-GP-062-015-S	15	0.0117	0.00995
600830	T1096-GP-062-020-S	20	0.0102	0.00965
600830	T1096-GP-063-001-S	1	0.01155	0.01
600830	T1096-GP-063-010-S	10	0.01185	0.00995
600830	T1096-GP-063-015-S	15	0.01335	0.0099
600830	T1096-GP-064-005-S	5	0.01105	0.00995
600831	T1096-GP-066-005-S	5	0.00995	0.01025
600842	T1096-GP-072-010-S	10	0.00945	0.00955
600843	T1096-GP-073-005-S	5	0.0146	0.0102
600843	T1096-GP-073-020-S	20	0.01425	0.01085
600843	T1096-GP-074-001-S	1	0.0123	0.01025
600845	T1096-GP-076-020-S	20	0.0134	0.01115
600845	T1096-GP-077-010-S	10	0.0138	0.01035
600845	T1096-GP-077-020-S	20	0.0095	0.01015

^aAnalysis request/chain-of-custody record.

^bTwo standard deviations about the mean detected activity.

ER = Environmental Restoration.

ft = Foot (feet).

GP = Geoprobe.

ID = Identification.

pCi/g = Picocuries per gram.

S = Soil Sample.

SWMU = Solid Waste Management Unit.

T1 = Technical Area 1.

Table H2-5d
 SWMU 96, Summary of Radiochemistry Analytical Results,
 1998 Supplemental Investigation

Sample Attributes			Activity (pCi/g) Uranium-233/234	
Record Number ^a	ER Sample ID	Sample Depth (ft)	Result	Error ^b
600829	T1096-GP-060-005-S	5	1.2	0.164
600829	T1096-GP-060-010-S	10	0.876	0.128
600829	T1096-GP-061-005-S	5	1.09	0.152
600829	T1096-GP-061-010-S	10	1.02	0.142
600829	T1096-GP-061-015-S	15	1.1	0.151
600829	T1096-GP-061-020-S	20	0.871	0.138
600830	T1096-GP-062-005-S	5	1.07	0.145
600830	T1096-GP-062-010-S	10	0.813	0.124
600830	T1096-GP-062-015-S	15	0.824	0.13
600830	T1096-GP-062-020-S	20	1.03	0.143
600830	T1096-GP-063-001-S	1	0.81	0.124
600830	T1096-GP-063-005-S	5	0.946	0.142
600830	T1096-GP-063-010-S	10	0.897	0.133
600830	T1096-GP-063-015-S	15	1.06	0.15
600830	T1096-GP-063-020-S	20	0.875	0.126
600830	T1096-GP-064-001-S	1	0.819	0.125
600830	T1096-GP-064-005-S	5	1.06	0.146
600830	T1096-GP-064-010-S	10	0.944	0.139
600830	T1096-GP-064-015-S	15	0.847	0.127
600830	T1096-GP-064-020-S	20	0.926	0.139
600831	T1096-GP-065-005-S	5	0.861	0.161
600831	T1096-GP-065-010-S	10	0.998	0.17
600831	T1096-GP-065-015-S	15	0.81	0.142
600831	T1096-GP-065-020-S	20	0.968	0.149
600831	T1096-GP-066-005-S	5	0.866	0.147
600831	T1096-GP-066-010-S	10	1.13	0.17
600831	T1096-GP-066-015-S	15	0.89	0.154
600831	T1096-GP-066-020-S	20	0.724	0.132
600831	T1096-GP-067-005-S	5	1.07	0.193
600831	T1096-GP-067-010-S	10	1.02	0.173
600831	T1096-GP-067-015-S	15	1.31	0.22
600831	T1096-GP-067-020-S	20	0.774	0.139
600831	T1096-GP-085-005-SD	5	0.587	0.127
600832	T1096-GP-068-001-S	1	0.582	0.121
600832	T1096-GP-068-005-S	5	1.34	0.21
600832	T1096-GP-068-010-S	10	1.02	0.181
600832	T1096-GP-068-015-S	15	0.904	0.134
600832	T1096-GP-068-020-S	20	0.697	0.109
600832	T1096-GP-069-001-S	1	0.621	0.129
600832	T1096-GP-069-005-S	5	0.962	0.162

Refer to footnotes at end of table.

Table H2-5d (Continued)
 SWMU 96, Summary of Radiochemistry Analytical Results,
 1998 Supplemental Investigation

Sample Attributes			Activity (pCi/g) Uranium-233/234	
Record Number ^a	ER Sample ID	Sample Depth (ft)	Result	Error ^b
600832	T1096-GP-069-010-S	10	1.14	0.205
600832	T1096-GP-069-015-S	15	0.861	0.166
600832	T1096-GP-069-020-S	20	0.959	0.169
600842	T1096-GP-070-005-S	5	0.937	0.148
600842	T1096-GP-070-010-S	10	0.846	0.143
600842	T1096-GP-070-015-S	15	0.732	0.137
600842	T1096-GP-070-020-S	20	0.782	0.143
600842	T1096-GP-071-005-S	5	1.24	0.199
600842	T1096-GP-071-010-S	10	0.809	0.152
600842	T1096-GP-071-015-S	15	0.796	0.143
600842	T1096-GP-071-020-S	20	1.09	0.192
600842	T1096-GP-072-005-S	5	0.755	0.135
600842	T1096-GP-072-010-S	10	0.68	0.127
600842	T1096-GP-072-015-S	15	0.778	0.143
600842	T1096-GP-072-020-S	20	0.751	0.124
600843	T1096-GP-073-001-S	1	0.581	0.146
600843	T1096-GP-073-005-S	5	1.05	0.226
600843	T1096-GP-073-010-S	10	0.839	0.18
600843	T1096-GP-073-015-S	15	0.885	0.227
600843	T1096-GP-073-020-S	20	0.834	0.182
600843	T1096-GP-074-001-S	1	0.648	0.185
600845	T1096-GP-075-005-S	5	1.11	0.226
600845	T1096-GP-075-010-S	10	0.916	0.213
600845	T1096-GP-075-015-S	15	0.819	0.175
600845	T1096-GP-075-020-S	20	0.986	0.197
600845	T1096-GP-076-005-S	5	1.05	0.216
600845	T1096-GP-076-010-S	10	0.761	0.177
600845	T1096-GP-076-015-S	15	0.995	0.19
600845	T1096-GP-076-020-S	20	0.868	0.193
600845	T1096-GP-077-005-S	5	1.14	0.191
600845	T1096-GP-077-010-S	10	0.765	0.202
600845	T1096-GP-077-015-S	15	0.622	0.157
600845	T1096-GP-077-020-S	20	0.855	0.362
600845	T1096-GP-086-010-SD	10	0.766	0.155
600845	T1096-GP-087-001-SD	1	0.764	0.173
600846	T1096-GP-078-001-S	1	0.915	0.12
600846	T1096-GP-079-001-S	1	0.913	0.138
600846	T1096-GP-078-005-S	5	0.76	0.111
600846	T1096-GP-078-010-S	10	0.678	0.106
600846	T1096-GP-078-015-S	15	0.857	0.116

Refer to footnotes at end of table.

Table H2-5d (Continued)
 SWMU 96, Summary of Radiochemistry Analytical Results,
 1998 Supplemental Investigation

Sample Attributes			Activity (pCi/g) Uranium-233/234	
Record Number ^a	ER Sample ID	Sample Depth (ft)	Result	Error ^b
600846	T1096-GP-078-020-S	20	0.701	0.101
600846	T1096-GP-079-005-S	5	0.912	0.146
600846	T1096-GP-079-010-S	10	0.743	0.103
600846	T1096-GP-079-015-S	15	0.713	0.105
600846	T1096-GP-079-020-S	20	0.809	0.111
600838	T1096-GP-080-005-S	5	1.17	0.191
600838	T1096-GP-080-010-S	10	0.998	0.169
600838	T1096-GP-080-015-S	15	0.787	0.139
600838	T1096-GP-080-020-S	20	0.901	0.159
600838	T1096-GP-081-005-S	5	1.08	0.175
600838	T1096-GP-081-010-S	10	0.902	0.156
600838	T1096-GP-081-015-S	15	0.793	0.144
600838	T1096-GP-081-020-S	20	0.726	0.133
600838	T1096-GP-082-005-S	5	0.99	0.177
600838	T1096-GP-082-010-S	10	0.886	0.156
600838	T1096-GP-082-015-S	15	0.909	0.212
600838	T1096-GP-082-020-S	20	0.766	0.145
600838	T1096-GP-083-001-S	1	0.793	0.146
600838	T1096-GP-083-005-S	5	1.09	0.194
600838	T1096-GP-083-010-S	10	1.02	0.181
600838	T1096-GP-083-015-S	15	0.877	0.168
600838	T1096-GP-083-020-S	20	0.646	0.128
600840	T1096-GP-084-001-S	1	0.788	0.115
600840	T1096-GP-084-005-S	5	1.03	0.135
600840	T1096-GP-084-010-S	10	0.923	0.132
600840	T1096-GP-084-015-S	15	0.9	0.14
600840	T1096-GP-084-020-S	20	0.723	0.162
601096	T1096-GP-074-005	5	0.855	0.14
601096	T1096-GP-074-010	10	0.983	0.149
601096	T1096-GP-074-015	15	0.694	0.124
601096	T1096-GP-074-020	20	0.773	0.12
601096	T1096-GP-088-005	5	0.793	0.126
601096	T1096-GP-089-010	10	1.18	0.182
600831	T1096-EB-006-000-W	0	0.151	0.0681
600838	T1096-EB-009-000-W	0	0.0648	0.0755

Refer to footnotes at end of table.

Table H2-5d (Concluded)
SWMU 96, Summary of Radiochemistry Analytical Results,
1998 Supplemental Investigation

^aAnalysis request/chain-of-custody record.

^bTwo standard deviations about the mean detected activity.

EB = Equipment Blank.

ER = Environmental Restoration.

ft = Foot (feet).

GP = Geoprobe.

ID = Identification.

pCi/g = Picocuries per gram.

S = Soil Sample.

SD = Sample Duplicate.

SWMU = Solid Waste Management Unit.

T1 = Technical Area 1.

W = Water Sample.

Table H2-5e
 SWMU 96, Summary of Radiochemistry Analytical Results,
 1998 Supplemental Investigation

Sample Attributes			Activity (pCi/g) Uranium-235	
Record Number ^a	ER Sample ID	Sample Depth (ft)	Result	Error ^b
600829	T1096-GP-060-005-S	5	0.0431	0.0228
600829	T1096-GP-060-010-S	10	0.0578	0.0253
600829	T1096-GP-061-005-S	5	0.0599	0.0269
600829	T1096-GP-061-010-S	10	0.0458	0.0228
600829	T1096-GP-061-015-S	15	0.0507	0.0238
600829	T1096-GP-061-020-S	20	0.0513	0.0284
600830	T1096-GP-062-005-S	5	0.0473	0.023
600830	T1096-GP-062-010-S	10	0.0458	0.0233
600830	T1096-GP-062-015-S	15	0.0535	0.0287
600830	T1096-GP-062-020-S	20	0.0494	0.0232
600830	T1096-GP-063-001-S	1	0.0495	0.0246
600830	T1096-GP-063-005-S	5	0.026	0.0203
600830	T1096-GP-063-010-S	10	0.0397	0.0227
600830	T1096-GP-063-015-S	15	0.041	0.0245
600830	T1096-GP-063-020-S	20	0.0394	0.0209
600830	T1096-GP-064-001-S	1	0.0407	0.0233
600830	T1096-GP-064-005-S	5	0.0365	0.0208
600830	T1096-GP-064-010-S	10	0.0214	0.023
600830	T1096-GP-064-015-S	15	0.0463	0.0237
600830	T1096-GP-064-020-S	20	0.0466	0.0258
600831	T1096-GP-065-005-S	5	0.0368	0.031
600831	T1096-GP-065-010-S	10	0.0268	0.0247
600831	T1096-GP-065-015-S	15	0.0503	0.0329
600831	T1096-GP-065-020-S	20	0.0578	0.0288
600831	T1096-GP-066-005-S	5	0.0365	0.0267
600831	T1096-GP-066-010-S	10	0.0351	0.0241
600831	T1096-GP-066-015-S	15	0.0657	0.0349
600831	T1096-GP-066-020-S	20	0.0452	0.0277
600831	T1096-GP-067-005-S	5	0.0688	0.043
600831	T1096-GP-067-010-S	10	0.0543	0.0338
600831	T1096-GP-067-015-S	15	0.0505	0.0369
600831	T1096-GP-067-020-S	20	0.0352	0.0255
600831	T1096-GP-085-005-SD	5	0.0172	0.0237
600832	T1096-GP-068-001-S	1	0.0493	0.0341
600832	T1096-GP-068-005-S	5	0.0425	0.033
600832	T1096-GP-068-010-S	10	0.0817	0.0421
600832	T1096-GP-068-015-S	15	0.0584	0.0287
600832	T1096-GP-068-020-S	20	0.0609	0.0262
600832	T1096-GP-069-001-S	1	0.0627	0.0355
600832	T1096-GP-069-005-S	5	0.0458	0.0299

Refer to footnotes at end of table.

Table H2-5e (Continued)
 SWMU 96, Summary of Radiochemistry Analytical Results,
 1998 Supplemental Investigation

Sample Attributes			Activity (pCi/g) Uranium-235	
Record Number ^a	ER Sample ID	Sample Depth (ft)	Result	Error ^b
600832	T1096-GP-069-010-S	10	0.0388	0.0355
600832	T1096-GP-069-015-S	15	0.0351	0.0293
600832	T1096-GP-069-020-S	20	0.0449	0.0307
600842	T1096-GP-070-005-S	5	0.0488	0.0279
600842	T1096-GP-070-010-S	10	0.0535	0.0291
600842	T1096-GP-070-015-S	15	0.0606	0.033
600842	T1096-GP-070-020-S	20	0.0477	0.0311
600842	T1096-GP-071-005-S	5	0.0456	0.0313
600842	T1096-GP-071-020-S	10	0.107	0.0512
600842	T1096-GP-072-005-S	5	0.0366	0.0247
600842	T1096-GP-072-010-S	10	0.0475	0.0293
600842	T1096-GP-072-015-S	15	0.0874	0.0417
600842	T1096-GP-072-020-S	20	0.0582	0.0291
600843	T1096-GP-073-001-S	1	0.0213	0.0247
600843	T1096-GP-073-005-S	5	0.0969	0.0602
600843	T1096-GP-073-010-S	10	0.0379	0.0348
600843	T1096-GP-073-015-S	15	0.0334	0.0443
600843	T1096-GP-073-020-S	20	0.0424	0.035
600843	T1096-GP-074-001-S	1	0.0712	0.0546
600845	T1096-GP-075-005-S	5	0.0831	0.0544
600845	T1096-GP-075-010-S	10	0.0299	0.0355
600845	T1096-GP-075-015-S	15	0.0469	0.0359
600845	T1096-GP-075-020-S	20	0.0162	0.0286
600845	T1096-GP-076-005-S	5	0.0696	0.051
600845	T1096-GP-076-010-S	10	0.0253	0.0434
600845	T1096-GP-076-015-S	15	0.0388	0.0325
600845	T1096-GP-076-020-S	20	0.0307	0.041
600845	T1096-GP-077-005-S	5	0.0769	0.0411
600845	T1096-GP-077-010-S	10	0.0101	0.0202
600845	T1096-GP-077-015-S	15	0.03	0.0355
600845	T1096-GP-077-020-S	20	0.0431	0.0894
600845	T1096-GP-086-010-SD	10	0.0449	0.0321
600845	T1096-GP-087-001-SD	1	0.0354	0.0365
600846	T1096-GP-078-001-S	1	0.0468	0.0199
600846	T1096-GP-079-001-S	1	0.0884	0.0354
600846	T1096-GP-078-005-S	5	0.0524	0.025
600846	T1096-GP-078-010-S	10	0.0581	0.0294
600846	T1096-GP-078-015-S	15	0.0987	0.0303
600846	T1096-GP-078-020-S	20	0.0435	0.0218
600846	T1096-GP-079-005-S	5	0.0448	0.0287

Refer to footnotes at end of table.

Table H2-5e (Concluded)
 SWMU 96, Summary of Radiochemistry Analytical Results,
 1998 Supplemental Investigation

Sample Attributes			Activity (pCi/g) Uranium-235	
Record Number ^a	ER Sample ID	Sample Depth (ft)	Result	Error ^b
600846	T1096-GP-079-010-S	10	0.0327	0.018
600846	T1096-GP-079-015-S	15	0.0421	0.0207
600846	T1096-GP-079-020-S	20	0.0414	0.0185
600838	T1096-GP-080-005-S	5	0.0397	0.0283
600838	T1096-GP-080-010-S	10	0.0644	0.0335
600838	T1096-GP-080-015-S	15	0.0163	0.0174
600838	T1096-GP-080-020-S	20	0.0319	0.0245
600838	T1096-GP-081-005-S	5	0.0521	0.0295
600838	T1096-GP-081-010-S	10	0.0335	0.0248
600838	T1096-GP-081-015-S	15	0.0526	0.0304
600838	T1096-GP-081-020-S	20	0.0352	0.0238
600838	T1096-GP-082-005-S	5	0.0359	0.0266
600838	T1096-GP-082-010-S	10	0.0658	0.0343
600838	T1096-GP-082-015-S	15	0.0302	0.0336
600838	T1096-GP-082-020-S	20	0.0431	0.0284
600838	T1096-GP-083-001-S	1	0.0253	0.0208
600838	T1096-GP-083-005-S	5	0.049	0.0324
600838	T1096-GP-083-010-S	10	0.0416	0.0289
600838	T1096-GP-083-015-S	15	0.0716	0.0392
600838	T1096-GP-083-020-S	20	0.0347	0.0249
600840	T1096-GP-084-001-S	1	0.0775	0.0283
600840	T1096-GP-084-005-S	5	0.0698	0.0248
600840	T1096-GP-084-010-S	10	0.0381	0.02
600840	T1096-GP-084-015-S	15	0.103	0.0372
600840	T1096-GP-084-020-S	20	0.0826	0.0483
601096	T1096-GP-074-005	5	0.0395	0.0241
601096	T1096-GP-074-010	10	0.0324	0.0223
601096	T1096-GP-074-015	15	0.0378	0.0242
601096	T1096-GP-074-020	20	0.0406	0.0233
601096	T1096-GP-088-005	5	0.049	0.025
601096	T1096-GP-089-010	10	0.0584	0.0308
600831	T1096-EB-006-000-W	0	0.0309	0.0317
600849	T1096-EB-007-000-W	0	0.0495	0.032

^aAnalysis request/chain-of-custody record.

^bTwo standard deviations about the mean detected activity.

EB = Equipment Blank.

ER = Environmental Restoration.

ft. = Foot (feet).

GP = Geoprobe.

ID = Identification.

pCi/g = Picocuries per gram.

S = Soil Sample.

SD = Sample Duplicate.

SWMU = Solid Waste Management Unit.

T1 = Technical Area 1.

W = Water Sample.

Table H2-5f
 SWMU 96, Summary of Radiochemistry Analytical Results,
 1998 Supplemental Investigation

Sample Attributes			Activity (pCi/g) Uranium-238	
Record Number ^a	ER Sample ID	Sample Depth (ft)	Result	Error ^b
600829	T1096-GP-060-005-S	5	1.07	0.149
600829	T1096-GP-060-010-S	10	0.787	0.118
600829	T1096-GP-061-005-S	5	0.895	0.132
600829	T1096-GP-061-010-S	10	0.875	0.127
600829	T1096-GP-061-015-S	15	0.837	0.124
600829	T1096-GP-061-020-S	20	0.894	0.14
600830	T1096-GP-062-005-S	5	1.11	0.148
600830	T1096-GP-062-010-S	10	0.788	0.122
600830	T1096-GP-062-015-S	15	0.763	0.123
600830	T1096-GP-062-020-S	20	0.721	0.11
600830	T1096-GP-063-001-S	1	0.679	0.109
600830	T1096-GP-063-005-S	5	1	0.147
600830	T1096-GP-063-010-S	10	0.807	0.123
600830	T1096-GP-063-015-S	15	1.04	0.147
600830	T1096-GP-063-020-S	20	0.77	0.115
600830	T1096-GP-064-001-S	1	0.74	0.116
600830	T1096-GP-064-005-S	5	1.05	0.144
600830	T1096-GP-064-010-S	10	0.873	0.131
600830	T1096-GP-064-015-S	15	0.637	0.105
600830	T1096-GP-064-020-S	20	1.02	0.149
600831	T1096-GP-065-005-S	5	0.77	0.148
600831	T1096-GP-065-010-S	10	1	0.17
600831	T1096-GP-065-015-S	15	0.8	0.14
600831	T1096-GP-065-020-S	20	0.878	0.139
600831	T1096-GP-066-005-S	5	0.808	0.139
600831	T1096-GP-066-010-S	10	0.903	0.145
600831	T1096-GP-066-015-S	15	0.797	0.143
600831	T1096-GP-066-020-S	20	0.654	0.124
600831	T1096-GP-067-005-S	5	0.873	0.169
600831	T1096-GP-067-010-S	10	0.786	0.145
600831	T1096-GP-067-015-S	15	1.01	0.183
600831	T1096-GP-067-020-S	20	0.64	0.122
600831	T1096-GP-085-005-SD	5	0.777	0.149
600832	T1096-GP-068-001-S	1	0.549	0.116
600832	T1096-GP-068-005-S	5	1.09	0.181
600832	T1096-GP-068-010-S	10	1.12	0.192
600832	T1096-GP-068-015-S	15	0.751	0.117
600832	T1096-GP-068-020-S	20	0.641	0.103
600832	T1096-GP-069-001-S	1	0.563	0.121
600832	T1096-GP-069-005-S	5	0.948	0.16

Refer to footnotes at end of table.

Table H2-5f (Continued)
 SWMU 96, Summary of Radiochemistry Analytical Results,
 1998 Supplemental Investigation

Sample Attributes			Activity (pCi/g) Uranium-238	
Record Number ^a	ER Sample ID	Sample Depth (ft)	Result	Error ^b
600832	T1096-GP-069-010-S	10	1.14	0.204
600832	T1096-GP-069-015-S	15	0.834	0.162
600832	T1096-GP-069-020-S	20	1	0.174
600842	T1096-GP-070-005-S	5	0.836	0.137
600842	T1096-GP-070-010-S	10	0.863	0.145
600842	T1096-GP-070-015-S	15	0.9	0.156
600842	T1096-GP-070-020-S	20	0.745	0.137
600842	T1096-GP-071-005-S	5	1.07	0.18
600842	T1096-GP-071-010-S	10	0.734	0.143
600842	T1096-GP-071-015-S	15	0.914	0.157
600842	T1096-GP-071-020-S	20	1.04	0.187
600842	T1096-GP-072-005-S	5	0.721	0.131
600842	T1096-GP-072-010-S	10	0.702	0.13
600842	T1096-GP-072-015-S	15	0.825	0.147
600842	T1096-GP-072-020-S	20	0.711	0.119
600843	T1096-GP-073-001-S	1	0.524	0.137
600843	T1096-GP-073-005-S	5	0.941	0.211
600843	T1096-GP-073-010-S	10	0.825	0.178
600843	T1096-GP-073-015-S	15	0.776	0.207
600843	T1096-GP-073-020-S	20	0.794	0.175
600843	T1096-GP-074-001-S	1	0.827	0.212
600845	T1096-GP-075-005-S	5	1.18	0.235
600845	T1096-GP-075-010-S	10	0.729	0.182
600845	T1096-GP-075-015-S	15	0.819	0.175
600845	T1096-GP-075-020-S	20	0.778	0.167
600845	T1096-GP-076-005-S	5	0.958	0.202
600845	T1096-GP-076-010-S	10	0.856	0.189
600845	T1096-GP-076-015-S	15	0.709	0.152
600845	T1096-GP-076-020-S	20	0.987	0.21
600845	T1096-GP-077-005-S	5	0.952	0.169
600845	T1096-GP-077-010-S	10	0.891	0.221
600845	T1096-GP-077-015-S	15	0.645	0.158
600845	T1096-GP-077-020-S	20	0.882	0.369
600845	T1096-GP-086-010-SD	10	0.76	0.154
600845	T1096-GP-087-001-SD	1	0.768	0.173
600846	T1096-GP-078-001-S	1	0.846	0.114
600846	T1096-GP-079-001-S	1	0.704	0.115
600846	T1096-GP-078-005-S	5	0.728	0.107
600846	T1096-GP-078-010-S	10	0.675	0.105
600846	T1096-GP-078-015-S	15	0.783	0.109

Refer to footnotes at end of table.

Table H2-5f (Continued)
 SWMU 96, Summary of Radiochemistry Analytical Results,
 1998 Supplemental Investigation

Sample Attributes			Activity (pCi/g) Uranium-238	
Record Number ^a	ER Sample ID	Sample Depth (ft)	Result	Error ^b
600846	T1096-GP-078-020-S	20	0.719	0.103
600846	T1096-GP-079-005-S	5	0.789	0.131
600846	T1096-GP-079-010-S	10	0.609	0.0887
600846	T1096-GP-079-015-S	15	0.74	0.108
600846	T1096-GP-079-020-S	20	0.777	0.108
600838	T1096-GP-080-005-S	5	1.22	0.197
600838	T1096-GP-080-010-S	10	1.01	0.17
600838	T1096-GP-080-015-S	15	0.784	0.139
600838	T1096-GP-080-020-S	20	0.768	0.143
600838	T1096-GP-081-005-S	5	1.03	0.169
600838	T1096-GP-081-010-S	10	0.729	0.135
600838	T1096-GP-081-015-S	15	0.833	0.149
600838	T1096-GP-081-020-S	20	0.616	0.119
600838	T1096-GP-082-005-S	1	0.774	0.149
600838	T1096-GP-082-010-S	10	0.891	0.157
600838	T1096-GP-082-015-S	15	0.968	0.221
600838	T1096-GP-082-020-S	20	0.778	0.147
600838	T1096-GP-083-001-S	1	0.717	0.136
600838	T1096-GP-083-005-S	5	0.987	0.182
600838	T1096-GP-083-010-S	10	0.946	0.172
600838	T1096-GP-083-015-S	15	0.881	0.169
600838	T1096-GP-083-020-S	20	0.636	0.127
600840	T1096-GP-084-001-S	1	0.62	0.0966
600840	T1096-GP-084-005-S	2	0.906	0.122
600840	T1096-GP-084-010-S	10	0.799	0.119
600840	T1096-GP-084-015-S	15	0.856	0.135
600840	T1096-GP-084-020-S	20	0.655	0.152
601096	T1096-GP-074-005	5	0.715	0.124
601096	T1096-GP-074-010	10	0.886	0.139
601096	T1096-GP-074-015	15	0.758	0.132
601096	T1096-GP-074-020	20	0.726	0.114
601096	T1096-GP-088-005	5	0.752	0.121
601096	T1096-GP-089-010	10	0.907	0.151
600831	T1096-EB-006-000-W	0	0.024	0.0284
600840	T1096-EB-010-000-W	0	0.0274	0.039

Table H2-5f (Continued)
SWMU 96, Summary of Radiochemistry Analytical Results,
1998 Supplemental Investigation

^aAnalysis request/chain-of-custody record.

^bTwo standard deviations about the mean detected activity.

EB = Equipment Blank.
ER = Environmental Restoration.
ft = Foot (feet).
GP = Geoprobe.
ID = Identification.
pCi/g = Picocuries per gram.
S = Soil Sample.
SD = Sample Duplicate.
SWMU = Solid Waste Management Unit.
T1 = Technical Area 1.
W = Water Sample.

Table H3-1
SWMU 96, Summary of Metals Analytical Results,
2002 Supplemental Investigation

Sample Attributes			Metals (EPA Method SW846 3005/SW846 3050/SW846 7470/SW846 7471 ^a) (mg/kg)			
Record Number ^b	ER Sample ID	Sample Depth (ft)	Arsenic	Barium	Cadmium	Chromium
605198	T1096-GP-098	5	2.06	113	0.253 J (0.476)	8.92
605198	T1096-GP-099	5	2.6	114	ND (0.0249)	10.6
605198	T1096-SD-034	1	3.05	111	ND (0.0252)	10.2
605198	T1096-SD-034	1	2.97	102	ND (0.0254)	9.73
605198	T1096-SD-035	1	3.53	169	ND (0.024)	4.39
605533	T1096-GP-092-06-S	6	4.11	292	ND (0.0455)	18
605533	T1096-GP-093-06-DUP	6	3.22	162	ND (0.0447)	10.5
605533	T1096-GP-093-06-S	6	3.13	314	ND (0.046)	10.1
605533	T1096-SD-030-00-S	1	5.28	271	ND (0.0464)	12.6
605533	T1096-SD-031-00-S	1	4.28	200	ND (0.046)	13.1
Background Concentration—North Area ^c			4.4	200	<1	12
Quality Assurance/Quality Control Samples (mg/L)						
605198	T1096-EB	0	ND (0.00457)	0.00069 J (0.005)	ND (0.00025)	0.00126 J (0.005)
605533	T1096-GP-00-EB	0	ND (0.00224)	0.00097 J (0.005)	0.00038 J (0.005)	0.0009 J (0.005)

Refer to footnotes at end of table.

Table H3-1 (Concluded)
 SWMU 96, Summary of Metals Analytical Results,
 2002 Supplemental Investigation

Sample Attributes			Metals (EPA Method SW846 3005/SW846 3050/SW846 7470/SW846 7471 ^a) (mg/kg)			
Record Number ^b	ER Sample ID	Sample Depth (ft)	Lead	Mercury	Selenium	Silver
605198	T1096-GP-098	5	5.02	ND (0.00414)	ND (0.257)	ND (0.11)
605198	T1096-GP-099	5	4.3	ND (0.00438)	ND (0.26)	ND (0.111)
605198	T1096-SD-034	1	9.25	0.0112	0.516	ND (0.112)
605198	T1096-SD-034	1	9.47	0.00696 J (0.00922)	0.295 J (0.49)	ND (0.113)
605198	T1096-SD-035	1	2.94	ND (0.00431)	0.341 J (0.463)	ND (0.107)
605533	T1096-GP-092-06-S	6	5.67	0.00462 J (0.0086)	0.562	ND (0.0859)
605533	T1096-GP-093-06-DUP	6	6.14	0.00311 J (0.00946)	0.626	ND (0.0843)
605533	T1096-GP-093-06-S	6	6.36	0.00466 J (0.00972)	0.488	ND (0.0867)
605533	T1096-SD-030-00-S	1	10.7	0.00395 J (0.00939)	0.51	ND (0.0876)
605533	T1096-SD-031-00-S	1	17	0.00748 J (0.00951)	0.584	0.496
Background Concentration—North Area ^c			11.2	<0.1	<10	<1
Quality Assurance/Quality Control Samples (mg/L)						
605198	T1096-EB	0	ND (0.00344)	ND (0.00007)	0.00365 JB (0.005)	0.00089 JB (0.005)
605533	T1096-GP-00-EB	0	ND (0.00172)	ND (0.00005)	ND (0.00281)	ND (0.00084)

Note: **Bold** indicates values that exceed background screening levels.

^aEPA November 1986.

^bAnalysis request/chain-of-custody record.

^cDinwiddie September 1997.

- B = Analyte detected in associated blank.
- DUP = Duplicate.
- EB = Equipment Blank.
- EPA = U.S. Environmental Protection Agency.
- ER = Environmental Restoration.
- ft = Foot (feet).
- GP = Geoprobe.
- ID = Identification.
- J () = The reported value is greater than or equal to the MDL but is less than the PQL, shown in parentheses.

- MDL = Method detection limit.
- mg/kg = Milligram(s) per kilogram.
- mg/L = Milligram(s) per liter.
- ND () = Not detected above the MDL, shown in parentheses.
- PQL = Practical quantitation limit.
- S = Soil Sample.
- SD = Sediment Sample.
- SWMU = Solid Waste Management Unit.
- T1 = Technical Area 1.

Table H3-2
SWMU 96, Summary of PCB Analytical Results—Detections Only,
2002 Supplemental Investigation

Sample Attributes			(EPA Method SW846 8082 ^a) (µg/kg)
Record Number ^b	ER Sample ID	Sample Depth (ft)	Aroclor-1260
605533	T1096-SD-02R-00-S	0	3 J (3.33)
605533	T1096-SD-030-00-S	0	42.9
605533	T1096-SD-031-00-S	0	76
Quality Assurance/Quality Control Samples (µg/L)			
605533	T1096-GP-00-EB	0	ND (0.0485)

Note: **Bold** indicates values that exceed background screening levels.

^aEPA November 1986.

^bAnalysis request/chain-of-custody record.

EB = Equipment Blank.

EPA = U.S. Environmental Protection Agency.

ER = Environmental Restoration.

ft = Foot (feet).

GP = Geoprobe.

ID = Identification.

J () = The reported value is greater than or equal to the MDL but is less than the PQL, shown in parentheses.

MDL = Method detection limit.

µg/kg = Microgram(s) per kilogram.

µg/L = Microgram(s) per liter.

ND () = Not detected above the MDL, shown in parentheses.

PCB = Polychlorinated biphenyl.

PQL = Practical quantitation limit.

S = Soil Sample.

SD = Sediment Sample.

SWMU = Solid Waste Management Unit.

T1 = Technical Area 1.

Table H3-3
SWMU 96, Summary of SVOC Analytical Results—Detections Only,
2002 Supplemental Investigation

Sample Attributes			SVOCs (EPA Method SW846 8270 ^a) (µg/kg)			
Record Number ^b	ER Sample ID	Sample Depth (ft)	Anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene
605198	T1096-SD-032	1	ND (4.67)	ND (2)	ND (2.33)	ND (5)
605198	T1096-SD-033	1	ND (4.67)/ND (4.67)	ND (2)/ND (2)	17.4 HJ (33.3)/ND (2.33)	10.1 HJ (33.3)/ND (5)
605198	T1096-SD-15R	1	23.5 J (33.3)/ND (4.67)	12.7 HJ (33.3)/ND (2)	20.4 HJ (33.3)/ND (2.33)	16.9 HJ (33.3)/ND (5)
Quality Assurance/Quality Control Samples (µg/L)						
605198	T1096-EB	0	ND (0.126)	ND (0.126)	ND (0.126)	ND (0.222)

Sample Attributes			SVOCs (EPA Method SW846 8270 ^a) (µg/kg)			
Record Number ^b	ER Sample ID	Sample Depth (ft)	Butylbenzyl phthalate	Chrysene	Diethylphthalate	bis(2-Ethylhexyl) phthalate
605198	T1096-SD-032	1	ND (12.7)	ND (6.33)	35.9 JB (333)	ND (7)
605198	T1096-SD-033	1	ND (12.7)/ND (12.7)	19.3 HJ (33.3)/ND (6.33)	31.4 JHB (333)/34.1	67.4 JHB (333)/ND (7)
605198	T1096-SD-15R	1	52.2 J (333)/ND (12.7)	38.3/ND (6.33)	39.5 JB (333)/ND (19.7)	ND (7)/ND (7)
Quality Assurance/Quality Control Samples (µg/L)						
605198	T1096-EB	0	ND (1.76)	ND (0.116)	1.36 JB (9.66)	0.285 JB (9.66)

Sample Attributes			SVOCs (EPA Method SW846 8270 ^a) (µg/kg)		
Record Number ^b	ER Sample ID	Sample Depth (ft)	Fluoranthene	Phenanthrene	Pyrene
605198	T1096-SD-032	1	21.6 J (33.3)	ND (4)	ND (8.67)
605198	T1096-SD-033	1	18.8 J (33.3)/28.1	15.1 HJ (33.3)/ND (4)	26.2 HJ (33.3)/ND (8.67)
605198	T1096-SD-15R	1	32.4 HJ (33.3)/51.1	21.1 HJ (33.3)/ND (4)	20.8 J (33.3)/34.5
Quality Assurance/Quality Control Samples (µg/L)					
605198	T1096-EB	0	ND (0.116)	ND (0.116)	ND (0.135)

Refer to footnotes at end of table.

Table H3-3 (Concluded)
SWMU 96, Summary of SVOC Analytical Results—Detections Only,
2002 Supplemental Investigation

Note: **Bold** indicates values that exceed background screening levels.

^aEPA November 1986.

^bAnalysis request/chain-of-custody record.

B = Analyte detected in associated blank.
EB = Equipment Blank.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
H = The hold time was exceeded for the associated sample analysis.
ID = Identification.
J () = The reported value is greater than or equal to the MDL but is less than the PQL, shown in parentheses.
MDL = Method detection limit.
μg/kg = Microgram(s) per kilogram.
μg/L = Microgram(s) per liter.
ND () = Not detected above the MDL, shown in parentheses.
PQL = Practical quantitation limit.
R = Resampled Location.
SD = Sediment Sample.
SVOC = Semivolatile organic compound.
SWMU = Solid Waste Management Unit.
T1 = Technical Area 1.

Table H3-4
 SWMU 96, Summary of VOC Analytical Results—Detections Only,
 2002 Supplemental Investigation

Sample Attributes			VOCs (EPA Method SW846 8260 ^a) (µg/kg)	
Record Number ^b	ER Sample ID	Sample Depth (ft)	Acetone	Methylene chloride
605533	T1096-GP-01R-09-S	9	ND (3.52)	2.88 JB (5)
605533	T1096-GP-090-09-S	9	ND (3.52)	2.58 JB (5)
605533	T1096-GP-091-09-S	9	ND (3.52)	2.61 JB (5)
605533	T1096-GP-096-06-S	6	ND (3.52)	2.46 JB (5)
605533	T1096-GP-097-06-S	6	4.98 JB (5)	2.43 JB (5)
605533	T1096-GP-47R-06-DUP	6	ND (3.52)	2.51 JB (5)
605533	T1096-GP-47R-06-S	6	ND (3.52)	2.54 JB (5)
Quality Assurance/Quality Control Samples (µg/L)				
605533	T1096-GP-00-TB	0	ND (2.29)	ND (1.9)

Note: **Bold** indicates values that exceed background screening levels.

^aEPA November 1986.

^bAnalysis request/chain-of-custody record.

- B = Analyte detected in associated blank.
- J () = The reported value is greater than or equal to the MDL but is less than the PQL, shown in parentheses.
- DUP = Duplicate.
- EPA = U.S. Environmental Protection Agency.
- ER = Environmental Restoration.
- ft = Foot (feet).
- GP = Geoprobe.
- ID = Identification.
- MDL = Method detection limit.

- µg/kg = Microgram(s) per kilogram.
- µg/L = Microgram(s) per liter.
- ND () = Not detected above the MDL, shown in parentheses.
- PQL = Practical quantitation limit.
- R = Resampled Location.
- S = Soil Sample.
- SWMU = Solid Waste Management Unit.
- T1 = Technical Area 1.
- TB = Trip Blank.
- VOC = Volatile organic compound.

Table H3-5
 SWMU 96, Summary of Radiochemistry Analytical Results,
 2002 Supplemental Investigation

Sample Attributes			Activity (pCi/g)			
Record Number ^a	ER Sample ID	Sample Depth (ft)	Plutonium-238		Plutonium-239/240	
			Result	Error ^b	Result	Error ^b
605198	T1096-SD-036	1	0.00122 U	0.00535	0.00488 U	0.00678
605198	T1096-SD-037	1	0.00774 U	0.00719	0 U	0.00715
605533	T1096-GP-090-09-DUP	9	0 U	0.00473	-0.00171 U	0.0058
605533	T1096-GP-090-09-S	9	-0.00151 U	0.00661	0.00301 U	0.00724
605533	T1096-GP-091-09-S	9	-0.00174 U	0.00589	0.00173 U	0.00589
605533	T1096-GP-092-06-S	6	0 U	0.00552	-0.00598 U	0.0103
605533	T1096-GP-093-06-S	6	-0.00397 U	0.00675	0.00199 U	0.00674
605533	T1096-GP-094-05-S	5	0.00723 U	0.00712	-0.00542 U	0.00939
605533	T1096-GP-095-05-S	5	-0.00356 U	0.00604	0.0124 U	0.0144
605537	T1BSI-PGS-001-00-S	1	-0.00153 U	0.003	-0.00764 U	0.00796
605537	T1BSI-PGS-002-00-S	1	-0.0029 U/0.00476	0.00569	0.00724 U/0.0412	0.0124
605537	T1BSI-PGS-003-00-S	1	0.00144 U	0.00487	0.00574 U	0.0143
605537	T1BSI-PGS-004-00-S	1	-0.0061 U	0.00601	-0.00914 U	0.0153
605537	T1BSI-PGS-005-00-S	1	-0.00296 U	0.0071	-0.00591 U	0.01
605537	T1BSI-PGS-006-00-S	1	-0.00137 U	0.00464	0.00683 U	0.00806
605537	T1BSI-PGS-007-00-S	1	0.00166 U	0.00326	0.00332 U	0.00462
605537	T1BSI-PGS-008-00-S	1	0.00292 U	0.00573	-1.39E-11 U	0.0107
605537	T1BSI-PGS-009-00-S	1	0.00549 U	0.00852	0.0137 U	0.0108
605537	T1BSI-PGS-010-00-S	1	-0.00713 U	0.0101	0.00142 U	0.00739
605537	T1BSI-PGS-011-00-S	1	-0.00282 U	0.0135	0.00563 U	0.0103
605537	T1BSI-PGS-012-00-S	1	0.00139 U	0.00982	0.00139 U	0.0156
605537	T1BSI-PGS-013-00-S	1	-0.00271 U	0.00531	0.00811 U	0.0119
605537	T1BSI-PGS-014-00-S	1	0 U	0.00569	-0.0029 U	0.0106
605537	T1BSI-PGS-015-00-S	1	0.00401 U	0.00695	0.00401 U	0.00946
605537	T1BSI-PGS-016-00-S	1	0 U	0.00408	-0.00294 U	0.0108
605537	T1BSI-PGS-017-00-S	1	-0.00299 U	0.00508	0.00299 U	0.0117

Refer to footnotes at end of table.

Table H3-5 (Concluded)
 SWMU 96, Summary of Radiochemistry Analytical Results,
 2002 Supplemental Investigation

Sample Attributes			Activity (pCi/g)			
Record Number ^a	ER Sample ID	Sample Depth (ft)	Plutonium-238		Plutonium-239/240	
			Result	Error ^b	Result	Error ^b
605537	T1BSI-PGS-018-00-S	1	-0.00617 U/0.00	0.0186/0.0049	0.00529 U/0.0277	0.00601/0.0131
605537	T1BSI-PGS-019-00-S	1	-0.00338 U/-0.00913	0.00813/0.0223	0.00507 U/0.0167	0.00878/0.01
605537	T1BSI-PGS-020-00-S	1	-0.00142 U	0.00392	0 U	0.00679
605537	T1BSI-PGS-021-00-S	1	0.00302 U	0.0118	-7.19E-11 U	0.00836
605537	T1BSI-PGS-022-00-S	1	-0.00439 U	0.00862	-0.00732 U	0.00762
605537	T1BSI-PGS-023-00-S	1	0.00315 U	0.00757	0.00472 U	0.0102
605537	T1BSI-PGS-024-00-S	1	-0.00294 U	0.0108	-0.00587 U	0.00816
605537	T1BSI-PGS-025-00-S	1	0.00278 U	0.0102	-0.00139 U	0.0136
605537	T1BSI-PGS-026-00-S	1	0.00536 U	0.00832	-0.00268 U	0.0117
605537	T1BSI-PGS-027-00-S	1	0.00359 U	0.00499	-0.00359 U	0.00704
605537	T1BSI-PGS-028-00-S	1	-1.60E-11 U	0.00371	0.00535 U	0.00644
605537	T1BSI-PGS-029-00-S	1	0 U	0.0029	0 U	0.00709
605537	T1BSI-PGS-030-00-S	1	0.00303 U	0.00421	-0.00152 U	0.00515
605537	T1BSI-PGS-031-00-S	1	0.0115 U	0.0133	-0.00144 U	0.00746
605537	T1BSI-PGS-032-00-S	1	-0.00447 U	0.00877	-0.00595 U	0.00827
605537	T1BSI-PGS-033-00-S	1	0 U	0.00701	0.00357 U	0.0111
605537	T1BSI-PGS-034-00-S	1	0 U	0.0116	-0.00446 U	0.00874
605537	T1BSI-PGS-035-00-S	1	0 U	0.00738	0.00307 U	0.0148

^aAnalysis request/chain-of-custody record.

^bTwo standard deviations about the mean detected activity.

BSI = Background Soil Investigation.

DUP = Duplicate.

ER = Environmental Restoration.

ft = Foot (feet).

GP = Geoprobe.

ID = Identification.

pCi/g = Picocurie(s) per gram.

PGS = Plutonium Grid Survey.

S = Soil Sample.

SD = Sediment Sample.

SWMU = Solid Waste Management Unit.

T1 = Technical Area 1.

U = Analyte not detected.





National Nuclear Security Administration
Sandia Site Office
P.O. Box 5400
Albuquerque, New Mexico 87185-5400



2010-10-10
11/639

SEP 17 2004

CERTIFIED MAIL-RETURN RECEIPT REQUESTED

cc: ESKSEC

MB

Mr. James Bearzi, Chief
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Road East, Building 1
Santa Fe, NM 87505

Dear Mr. Bearzi,

On behalf of the Department of Energy (DOE) and Sandia Corporation, DOE is submitting the enclosed Responses to NMED's June 25, 2004 Request for Supplemental Information, Solid Waste Management Units 96, 187, and 226, Environmental Restoration Project at Sandia National Laboratories, New Mexico, EPA ID No. NM5890110518.

DOE and Sandia are requesting a determination that these sites are acceptable for No Further Action or Corrective Action Complete without controls.

If you have any questions, please contact John Gould at (505) 845-6089.

Sincerely,

Patty Wagner
Patty Wagner
Manager

Enclosure

cc.w/ enclosure:
W. Moats, NMED-HWB (via Certified Mail)
L. King, EPA, Region 6 (Via Certified Mail)
M. Gardipe, NNSA/SC/ERD
C. Voorhees, NMED-OB

Mr. J. Bearzi

(2)

SEP 17 2004

cc w/o enclosure:

K. Thomas, EPA, Region 6

F. Nimick, SNL, MS 1089

R. E. Fate, SNL, MS 1089

M. J. Davis, SNL, MS 1089

D. Stockham, SNL, MS 1087

B. Langkopf, SNL, MS 1087

M. Skelly, SNL, MS 1088

A. Blumberg, SNL, MS 0141

Sandia National Laboratories/Albuquerque, New Mexico

Responses to NMED's June 25, 2004 Request for Supplemental Information Solid Waste Management Units 96, 187, and 226 Environmental Restoration Project

September 2004

INTRODUCTION

Sandia National Laboratories/New Mexico (SNL/NM) is submitting this response to a Request for Supplemental Information (RSI) for Solid Waste Management Units (SWMUs) 96, 187, and 226 which are managed by the Technical Area I (TA-I), Operable Unit (OU) 1302. The three SWMUs discussed in this RSI response are:

- SWMU 96—Storm Drain System
- SWMU 187—Sanitary Sewer System, and
- SWMU 226—Old Acid Waste Line

Over the past ten years these three SWMUs have been the subjects of numerous investigations as well as the topic of numerous discussions with the NMED. This RSI response addresses the most current correspondence from the NMED (NMED June 2004) by providing the requested information for the site-specific comments (discussed in numerical order). Each section provides NMED technical comments repeated in **bold** arranged by comment number in the original order.

The DOE/Sandia National Laboratories response is written in normal font style on a separate line under "Response." Additional supporting information for the general and site-specific comments is included as appendices to this document (Table 1).

Table 1

List of Appendices to the RSI Response

Appendix A	Summary Data Tables for the Storm Drain/Sanitary Sewer Cross-Connect Elimination Project
Appendix B	Excerpt from IT 1993 discussing the results from VOC analysis.
Appendix C	Revised radionuclide constituent tables.
Appendix D	Revised Table H3-5.
Appendix E	Figures 5.4.4-1 (Land Survey) and 5.4.4-2 (Radiological Survey) from Rust Geotech 1994
Appendix F	Figure 4 from Bldg 839 VCM Report (IT December 1995)

**RESPONSES TO NMED REQUEST FOR SUPPLEMENTAL INFORMATION
ON NO FURTHER ACTION PROPOSALS
DATED MAY 1997 (7th ROUND)**

GENERAL COMMENTS

It is NMED policy that everything needed to support a decision for No Further Action (NFA) must be included in any document that proposes NFA for a SWMU or Area Of Concern (AOC). General issues related to the subject document are described below, followed by site-specific comments.

- 1. Residential Screening Levels: SNL conducted separate screening assessments using both industrial and residential levels. NMED will only approve NFA status at this time for sites that can meet an unrestricted residential land use scenario. Therefore, NMED only reviewed the risk calculations on residential screening levels.**

Response 1: For completeness, Sandia National Laboratories, New Mexico (SNL/NM) provided risk assessments for both industrial and residential land use scenarios. Based on the requirements of the Compliance Order on Consent (NMED April 2004), SNL/NM understands that NMED will review the risk calculations on industrial screening levels for SWMUs proposed for "Corrective Action Complete With Controls". The "Corrective Action Complete With Controls" status indicates that these SWMUs will require structural or institutional controls to maintain the projected future land use. Because these SWMUs will be proposed for Corrective Action Complete with Controls, SNL/NM requests that NMED review the risk assessment under the industrial scenario for each SWMU.

SPECIFIC COMMENTS

SWMU 96

- 2. Laboratory data sheets were provided for the "Storm Drain/Sanitary Sewer Cross-Connect Elimination" project. Provide summary data tables and a figure showing sample locations for the cross-connect study.**

Response 2: Appendix A presents the summary data tables for the Storm Drain/Sanitary Sewer Cross-Connect Elimination project, and includes:

- Table A1--Summary of Confirmatory Soil Sampling SVOC Analytical Results, March/April 1993.
- Table A2--Summary of SVOC Analytical Method Detection Limits, March/April 1993.
- Table A3--Summary of Confirmatory Soil Sampling Metals Analytical Results, March/April 1993.
- Table A4--Summary of Metals/Inorganics Analytical Method Detection Limits, March/April 1993.

- **Table A5—Summary of PCB Analytical Method Detection Limits, March/April 1993.**

The Storm Drain/Sanitary Sewer Cross-Connect Elimination Project Report (IT June 1993) refers to analytical results for volatile organic compounds (VOCs) associated with sample 4708. However, the document in the Environmental Restoration records center did not contain the VOC data. Because this investigation was part of SNL/NM's Decontamination and Demolition Program, the data do not reside in the Environmental Restoration Data Management System. Attempts to retrieve the analytical package were unsuccessful. However, the report states that VOCs were not detected in concentrations that exceed EPA proposed RCRA corrective action levels. The portion of the report that discusses the VOC data is provided in Appendix B.

- 3. Addendum H contains the Analytical Data Tables for SWMU 96 and the Method Detection Limit Tables for the three subject SWMUs. Provide the background levels and detection limits for the radionuclide constituent tables.**

Response 3: For those constituents with established background levels, the background concentrations have been added to the revised radionuclide constituent tables (Appendix C). Tables with radionuclides that do not have established background levels have not been revised. Method Detection Limit (or Minimum Detectable Activity) tables are not usually provided for radionuclide constituents; detection limits for nondetected radionuclides are included in the tables in Appendix C.

- 4. Include a footnote at the bottom of Table H3-5 that identifies the duplicate samples.**

Response 4: A footnote has been added to identify the duplicate samples in the revised Table H3-5 (Appendix D).

SWMU 226

- 5. The radiation screening data for the outfall area (SWMU 46) were not provided in Addendum E. Provide summary data tables and a figure showing sample locations for the radiation screening conducted at the outfall area.**

Response 5: SNL/NM regrets not including these figures in our 2003 expanded response. Appendix E includes copies of Figures 5.4.4-1 (Land Survey) and 5.4.4-2 (Radiological Survey) from Rust Geotech (July 1994). It should be noted that the Rust Geotech report did not include a summary data table for the radiological survey, and there is no data available to create a summary table. Figure 5.4.4-2 simply shows the location of the radiological survey boundary and includes the statement, "All gamma measurements are within the range of natural background of 10-13 μ R/h." (Rust Geotech July 1994).

6. Provide a figure showing all of the Phase I and II sample locations, Voluntary Corrective Measure (VCM) confirmatory sample locations, and the locations of all piping that was removed during the VCM at Buildings 838 and 839.

Response 6: The Figure 4 submitted to NMED was incomplete. A complete Figure 4 showing all of the VCM confirmatory sample locations is included as Appendix F.

References

- International Technology (IT) Corporation, June 1993. *Field and Laboratory Documentation for Subsurface Soil Samples for TA-I Storm Drain/Sanitary Sewer Cross-Connect Elimination Project*. Prepared for Sandia National Laboratories Environmental Protection Department 7044. June 1993.
- New Mexico Environment Department (NMED), April 2004. *Compliance Order on Consent Pursuant to the New Mexico Hazardous Waste Act, § 74-4-10*, NMED Santa Fe, New Mexico. April 29, 2004.
- New Mexico Environment Department (NMED), June 2004. *Request for Supplemental Information: Environmental Restoration Project Expanded Responses to NMED's 1998 Technical Comments on No Further Action Proposal for Solid Waste Management Units (SWMUs) 96, 187, 226; Dated May 1997; November 2003. Sandia National Laboratories, EPA ID# NM5890110518. HWB-SNL-04-019*. Letter from William S. McDonald, NMED to Patty Wagner, U.S. Department of Energy Sandia Site Office/NNSA; and Peter Davies, Sandia National Laboratories, Geoscience and Environment Center. Santa Fe, New Mexico. June 25, 2004.
- RUST Geotech, Inc., July 1994. *Sandia Surface Radiological Surveys Report (4 Volumes)*, Technical Support Program for Sandia National Laboratories/New Mexico. July 1994.
- Tharp, February 1999. Internal memorandum from Tommy L. Tharp (Roy F. Weston, Inc.) to Fran. B. Nimick (SNL/NM), *Tritium Background Data Statistical Analysis for Site-Wide Surface Soils*. Sandia National Laboratories, Albuquerque, New Mexico. February 25, 1999.



Appendix A

Summary Data Tables for the Storm Drain/Sanitary Sewer Cross-Connect Elimination Project

Table A1
Storm Drain/Sanitary Sewer Cross-Connect Elimination
Summary of Confirmatory Soil Sampling Detected SVOC Analytical Results, March/April 1993

Sample Attributes			SVOCs (EPA Method 8270) (mg/kg)
Record Number ^a	Sample ID	Sample Depth (ft) ^b	bis(2-Ethylhexyl)phthalate
Unknown	ER9200 4708-1	7.5	0.066 J (0.330)

- a = Analysis request/chain-of-custody record numbers are not provided in the data package submitted to the Environmental Restoration Records Center.
- b = End depths are provided.
- EPA = (US) Environmental Protection Agency.
- ft = foot (feet).
- ID = Identification.
- J = Analyte present at level less than detection limit.
- mg/kg = Milligram(s) per kilogram.
- SVOC = Semivolatile organic compound.

Table A2
 Storm Drain/Sanitary Sewer Cross-Connect Elimination
 Summary of SVOC Analytical Method Detection Limits, March/April 1993

Analyte	Method Detection Limit (mg/kg)
1,2,4-Trichlorobenzene	0.330
1,2-Dichlorobenzene	0.330
1,3-Dichlorobenzene	0.330
1,4-Dichlorobenzene	0.330
2,4,5-Trichlorophenol	0.330
2,4,6-Trichlorophenol	0.330
2,4-Dichlorophenol	0.330
2,4-Dimethylphenol	0.330
2,4-Dinitrophenol	1.67
2,4-Dinitrotoluene	0.330
2,6-Dinitrotoluene	0.330
2-Chloronaphthalene	0.330
2-Chlorophenol	0.330
2-Methylnaphthalene	0.330
2-Methylphenol	0.330
2-Nitroaniline	1.67
2-Nitrophenol	0.330
3,3'-Dichlorobenzidine	0.670
3-Nitroaniline	1.67
4,6-Dinitro-2-methylphenol	1.67
4-Bromophenyl phenyl ether	0.330
4-Chloro-3-methylphenol	0.330
4-Chloroaniline	0.330
4-Chlorophenyl phenyl ether	0.330
4-Methylphenol	0.330
4-Nitroaniline	1.67
4-Nitrophenol	1.67
Acenaphthene	0.330
Acenaphthylene	0.330
Anthracene	0.330
Benzidine	2.66
Benzo(a)anthracene	0.330
Benzo(a)pyrene	0.330
Benzo(b)fluoranthene	0.330
Benzo(ghi)perylene	0.330
Benzo(k)fluoranthene	0.330
Benzoic acid	1.67
Benzyl alcohol	0.330
Butyl benzyl phthalate	0.330
Chrysene	0.330
Di-n-butyl phthalate	0.330
Di-n-octyl phthalate	0.330
Dibenz[a,h]anthracene	0.330
Dibenzofuran	0.330
Diethyl phthalate	0.330
Dimethylphthalate	0.330
Fluoranthene	0.330
Fluorene	0.330
Hexachlorobenzene	0.330
Hexachlorobutadiene	0.330

Table A2 (concluded)
 Storm Drain/Sanitary Sewer Cross-Connect Elimination
 Summary of SVOC Analytical Method Detection Limits, March 1993

Analyte	Method Detection Limit (mg/kg)
Hexachlorocyclopentadiene	0.330
Hexachloroethane	0.330
Indeno(1,2,3-c,d)pyrene	0.330
Isophorone	0.330
Naphthalene	0.330
Nitrobenzene	0.330
Pentachlorophenol	1.67
Phenanthrene	0.330
Phenol	0.330
Pyrene	0.330
bis(2-Chloroethoxy)methane	0.330
bis(2-Chloroethyl)ether	0.330
bis(2-Ethylhexyl)phthalate	0.330
bis(2-Chloroisopropyl) ether	0.330
n-Nitrosodiphenylamine	0.330
n-Nitroso di n-propylamine	0.330

SVOC = Semivolatile organic compound.
 mg/kg = Milligram(s) per kilogram.

Table A3
Storm Drain/Sanitary Sewer Cross-Connect Elimination
Summary of Confirmatory Soil Sampling Metals Analytical Results, March/April 1993

Sample Attributes			Metals (EPA Method 6010/7060/7061/7741) (mg/kg)						
Record Number ^a	Sample ID	Sample Depth(ft) ^b	Arsenic	Barium	Cadmium	Chromium	Lead	Selenium	Silver
Unknown	ER9200 4290-1	8	3.6	120	ND (0.28)	4.0	4.0	ND (0.11)	ND (0.56)
Unknown	ER9200 4693-1	6	3.2	194	ND (0.27)	7.5	5.3	0.11	ND (0.55)
Unknown	ER9200 4695-1	6	6.2	591	ND (0.28)	9.9	6.2	0.14	ND (0.56)
Unknown	ER9200 4697-1	6	3.4	244	0.34	6.4	5.1	ND (0.11)	ND (0.55)
Unknown	ER9200 4699-1	6.5	5.3	191	ND (0.29)	8.3	5.1	ND (0.12)	ND (0.58)
Unknown	ER9200 4701-1	6.5	3.6	130	ND (0.27)	5.8	4.3	ND (0.11)	ND (0.54)
Unknown	ER9200 4703-1	7	4.6	349	0.30	7.6	11	ND (0.11)	ND (0.57)
Unknown	ER9200 4705-1	7.5	4.3	296	ND (0.28)	7.0	6.0	ND (0.11)	ND (0.56)
Unknown	ER9200 4706-1	7.5	4.2	93.6	ND (0.50)	4.3	5.6	ND (1.0)	0.76
Unknown	ER9200 4708-1	7.5	4.6	268	0.31	7.7	6.9	0.11	ND (0.53)
Unknown	ER9200 4712-1	6	4.2	275	0.40	13	9.2	0.13	ND (0.57)
Unknown	ER9200 4715-1	6	4.8	275	0.53	14	11	0.14	ND (0.60)
Unknown	ER9200 4717-1	6	4.7	421	ND (0.28)	5.0	5.0	ND (0.11)	ND (0.56)
Unknown	ER9200 4719-1	6	2.4	224	ND (0.29)	7.7	8.2	ND (0.12)	ND (0.58)
Unknown	ER9200 4720-1	6	1.1	126	ND (0.26)	3.3	5.5	ND (0.1)	ND (0.52)
Background concentration—North Area ^c			4.4	200	0.9	12.8	11.2	<1	<1

- ^a = Analysis request/chain-of-custody record numbers are not provided in the data package submitted to the Environmental Restoration Records Center.
- ^b = End depths are provided.
- ^c = Dinwiddie September 1997.
- bold** = Value exceeds the approved background concentration.
- EPA = (US) Environmental Protection Agency.
- ft = foot (feet).
- ID = Identification.
- ND = Not Detected, method detection limits provided parenthetically.
- mg/kg = Milligram(s) per kilogram.

Table A4
Storm Drain/Sanitary Sewer Cross-Connect Elimination
Summary of Metals/Inorganics Analytical Method Detection Limits, March/April 1993

Analyte	Method Detection Limit (mg/kg)
Arsenic	1.0 – 1.2
Barium	1.1 – 1.2
Cadmium	0.26 - 0.50
Chromium	1.1 – 1.2
Cyanide, Total (mg/L)	0.10
Lead	2.1 – 2.4
Mercury	0.042 – 0.050
Selenium	0.10 – 1.0
Silver	0.52 – 0.60

mg/kg = Milligram(s) per kilogram.
mg/L = Milligram(s) per liter.

Table A5
Storm Drain/Sanitary Sewer Cross-Connect Elimination
Summary of PCB Analytical Method Detection Limits, March/April 1993

Analyte	Method Detection Limit ($\mu\text{g}/\text{kg}$)
Aroclor-1016	33 - 80
Aroclor-1221	33 - 80
Aroclor-1232	33 - 80
Aroclor-1242	33 - 80
Aroclor-1248	33 - 80
Aroclor-1254	33 - 80
Aroclor-1260	33 - 80

$\mu\text{g}/\text{kg}$ = Microgram(s) per kilogram.
PCB = Polychlorinated biphenyl.



Appendix B

Excerpt from IT 1993 Discussing the Results from VOC Analysis.

WA/CC 1/DAT/93 ANA
BC# 12479



Sandia National Laboratories

Field and Laboratory Documentation for Subsurface Soil Samples for TA-I Storm Drain/Sanitary Sewer Cross-Connect Elimination Project

Prepared for:
Sandia National Laboratories, Albuquerque
Environmental Protection Department 7044
P.O. Box 5800
Albuquerque, New Mexico 87185-5800

Prepared by:
IT Corporation
5301 Central Avenue NE, Suite 700
Albuquerque, New Mexico 87108

June 1993



Each sample was packaged and shipped to the designated SNL/NM contract laboratory for analysis of total Resource Conservation and Recovery Act (RCRA) metals, total cyanide, soil pH, and polychlorinated biphenyls (PCB). Soil samples with headspace readings elevated above background were also analyzed for VOCs and semivolatile organic compounds (SVOC). Ten percent of the soil samples were analyzed at the TMA/Eberline analytical laboratory for isotopic uranium, plutonium, thorium, and tritium.

All field activities were performed in accordance with the original work plan, "Operating Procedure for Sampling and Analysis During the Storm Drain/Sanitary Sewer Cross-Connect Elimination Project," (IT,1993) except as noted in Chapter 4.0 of this report.

3.0 Analytical Results

Soil sample chemical analyses were performed by Environmental Control Technology Corporation (ENCOTEC) in Ann Arbor, Michigan. One duplicate soil sample was analyzed by Enseco/Rocky Mountain Analytical Laboratory in Arvada, Colorado. The analytical reports include the date of sample collection, receipt, preparation and analysis; sample identification number and corresponding laboratory control number; test method reference; analyst name; analytical results and corresponding laboratory reporting limits for each target analyte; and the results of concurrently analyzed quality control (QC) samples. Complete analytical reports for environmental soil and sediment samples are contained in Appendix B.

Total metals concentrations in all soil samples collected during this project are below the proposed EPA RCRA corrective action limits for all listed analytes (EPA,1990).

Soil sample ER92004708 and trip blank ER92004710 were analyzed for VOCs. Sample ER92004708 was also analyzed for SVOCs. Concentrations of VOCs and SVOCs in these samples were limited to "J"-values (concentrations detected below the normal laboratory reporting limit) and to concentrations which did not exceed the EPA's "10-times (10x) rule". The 10x rule is applied to samples when the associated method blank contains the analyte of interest and the concentrations in the samples are less than 10 times those in the blank (EPA, 1991). No VOCs or SVOCs were detected in concentrations which exceed EPA proposed RCRA corrective action levels (EPA, 1990).

Fractions of all soil samples were sent to SNL/NM Radiation Protection Measurements Department 7715 and screened for tritium, gross alpha/beta, and gamma spectroscopy.



Appendix C

Revised Radionuclide Constituent Tables.

Table H2-5b
 SWMU 96, Summary of Radiochemistry Analytical Results,
 1998 Supplemental Investigation

Sample Attributes			Activity (pCi/g) Plutonium-239/240	
Record Number ^a	ER Sample ID	Sample Depth (ft)	Result	Error ^b
600829	T1096-GP-060-005-S	5	0.0323 J	0.0233
600829	T1096-GP-060-010-S	10	ND (0.0061)	--
600829	T1096-GP-061-005-S	5	ND (0.0067)	--
600829	T1096-GP-061-010-S	10	ND (0.0202)	--
600829	T1096-GP-061-015-S	15	ND (0.00602)	--
600829	T1096-GP-061-020-S	20	0.213	0.0644
600830	T1096-GP-062-005-S	5	0.0335 J	0.0635
600830	T1096-GP-062-010-S	10	ND (0.0138)	--
600830	T1096-GP-062-015-S	15	0.0222 J	0.0259
600830	T1096-GP-062-020-S	20	ND (0.00456)	--
600830	T1096-GP-063-001-S	1	0.18	0.0687
600830	T1096-GP-063-005-S	5	0.0926 J	0.0506
600830	T1096-GP-063-010-S	10	ND (0.00757)	--
600830	T1096-GP-063-015-S	15	ND (0.0116)	--
600830	T1096-GP-063-020-S	20	ND (0.0221)	--
600830	T1096-GP-064-001-S	1	ND (0.0346)	--
600830	T1096-GP-064-005-S	5	0.0171 J	0.0346
600830	T1096-GP-064-010-S	10	ND (0.0052)	--
600830	T1096-GP-064-015-S	15	ND (0.00733)	--
600830	T1096-GP-064-020-S	20	0.00653 J	0.00977
600831	T1096-GP-065-005-S	5	0.00856	0.0173
600831	T1096-GP-065-010-S	10	ND (0.00781)	--
600831	T1096-GP-065-015-S	15	ND (0.00371)	--
600831	T1096-GP-065-020-S	20	ND (0.0125)	--
600831	T1096-GP-066-005-S	5	ND (0)	--
600831	T1096-GP-066-010-S	10	ND (0.0114)	--
600831	T1096-GP-066-015-S	15	0.00829	0.0146
600831	T1096-GP-066-020-S	20	0.0183	0.0166
600831	T1096-GP-067-005-S	5	0.0131	0.0155
600831	T1096-GP-067-010-S	10	ND (0.00655)	--
600831	T1096-GP-067-015-S	15	0.0136	0.014
600831	T1096-GP-067-020-S	20	ND (0.0122)	--
600832	T1096-GP-068-001-S	1	ND (0.00598)	--
600832	T1096-GP-068-005-S	5	ND (0.00833)	--
600832	T1096-GP-068-010-S	10	ND (0.00469)	--
600832	T1096-GP-068-015-S	15	ND (0.00895)	--
600832	T1096-GP-068-020-S	20	ND (0.0061)	--
600832	T1096-GP-069-001-S	1	ND (0.0106)	--
600832	T1096-GP-069-005-S	5	0.00624	0.00887
600832	T1096-GP-069-010-S	10	ND (0.00887)	--
600832	T1096-GP-069-015-S	15	ND (0.0103)	--
Background Activity—North Area		NA	NA	NA

Refer to footnotes at end of table.

Table H2-5b (Continued)
 SWMU 96, Summary of Radiochemistry Analytical Results,
 1998 Supplemental Investigation

Sample Attributes			Activity (pCi/g) Plutonium-239/240	
Record Number ^a	ER Sample ID	Sample Depth (ft)	Result	Error ^b
600832	T1096-GP-069-020-S	20	ND (0.00679)	--
600842	T1096-GP-070-005-S	5	ND (0.0129)	--
600842	T1096-GP-070-010-S	10	ND (0.0103)	--
600842	T1096-GP-070-015-S	15	ND (0.0113)	--
600842	T1096-GP-070-020-S	20	ND (0.0116)	--
600842	T1096-GP-071-005-S	5	0.0139 J	0.0115
600842	T1096-GP-071-010-S	10	ND (0.0117)	--
600842	T1096-GP-071-015-S	15	0.0114 J	0.0103
600842	T1096-GP-071-020-S	20	ND (0.0113)	--
600842	T1096-GP-072-005-S	5	ND (0.0112)	--
600842	T1096-GP-072-010-S	10	0.0307 J	0.0192
600842	T1096-GP-072-015-S	15	ND (0.0109)	--
600842	T1096-GP-072-020-S	20	0.0181 J	0.0154
600843	T1096-GP-073-001-S	1	ND (0.0108)	--
600843	T1096-GP-073-005-S	5	0.0137	0.016
600843	T1096-GP-073-010-S	10	ND (0.0112)	--
600843	T1096-GP-073-015-S	15	ND (0.00993)	--
600843	T1096-GP-073-020-S	20	ND (0.0116)	--
600843	T1096-GP-074-001-S	1	ND (0.0116)	--
601096	T1096-GP-074-005	5	ND (0.0056)	--
601096	T1096-GP-074-010	10	ND (0.00409)	--
601096	T1096-GP-074-015	15	0.0182 J	0.014
601096	T1096-GP-074-020	20	0.0453 J	0.0228
600845	T1096-GP-075-005-S	5	0.0332	0.0258
600845	T1096-GP-075-010-S	10	ND (0.00906)	--
600845	T1096-GP-075-015-S	15	ND (0.0134)	--
600845	T1096-GP-075-020-S	20	ND (0.00884)	--
600845	T1096-GP-076-005-S	5	ND (0.0102)	--
600845	T1096-GP-076-010-S	10	ND (0.00912)	--
600845	T1096-GP-076-015-S	15	ND (0.00781)	--
600845	T1096-GP-076-020-S	20	ND (0.0121)	--
600845	T1096-GP-077-005-S	5	ND (0.00867)	--
600845	T1096-GP-077-010-S	10	0.00953	0.0133
600845	T1096-GP-077-015-S	15	ND (0.0112)	--
600845	T1096-GP-077-020-S	20	ND (0.0125)	--
600846	T1096-GP-078-001-S	1	0.01	0.0107
600846	T1096-GP-078-005-S	5	ND (0.00827)	--
600846	T1096-GP-078-010-S	10	0.0298	0.0193
600846	T1096-GP-078-015-S	15	ND (0.00504)	--
600846	T1096-GP-078-020-S	20	ND (0.00707)	--
Background Activity—North Area		NA	NA	NA

Refer to footnotes at end of table.

Table H2-5b (Concluded)
 SWMU 96, Summary of Radiochemistry Analytical Results,
 1998 Supplemental Investigation

Sample Attributes			Activity (pCi/g) Plutonium-239/240	
Record Number ^a	ER Sample ID	Sample Depth (ft)	Result	Error ^b
600846	T1096-GP-079-001-S	1	0.105	0.0425
600846	T1096-GP-079-005-S	5	ND (0.00691)	--
600846	T1096-GP-079-010-S	10	ND (0.0114)	--
600846	T1096-GP-079-015-S	15	0.115	0.0409
600846	T1096-GP-079-020-S	20	0.0199	0.0189
600838	T1096-GP-080-005-S	5	ND (0.00363)	--
600838	T1096-GP-080-010-S	10	0.0262	0.0178
600838	T1096-GP-080-015-S	15	ND (0.00516)	--
600838	T1096-GP-080-020-S	20	0.031	0.0201
600838	T1096-GP-081-005-S	5	ND (0.00552)	--
600838	T1096-GP-081-010-S	10	ND (0.00828)	--
600838	T1096-GP-081-015-S	15	ND (0.00401)	--
600838	T1096-GP-081-020-S	20	0.00585	0.0083
600838	T1096-GP-082-005-S	5	ND (0.00379)	--
600838	T1096-GP-082-010-S	10	ND (0.00367)	--
600838	T1096-GP-082-015-S	15	0.00563	0.00654
600838	T1096-GP-082-020-S	20	ND (0.00485)	--
600838	T1096-GP-083-001-S	1	ND (0.00535)	--
600838	T1096-GP-083-005-S	5	0.0157	0.0131
600838	T1096-GP-083-010-S	10	ND (0.00455)	--
600838	T1096-GP-083-015-S	15	ND (0.00598)	--
600838	T1096-GP-083-020-S	20	0.00808	0.00955
600840	T1096-GP-084-001-S	1	ND (0.00565)	--
600840	T1096-GP-084-005-S	5	0.0045 J	0.00792
600840	T1096-GP-084-010-S	10	ND (0.0075)	--
600840	T1096-GP-084-015-S	15	ND (0.0106)	--
600840	T1096-GP-084-020-S	20	ND (0.00431)	--
600831	T1096-GP-085-005-SD	5	ND (0.00715)	--
600845	T1096-GP-086-010-SD	10	ND (0.0108)	--
600845	T1096-GP-087-001-SD	1	ND (0.00889)	--
600831	T1096-EB-006-000-W	0	0.0534	0.0315
600849	T1096-EB-007-000-W	0	0.0253	0.0272
601096	T1096-EB-011-000	0	0.0258	0.0329
Background Activity—North Area		NA	NA	NA

^aAnalysis request/chain-of-custody record.

^bTwo standard deviations about the mean detected activity.

No NMED-approved background concentrations are available for plutonium.

-- = Error not calculated for non-detect results.

EB = Equipment Blank.

ER = Environmental Restoration.

ft = Foot (feet).

GP = Geoprobe.

ID = Identification.

J = Estimated value.

NA = Not Applicable.

pCi/g = Picocuries per gram.

S = Soil Sample.

SWMU = Solid Waste Management Unit.

T1 = Technical Area 1.

W = Water Sample.

Revised Table H2-5c
 SWMU 96, Summary of Radiochemistry Analytical Results,
 1998 Supplemental Investigation

Sample Attributes			Activity (pCi/g) Tritium	
Record Number ^a	ER Sample ID	Sample Depth (ft)	Result	Error ^b
600829	T1096-GP-060-005-S	5	ND (0.0083)	--
600829	T1096-GP-060-010-S	10	ND (0.0084)	--
600829	T1096-GP-061-005-S	5	ND (0.0084)	--
600829	T1096-GP-061-010-S	10	ND (0.0082)	--
600829	T1096-GP-061-015-S	15	ND (0.0083)	--
600829	T1096-GP-061-020-S	20	ND (0.0084)	--
600830	T1096-GP-062-005-S	5	ND (0.0081)	--
600830	T1096-GP-062-010-S	10	0.0109	0.00975
600830	T1096-GP-062-015-S	15	0.0117	0.00995
600830	T1096-GP-062-020-S	20	0.0102	0.00965
600830	T1096-GP-063-001-S	1	0.01155	0.01
600830	T1096-GP-063-005-S	5	ND (0.0088)	--
600830	T1096-GP-063-010-S	10	0.01185	0.00995
600830	T1096-GP-063-015-S	15	0.01335	0.0099
600830	T1096-GP-063-020-S	20	ND (0.0084)	--
600830	T1096-GP-064-001-S	1	ND (0.0086)	--
600830	T1096-GP-064-005-S	5	0.01105	0.00995
600830	T1096-GP-064-010-S	10	ND (0.0084)	--
600830	T1096-GP-064-015-S	15	ND (0.0084)	--
600830	T1096-GP-064-020-S	20	ND (0.0084)	--
600831	T1096-GP-065-005-S	5	ND (0.0083)	--
600831	T1096-GP-065-010-S	10	ND (0.0082)	--
600831	T1096-GP-065-015-S	15	ND (0.0082)	--
600831	T1096-GP-065-020-S	20	ND (0.0084)	--
600831	T1096-GP-066-005-S	5	0.00995	0.01025
600831	T1096-GP-066-010-S	10	ND (0.0082)	--
600831	T1096-GP-066-015-S	15	ND (0.0083)	--
600831	T1096-GP-066-020-S	20	ND (0.0082)	--
600831	T1096-GP-067-005-S	5	ND (0.0082)	--
600831	T1096-GP-067-010-S	10	ND (0.0086)	--
600831	T1096-GP-067-015-S	15	ND (0.0082)	--
600831	T1096-GP-067-020-S	20	ND (0.0079)	--
600832	T1096-GP-068-001-S	1	ND (0.0084)	--
600832	T1096-GP-068-005-S	5	ND (0.0080)	--
600832	T1096-GP-068-010-S	10	ND (0.0080)	--
600832	T1096-GP-068-015-S	15	ND (0.0082)	--
600832	T1096-GP-068-020-S	20	ND (0.0082)	--
600832	T1096-GP-069-001-S	1	ND (0.0082)	--
600832	T1096-GP-069-005-S	5	ND (0.0082)	--
Background Activity—North Area ^c		NA	0.021	NA

Refer to footnotes at end of table.

Revised Table H2-5c (Continued)
 SWMU 96, Summary of Radiochemistry Analytical Results,
 1998 Supplemental Investigation

Sample Attributes			Activity (pCi/g) Tritium	
Record Number ^a	ER Sample ID	Sample Depth (ft)	Result	Error ^b
600832	T1096-GP-069-010-S	10	ND (0.0082)	--
600832	T1096-GP-069-015-S	15	ND (0.0080)	--
600832	T1096-GP-069-020-S	20	ND (0.0080)	--
600842	T1096-GP-070-005-S	5	ND (0.0078)	--
600842	T1096-GP-070-010-S	10	ND (0.0075)	--
600842	T1096-GP-070-015-S	15	ND (0.0077)	--
600842	T1096-GP-070-020-S	20	ND (0.0074)	--
600842	T1096-GP-071-005-S	5	ND (0.0079)	--
600842	T1096-GP-071-010-S	10	ND (0.0077)	--
600842	T1096-GP-071-015-S	15	ND (0.0076)	--
600842	T1096-GP-071-020-S	20	ND (0.0077)	--
600842	T1096-GP-072-005-S	5	ND (0.0078)	--
600842	T1096-GP-072-010-S	10	0.00945	0.00955
600842	T1096-GP-072-015-S	15	ND (0.0077)	--
600842	T1096-GP-072-020-S	20	ND (0.0076)	--
600843	T1096-GP-073-001-S	1	ND (0.0084)	--
600843	T1096-GP-073-005-S	5	0.0146	0.0102
600843	T1096-GP-073-010-S	10	ND (0.0085)	--
600843	T1096-GP-073-015-S	15	ND (0.0084)	--
600843	T1096-GP-073-020-S	20	0.01425	0.01085
600843	T1096-GP-074-001-S	1	0.0123	0.01025
601096	T1096-GP-074-005	5	ND (0.0104)	--
601096	T1096-GP-074-010	10	ND (0.0098)	--
601096	T1096-GP-074-015	15	ND (0.0111)	--
601096	T1096-GP-074-020	20	ND (0.0111)	--
600845	T1096-GP-075-005-S	5	ND (0.0088)	--
600845	T1096-GP-075-010-S	10	ND (0.0084)	--
600845	T1096-GP-075-015-S	15	ND (0.0088)	--
600845	T1096-GP-075-020-S	20	ND (0.0082)	--
600845	T1096-GP-076-005-S	5	ND (0.0085)	--
600845	T1096-GP-076-010-S	10	ND (0.0084)	--
600845	T1096-GP-076-015-S	15	ND (0.0083)	--
600845	T1096-GP-076-020-S	20	0.0134	0.01115
600845	T1096-GP-077-005-S	5	ND (0.0086)	--
600845	T1096-GP-077-010-S	10	0.0138	0.01035
600845	T1096-GP-077-015-S	15	ND (0.0084)	--
600845	T1096-GP-077-020-S	20	0.0095	0.01015
600846	T1096-GP-078-001-S	1	ND (0.0108)	--
600846	T1096-GP-078-005-S	5	ND (0.0108)	--
Background Activity—North Area ^c		NA	0.021	NA

Refer to footnotes at end of table.

Revised Table H2-5c (Continued)
 SWMU 96, Summary of Radiochemistry Analytical Results,
 1998 Supplemental Investigation

Sample Attributes			Activity (pCi/g) Tritium	
Record Number ^a	ER Sample ID	Sample Depth (ft)	Result	Error ^b
600846	T1096-GP-078-010-S	10	ND (0.0106)	--
600846	T1096-GP-078-015-S	15	ND (0.0108)	--
600846	T1096-GP-078-020-S	20	ND (0.0109)	--
600846	T1096-GP-079-001-S	1	ND (0.0112)	--
600846	T1096-GP-079-005-S	5	ND (0.0110)	--
600846	T1096-GP-079-010-S	10	ND (0.0112)	--
600846	T1096-GP-079-015-S	15	ND (0.0110)	--
600846	T1096-GP-079-020-S	20	ND (0.0108)	--
600838	T1096-GP-080-005-S	5	ND (0.0112)	--
600838	T1096-GP-080-010-S	10	ND (0.0112)	--
600838	T1096-GP-080-015-S	15	ND (0.0112)	--
600838	T1096-GP-080-020-S	20	ND (0.0114)	--
600838	T1096-GP-081-005-S	5	ND (0.0106)	--
600838	T1096-GP-081-010-S	10	ND (0.0111)	--
600838	T1096-GP-081-015-S	15	ND (0.0114)	--
600838	T1096-GP-081-020-S	20	ND (0.0109)	--
600838	T1096-GP-082-005-S	5	ND (0.0106)	--
600838	T1096-GP-082-010-S	10	ND (0.0104)	--
600838	T1096-GP-082-015-S	15	ND (0.0112)	--
600838	T1096-GP-082-020-S	20	ND (0.0116)	--
600838	T1096-GP-083-001-S	1	ND (0.0115)	--
600838	T1096-GP-083-005-S	5	ND (0.0114)	--
600838	T1096-GP-083-010-S	10	ND (0.0112)	--
600838	T1096-GP-083-015-S	15	ND (0.0118)	--
600838	T1096-GP-083-020-S	20	ND (0.0114)	--
600840	T1096-GP-084-001-S	1	ND (0.0110)	--
600840	T1096-GP-084-005-S	5	ND (0.0112)	--
600840	T1096-GP-084-010-S	10	ND (0.0114)	--
600840	T1096-GP-084-015-S	15	ND (0.0115)	--
600840	T1096-GP-084-020-S	20	ND (0.0116)	--
600831	T1096-GP-085-005-SD	5	ND (0.0076)	--
600845	T1096-GP-086-010-SD	10	ND (0.0082)	--
600845	T1096-GP-087-001-SD	1	ND (0.0082)	--
601096	T1096-GP-088-005	5	ND (0.0089)	--
601096	T1096-GP-089-010	10	ND (0.0101)	--
Background Activity—North Area ^c		NA	0.021	NA

Refer to footnotes at end of table.

Revised Table H2-5c (Concluded)
SWMU 96, Summary of Radiochemistry Analytical Results,
1998 Supplemental Investigation

^aAnalysis request/chain-of-custody record.

^bTwo standard deviations about the mean detected activity.

^cTharp February 1999.

-- = Error not calculated for non-detect results.

ER = Environmental Restoration.

ft = Foot (feet).

GP = Geoprobe.

ID = Identification.

NA = Not Applicable.

pCi/g = Picocuries per gram.

S = Soil Sample.

SWMU = Solid Waste Management Unit.

T1 = Technical Area 1.

Revised Table H2-5d
 SWMU 96, Summary of Radiochemistry Analytical Results,
 1998 Supplemental Investigation

Sample Attributes			Activity (pCi/g) Uranium-233/234	
Record Number ^a	ER Sample ID	Sample Depth (ft)	Result	Error ^b
600829	T1096-GP-060-005-S	5	1.2	0.164
600829	T1096-GP-060-010-S	10	0.876	0.128
600829	T1096-GP-061-005-S	5	1.09	0.152
600829	T1096-GP-061-010-S	10	1.02	0.142
600829	T1096-GP-061-015-S	15	1.1	0.151
600829	T1096-GP-061-020-S	20	0.871	0.138
600830	T1096-GP-062-005-S	5	1.07	0.145
600830	T1096-GP-062-010-S	10	0.813	0.124
600830	T1096-GP-062-015-S	15	0.824	0.13
600830	T1096-GP-062-020-S	20	1.03	0.143
600830	T1096-GP-063-001-S	1	0.81	0.124
600830	T1096-GP-063-005-S	5	0.946	0.142
600830	T1096-GP-063-010-S	10	0.897	0.133
600830	T1096-GP-063-015-S	15	1.06	0.15
600830	T1096-GP-063-020-S	20	0.875	0.126
600830	T1096-GP-064-001-S	1	0.819	0.125
600830	T1096-GP-064-005-S	5	1.06	0.146
600830	T1096-GP-064-010-S	10	0.944	0.139
600830	T1096-GP-064-015-S	15	0.847	0.127
600830	T1096-GP-064-020-S	20	0.926	0.139
600831	T1096-GP-065-005-S	5	0.861	0.161
600831	T1096-GP-065-010-S	10	0.998	0.17
600831	T1096-GP-065-015-S	15	0.81	0.142
600831	T1096-GP-065-020-S	20	0.968	0.149
600831	T1096-GP-066-005-S	5	0.866	0.147
600831	T1096-GP-066-010-S	10	1.13	0.17
600831	T1096-GP-066-015-S	15	0.89	0.154
600831	T1096-GP-066-020-S	20	0.724	0.132
600831	T1096-GP-067-005-S	5	1.07	0.193
600831	T1096-GP-067-010-S	10	1.02	0.173
600831	T1096-GP-067-015-S	15	1.31	0.22
600831	T1096-GP-067-020-S	20	0.774	0.139
600831	T1096-GP-085-005-SD	5	0.587	0.127
600832	T1096-GP-068-001-S	1	0.582	0.121
600832	T1096-GP-068-005-S	5	1.34	0.21
600832	T1096-GP-068-010-S	10	1.02	0.181
600832	T1096-GP-068-015-S	15	0.904	0.134
600832	T1096-GP-068-020-S	20	0.697	0.109
600832	T1096-GP-069-001-S	1	0.621	0.129
600832	T1096-GP-069-005-S	5	0.962	0.162
Background Activity—North Area ^c		NA	1.6	NA

Refer to footnotes at end of table.

Revised Table H2-5d (Continued)
 SWMU 96, Summary of Radiochemistry Analytical Results,
 1998 Supplemental Investigation

Sample Attributes			Activity (pCi/g) Uranium-233/234	
Record Number ^a	ER Sample ID	Sample Depth (ft)	Result	Error ^b
600832	T1096-GP-069-010-S	10	1.14	0.205
600832	T1096-GP-069-015-S	15	0.861	0.166
600832	T1096-GP-069-020-S	20	0.959	0.169
600842	T1096-GP-070-005-S	5	0.937	0.148
600842	T1096-GP-070-010-S	10	0.846	0.143
600842	T1096-GP-070-015-S	15	0.732	0.137
600842	T1096-GP-070-020-S	20	0.782	0.143
600842	T1096-GP-071-005-S	5	1.24	0.199
600842	T1096-GP-071-010-S	10	0.809	0.152
600842	T1096-GP-071-015-S	15	0.796	0.143
600842	T1096-GP-071-020-S	20	1.09	0.192
600842	T1096-GP-072-005-S	5	0.755	0.135
600842	T1096-GP-072-010-S	10	0.68	0.127
600842	T1096-GP-072-015-S	15	0.778	0.143
600842	T1096-GP-072-020-S	20	0.751	0.124
600843	T1096-GP-073-001-S	1	0.581	0.146
600843	T1096-GP-073-005-S	5	1.05	0.226
600843	T1096-GP-073-010-S	10	0.839	0.18
600843	T1096-GP-073-015-S	15	0.885	0.227
600843	T1096-GP-073-020-S	20	0.834	0.182
600843	T1096-GP-074-001-S	1	0.648	0.185
600845	T1096-GP-075-005-S	5	1.11	0.226
600845	T1096-GP-075-010-S	10	0.916	0.213
600845	T1096-GP-075-015-S	15	0.819	0.175
600845	T1096-GP-075-020-S	20	0.986	0.197
600845	T1096-GP-076-005-S	5	1.05	0.216
600845	T1096-GP-076-010-S	10	0.761	0.177
600845	T1096-GP-076-015-S	15	0.995	0.19
600845	T1096-GP-076-020-S	20	0.868	0.193
600845	T1096-GP-077-005-S	5	1.14	0.191
600845	T1096-GP-077-010-S	10	0.765	0.202
600845	T1096-GP-077-015-S	15	0.622	0.157
600845	T1096-GP-077-020-S	20	0.855	0.362
600845	T1096-GP-086-010-SD	10	0.766	0.155
600845	T1096-GP-087-001-SD	1	0.764	0.173
600846	T1096-GP-078-001-S	1	0.915	0.12
600846	T1096-GP-079-001-S	1	0.913	0.138
600846	T1096-GP-078-005-S	5	0.76	0.111
600846	T1096-GP-078-010-S	10	0.678	0.106
600846	T1096-GP-078-015-S	15	0.857	0.116
Background Activity—North Area ^c		NA	1.6	NA

Refer to footnotes at end of table.

Revised Table H2-5d (Continued)
 SWMU 96, Summary of Radiochemistry Analytical Results,
 1998 Supplemental Investigation

Sample Attributes			Activity (pCi/g) Uranium-233/234	
Record Number ^a	ER Sample ID	Sample Depth (ft)	Result	Error ^b
600846	T1096-GP-078-020-S	20	0.701	0.101
600846	T1096-GP-079-005-S	5	0.912	0.146
600846	T1096-GP-079-010-S	10	0.743	0.103
600846	T1096-GP-079-015-S	15	0.713	0.105
600846	T1096-GP-079-020-S	20	0.809	0.111
600838	T1096-GP-080-005-S	5	1.17	0.191
600838	T1096-GP-080-010-S	10	0.998	0.169
600838	T1096-GP-080-015-S	15	0.787	0.139
600838	T1096-GP-080-020-S	20	0.901	0.159
600838	T1096-GP-081-005-S	5	1.08	0.175
600838	T1096-GP-081-010-S	10	0.902	0.156
600838	T1096-GP-081-015-S	15	0.793	0.144
600838	T1096-GP-081-020-S	20	0.726	0.133
600838	T1096-GP-082-005-S	5	0.99	0.177
600838	T1096-GP-082-010-S	10	0.886	0.156
600838	T1096-GP-082-015-S	15	0.909	0.212
600838	T1096-GP-082-020-S	20	0.766	0.145
600838	T1096-GP-083-001-S	1	0.793	0.146
600838	T1096-GP-083-005-S	5	1.09	0.194
600838	T1096-GP-083-010-S	10	1.02	0.181
600838	T1096-GP-083-015-S	15	0.877	0.168
600838	T1096-GP-083-020-S	20	0.646	0.128
600840	T1096-GP-084-001-S	1	0.788	0.115
600840	T1096-GP-084-005-S	5	1.03	0.135
600840	T1096-GP-084-010-S	10	0.923	0.132
600840	T1096-GP-084-015-S	15	0.9	0.14
600840	T1096-GP-084-020-S	20	0.723	0.162
601096	T1096-GP-074-005	5	0.855	0.14
601096	T1096-GP-074-010	10	0.983	0.149
601096	T1096-GP-074-015	15	0.694	0.124
601096	T1096-GP-074-020	20	0.773	0.12
601096	T1096-GP-088-005	5	0.793	0.126
601096	T1096-GP-089-010	10	1.18	0.182
600831	T1096-EB-006-000-W	0	0.151	0.0681
600838	T1096-EB-009-000-W	0	0.0648	0.0755
Background Activity—North Area ^c		NA	1.6	NA

Refer to footnotes at end of table.

Revised Table H2-5d (Concluded)
SWMU 96, Summary of Radiochemistry Analytical Results,
1998 Supplemental Investigation

^aAnalysis request/chain-of-custody record.

^bTwo standard deviations about the mean detected activity.

^cDinwiddie September 1997; background value provided is for Uranium-234.

EB = Equipment Blank.

ER = Environmental Restoration.

ft = Foot (feet).

GP = Geoprobe.

ID = Identification.

NA = Not Applicable.

pCi/g = Picocuries per gram.

S = Soil Sample.

SD = Sample Duplicate.

SWMU = Solid Waste Management Unit.

T1 = Technical Area 1.

W = Water Sample.

Revised Table H2-5e
 SWMU 96, Summary of Radiochemistry Analytical Results,
 1998 Supplemental Investigation

Sample Attributes			Activity (pCi/g) Uranium-235	
Record Number ^a	ER Sample ID	Sample Depth (ft)	Result	Error ^b
600829	T1096-GP-060-005-S	5	0.0431 J	0.0228
600829	T1096-GP-060-010-S	10	0.0578 J	0.0253
600829	T1096-GP-061-005-S	5	0.0599 J	0.0269
600829	T1096-GP-061-010-S	10	0.0458	0.0228
600829	T1096-GP-061-015-S	15	0.0507 J	0.0238
600829	T1096-GP-061-020-S	20	0.0513	0.0284
600830	T1096-GP-062-005-S	5	0.0473	0.023
600830	T1096-GP-062-010-S	10	0.0458 J	0.0233
600830	T1096-GP-062-015-S	15	0.0535 J	0.0287
600830	T1096-GP-062-020-S	20	0.0494	0.0232
600830	T1096-GP-063-001-S	1	0.0495 J	0.0246
600830	T1096-GP-063-005-S	5	0.026	0.0203
600830	T1096-GP-063-010-S	10	0.0397 J	0.0227
600830	T1096-GP-063-015-S	15	0.041 J	0.0245
600830	T1096-GP-063-020-S	20	0.0394 J	0.0209
600830	T1096-GP-064-001-S	1	0.0407 J	0.0233
600830	T1096-GP-064-005-S	5	0.0365 J	0.0208
600830	T1096-GP-064-010-S	10	0.0214 J	0.023
600830	T1096-GP-064-015-S	15	0.0463 J	0.0237
600830	T1096-GP-064-020-S	20	0.0466 J	0.0258
600831	T1096-GP-065-005-S	5	0.0368	0.031
600831	T1096-GP-065-010-S	10	0.0268	0.0247
600831	T1096-GP-065-015-S	15	0.0503	0.0329
600831	T1096-GP-065-020-S	20	0.0578	0.0288
600831	T1096-GP-066-005-S	5	0.0365	0.0267
600831	T1096-GP-066-010-S	10	0.0351	0.0241
600831	T1096-GP-066-015-S	15	0.0657	0.0349
600831	T1096-GP-066-020-S	20	0.0452	0.0277
600831	T1096-GP-067-005-S	5	0.0688	0.043
600831	T1096-GP-067-010-S	10	0.0543	0.0338
600831	T1096-GP-067-015-S	15	0.0505	0.0369
600831	T1096-GP-067-020-S	20	0.0352	0.0255
600831	T1096-GP-085-005-SD	5	0.0172	0.0237
600832	T1096-GP-068-001-S	1	0.0493	0.0341
600832	T1096-GP-068-005-S	5	0.0425	0.033
600832	T1096-GP-068-010-S	10	0.0817	0.0421
600832	T1096-GP-068-015-S	15	0.0584	0.0287
600832	T1096-GP-068-020-S	20	0.0609	0.0262
600832	T1096-GP-069-001-S	1	0.0627	0.0355
600832	T1096-GP-069-005-S	5	0.0458	0.0299
Background Activity—North Area ^c		NA	0.18	NA

Refer to footnotes at end of table.

Revised Table H2-5e (Continued)
 SWMU 96, Summary of Radiochemistry Analytical Results,
 1998 Supplemental Investigation

Sample Attributes			Activity (pCi/g) Uranium-235	
Record Number ^a	ER Sample ID	Sample Depth (ft)	Result	Error ^b
600832	T1096-GP-069-010-S	10	0.0388	0.0355
600832	T1096-GP-069-015-S	15	0.0351	0.0293
600832	T1096-GP-069-020-S	20	0.0449	0.0307
600842	T1096-GP-070-005-S	5	0.0488	0.0279
600842	T1096-GP-070-010-S	10	0.0535 J	0.0291
600842	T1096-GP-070-015-S	15	0.0606 J	0.033
600842	T1096-GP-070-020-S	20	0.0477 J	0.0311
600842	T1096-GP-071-005-S	5	0.0456 J	0.0313
600842	T1096-GP-071-010-S	10	ND (0.0165)	--
600842	T1096-GP-071-015-S	15	0.0385 J	0.026
600842	T1096-GP-071-020-S	20	0.107	0.0512
600842	T1096-GP-072-005-S	5	0.0366 J	0.0247
600842	T1096-GP-072-010-S	10	0.0475 J	0.0293
600842	T1096-GP-072-015-S	15	0.0874	0.0417
600842	T1096-GP-072-020-S	20	0.0582	0.0291
600843	T1096-GP-073-001-S	1	0.0213 J	0.0247
600843	T1096-GP-073-005-S	5	0.0969 J	0.0602
600843	T1096-GP-073-010-S	10	0.0379 J	0.0348
600843	T1096-GP-073-015-S	15	0.0334 J	0.0443
600843	T1096-GP-073-020-S	20	0.0424	0.035
600843	T1096-GP-074-001-S	1	0.0712 J	0.0546
600845	T1096-GP-075-005-S	5	0.0831 J	0.0544
600845	T1096-GP-075-010-S	10	0.0299 J	0.0355
600845	T1096-GP-075-015-S	15	0.0469 J	0.0359
600845	T1096-GP-075-020-S	20	0.0162 J	0.0286
600845	T1096-GP-076-005-S	5	0.0696 J	0.051
600845	T1096-GP-076-010-S	10	0.0253 J	0.0434
600845	T1096-GP-076-015-S	15	0.0388 J	0.0325
600845	T1096-GP-076-020-S	20	0.0307 J	0.041
600845	T1096-GP-077-005-S	5	0.0769	0.0411
600845	T1096-GP-077-010-S	10	0.0101	0.0202
600845	T1096-GP-077-015-S	15	0.03 J	0.0355
600845	T1096-GP-077-020-S	20	0.0431 J	0.0894
600845	T1096-GP-086-010-SD	10	0.0449 J	0.0321
600845	T1096-GP-087-001-SD	1	0.0354 J	0.0365
600846	T1096-GP-078-001-S	1	0.0468	0.0199
600846	T1096-GP-079-001-S	1	0.0884	0.0354
600846	T1096-GP-078-005-S	5	0.0524	0.025
600846	T1096-GP-078-010-S	10	0.0581	0.0294
600846	T1096-GP-078-015-S	15	0.0987	0.0303
Background Activity—North Area ^c		NA	0.18	NA

Refer to footnotes at end of table.

Revised Table H2-5e (Continued)
 SWMU 96, Summary of Radiochemistry Analytical Results,
 1998 Supplemental Investigation

Sample Attributes			Activity (pCi/g) Uranium-235	
Record Number ^a	ER Sample ID	Sample Depth (ft)	Result	Error ^b
600846	T1096-GP-078-020-S	20	0.0435	0.0218
600846	T1096-GP-079-005-S	5	0.0448	0.0287
600846	T1096-GP-079-010-S	10	0.0327	0.018
600846	T1096-GP-079-015-S	15	0.0421	0.0207
600846	T1096-GP-079-020-S	20	0.0414	0.0185
600838	T1096-GP-080-005-S	5	0.0397	0.0283
600838	T1096-GP-080-010-S	10	0.0644	0.0335
600838	T1096-GP-080-015-S	15	0.0163	0.0174
600838	T1096-GP-080-020-S	20	0.0319	0.0245
600838	T1096-GP-081-005-S	5	0.0521	0.0295
600838	T1096-GP-081-010-S	10	0.0335	0.0248
600838	T1096-GP-081-015-S	15	0.0526	0.0304
600838	T1096-GP-081-020-S	20	0.0352	0.0238
600838	T1096-GP-082-005-S	5	0.0359	0.0266
600838	T1096-GP-082-010-S	10	0.0658	0.0343
600838	T1096-GP-082-015-S	15	0.0302	0.0336
600838	T1096-GP-082-020-S	20	0.0431	0.0284
600838	T1096-GP-083-001-S	1	0.0253	0.0208
600838	T1096-GP-083-005-S	5	0.049	0.0324
600838	T1096-GP-083-010-S	10	0.0416	0.0289
600838	T1096-GP-083-015-S	15	0.0716	0.0392
600838	T1096-GP-083-020-S	20	0.0347	0.0249
600840	T1096-GP-084-001-S	1	0.0775	0.0283
600840	T1096-GP-084-005-S	5	0.0698	0.0248
600840	T1096-GP-084-010-S	10	0.0381 J	0.02
600840	T1096-GP-084-015-S	15	0.103	0.0372
600840	T1096-GP-084-020-S	20	0.0826 J	0.0483
601096	T1096-GP-074-005	5	0.0395 J	0.0241
601096	T1096-GP-074-010	10	0.0324 J	0.0223
601096	T1096-GP-074-015	15	0.0378 J	0.0242
601096	T1096-GP-074-020	20	0.0406 J	0.0233
601096	T1096-GP-088-005	5	0.049 J	0.025
601096	T1096-GP-089-010	10	0.0584 J	0.0308
600831	T1096-EB-006-000-W	0	0.0309	0.0317
600849	T1096-EB-007-000-W	0	0.0495	0.032
Background Activity—North Area ^c		NA	0.18	NA

Refer to footnotes at end of table.

Revised Table H2-5e (Concluded)
SWMU 96, Summary of Radiochemistry Analytical Results,
1998 Supplemental Investigation

^aAnalysis request/chain-of-custody record.

^bTwo standard deviations about the mean detected activity.

^cDinwiddie September 1997.

-- = Error not calculated for non-detect results.

EB = Equipment Blank.

ER = Environmental Restoration.

ft = Foot (feet).

GP = Geoprobe.

ID = Identification.

J = Estimated value.

NA = Not Applicable

pCi/g = Picocuries per gram.

S = Soil Sample.

SD = Sample Duplicate.

SWMU = Solid Waste Management Unit.

T1 = Technical Area 1.

W = Water Sample.

Revised Table H2-5f
 SWMU 96, Summary of Radiochemistry Analytical Results,
 1998 Supplemental Investigation

Sample Attributes			Activity (pCi/g) Uranium-238	
Record Number ^a	ER Sample ID	Sample Depth (ft)	Result	Error ^b
600829	T1096-GP-060-005-S	5	1.07 J	0.149
600829	T1096-GP-060-010-S	10	0.787 J	0.118
600829	T1096-GP-061-005-S	5	0.895 J	0.132
600829	T1096-GP-061-010-S	10	0.875	0.127
600829	T1096-GP-061-015-S	15	0.837 J	0.124
600829	T1096-GP-061-020-S	20	0.894	0.14
600830	T1096-GP-062-005-S	5	1.11	0.148
600830	T1096-GP-062-010-S	10	0.788	0.122
600830	T1096-GP-062-015-S	15	0.763	0.123
600830	T1096-GP-062-020-S	20	0.721	0.11
600830	T1096-GP-063-001-S	1	0.679	0.109
600830	T1096-GP-063-005-S	5	1	0.147
600830	T1096-GP-063-010-S	10	0.807	0.123
600830	T1096-GP-063-015-S	15	1.04	0.147
600830	T1096-GP-063-020-S	20	0.77	0.115
600830	T1096-GP-064-001-S	1	0.74	0.116
600830	T1096-GP-064-005-S	5	1.05	0.144
600830	T1096-GP-064-010-S	10	0.873	0.131
600830	T1096-GP-064-015-S	15	0.637	0.105
600830	T1096-GP-064-020-S	20	1.02	0.149
600831	T1096-GP-065-005-S	5	0.77	0.148
600831	T1096-GP-065-010-S	10	1	0.17
600831	T1096-GP-065-015-S	15	0.8	0.14
600831	T1096-GP-065-020-S	20	0.878	0.139
600831	T1096-GP-066-005-S	5	0.808	0.139
600831	T1096-GP-066-010-S	10	0.903	0.145
600831	T1096-GP-066-015-S	15	0.797	0.143
600831	T1096-GP-066-020-S	20	0.654	0.124
600831	T1096-GP-067-005-S	5	0.873	0.169
600831	T1096-GP-067-010-S	10	0.786	0.145
600831	T1096-GP-067-015-S	15	1.01	0.183
600831	T1096-GP-067-020-S	20	0.64	0.122
600831	T1096-GP-085-005-SD	5	0.777	0.149
600832	T1096-GP-068-001-S	1	0.549	0.116
600832	T1096-GP-068-005-S	5	1.09	0.181
600832	T1096-GP-068-010-S	10	1.12	0.192
600832	T1096-GP-068-015-S	15	0.751	0.117
600832	T1096-GP-068-020-S	20	0.641	0.103
600832	T1096-GP-069-001-S	1	0.563	0.121
600832	T1096-GP-069-005-S	5	0.948	0.16
Background Activity—North Area ^c		NA	1.3	NA

Refer to footnotes at end of table.

Revised Table H2-5f (Continued)
 SWMU 96, Summary of Radiochemistry Analytical Results,
 1998 Supplemental Investigation

Sample Attributes			Activity (pCi/g) Uranium-238	
Record Number ^a	ER Sample ID	Sample Depth (ft)	Result	Error ^b
600832	T1096-GP-069-010-S	10	1.14	0.204
600832	T1096-GP-069-015-S	15	0.834	0.162
600832	T1096-GP-069-020-S	20	1	0.174
600842	T1096-GP-070-005-S	5	0.836	0.137
600842	T1096-GP-070-010-S	10	0.863	0.145
600842	T1096-GP-070-015-S	15	0.9	0.156
600842	T1096-GP-070-020-S	20	0.745	0.137
600842	T1096-GP-071-005-S	5	1.07	0.18
600842	T1096-GP-071-010-S	10	0.734	0.143
600842	T1096-GP-071-015-S	15	0.914	0.157
600842	T1096-GP-071-020-S	20	1.04	0.187
600842	T1096-GP-072-005-S	5	0.721	0.131
600842	T1096-GP-072-010-S	10	0.702	0.13
600842	T1096-GP-072-015-S	15	0.825	0.147
600842	T1096-GP-072-020-S	20	0.711	0.119
600843	T1096-GP-073-001-S	1	0.524 J	0.137
600843	T1096-GP-073-005-S	5	0.941 J	0.211
600843	T1096-GP-073-010-S	10	0.825 J	0.178
600843	T1096-GP-073-015-S	15	0.776 J	0.207
600843	T1096-GP-073-020-S	20	0.794	0.175
600843	T1096-GP-074-001-S	1	0.827 J	0.212
600845	T1096-GP-075-005-S	5	1.18 J	0.235
600845	T1096-GP-075-010-S	10	0.729 J	0.182
600845	T1096-GP-075-015-S	15	0.819 J	0.175
600845	T1096-GP-075-020-S	20	0.778 J	0.167
600845	T1096-GP-076-005-S	5	0.958 J	0.202
600845	T1096-GP-076-010-S	10	0.856 J	0.189
600845	T1096-GP-076-015-S	15	0.709 J	0.152
600845	T1096-GP-076-020-S	20	0.987 J	0.21
600845	T1096-GP-077-005-S	5	0.952	0.169
600845	T1096-GP-077-010-S	10	0.891 J	0.221
600845	T1096-GP-077-015-S	15	0.645 J	0.158
600845	T1096-GP-077-020-S	20	0.882 J	0.369
600845	T1096-GP-086-010-SD	10	0.76	0.154
600845	T1096-GP-087-001-SD	1	0.768 J	0.173
600846	T1096-GP-078-001-S	1	0.846	0.114
600846	T1096-GP-079-001-S	1	0.704	0.115
600846	T1096-GP-078-005-S	5	0.728	0.107
600846	T1096-GP-078-010-S	10	0.675	0.105
600846	T1096-GP-078-015-S	15	0.783	0.109
Background Activity—North Area ^c		NA	1.3	NA

Refer to footnotes at end of table.

Revised Table H2-5f (Continued)
 SWMU 96, Summary of Radiochemistry Analytical Results,
 1998 Supplemental Investigation

Sample Attributes			Activity (pCi/g) Uranium-238	
Record Number ^a	ER Sample ID	Sample Depth (ft)	Result	Error ^b
600846	T1096-GP-078-020-S	20	0.719	0.103
600846	T1096-GP-079-005-S	5	0.789	0.131
600846	T1096-GP-079-010-S	10	0.609	0.0887
600846	T1096-GP-079-015-S	15	0.74	0.108
600846	T1096-GP-079-020-S	20	0.777	0.108
600838	T1096-GP-080-005-S	5	1.22	0.197
600838	T1096-GP-080-010-S	10	1.01	0.17
600838	T1096-GP-080-015-S	15	0.784	0.139
600838	T1096-GP-080-020-S	20	0.768	0.143
600838	T1096-GP-081-005-S	5	1.03	0.169
600838	T1096-GP-081-010-S	10	0.729	0.135
600838	T1096-GP-081-015-S	15	0.833	0.149
600838	T1096-GP-081-020-S	20	0.616	0.119
600838	T1096-GP-082-005-S	1	0.774	0.149
600838	T1096-GP-082-010-S	10	0.891	0.157
600838	T1096-GP-082-015-S	15	0.968	0.221
600838	T1096-GP-082-020-S	20	0.778	0.147
600838	T1096-GP-083-001-S	1	0.717	0.136
600838	T1096-GP-083-005-S	5	0.987	0.182
600838	T1096-GP-083-010-S	10	0.946	0.172
600838	T1096-GP-083-015-S	15	0.881	0.169
600838	T1096-GP-083-020-S	20	0.636	0.127
600840	T1096-GP-084-001-S	1	0.62	0.0966
600840	T1096-GP-084-005-S	2	0.906	0.122
600840	T1096-GP-084-010-S	10	0.799	0.119
600840	T1096-GP-084-015-S	15	0.856	0.135
600840	T1096-GP-084-020-S	20	0.655	0.152
601096	T1096-GP-074-005	5	0.715	0.124
601096	T1096-GP-074-010	10	0.886	0.139
601096	T1096-GP-074-015	15	0.758	0.132
601096	T1096-GP-074-020	20	0.726	0.114
601096	T1096-GP-088-005	5	0.752	0.121
601096	T1096-GP-089-010	10	0.907	0.151
600831	T1096-EB-006-000-W	0	0.024	0.0284
600840	T1096-EB-010-000-W	0	0.0274	0.039
Background Activity—North Area ^c		NA	1.3	NA

Refer to footnotes at end of table.

Revised Table H2-5f (Concluded)
SWMU 96, Summary of Radiochemistry Analytical Results,
1998 Supplemental Investigation

^aAnalysis request/chain-of-custody record.

^bTwo standard deviations about the mean detected activity.

^cDinwiddie September 1997.

EB = Equipment Blank.

ER = Environmental Restoration.

ft = Foot (feet).

GP = Geoprobe.

ID = Identification.

J = Estimated value.

NA = Not Applicable.

pCi/g = Picocuries per gram.

S = Soil Sample.

SD = Sample Duplicate.

SWMU = Solid Waste Management Unit.

T1 = Technical Area 1.

W = Water Sample.

Revised Table I-4
 SWMU 187, Summary of Radiochemistry Analytical Results,
 2002 Supplemental Investigation

Sample Attributes			Activity (pCi/g)				Activity (pCi/L)	
Record Number ^a	ER Sample ID	Sample Depth (ft)	Plutonium-238		Plutonium-239/240		Tritium	
			Result	Error ^b	Result	Error ^b	Result	Error ^b
605534	T1187-BH-088-07-S	7	-0.00381 U	0.00747	0.0019 U	0.0112	NR	--
605534	T1187-BH-089-07-DUP	7	-0.00164 U	0.00849	-0.00164 U	0.00717	NR	--
605534	T1187-BH-089-07-S	7	0.00155 U	0.01	-0.00154 U	0.00524	NR	--
605534	T1187-BH-090-04-S	4	NR	--	NR	--	57.1 U	121
605534	T1187-BH-091-04-S	4	NR	--	NR	--	173 U	132
605534	T1187-BH-092-07-S	7	-0.00201 U	0.0104	-0.00201 U	0.00681	NR	--
605534	T1187-BH-093-07-S	7	0.00178 U	0.0144	-0.00889 U	0.0126	NR	--
605534	T1187-BH-098-05-S	5	NR	--	NR	--	85.1 U	122
605534	T1187-BH-099-05-S	5	NR	--	NR	--	57.4 U	122
605535	T1187-BH-094-07-S	7	0.00352 U	0.00489	-0.00528 U	0.00599	88.4 U	118
605535	T1187-BH-102-11-S	11	NR	--	NR	--	29.5 U	114
605535	T1187-BH-103-11-S	11	NR	--	NR	--	146 U	120
Background Activity—North Area ^c		NA	NA	NA	NA	NA	420	NA

^aAnalysis request/chain-of-custody record.

^bTwo standard deviations about the mean detected activity.

^cTharp February 1999.

BH = Borehole.

DUP = Duplicate.

ER = Environmental Restoration.

ft = Foot (feet).

ID = Identification.

NA = Not Applicable.

NR = Not Reported.

pCi/g = Picocurie(s) per gram.

pCi/L = Picocuries per liter.

S = Soil Sample.

SWMU = Solid Waste Management Unit.

T1 = Technical Area 1.

U = Analyte not detected.

-- = Error not calculated for nondetected results.

Table A1
Storm Drain/Sanitary Sewer Cross-Connect Elimination
Summary of Confirmatory Soil Sampling Detected SVOC Analytical Results, March/April 1993

Sample Attributes			SVOCs (EPA Method 8270) (mg/kg)
Record Number ^a	Sample ID	Sample Depth (ft) ^b	bis(2-Ethylhexyl)phthalate
Unknown	ER9200 4708-1	7.5	0.066 J (0.330)

- a = Analysis request/chain-of-custody record numbers are not provided in the data package submitted to the Environmental Restoration Records Center.
- b = End depths are provided.
- EPA = (US) Environmental Protection Agency.
- ft = foot (feet).
- ID = Identification.
- J = Analyte present at level less than detection limit.
- mg/kg = Milligram(s) per kilogram.
- SVOC = Semivolatile organic compound.

Table A2
 Storm Drain/Sanitary Sewer Cross-Connect Elimination
 Summary of SVOC Analytical Method Detection Limits, March/April 1993

Analyte	Method Detection Limit (mg/kg)
1,2,4-Trichlorobenzene	0.330
1,2-Dichlorobenzene	0.330
1,3-Dichlorobenzene	0.330
1,4-Dichlorobenzene	0.330
2,4,5-Trichlorophenol	0.330
2,4,6-Trichlorophenol	0.330
2,4-Dichlorophenol	0.330
2,4-Dimethylphenol	0.330
2,4-Dinitrophenol	1.67
2,4-Dinitrotoluene	0.330
2,6-Dinitrotoluene	0.330
2-Chloronaphthalene	0.330
2-Chlorophenol	0.330
2-Methylnaphthalene	0.330
2-Methylphenol	0.330
2-Nitroaniline	1.67
2-Nitrophenol	0.330
3,3'-Dichlorobenzidine	0.670
3-Nitroaniline	1.67
4,6-Dinitro-2-methylphenol	1.67
4-Bromophenyl phenyl ether	0.330
4-Chloro-3-methylphenol	0.330
4-Chloroaniline	0.330
4-Chlorophenyl phenyl ether	0.330
4-Methylphenol	0.330
4-Nitroaniline	1.67
4-Nitrophenol	1.67
Acenaphthene	0.330
Acenaphthylene	0.330
Anthracene	0.330
Benzidine	2.66
Benzo(a)anthracene	0.330
Benzo(a)pyrene	0.330
Benzo(b)fluoranthene	0.330
Benzo(ghi)perylene	0.330
Benzo(k)fluoranthene	0.330
Benzoic acid	1.67
Benzyl alcohol	0.330
Butyl benzyl phthalate	0.330
Chrysene	0.330
Di-n-butyl phthalate	0.330
Di-n-octyl phthalate	0.330
Dibenz[a,h]anthracene	0.330
Dibenzofuran	0.330
Diethyl phthalate	0.330
Dimethylphthalate	0.330
Fluoranthene	0.330
Fluorene	0.330
Hexachlorobenzene	0.330
Hexachlorobutadiene	0.330

Table A2 (concluded)
 Storm Drain/Sanitary Sewer Cross-Connect Elimination
 Summary of SVOC Analytical Method Detection Limits, March 1993

Analyte	Method Detection Limit (mg/kg)
Hexachlorocyclopentadiene	0.330
Hexachloroethane	0.330
Indeno(1,2,3-c,d)pyrene	0.330
Isophorone	0.330
Naphthalene	0.330
Nitrobenzene	0.330
Pentachlorophenol	1.67
Phenanthrene	0.330
Phenol	0.330
Pyrene	0.330
bis(2-Chloroethoxy)methane	0.330
bis(2-Chloroethyl)ether	0.330
bis(2-Ethylhexyl)phthalate	0.330
bis(2-Chloroisopropyl) ether	0.330
n-Nitrosodiphenylamine	0.330
n-Nitroso di n-propylamine	0.330

SVOC = Semivolatile organic compound.
 mg/kg = Milligram(s) per kilogram.

Table A3
 Storm Drain/Sanitary Sewer Cross-Connect Elimination
 Summary of Confirmatory Soil Sampling Metals Analytical Results, March/April 1993

Sample Attributes			Metals (EPA Method 6010/7060/7061/7741) (mg/kg)						
Record Number ^a	Sample ID	Sample Depth(ft) ^b	Arsenic	Barium	Cadmium	Chromium	Lead	Selenium	Silver
Unknown	ER9200 4290-1	8	3.6	120	ND (0.28)	4.0	4.0	ND (0.11)	ND (0.56)
Unknown	ER9200 4693-1	6	3.2	194	ND (0.27)	7.5	5.3	0.11	ND (0.55)
Unknown	ER9200 4695-1	6	6.2	591	ND (0.28)	9.9	6.2	0.14	ND (0.56)
Unknown	ER9200 4697-1	6	3.4	244	0.34	6.4	5.1	ND (0.11)	ND (0.55)
Unknown	ER9200 4699-1	6.5	5.3	191	ND (0.29)	8.3	5.1	ND (0.12)	ND (0.58)
Unknown	ER9200 4701-1	6.5	3.6	130	ND (0.27)	5.8	4.3	ND (0.11)	ND (0.54)
Unknown	ER9200 4703-1	7	4.6	349	0.30	7.6	11	ND (0.11)	ND (0.57)
Unknown	ER9200 4705-1	7.5	4.3	296	ND (0.28)	7.0	6.0	ND (0.11)	ND (0.56)
Unknown	ER9200 4706-1	7.5	4.2	93.6	ND (0.50)	4.3	5.6	ND (1.0)	0.76
Unknown	ER9200 4708-1	7.5	4.6	268	0.31	7.7	6.9	0.11	ND (0.53)
Unknown	ER9200 4712-1	6	4.2	275	0.40	13	9.2	0.13	ND (0.57)
Unknown	ER9200 4715-1	6	4.8	275	0.53	14	11	0.14	ND (0.60)
Unknown	ER9200 4717-1	6	4.7	421	ND (0.28)	5.0	5.0	ND (0.11)	ND (0.56)
Unknown	ER9200 4719-1	6	2.4	224	ND (0.29)	7.7	8.2	ND (0.12)	ND (0.58)
Unknown	ER9200 4720-1	6	1.1	126	ND (0.26)	3.3	5.5	ND (0.1)	ND (0.52)
Background concentration—North Area ^c			4.4	200	0.9	12.8	11.2	<1	<1

- ^a = Analysis request/chain-of-custody record numbers are not provided in the data package submitted to the Environmental Restoration Records Center.
- ^b = End depths are provided.
- ^c = Dinwiddie September 1997.
- bold** = Value exceeds the approved background concentration.
- EPA = (US) Environmental Protection Agency.
- ft = foot (feet).
- ID = Identification.
- ND = Not Detected, method detection limits provided parenthetically.
- mg/kg = Milligram(s) per kilogram.

Table A4
Storm Drain/Sanitary Sewer Cross-Connect Elimination
Summary of Metals/Inorganics Analytical Method Detection Limits, March/April 1993

Analyte	Method Detection Limit (mg/kg)
Arsenic	1.0 – 1.2
Barium	1.1 – 1.2
Cadmium	0.26 - 0.50
Chromium	1.1 – 1.2
Cyanide, Total (mg/L)	0.10
Lead	2.1 – 2.4
Mercury	0.042 – 0.050
Selenium	0.10 – 1.0
Silver	0.52 – 0.60

mg/kg = Milligram(s) per kilogram.
mg/L = Milligram(s) per liter.

Table A5
Storm Drain/Sanitary Sewer Cross-Connect Elimination
Summary of PCB Analytical Method Detection Limits, March/April 1993

Analyte	Method Detection Limit ($\mu\text{g}/\text{kg}$)
Aroclor-1016	33 - 80
Aroclor-1221	33 - 80
Aroclor-1232	33 - 80
Aroclor-1242	33 - 80
Aroclor-1248	33 - 80
Aroclor-1254	33 - 80
Aroclor-1260	33 - 80

$\mu\text{g}/\text{kg}$ = Microgram(s) per kilogram.
PCB = Polychlorinated biphenyl.



Appendix D

Revised Table H3-5.

Revised Table H3-5
 SWMU 96, Summary of Radiochemistry Analytical Results,
 2002 Supplemental Investigation

Sample Attributes			Activity (pCi/g)			
Record Number ^a	ER Sample ID	Sample Depth (ft)	Plutonium-238		Plutonium-239/240	
			Result	Error ^b	Result	Error ^b
605198	T1096-SD-036	1	0.00122 U	0.00535	0.00488 U	0.00678
605198	T1096-SD-037	1	0.00774 U	0.00719	0 U	0.00715
605533	T1096-GP-090-09-DUP	9	0 U	0.00473	-0.00171 U	0.0058
605533	T1096-GP-090-09-S	9	-0.00151 U	0.00661	0.00301 U	0.00724
605533	T1096-GP-091-09-S	9	-0.00174 U	0.00589	0.00173 U	0.00589
605533	T1096-GP-092-06-S	6	0 U	0.00552	-0.00598 U	0.0103
605533	T1096-GP-093-06-S	6	-0.00397 U	0.00675	0.00199 U	0.00674
605533	T1096-GP-094-05-S	5	0.00723 U	0.00712	-0.00542 U	0.00939
605533	T1096-GP-095-05-S	5	-0.00356 U	0.00604	0.0124 U	0.0144
605537	T1BSI-PGS-001-00-S	1	-0.00153 U	0.003	-0.00764 U	0.00796
605537	T1BSI-PGS-002-00-S	1	-0.0029 U/0.00476	0.00569	0.00724 U/0.0412	0.0124
605537	T1BSI-PGS-003-00-S	1	0.00144 U	0.00487	0.00574 U	0.0143
605537	T1BSI-PGS-004-00-S	1	-0.0061 U	0.00601	-0.00914 U	0.0153
605537	T1BSI-PGS-005-00-S	1	-0.00296 U	0.0071	-0.00591 U	0.01
605537	T1BSI-PGS-006-00-S	1	-0.00137 U	0.00464	0.00683 U	0.00806
605537	T1BSI-PGS-007-00-S	1	0.00166 U	0.00326	0.00332 U	0.00462
605537	T1BSI-PGS-008-00-S	1	0.00292 U	0.00573	-1.39E-11 U	0.0107
605537	T1BSI-PGS-009-00-S	1	0.00549 U	0.00852	0.0137 U	0.0108
605537	T1BSI-PGS-010-00-S	1	-0.00713 U	0.0101	0.00142 U	0.00739
605537	T1BSI-PGS-011-00-S	1	-0.00282 U	0.0135	0.00563 U	0.0103
605537	T1BSI-PGS-012-00-S	1	0.00139 U	0.00982	0.00139 U	0.0156
605537	T1BSI-PGS-013-00-S	1	-0.00271 U	0.00531	0.00811 U	0.0119
605537	T1BSI-PGS-014-00-S	1	0 U	0.00569	-0.0029 U	0.0106
605537	T1BSI-PGS-015-00-S	1	0.00401 U	0.00695	0.00401 U	0.00946
605537	T1BSI-PGS-016-00-S	1	0 U	0.00408	-0.00294 U	0.0108
605537	T1BSI-PGS-017-00-S	1	-0.00299 U	0.00508	0.00299 U	0.0117
Background Activity—North Area		NA	NA	NA	NA	NA

Refer to footnotes at end of table.

Revised Table H3-5 (Concluded)
 SWMU 96, Summary of Radiochemistry Analytical Results,
 2002 Supplemental Investigation

Sample Attributes			Activity (pCi/g)			
Record Number ^a	ER Sample ID	Sample Depth (ft)	Plutonium-238		Plutonium-239/240	
			Result	Error ^b	Result	Error ^b
605537	T1BSI-PGS-018-00-S	1	-0.00617 U/0.00	0.0186/0.0049	0.00529 U/0.0277	0.00601/0.0131
605537	T1BSI-PGS-019-00-S	1	-0.00338 U/-0.00913	0.00813/0.0223	0.00507 U/0.0167	0.00878/0.01
605537	T1BSI-PGS-020-00-S	1	-0.00142 U	0.00392	0 U	0.00679
605537	T1BSI-PGS-021-00-S	1	0.00302 U	0.0118	-7.19E-11 U	0.00836
605537	T1BSI-PGS-022-00-S	1	-0.00439 U	0.00862	-0.00732 U	0.00762
605537	T1BSI-PGS-023-00-S	1	0.00315 U	0.00757	0.00472 U	0.0102
605537	T1BSI-PGS-024-00-S	1	-0.00294 U	0.0108	-0.00587 U	0.00816
605537	T1BSI-PGS-025-00-S	1	0.00278 U	0.0102	-0.00139 U	0.0136
605537	T1BSI-PGS-026-00-S	1	0.00536 U	0.00832	-0.00268 U	0.0117
605537	T1BSI-PGS-027-00-S	1	0.00359 U	0.00499	-0.00359 U	0.00704
605537	T1BSI-PGS-028-00-S	1	-1.60E-11 U	0.00371	0.00535 U	0.00644
605537	T1BSI-PGS-029-00-S	1	0 U	0.0029	0 U	0.00709
605537	T1BSI-PGS-030-00-S	1	0.00303 U	0.00421	-0.00152 U	0.00515
605537	T1BSI-PGS-031-00-S	1	0.0115 U	0.0133	-0.00144 U	0.00746
605537	T1BSI-PGS-032-00-S	1	-0.00447 U	0.00877	-0.00595 U	0.00827
605537	T1BSI-PGS-033-00-S	1	0 U	0.00701	0.00357 U	0.0111
605537	T1BSI-PGS-034-00-S ^c	1	0 U	0.0116	-0.00446 U	0.00874
605537	T1BSI-PGS-035-00-S ^d	1	0 U	0.00738	0.00307 U	0.0148
Background Activity—North Area		NA	NA	NA	NA	NA

^aAnalysis request/chain-of-custody record.

^bTwo standard deviations about the mean detected activity.

^cSample T1BSI-PGS-034-00-S is a blind duplicate of sample T1BSI-PGS-032-00-S.

^dSample T1BSI-PGS-035-00-S is a blind duplicate of sample T1BSI-PGS-018-00-S.

No NMED-approved background concentrations are available for plutonium.

BSI = Background Soil Investigation.
 DUP = Duplicate.
 ER = Environmental Restoration.
 ft = Foot (feet).
 GP = Geoprobe.
 ID = Identification.

NA = Not applicable.
 pCi/g = Picocurie(s) per gram.
 PGS = Plutonium Grid Survey.
 S = Soil Sample.
 SD = Sediment Sample.
 SWMU = Solid Waste Management Unit.

T1 = Technical Area 1.
 U = Analyte not detected.