

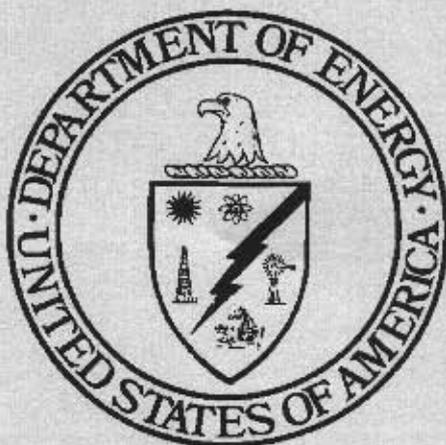


Sandia National Laboratories/New Mexico

**PROPOSAL FOR NO FURTHER ACTION
ENVIRONMENTAL RESTORATION PROJECT
SITE 161, BUILDING 6636 SEPTIC SYSTEM
OPERABLE UNIT 1295**

June 1996

**Environmental
Restoration
Project**



**United States Department of Energy
Albuquerque Operations Office**

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

Prepared for the
United States Department of Energy

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1. INTRODUCTION

1.1 ER Site 161, Building 6636 Septic System

Sandia National Laboratories/New Mexico (SNL/NM) is proposing a no further action (NFA) decision based on confirmatory sampling for Environmental Restoration (ER) Site 161, Building 6636 Septic System, Operable Unit (OU) 1295. ER Site 161 is listed in the Hazardous and Solid Waste Amendments (HSWA) Module IV (EPA August 1993) of the SNL/NM Resource Conservation and Recovery Act (RCRA) Hazardous Waste Management Facility Permit (NM5890110518-1) (EPA August 1992).

1.2 SNL/NM Administrative NFA Process

This proposal for a determination of a NFA decision based on confirmatory sampling was prepared using the criteria presented in Section 4.5.3 of the SNL/NM Program Implementation Plan (PIP) (SNL/NM February 1995). Specifically, this proposal "must contain information demonstrating that there are no releases of hazardous waste (including hazardous constituents) from solid waste management units (SWMUs) at the facility that may pose a threat to human health or the environment" (as proposed in 40 CFR 264.514[a] [2]) (EPA July 1990). The HSWA Module IV contains the same requirements for an NFA demonstration:

"Based on the results of the RFI [RCRA Facility Investigation] and other relevant information, the Permittee may submit an application to the Administrative Authority for a Class III permit modification under 40 CFR 270.42(c) to terminate the RFI/CMS [corrective measures study] process for a specific unit. This permit modification application must contain information demonstrating that there are no releases of hazardous waste including hazardous constituents from a particular SWMU at the facility that pose threats to human health and/or the environment, as well as additional information required in 40 CFR 270.42(c) (EPA August 1993)."

If the available archival evidence is not considered convincing, SNL/NM performs confirmatory sampling to increase the weight of the evidence and allow an informed decision on whether to proceed with the administrative-type NFA or to return to the site characterization program for additional data collection (SNL/NM February 1995).

The Environmental Protection Agency (EPA) acknowledged that the extent of sampling required may vary greatly, stating that:

the agency does not intend this rule [the second codification of HSWA] to require extensive sampling and monitoring at every SWMU. . . . Sampling is generally required only in situations where there is insufficient evidence on which to make an initial release determination. . . . The actual extent of sampling will vary . . . depending on the amount and quality of existing information available (EPA December 1987).

This request for an NFA decision for ER Site 161 is based primarily on analytical results of confirmatory soil samples collected at the site. Concentrations of site-specific constituents of concern (COCs) detected in the soil samples were first compared to background 95th percentile or upper tolerance limit (UTL) concentrations of COCs found in SNL/NM soils (IT March 1996). If no SNL/NM or other relevant background limit was available for a particular COC, or if the COC concentration exceeded the SNL/NM or other relevant background limit, then the constituent concentration was compared to the proposed 40 CFR Part 264 Subpart S (Subpart S) or other relevant soil action level for the compound (EPA July 1990). If the COC concentration exceeded both the background limit and relevant action level for that compound, or if no background limit or action level has been determined or proposed for the constituent, then a risk assessment was performed. The highest concentration of the particular COC identified at the site was then compared to the derived risk assessment action level to determine if the COC concentration at the site poses a significant health risk.

A site is eligible for an NFA proposal if it meets one or more of the following criteria taken from the Environmental Restoration Document of Understanding (NMED November 1995):

- NFA Criterion 1: The site cannot be located or has been found not to exist, is a duplicate potential release site (PRS) or is located within and therefore, investigated as part of another PRS.
- NFA Criterion 2: The site has never been used for the management (that is, generation, treatment, storage, or disposal) of RCRA solid or hazardous wastes and/or constituents or other CERCLA hazardous substances.
- NFA Criterion 3: No release to the environment has occurred, nor is likely to occur in the future.
- NFA Criterion 4: There was a release, but the site was characterized and/or remediated under another authority which adequately addresses corrective action, and documentation, such as a closure letter, is available.
- NFA Criterion 5: The PRS has been characterized or remediated 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.

Review and analysis of the ER Site 161 soil sample analytical data indicate that concentrations of COCs at this site are less than (1) SNL/NM or other applicable background limits, or (2) proposed Subpart S or other action levels, or (3) derived risk assessment action levels.

ER Site 161 is being proposed for an NFA decision based on confirmatory sampling data demonstrating that hazardous waste or COCs that may have been released from this SWMU into the environment pose an acceptable level of risk under current and projected future land use (Criterion 5).

1.3 Local Setting

SNL/NM occupies 2,829 acres of land owned by the Department of Energy (DOE), with an additional 14,920 acres of land provided by land-use permits with Kirtland Air Force Base (KAFB), the United States Forest Service (USFS), the State of New Mexico, and the Isleta Indian Reservation. SNL/NM has been involved in nuclear weapons research, component development, assembly, testing, and other research and development activities since 1945 (DOE September 1987).

ER Site 161 is located on KAFB, and is in the southeastern portion of SNL/NM Technical Area III (TA III). Access to the site is provided by paved and graded dirt roads that extend approximately 1.5 miles in a southerly direction from the entrance to TA-III (Figure 1-1). ER Site 161 consists of the immediate area around a 750 gallon septic tank southeast of Building 6636, and the area around a drainfield which consists of ten 4-inch perforated clay pipe distribution lines, located beyond the outer perimeter fence at the facility (SNL/NM September 1994) (Figure 1-2). The site encompasses approximately 0.15 acres of flat-lying land at an average mean elevation of 5,384 feet above mean sea level (AMSL).

The surficial geology at ER Site 161 is characterized by a veneer of aeolian sediments that are underlain by alluvial fan or alluvial deposits. Based on drilling records of similar deposits at KAFB, the alluvial materials are highly heterogeneous, composed primarily of medium to fine silty sands with frequent coarse sand, gravel, and cobble lenses. The alluvial deposits probably extend to the water-table. Vegetation consists predominantly of grasses including grama, muhly, dropseed, and galleta. Shrubs commonly associated with the grasslands include sand sage, winter fat, saltbrush, and rabbitbush. Cacti are common, and include cholla, pincushion, strawberry, and prickly pear (SNL/NM March 1993).

The water-table elevation is approximately 4,955 feet AMSL at this location, so depth to ground-water is approximately 429 feet. Local groundwater flow is believed to be in a generally west to northwest direction in the vicinity of this site (SNL/NM March 1995). The nearest production wells are northwest of the site and include KAFB-1, 2, 4, 7, and 14 which are approximately 3.9 to 5.7 miles away. The nearest ground-water monitoring wells to the site are the group of wells installed around the Chemical Waste Landfill in the southeast corner of TA III. These wells are located approximately 0.7 miles southeast of ER Site 161 (SNL/NM June 1995).

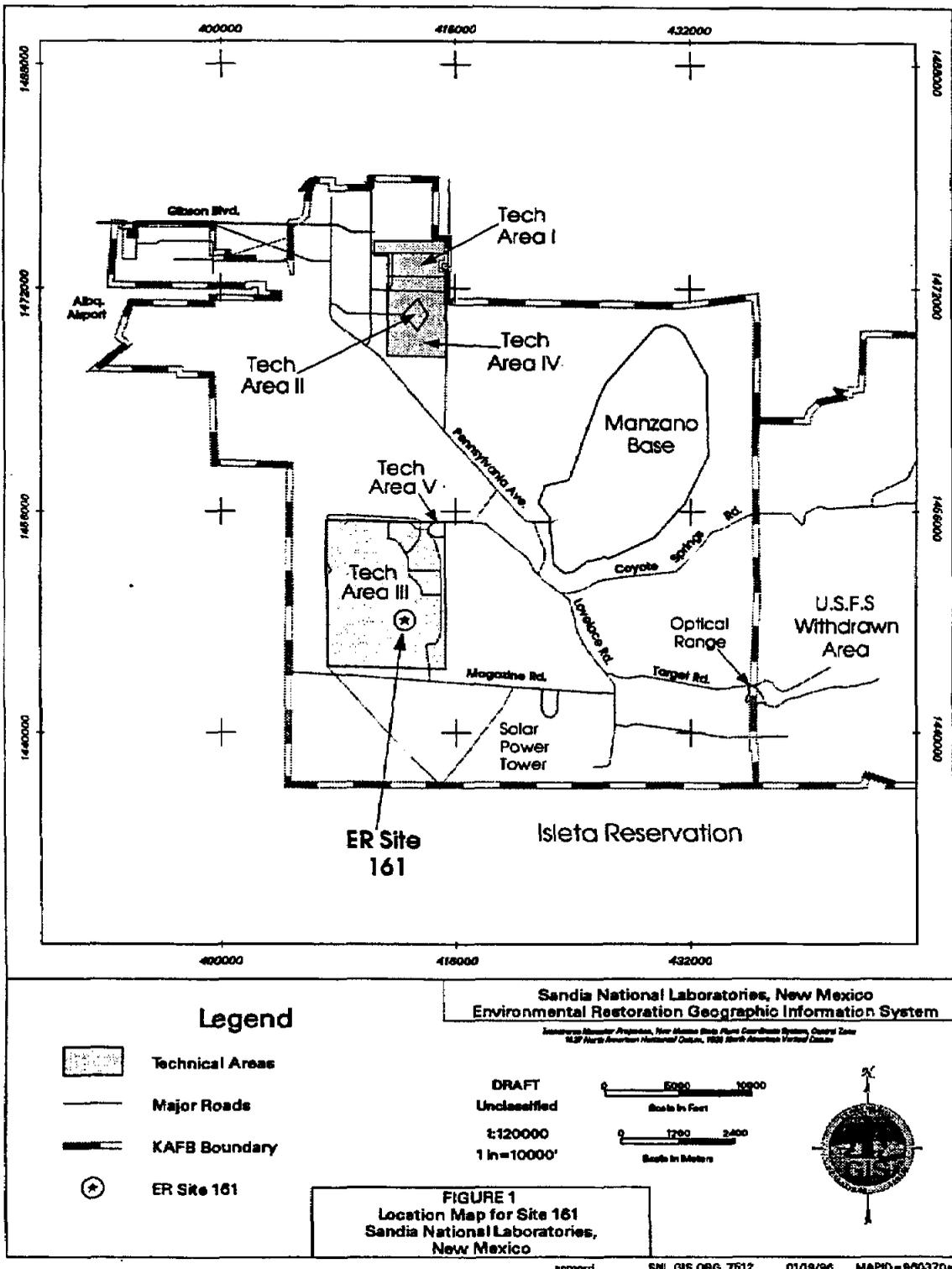
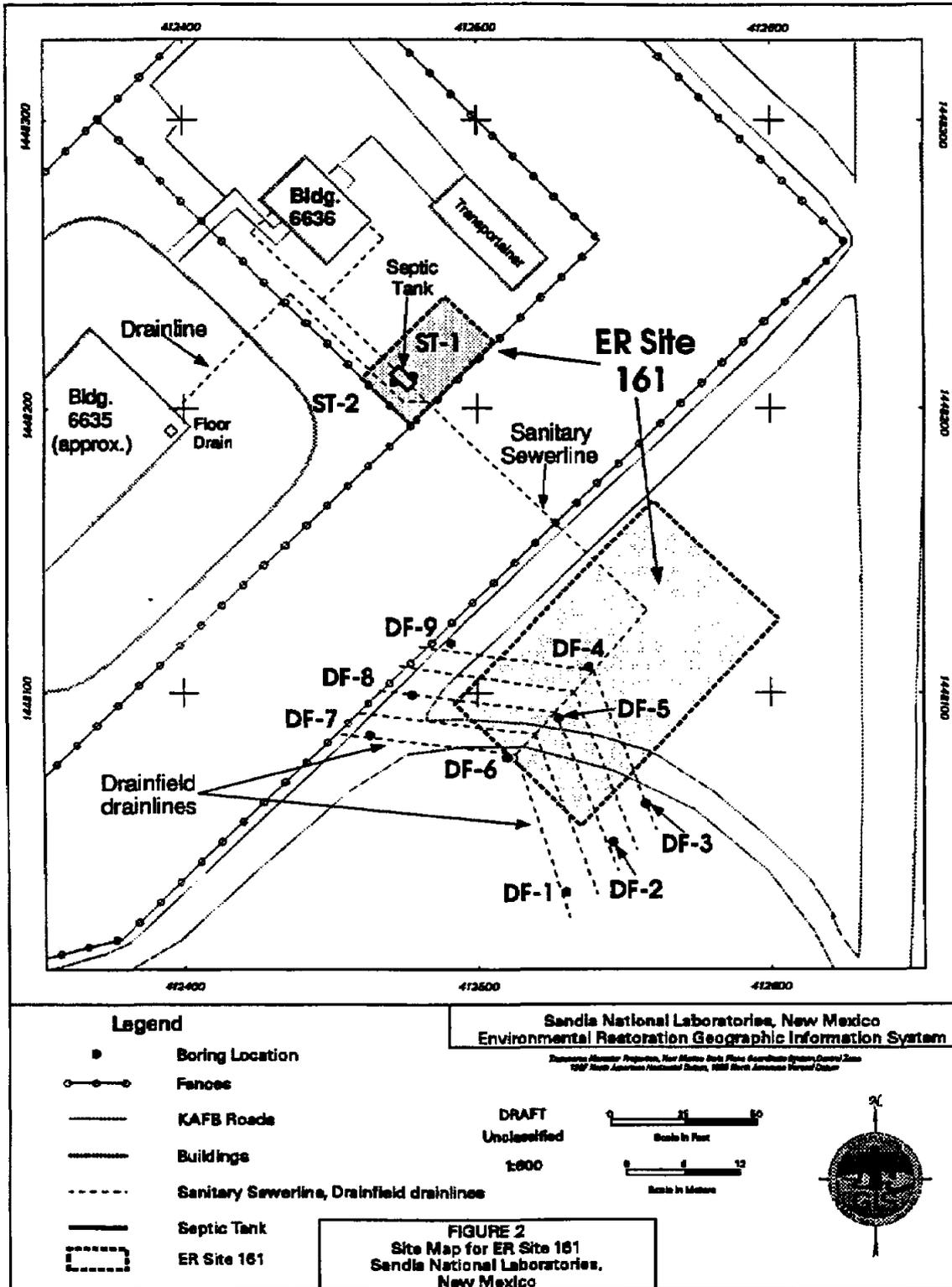


Figure 1-1
ER Site 161 Location Map



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Figure 1-2
ER Site 161 Site Map

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2. HISTORY OF THE SWMU

2.1 Sources of Supporting Information

In preparing the confirmatory sampling NFA proposal for ER Site 161, available background information was reviewed to quantify potential releases and to select analytes for the soil sampling. Background information was collected from SNL/NM Facilities Engineering drawings and interviews with employees familiar with the site operational history. The following sources of information, hierarchically listed with respect to assigned validity, were used to evaluate ER Site 161:

- Confirmatory subsurface soil sampling conducted in December 1994 (SNL/NM December 1994a);
- Two survey reports, including a geophysical survey (Lamb 1994), and a passive soil gas survey (NERI June 1995);
- Results of samples collected from the septic tank in 1992 (SNL/NM June 1993), and 1994;
- RCRA Facilities Investigation Work Plan for OU 1295, Septic Tanks and Drainfields (SNL/NM March 1993);
- Photographs and field notes collected at the site by SNL/NM ER staff;
- SNL/NM Facilities Engineering building drawings;
- SNL/NM Geographic Information System (GIS) data; and
- The RCRA Facility Assessment (RFA) report (EPA April 1987).

2.2 Previous Audits, Inspections, and Findings

ER Site 161 was first listed as a potential release site in the RFA report to the EPA in 1987 (EPA April 1987). This report contained a generic statement about this and many other SNL/NM septic systems that sanitary and industrial wastes may have been discharged to septic tanks and drainfields during past operations. This SWMU was included in the RFA report as Site number 79, along with other septic and drain systems at SNL/NM. All the sites included in Site 79 are now designated by individual SWMU numbers.

2.3 Historical Operations

The following historical information has been excerpted from several sources, including SNL/NM March 1993, IT March 1994, and SNL/NM November 1994b.

Building 6636, the control building for the Nondestructive Test Facility, was constructed in 1971 for monitoring climatic tests and for developing x-ray film. From 1971 to 1989, approximately 900 gallons of waste photographic processing chemicals containing silver and sodium dichromate were discharged to the septic system, which is no longer in use. No releases of radioactive contaminants are known to have occurred. Since 1989, the waste photographic chemicals have been containerized. Currently, a silver recovery cartridge is attached to the waste line from the photoprocessing equipment and the facility is connected to the sanitary sewer system. The Nondestructive Test Facility itself (Building 6635) is located immediately southwest of Building 6636, and contains floor drains in the east and west corners of the building which discharge to the drainfield for Building 6636. These two drains may have received ethylene glycol coolant from past spills within Building 6635. Estimated total effluent rates range from 10 to 100 gallons per day.

3. EVALUATION OF RELEVANT EVIDENCE

3.1 Unit Characteristics

There are no safeguards inherent in the drain systems from Buildings 6636 or 6635, or in facility operations, that could have prevented past releases to the environment.

3.2 Operating Practices

As discussed in Section 2.3, effluent was released to the Building 6636 septic tank and drainfield when the septic system was active. Hazardous wastes were not managed or contained at ER Site 161.

3.3 Presence or Absence of Visual Evidence

No visible evidence of soil discoloration, staining, or odors indicating residual contamination was observed when soil samples were collected in the drainfield and around the septic tank in December 1994 (SNL/NM December 1994a).

3.4 Results of Previous Sampling/Surveys

A sludge sample was collected from the ER Site 161 septic tank in August 1992 and was analyzed for selected radionuclide constituents. The brief narrative report for that sample indicated that "...no parameters were detected that exceed U.S. Department of Energy (DOE) derived concentration guideline (DCG) limits or the investigation levels (IL) established during this investigation." (SNL/NM June 1993). The analytical results of this sample are presented in Appendix A.1.

A second round of septic tank sludge samples and a sample of the liquid fraction were collected for waste characterization purposes in May 1994 and were analyzed for total and Toxicity Characteristic Leaching Procedure (TCLP) volatile organic compounds (VOCs), total and TCLP RCRA metals, hexavalent chromium, cyanide, isotopic uranium, tritium, and gamma spectroscopy radionuclides. Trace concentrations of three VOC compounds were identified in the liquid, and none were found in the sludge. Only one of the eight RCRA metals (barium) was detected in the liquid fraction. Seven out of eight total RCRA metals were identified in the sludge, but only one out of eight of these metals (barium) was detected in the TCLP-derived leachate from the same material. Hexavalent chromium was not detected in the sludge, and cyanide was not identified in either the liquid or sludge. Anomalous activity levels of isotopic uranium, tritium, or radionuclides detected by gamma spectroscopy were not found in the liquid or sludge. The analytical results of the May 1994 septic tank samples are presented in Appendix A.2.

A geophysical survey using a GeonicsTM model EM-38 ground conductivity meter was performed at the site in June 1994 to attempt to locate the drainfield. An area southeast of Building 6636 and between the two perimeter fences was identified as the possible location of the unit (Lamb 1994), but the actual location was later determined with a backhoe to be outside of the outer fence (Figure 1-2) (SNL/NM September 1994).

The passive soil-gas survey conducted in the drainfield area in November and December 1994 used PETREX™ sampling tubes to identify any releases of VOCs and semivolatile organic compounds (SVOCs) from the drainfield that may have occurred. A PETREX™ tube soil-gas survey is a semi-quantitative screening procedure that can be used to identify many volatile and. This technique may be used to guide VOC and SVOC site investigations. The advantages of this sampling methodology are that large areas can be surveyed at relatively low cost, the technique is highly sensitive to organic vapors, and the result produces a measure of soil vapor chemistry over a two- to three-week period rather than at one point in time. Each PETREX™ soil-gas sampler consists of two activated charcoal-coated wires housed in a reusable glass test tube container. At each sampling location, sample tubes are buried in an inverted position so that the mouth of the sampler is about 1 foot below grade. Samplers are left in place for a two- to three-week period, and are then removed from the ground and sent to the manufacturer, Northeast Research Institute (NERI), for analysis using Thermal Desorption-Gas Chromatography/Mass Spectrometry. The analytical laboratory reports all sample results in terms of "ion counts" instead of concentrations, and identifies those samples that contain compounds above the PETREX™ technique detection limits. In NERI's experience, levels below 100,000 ion counts for a single compound (such as perchloroethene [PCE] or trichloroethene[TCE]), and 200,000 ion counts for mixtures (such as BTEX or aliphatic compounds [C4-C11 cycloalkanes]), under normal site conditions, would not represent detectable levels by standard quantitative methods for soils and/or groundwater (NERI June 1995).

Twenty-five PETREX™ tube samplers were placed in a grid pattern that covered the drainfield area at this site (SNL/NM November 1994a). A map showing the PETREX™ tube sampling locations, and the analytical results of the ER Site 161 passive soil gas survey are presented in Appendix A.3 of Appendix A. PCE or TCE compounds were not detected in soil gas at any of the twenty-five PETREX™ sampling locations at this site, and BTEX and/or aliphatic compounds at potentially detectable concentrations were identified at only 3 (P-516, P-520, and P-525 on the PETREX™ map) of the 25 locations. However, significant concentrations of VOCs and SVOCs were not detected confirmatory soil samples collected within 7 to 15 feet of these three PETREX™ locations, or in any of the other soil samples collected at this site.

3.5 Assessment of Gaps in Information

The most recent material in the septic tank was not necessarily representative of all discharges to the unit that have occurred since it was put into service in 1971. The analytical results of the various rounds of septic tank sampling were used, along with process knowledge and other available information, to help identify the most likely COCs that might be found in soils surrounding the septic tank and beneath the drainfield, and to help select the types of analyses to be performed on soil samples collected from the site. While the history of past releases at the site is incomplete, analytical data from confirmatory soil samples collected in December 1994 (discussed below) are sufficient to determine whether releases of COCs occurred at the site.

3.6 Confirmatory Sampling

Although the likelihood of hazardous waste releases at ER Site 161 was considered low, confirmatory soil sampling was conducted to determine whether COCs above background or detectable levels were released at this site.

A backhoe was used in September 1994 to determine the precise location, dimensions, and depth of the ER Site 161 drainfield, which had no surface expression (SNL/NM September 1994). The drainfield excavation operation is shown in the Figure 3-1 photographs. Once the drainfield was located, soil samples were collected from boreholes within the drainfield, and from either side of the septic tank (SNL/NM December 1994a). The confirmatory soil sampling program was performed in accordance with the rationale and procedures described in the Septic Tank and Drainfields (ADS-1295) RCRA Facility Investigation Work Plan (SNL/NM March 1993), and addenda to the Work Plan developed during the OU 1295 project approval process (IT March 1994 and SNL/NM November 1994b). A summary of the types of samples, number of sample locations, sample depths and analytical requirements for confirmatory soil samples collected at this site is presented in Table 3-1.

**Table 3-1
ER Site 161: Confirmatory Sampling Summary Table**

Sampling Location	Analytical Parameters	Number of Borehole Locations	Top of Sampling Intervals at Each Boring Location	Total Number of Investigative Samples	Total Number of Duplicate Samples	Date(s) Samples Collected
Drainfield	VOCs	9	10', 20'	18	1	12/13-14/94
	SVOCs	9	10', 20'	18	1	
	RCRA metals + Cr ⁶⁺	9	10', 20'	18	1	
	Cyanide	9	10', 20'	18	1	
	Gamma spec. composite	9	10', 20'	2		
	Tritium composite	9	10', 20'	2		
Septic tank	VOCs	2	7.5'	2	1	12/19/94
	SVOCs	2	7.5'	2	1	
	RCRA metals + Cr ⁶⁺	2	7.5'	2	1	
	Cyanide	2	7.5'	2	1	

Notes

- Cr⁶⁺ = Hexavalent chromium
- RCRA = Resource Conservation and Recovery Act
- Spec. = Spectroscopy
- SVOCs = Semivolatile organic compounds
- VOCs = Volatile organic compounds



Exposing the main drain line of the ER Site 161 Drainfield.
9/1/94. View looking south-west.



Excavation to locate the ER Site 161 Drainfield lines.
9/1/94. View looking north.

Figure 3-1
ER Site 161 Photographs

Soil samples were collected from one boring on either side of the septic tank, and from nine borings located near the ends of alternate drainfield lateral lines, and at alternate lateral line junction points (Figure 1-2). For septic tank borings, samples were collected from one interval in each borehole starting at the outside bottom of the tank, which was 7.5 feet below ground surface (BGS) at this site. For drainfield borings, samples were collected from two intervals in each borehole. The top of the shallow interval started at the bottom of the drain line trenches which were 10 feet BGS on average at this site, and the lower (deep) interval started at 10 feet below the top of the upper interval, or 20 feet BGS.

The Geoprobe™ sampling system was used to collect subsurface soil samples at this site. The Geoprobe™ sampling tool was fitted with a butyl acetate (BA) sampling sleeve and was then hydraulically driven to the top of the designated sampling depth. The sampling tool was opened, and driven an additional two feet in order to fill the two-foot long by approximately 1.25-inch diameter BA sleeve. The sampling tool and soil-filled sleeve were then retrieved from the borehole. In order to minimize the potential for loss of volatile compounds (if present), the soil to be analyzed for VOCs was not emptied from the BA sleeve into another sample container. The filled BA sleeve was removed from the sampling tool, and the top seven inches were cut off. Both ends of the seven-inch section of filled sleeve were immediately capped with a teflon membrane and rubber end cap, sealed with tape, and placed in an ice-filled cooler at the site. The soil in this section of sleeve was submitted for a VOC analysis.

Soil from the remainder of the sleeve was then emptied into a decontaminated mixing bowl. Following this, one or two more two-foot sampling runs were then completed at each interval in order to recover enough soil to satisfy sample volume requirements for the interval. Soil recovered from these additional runs was also emptied into the mixing bowl, and blended with soil from the first sampling run. The soil was then transferred from the bowl into sample containers using a decontaminated plastic spatula.

Drainfield and septic tank soil samples were analyzed for VOCs, SVOCs, cyanide, RCRA metals, and hexavalent chromium by an offsite commercial laboratory. Also, to determine if radionuclides were released from past activities at this site, composite samples were collected from the drainfield shallow and deep sampling intervals and were analyzed by an offsite commercial laboratory for tritium, and were screened for other radionuclides using SNL/NM in-house gamma spectroscopy. Routine SNL/NM chain-of-custody and sample documentation procedures were employed for all samples collected at this site. Samples were shipped to the offsite commercial laboratories by an overnight delivery service.

Quality assurance/quality control (QA/QC) samples collected during this effort consisted of one set of duplicate soil samples from the shallow sampling interval at location DF-7, and a second set from the septic tank soil sampling location ST-1 (Figure 1-2). Concentrations of constituents detected in the duplicate soil samples were generally in good agreement with those detected in the equivalent field samples from the same intervals. One set of aqueous equipment rinsate samples were also collected following completion of soil sampling at the site and were analyzed for the same non-radiologic constituents as the soil samples collected at this site. Very low levels of the common laboratory contaminants acetone and methylene chloride were detected in the equipment blank, and no SVOCs, cyanide, or metals were identified. Also, soil trip blank samples were included with each of the two shipments of ER Site 161 VOC soil samples to the offsite laboratory and were analyzed for VOCs only. The following compounds were detected in

the trip blanks: acetone, 2-hexanone, methyl ethyl ketone (MEK), methylene chloride, toluene, and total xylenes. These common laboratory contaminants were either not detected, or were for the most part found in lower concentrations in the site samples compared to the trip blanks.

Soil used for the trip blanks was prepared by heating the material, and then transferring it immediately to the sample container. This heating process drives off any residual organic compounds (if present) and soil moisture that may be contained in the material. It is thought that when the soil trip blank container was opened at the laboratory, it immediately adsorbed both moisture and VOCs present in the laboratory atmosphere, and therefore became contaminated.

Summaries of constituents analyzed for and detected by commercial laboratory analyses in these confirmatory samples are presented in Tables 3-2, 3-3, and 3-4. Results of the SNL/NM in-house gamma spectroscopy composite soil sample screening for other radionuclides are presented in Appendices A.4 and A.5. Complete soil sample analytical data packages are archived in the SNL/NM Environmental Operations Records Center and are readily available for review and verification (SNL/NM December 1994b).

3.7 Rationale for Pursuing a Confirmatory Sampling NFA Decision

As discussed in Section 3.4, the passive soil-gas survey did not indicate any anomalies or areas of VOC or SVOC contamination in the drainfield area of this site.

Confirmatory soil sampling around the septic tank and in the drainfield did not identify any residual COCs indicating past discharges that could pose a threat to human health or the environment. As shown in Table 3-2, only low concentrations of four VOC compounds (acetone, MEK, methyl isobutyl ketone [MIBK], and methylene chloride), which are common laboratory contaminants, were detected in soil samples collected from this site. No SVOC constituents were detected in any of the soil samples. Cyanide was detected at a near-reporting-limit concentration of 0.56 micrograms per kilogram (ug/kg) in one soil sample from the southwest side of the septic tank. This concentration is much lower than the proposed Subpart S action level of 2,000,000 ug/kg for this constituent.

As shown on Table 3-3, septic tank and drainfield soil sample analytical results indicate that the nine metals that were targeted in the Site 161 investigation were either (1) not detected, or (2) were detected in concentrations below the background UTL or 95th percentile concentrations presented in the draft SNL/NM study of naturally-occurring constituents (IT March 1996), or (3) were less than the proposed Subpart S action levels for these metals.

Tritium was not detected in soil moisture from the shallow and deep interval composite samples collected from the drainfield sampling intervals (Table 3-4). Also, the gamma spectroscopy semi-qualitative screening of composite samples from the drainfield shallow and deep sampling intervals did not indicate the presence of contamination from other radionuclides in soils at this location (Appendices A.4 and A.5).

Table 3-2

ER Site 161
 Summary of Organic and Other Constituents in Confirmatory Soil Samples
 Collected Around the Septic Tank and in the Drainfield

Sample Number	Sample Matrix	Sample Type	Sample Date	Sample Location (Figure 2)	Top of Sample Interval (fbs)	VOCs Method 8240										SVOCs Method 8270	Cyanide Method 9010/9012	Units
						Acetone	2-Hexa- none	MEK	MIBK	Chloride	Meth. Toluene	Total Xylenes						
Drainfield Soil and QA Samples:																		
018826-1,2	Soil	Field	12/13/94	DF-1	10	5 J	ND	ND	ND	2.8 J	ND	ND	ND	ND	ND	ND	ug/kg	
018827-1,2	Soil	Field	12/13/94	DF-1	20	ND	ND	ND	ND	2.9 J	ND	ND	ND	ND	ND	ND	ug/kg	
018828-1,2	Soil	Field	12/13/94	DF-2	10	ND	ND	ND	ND	3.3 J	ND	ND	ND	ND	ND	ND	ug/kg	
018829-1,2	Soil	Field	12/13/94	DF-2	20	2.2 J	ND	ND	ND	3.3 J	ND	ND	ND	ND	ND	ND	ug/kg	
018830-1,2	Soil	Field	12/14/94	DF-3	10	5.3 J	ND	ND	ND	3.4 J	ND	ND	ND	ND	ND	ND	ug/kg	
018840-1,2	Soil	Field	12/14/94	DF-3	20	11	ND	2.7 J	1.4 J	2 J	ND	ND	ND	ND	ND	ND	ug/kg	
018824-1,2	Soil	Field	12/13/94	DF-4	10	9.7 J	ND	ND	ND	3.1 J	ND	ND	ND	ND	ND	ND	ug/kg	
018825-1,2	Soil	Field	12/13/94	DF-4	20	3.7 J	ND	ND	ND	3 J	ND	ND	ND	ND	ND	ND	ug/kg	
018822-1,2	Soil	Field	12/12/94	DF-5	10	15	ND	ND	ND	3 J	ND	ND	ND	ND	ND	ND	ug/kg	
018823-1,2	Soil	Field	12/13/94	DF-5	20	5.2 J	ND	ND	ND	3.5 J	ND	ND	ND	ND	ND	ND	ug/kg	
018821-1,2	Soil	Field	12/12/94	DF-6	10	13	ND	ND	ND	2.7 J	ND	ND	ND	ND	ND	ND	ug/kg	
018839-1,2	Soil	Field	12/14/94	DF-6	20	17	ND	ND	1.4 J	2.1 J	ND	ND	ND	ND	ND	ND	ug/kg	
018832-1,2	Soil	Field	12/14/94	DF-7	10	13	ND	ND	ND	3.5 J	ND	ND	ND	ND	ND	ND	ug/kg	
018834-1,2	Soil	Dupl.	12/14/94	DFD-7	10	3.5 J	ND	ND	ND	3.5 J	ND	ND	ND	ND	ND	ND	ug/kg	
018833-1,2	Soil	Field	12/14/94	DF-7	20	ND	ND	ND	ND	3.2 J	ND	ND	ND	ND	ND	ND	ug/kg	
018835-1,2	Soil	Field	12/14/94	DF-8	10	ND	ND	ND	ND	3.3 J	ND	ND	ND	ND	ND	ND	ug/kg	
018836-1,2	Soil	Field	12/14/94	DF-8	20	13	ND	5.8 J	2.7 J	1.9 J	ND	ND	ND	ND	ND	ND	ug/kg	
018837-1,2	Soil	Field	12/14/94	DF-9	10	8.4 J	ND	2.6 J	1.2 J	2.2 J	ND	ND	ND	ND	ND	ND	ug/kg	
018838-1,2	Soil	Field	12/14/94	DF-9	20	7.5 J	ND	ND	ND	1.7 J	ND	ND	ND	ND	ND	ND	ug/kg	
021306-1	Soil	TB	12/15/94	Site 161	NA	36	3.2 J	22	ND	6.4	ND	ND	ND	NS	NS	NS	ug/kg	

Table 3-2, concluded:
ER Site 161
Summary of Organic and Other Constituents in Confirmatory Soil Samples
Collected Around the Septic Tank and in the Drainfield

Sample Number	Sample Matrix	Sample Type	Sample Date	Sample Location (Figure 2)	Top of Sample Interval (fbgs)	VOCs Method 8240										SVOCs Method 8270	Cyanide Method 9010/9012	Units	
						Acetone	2-Hexa-	MEK	MIBK	Chloride	Meth.	Toluene	Xylenes	Total					
Septic Tank Soil and QA Samples:																			
018842-1,2	Soil	Field	12/19/94	ST-1	7.5	ND	ND	ND	ND	2.2 J,B	ND	ND	ND	ND	ND	ND	ug/kg		
018843-1,2	Soil	Dupl.	12/19/94	STD-1	7.5	ND	ND	ND	ND	2.7 J,B	ND	ND	ND	ND	ND	ND	ug/kg		
018841-1,2	Soil	Field	12/19/94	ST-2	7.5	11	ND	ND	ND	2.6 J,B	ND	ND	ND	ND	0.56	ug/kg			
021316-1	Soil	TB	12/19/94	Site 161	NA	13	ND	ND	ND	10 B	3.5 J	1.6 J	ND	NS	NS	ug/kg			
018844-1,2,5	Water	EB	12/19/94	Site 161	NA	8.6 J	ND	ND	ND	1.6 J	ND	ND	ND	ND	ND	ug/L			
Laboratory Reporting Limit For Soil						10	10	10	10	5	5	5	5	5	5	ug/kg			
Laboratory Reporting Limit For Water						10	10	10	10	5	5	5	5	5	5	ug/L			
Proposed Subpart S Action Level For Soil						8E+06	None	5E+07	4E+06	9E+04	2E+07	2E+08	2E+08	2E+08	2E+06	ug/kg			

Notes:

- B = Compound detected in associated method blank sample
- Dupl. = Duplicate soil sample
- EB = Equipment rinsate blank
- fbgs = feet below ground surface
- J = Result is detected below the reporting limit or is an estimated concentration.
- MEK = Methyl ethyl ketone, or 2-Butanone
- Meth. chloride = Methylene chloride
- MIBK = Methyl isobutyl ketone, or 4-methyl-2-pentanone
- NA = Not applicable
- ND = Not detected
- NS = No sample
- QA = Quality assurance
- SVOCs = Semivolatile organic compounds
- TB = Trip blank
- ug/kg = Micrograms per kilogram
- ug/L = Micrograms per liter
- VOCs = Volatile organic compounds

Table 3-3
ER Site 161
Summary of RCRA Metals and Hexavalent Chromium in Confirmatory Soil Samples
Collected Around the Septic Tank and in the Drainfield

Sample Number	Sample Matrix	Sample Type	Sample Date	Sample Location (Figure 2)	Top of Sample Interval (ftgs)	RCRA Metals, Methods 6010 and 7471											Other Metals:																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
						As	Ba	Cd	Cr, total	Pb	Hg	Se	Ag	Cr ⁶⁺ Method 7196	Units																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
Drainfield Soil and QA Samples:																										018826-2	Soil	Field	12/13/94	DF-1	10	4.3	86.8	ND	6.5	ND	ND	ND	ND	0.4 J	ND			ND	mg/kg	018827-2	Soil	Field	12/13/94	DF-1	20	2.9	39.1	ND	8.7	3.6 J	ND	ND	ND	ND	ND			ND	mg/kg	018828-2	Soil	Field	12/13/94	DF-2	10	2.6	67.8	ND	5.6	3.7 J	ND	ND	ND	ND	ND			ND	mg/kg	018829-2	Soil	Field	12/13/94	DF-2	20	2.8	87.4	ND	14.1	5.2	ND	ND	ND	ND	ND			ND	mg/kg	018830-2	Soil	Field	12/14/94	DF-3	10	2.2	62.8	ND	8.3	ND	ND	ND	ND	ND	ND			ND	mg/kg	018840-2	Soil	Field	12/14/94	DF-3	20	2.6	172	ND	9.3	4.6 J	ND	ND	ND	ND	ND			ND	mg/kg	018824-2	Soil	Field	12/13/94	DF-4	10	2.5	88	0.53	9.4	4.5 J	ND	ND	40.8	ND	ND			ND	mg/kg	018825-2	Soil	Field	12/13/94	DF-4	20	2.8	162	ND	9.9	4 J	ND	ND	10.5	ND	ND			ND	mg/kg	018822-2	Soil	Field	12/12/94	DF-5	10	1.8	60.2	ND	14.2	3.9 J	ND	ND	13.3	ND	ND			ND	mg/kg	018823-2	Soil	Field	12/13/94	DF-5	20	2.7	84.3	ND	8.8	4.4 J	ND	ND	1.3	ND	ND			ND	mg/kg	018821-2	Soil	Field	12/12/94	DF-6	10	2.6	81.1	ND	7.5	ND	ND	ND	24.6	ND	ND			ND	mg/kg	018839-2	Soil	Field	12/14/94	DF-6	20	3	104	ND	22	10.3	ND	ND	ND	ND	ND			ND	mg/kg	018832-2	Soil	Field	12/14/94	DF-7	10	2.4	107	ND	12.5	4 J	ND	ND	ND	ND	ND			ND	mg/kg	018834-2	Soil	Dupl.	12/14/94	DFD-7	10	2	60	ND	6.9	ND	ND	ND	ND	ND	ND			ND	mg/kg	018833-2	Soil	Field	12/14/94	DF-7	20	3.2	144	ND	13.6	5.5	ND	ND	ND	ND	ND			ND	mg/kg	018835-2	Soil	Field	12/14/94	DF-8	10	2	56.3	ND	5.5	ND	ND	ND	ND	ND	ND			ND	mg/kg	018836-2	Soil	Field	12/14/94	DF-8	20	1.6	56.3	ND	5.5	ND	ND	ND	ND	ND	ND			ND	mg/kg	018837-2	Soil	Field	12/14/94	DF-9	10	2.8	42.8	ND	6.7	ND	ND	ND	ND	ND	ND			ND	mg/kg	018838-2	Soil	Field	12/14/94	DF-9	20	2.6	113	ND	10.3	4.8 J	ND	ND	ND	ND	ND			ND	mg/kg	Septic Tank Soil and QA Samples:																									018842-2	Soil	Field	12/19/94	ST-1	7.5	2.6	101	ND	5	5.1	ND	ND	ND	ND	ND			ND	mg/kg	018843-2	Soil	Dupl.	12/19/94	STD-1	7.5	2.3	64.5	ND	6.2	ND	ND	ND	ND	ND	ND			ND	mg/kg	018841-2	Soil	Field	12/19/94	ST-2	7.5	2.2	85.2	ND	9.3	ND	ND	ND	4.4	ND	ND			ND	mg/kg	018844-3,4	Water	EB	12/19/94	Site 161	NA	ND			NS	mg/L	Laboratory Reporting Limit For Soil						1	1	0.5	1	5	0.1	0.5	1	1	0.05 - 0.1			mg/kg	Laboratory Reporting Limit For Water						0.01	0.01	0.005	0.01	0.003	0.0002	0.005	0.01	0.01	NA			mg/L	Number of SNL/NM Background Soil Sample Analyses *						15	727	1,740	647	536	1,724	2,134	2,302	393	NA			NA	SNL/NM Soil Background Range *						2.1-7.9	0.5-495	0.0027-6.2	0.5-31.4	0.75-103	0.0001-0.68	0.037-17.2	0.0016-8.7	0.02-<2.5	0.02-<2.5	mg/kg	SNL/NM Soil Background UTL or 95th Percentile *						7	214	0.9	15.9	11.8	<0.1	<1.0	<1.0	<2.5	<2.5	mg/kg	Proposed Subpart S Action Level For Soil						0.50	6,000	80	80,000 **	400 ***	20	400	400	400 **	400 **	mg/kg									
018826-2	Soil	Field	12/13/94	DF-1	10	4.3	86.8	ND	6.5	ND	ND	ND	ND	0.4 J	ND			ND	mg/kg																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
018827-2	Soil	Field	12/13/94	DF-1	20	2.9	39.1	ND	8.7	3.6 J	ND	ND	ND	ND	ND			ND	mg/kg																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
018828-2	Soil	Field	12/13/94	DF-2	10	2.6	67.8	ND	5.6	3.7 J	ND	ND	ND	ND	ND			ND	mg/kg																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
018829-2	Soil	Field	12/13/94	DF-2	20	2.8	87.4	ND	14.1	5.2	ND	ND	ND	ND	ND			ND	mg/kg																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
018830-2	Soil	Field	12/14/94	DF-3	10	2.2	62.8	ND	8.3	ND	ND	ND	ND	ND	ND			ND	mg/kg																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
018840-2	Soil	Field	12/14/94	DF-3	20	2.6	172	ND	9.3	4.6 J	ND	ND	ND	ND	ND			ND	mg/kg																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
018824-2	Soil	Field	12/13/94	DF-4	10	2.5	88	0.53	9.4	4.5 J	ND	ND	40.8	ND	ND			ND	mg/kg																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
018825-2	Soil	Field	12/13/94	DF-4	20	2.8	162	ND	9.9	4 J	ND	ND	10.5	ND	ND			ND	mg/kg																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
018822-2	Soil	Field	12/12/94	DF-5	10	1.8	60.2	ND	14.2	3.9 J	ND	ND	13.3	ND	ND			ND	mg/kg																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
018823-2	Soil	Field	12/13/94	DF-5	20	2.7	84.3	ND	8.8	4.4 J	ND	ND	1.3	ND	ND			ND	mg/kg																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
018821-2	Soil	Field	12/12/94	DF-6	10	2.6	81.1	ND	7.5	ND	ND	ND	24.6	ND	ND			ND	mg/kg																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
018839-2	Soil	Field	12/14/94	DF-6	20	3	104	ND	22	10.3	ND	ND	ND	ND	ND			ND	mg/kg																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
018832-2	Soil	Field	12/14/94	DF-7	10	2.4	107	ND	12.5	4 J	ND	ND	ND	ND	ND			ND	mg/kg																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
018834-2	Soil	Dupl.	12/14/94	DFD-7	10	2	60	ND	6.9	ND	ND	ND	ND	ND	ND			ND	mg/kg																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
018833-2	Soil	Field	12/14/94	DF-7	20	3.2	144	ND	13.6	5.5	ND	ND	ND	ND	ND			ND	mg/kg																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
018835-2	Soil	Field	12/14/94	DF-8	10	2	56.3	ND	5.5	ND	ND	ND	ND	ND	ND			ND	mg/kg																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
018836-2	Soil	Field	12/14/94	DF-8	20	1.6	56.3	ND	5.5	ND	ND	ND	ND	ND	ND			ND	mg/kg																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
018837-2	Soil	Field	12/14/94	DF-9	10	2.8	42.8	ND	6.7	ND	ND	ND	ND	ND	ND			ND	mg/kg																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
018838-2	Soil	Field	12/14/94	DF-9	20	2.6	113	ND	10.3	4.8 J	ND	ND	ND	ND	ND			ND	mg/kg																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
Septic Tank Soil and QA Samples:																									018842-2	Soil	Field	12/19/94	ST-1	7.5	2.6	101	ND	5	5.1	ND	ND	ND	ND	ND			ND	mg/kg	018843-2	Soil	Dupl.	12/19/94	STD-1	7.5	2.3	64.5	ND	6.2	ND	ND	ND	ND	ND	ND			ND	mg/kg	018841-2	Soil	Field	12/19/94	ST-2	7.5	2.2	85.2	ND	9.3	ND	ND	ND	4.4	ND	ND			ND	mg/kg	018844-3,4	Water	EB	12/19/94	Site 161	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			NS	mg/L	Laboratory Reporting Limit For Soil						1	1	0.5	1	5	0.1	0.5	1	1	0.05 - 0.1			mg/kg	Laboratory Reporting Limit For Water						0.01	0.01	0.005	0.01	0.003	0.0002	0.005	0.01	0.01	NA			mg/L	Number of SNL/NM Background Soil Sample Analyses *						15	727	1,740	647	536	1,724	2,134	2,302	393	NA			NA	SNL/NM Soil Background Range *						2.1-7.9	0.5-495	0.0027-6.2	0.5-31.4	0.75-103	0.0001-0.68	0.037-17.2	0.0016-8.7	0.02-<2.5	0.02-<2.5	mg/kg	SNL/NM Soil Background UTL or 95th Percentile *						7	214	0.9	15.9	11.8	<0.1	<1.0	<1.0	<2.5	<2.5	mg/kg	Proposed Subpart S Action Level For Soil						0.50	6,000	80	80,000 **	400 ***	20	400	400	400 **	400 **	mg/kg																																																																																																																																																																																																																																																																																																																																																																																																																						
018842-2	Soil	Field	12/19/94	ST-1	7.5	2.6	101	ND	5	5.1	ND	ND	ND	ND	ND			ND	mg/kg																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
018843-2	Soil	Dupl.	12/19/94	STD-1	7.5	2.3	64.5	ND	6.2	ND	ND	ND	ND	ND	ND			ND	mg/kg																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
018841-2	Soil	Field	12/19/94	ST-2	7.5	2.2	85.2	ND	9.3	ND	ND	ND	4.4	ND	ND			ND	mg/kg																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
018844-3,4	Water	EB	12/19/94	Site 161	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			NS	mg/L																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
Laboratory Reporting Limit For Soil						1	1	0.5	1	5	0.1	0.5	1	1	0.05 - 0.1			mg/kg																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
Laboratory Reporting Limit For Water						0.01	0.01	0.005	0.01	0.003	0.0002	0.005	0.01	0.01	NA			mg/L																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
Number of SNL/NM Background Soil Sample Analyses *						15	727	1,740	647	536	1,724	2,134	2,302	393	NA			NA																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
SNL/NM Soil Background Range *						2.1-7.9	0.5-495	0.0027-6.2	0.5-31.4	0.75-103	0.0001-0.68	0.037-17.2	0.0016-8.7	0.02-<2.5	0.02-<2.5	mg/kg																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
SNL/NM Soil Background UTL or 95th Percentile *						7	214	0.9	15.9	11.8	<0.1	<1.0	<1.0	<2.5	<2.5	mg/kg																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
Proposed Subpart S Action Level For Soil						0.50	6,000	80	80,000 **	400 ***	20	400	400	400 **	400 **	mg/kg																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										

Table 3-3, concluded:

ER Site 161
Summary of RCRA Metals and Hexavalent Chromium in Confirmatory Soil Samples
Collected Around the Septic Tank and in the Drainfield

Notes:

As = Arsenic. Arsenic background concentrations presented above are based on analyses of subsurface soil samples collected in the Coyote Test Field (CTF) area.
Ba = Barium. Barium background concentrations presented above are based on analyses of subsurface soil samples collected in the Southwest and CTF areas.
Be = Beryllium. Beryllium background concentrations presented above are based on analyses of surface and subsurface samples collected in the Southwest, CTF, and Offsite areas.
Cd = Cadmium. Cadmium background concentrations presented above are based on analyses of subsurface soil samples collected in the North, Tijeras, Southwest, CTF, and Offsite areas.
Cr = Chromium. Chromium background concentrations presented above are based on analyses of subsurface soil samples collected in the Southwest area.
Cr⁶⁺ = Hexavalent chromium. Hexavalent chromium background concentrations presented above are based on analyses of surface and subsurface soil samples collected in the Southwest area.
Pb = Lead. Lead background concentrations presented above are based on analyses of subsurface samples collected in the Southwest and Offsite areas.
Hg = Mercury. Mercury background concentrations presented above are based on analyses of subsurface soil samples collected in the North, Tijeras, Southwest, CTF and Offsite areas.
Se = Selenium. Selenium background concentrations presented above are based on analyses of surface and subsurface soil samples collected in the North, Tijeras, Southwest, CTF and Offsite areas.
Ag = Silver. Silver background concentrations presented above are based on analyses of subsurface soil samples collected in the North, Tijeras, Southwest, CTF, and Offsite areas.
in the North, Tijeras, Southwest, CTF and Offsite areas.

Dupl. = Duplicate soil sample

EB = Equipment rinse blank

fbsg = Feet below ground surface

G = Sample diluted due to matrix interference, resulting in raised detection limit

J = Result is detected below the reporting limit or is an estimated concentration.

mg/kg = Milligrams per kilogram

mg/L = Milligrams per liter

NA = Not applicable

ND = Not detected

UTL = Upper Tolerance Limit

* JT March 1998

** 80,000 mg/kg is for Cr³⁺ only. For Cr⁶⁺, proposed Subpart S action level is 400 mg/kg.

*** No proposed Subpart S action level for lead in soil, 400 ppm is EPA proposed action level (EPA July 1994)

Table 3-4

ER Site 161
 Summary of Tritium in Composite Confirmatory Soil Samples
 Collected in the Drainfield

Sample Number	Sample Matrix	Sample Type	Sample Date	Sample Location (Figure 2)	Top of Sample Interval (fbgs)	Tritium Method EPA-600 906.0 (pCi/L)		
						Result	Error *	M.D.A.
018821-4	Soil	Composite	12/12/94	DF-1/9	10	ND	150	270
018823-4	Soil	Composite	12/13/94	DF-1/9	20	ND	150	270
SNL/NM Soil Background Range **						U		
SNL/NM Soil Background 95th percentile **						U		
Nationwide Tritium Range in Precipitation and Drinking Water ***						100-400		

fbgs = Feet below ground surface
 M.D.A. = Minimum detectable activity
 ND = Not detected
 pCi/L = Picocuries per liter
 U = Undefined for SNL/NM soils.
 * Error = +/- 2 sigma uncertainty
 ** IT March 1996
 *** EPA October 1993

qualitative screening of composite samples from the drainfield shallow and deep sampling intervals did not indicate the presence of contamination from other radionuclides in soils at this location (Appendices A.4 and A.5).

Finally, the ER Site 161 septic tank contents were removed and the tank was cleaned in January 1996 (SNL/NM January 1996a). The tank was then inspected by a representative of the New Mexico Environment Department (NMED) to verify that the tank contents had been removed and the tank had been closed in accordance with applicable State of New Mexico regulations (SNL/NM January 1996b).

4. CONCLUSION

Sample analytical results generated from this confirmatory sampling investigation have shown that detectable or significant concentrations of COCs are not present in soils at ER Site 161, and that additional investigations are unwarranted and unnecessary. Based on archival information and chemical and radiological analytical results of soil samples collected next to the seepage pits and septic tank, SNL/NM has demonstrated that hazardous waste or COCs were not released from this SWMU into the environment (Criterion 5 of Section 1.2), and the site does not pose a threat to human health or the environment. Therefore, ER Site 161 is recommended for an NFA determination.

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