



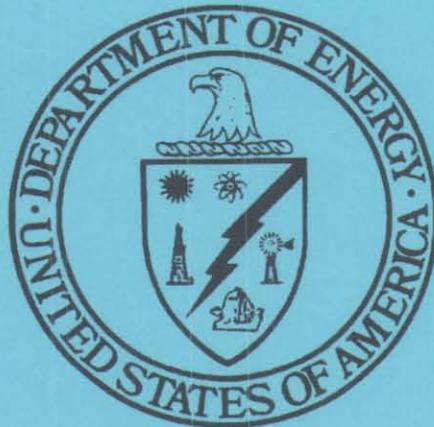
Sandia National Laboratories / New Mexico

**PROPOSAL FOR NO FURTHER ACTION
ENVIRONMENTAL RESTORATION PROJECT
SITE 146, BUILDING 9920 DRAIN SYSTEM
OPERABLE UNIT 1295**

FY 1995

August 1995

**Environmental
Restoration
Project**



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

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Environmental Restoration Project**

**Site 146, Building 9920 Drain System
OU 1295**

Prepared by
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Prepared for the
United States Department of Energy

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1. Introduction

1.1 ER Site 146, Building 9920 Drain 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 146, Building 9920 Drain System, Operable Unit (OU) 1295. ER Site 146 is listed in the Hazardous and Solid Waste Amendment (HSWA) Module IV (EPA August 1993) of the SNL/NM Resource Conservation and Recovery Act (RCRA) Hazardous Waste Management Facility Permit (NM5890110518) (EPA August 1992).

1.2 SNL/NM Confirmatory Sampling NFA Process

This proposal for a determination of an 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 (SWMU) at the facility that may pose a threat to human health or the environment" (as proposed in the code of Federal Regulations [CFR], Section 40 Part 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 146, Building 9920 Drain System, is based primarily on results of a passive soil-gas survey (NERI 1994) and analytical results of confirmatory soil samples collected from immediately around the ER Site 146 drywell. Concentrations of site-specific constituents of concern (COCs) were first compared to background upper tolerance limit (UTL) concentrations of COCs found in SNL/NM soils. If, however, no background data were available for a particular COC, concentrations of that constituent were then compared to proposed 40 CFR Part 264 Subpart S (Subpart S) soil action levels for the COC of interest (EPA July 1990). Concentrations of constituents at this site were found to be less than either or both background UTLs or proposed Subpart S action levels. This unit is therefore eligible for an NFA proposal based on one or more of the following criteria taken from the RCRA Facility Assessment (RFA) Guidance (EPA October 1986):

- Criterion A: The unit has never contained constituents of concern.
- Criterion B: The unit has design and/or operating characteristics that effectively prevent releases to the environment.
- Criterion C: The unit clearly has not released hazardous waste or constituents into the environment.

Specifically, ER Site 146 is being proposed for an NFA decision based on confirmatory sampling data demonstrating that hazardous waste or COCs have not been released from this SWMU into the environment (Criterion C).

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, 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 146 is located in the Coyote Test Field on KAFB and is approximately 0.3 mile east of Technical Area III (TA-III). Access to the site is provided by paved and graded dirt roads that extend southwest from Lovelace Road, and north from Magazine Road (Figure 1). ER Site 146 consists of the immediate area around a single drywell that is located between four and ten feet south of the southeast corner of the building (Figure 2). This drywell formerly served a darkroom sink and lavatory in Building 9920. The site encompasses approximately 0.03 acres of flat-lying land at an average elevation of 5,459 feet above mean sea level (AMSL).

The surficial geology at ER Site 146 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

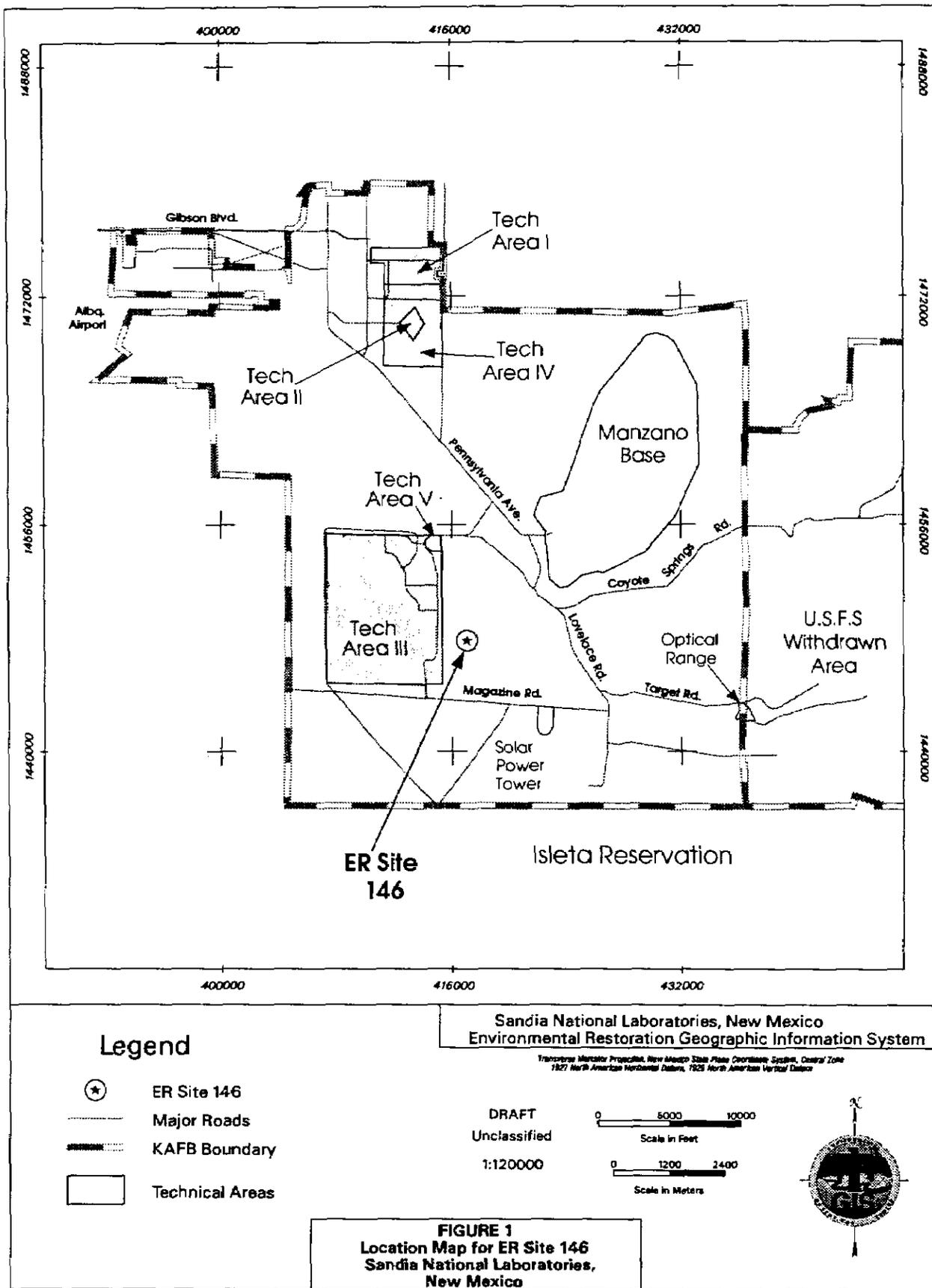


Figure 1. ER Site 146 Location Map

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 5,200 feet AMSL at this location, so depth to ground water is approximately 259 feet. No production wells are located in the immediate vicinity of ER Site 146. The nearest ground-water monitoring wells to ER Site 146 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 mile southwest of ER Site 146. Local ground water 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-2, KAFB-4, KAFB-7, and KAFB-8 which are approximately 3.9 to 5.4 miles away (SNL/NM March 1995).

2. History of the SWMU

2.1 Sources of Supporting Information

In preparing the confirmatory sampling NFA proposal for ER Site 146, 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 site operational history.

The following sources of information, hierarchically listed with respect to assigned validity, were used to evaluate ER Site 146:

- Confirmatory shallow subsurface soil sampling conducted in January 1995
- Two survey reports, including data from a surface radiation survey (RUST December 1994), and a passive soil-gas survey (NERI 1994)
- RCRA Facilities Investigation Work Plan for OU 1295, Septic Tanks and Drainfields. This document contains information from interviews with past employees of the site (SNL/NM March 1993)
- Photographs and field notes generated by SNL/NM ER program staff at ER Site 146
- SNL/NM facilities engineering construction drawings
- SNL/NM Geographic Information System (GIS) data
- The RFA report (EPA April 1987)

2.2 Previous Audits, Inspections, and Findings

ER Site 146 was first listed as a potential release site in the RFA report (EPA April 1987), which noted that explosives residue and other COCs may have been discharged to the Building 9920 Drain System during past operations. This SWMU was included in the RFA report as Site 79, along with several 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

Building 9920 was constructed in 1958. It contained instrumentation used to monitor explosives testing conducted in the immediate vicinity of the building. An SNL/NM Facilities Engineering construction drawing dated June 4, 1958, shows that the drywell served a darkroom sink and a lavatory in the southeast corner of Building 9920 (AEC June 1958). No toilet is shown on the drawing, and interviews with personnel familiar with this facility confirm that a toilet was never installed in the building. Prior to 1965, waste developing solutions were discharged into the darkroom sink. Black and white film processing was mainly performed, and some color film development may have also occurred. There are no floor drains in the building (SNL/NM March 1993). A SNL/NM employee familiar with the history of Building 9920 and who worked at the facility from 1965 to 1982 indicated that to the best of his recollection (1) a toilet and lavatory were never installed in the building; (2) the darkroom was dismantled sometime prior to 1965; and (3) the darkroom sink was removed about 1980 (SNL/NM June 1995).

Based on the activities performed at the facility, the primary COCs targeted in the investigation were spent photoprocessing chemicals (including silver, hexavalent chromium, cadmium, and cyanide). In addition, although ER Site 146 process knowledge indicates that radionuclides are unlikely COCs at this site, it lies within the eastern portion of ER Site 14 which is a designated Radioactive Materials Management Area (RMMA) (IT March 1994). For this reason, composite soil samples were collected from ER Site 146 and were analyzed for isotopic uranium. Potential beryllium surface contamination resulting from explosives experiments performed at the Building 9920 Firing Site, which is about 140 feet west of the building, is not included as part of OU 1295 assessment activities for ER Site 146 (SNL/NM March 1993). All potential surface contamination from this explosive testing is being investigated as part of the OU 1335 characterization program for ER Site 85.

3. Evaluation of Relevant Evidence

3.1 Unit Characteristics

There are no safeguards inherent in the drain system from Building 9920 or in facility operations that could have prevented past releases to the environment.

3.2 Operating Practices

As discussed in Section 2.3, the occasional release of photoprocessing wastes to the Building 9920 drywell was standard procedure. Hazardous wastes were not managed or contained at ER Site 146.

3.3 Presence or Absence of Visual Evidence

No visible evidence of soil discoloration, staining, or odors indicating residual contamination were observed when the drywell was located and partially uncovered with the backhoe, and soil samples were collected adjacent to the unit in January of 1995 (SNL/NM January 1995).

3.4 Results of Previous Sampling/Surveys

A surface radiological survey conducted by RUST Geotech Inc. at ER Sites 14 and 85 in March 1994 included the area around Building 9920, and did not detect any point or aerial anomalies above background levels within the confines of ER Site 146 (RUST December 1994).

A brief geophysical survey using a magnetometer was performed at the site in March 1994 to help locate metal parts of the drywell, if any. No attempt was made to use geophysical techniques to identify areas with high moisture content, since discharges of significant volumes of effluent did not occur at this site. The results of the magnetometer survey were inconclusive, most likely because of the abundance of buried utility cables in the immediate area of the drywell. Therefore, the geophysical survey results were not useful in identifying the location of the drywell.

The passive soil-gas survey conducted at the site in July 1994 utilized PETREX sampling tubes to identify any releases of volatile organic compounds (VOCs) and semivolatile organic compound (SVOCs) to the soil around the drywell (SNL/NM July 1994). The PETREX tube soil-gas survey is a semiquantitative screening procedure that can be used to identify many VOCs and SVOCs, and can be used to guide VOC and SVOC site investigations. The advantages of this soil-gas 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 integrated 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 upside down 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. NERI considers a "hit" for individual compounds (such as perchloroethene [PCE] or trichloroethene [TCE]) to be greater than 100,000 ion counts, and

200,000 ion counts for mixtures of compounds (BTEX compounds or aliphatics, for example) (NERI 1994). No VOCs or SVOCs were found in detectable quantities in PETREX tubes placed at this site. The analytical results of the passive soil-gas survey at Site 146 are summarized in Table A.1 of Appendix A.

In January 1995 a backhoe was used to locate and partially excavate the drywell to determine the exact location of the end of the drain pipe from Building 9920. The drywell was found to consist of a rectangular pit 6 feet long by 6 feet wide excavated in native material, and was filled with 2-inch aggregate from about 1 foot below grade down to the estimated bottom of the drywell at 4 feet below grade. No concrete or metal liner enclosing the gravel was found. The actual bottom of the drywell was not determined by excavating because of the abundance of buried utilities at this location. The end of the Building 9920 drainline was found to be positioned 1.3 feet into the north side of the drywell gravel. The drainline itself consists of a 4-inch-diameter cast iron pipe buried about 18 inches below grade. No visual or olfactory evidence of contamination was noted in soils excavated from immediately around the gravel-filled pit (SNL/NM January 1995a). The photograph in Figure 3 shows the drywell excavating operation.

3.5 Assessment of Gaps in Information

While the history of past releases at the site is incomplete, analytical data from confirmatory soil samples collected in January 1995 (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 146 was considered low, confirmatory soil sampling was conducted in January 1995 immediately adjacent to the drywell to determine whether COCs above background or detectable levels were released by the drywell to the environment at this site. 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 (RFI) Work Plan (SNL/NM March 1993), and addenda to the RFI Work Plan developed during the OU 1295 project approval process (IT March 1994 and SNL/NM November 1994).

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 1.

Soil samples were collected from one boring on either side of the drywell. The boreholes were located approximately 2 feet away from the edge of opposite sides of the gravel-filled drywell pit, and are shown on Figure 2. Two depth intervals were sampled in each borehole, the first starting at the estimated bottom of the drywell (4 feet below grade),

Table 1
ER Site 146: Confirmatory Sampling Summary Table

ER Site Number and Unit	Analytical Parameters	Number of Sample Locns.	Top of Spig. Interval(s) at Each Boring Location	Total Number of Invest. Samples	Total Number of Duplicate Samples	Date(s) Samples Collected
146 Drywell (bottom of drywell estimated to be 4 feet below grade)	VOCs	2	4', 14'	4	1	1/11/95: 2 of 2 shallow, 2 of 2 deep intervals. 1 set duplicate samples
	SVOCs	2	4', 14'	4	1	
	RCRA metals + Cr6	2	4', 14'	4	1	
	HE (TNT screen)	2	4', 14'	4	1	
	Cyanide	2	4', 14'	4	1	
	Iso. uranium compos.	2	4', 14'	2	1	
	Gamma spec. compos.	2	4', 14'	2		
	Tritium composite	2	4', 14'	2		

Notes

- VOC = Volatile organic compounds
- SVOC = Semivolatile organic compounds
- RCRA = Resource Conservation and Recovery Act
- Cr = Chromium
- HE = High explosives
- TNT = Trinitrotoluene

and the second starting at 10 feet below the top of the first sampling interval (14 feet below grade) (SNL/NM January 1995b). One set of duplicate samples was collected from the shallow sampling interval in borehole S146-DW1-2 (Figure 2).

The Geoprobe sampling system was used to collect subsurface soil samples at this site. This equipment was used for most of the OU 1295 soil sampling work completed from October 1994 through January 1995. 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 2 feet in order to fill the 2-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 2-foot sampling runs were completed at each interval in



Locating the ER Site 146 Drywell with a backhoe.
(View looking north, Building 9920 in background.)

Figure 3. ER Site 146: Photograph Showing the Drywell Excavating Operation

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, and was analyzed for SVOCs, RCRA metals, hexavalent chromium, and cyanide by laboratory analysis, and trinitrotoluene (TNT) compounds using a field screening immunoassay technique. Routine SNL/NM chain-of-custody and sample documentation procedures were employed, and samples were shipped to the laboratory by an overnight delivery service.

To determine if radionuclides were present in soils adjacent to the drywell at this site, shallow and deep interval composite soil samples were collected from the two borings, analyzed by a commercial laboratory for isotopic uranium and tritium, and screened for other radionuclides using SNL/NM in-house gamma spectroscopy.

Quality assurance/quality control (QA/QC) samples collected during this sampling effort consisted of one set of duplicate soil samples analyzed for the same constituents as the field samples, except for tritium and the gamma spectroscopy radionuclides. One set of aqueous equipment rinsate samples were also collected and analyzed for the same nonradiologic chemical constituents as the field samples; 3.7 parts per billion of methylene chloride was the only contaminant detected in the rinsate samples. Also, a soil trip blank sample was included with the shipment of ER Site 146 soil samples to the laboratory and was analyzed for VOCs only. Acetone, 2-hexanone, methyl ethyl ketone (MEK), methylene chloride, toluene, and xylenes were detected in this soil trip blank by the laboratory. These common laboratory contaminants were either not detected, or were found in generally lower concentrations in the site soil samples compared to the trip blank. Soil used for this trip blank 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. Apparently 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.

A summary of all constituents detected by commercial laboratory analyses in these confirmatory and associated QA/QC samples is presented in Tables 2, 3, and 4. Results of the SNL/NM in-house gamma spectroscopy composite soil sample screening for other radionuclides are presented in Tables A.2 and A.3 of Appendix A. Complete soil sample analytical data packages are archived in the Environmental Operations Records Center and are readily available for review and verification (SNL/NM January 1995c).

3.7 Rationale for Pursuing a Confirmatory Sampling NFA Decision

The passive soil-gas survey did not indicate any anomalies or areas of VOC or SVOC contamination in soils at ER Site 146.

Confirmatory soil sampling at the point of discharge around the drywell did not identify any residual COCs that indicate past releases from this unit that could pose a threat to human health or the environment. The four VOC compounds (acetone, MEK, methylene chloride,

Table 2

ER Site 146
 Summary of Organic and Other Constituents Detected in Confirmatory Soil Samples
 Collected Around the Drywell

Sample Number	Sample Matrix	Sample Type	Sample Date	Sample Location (Figure 2)	Top of Sample Interval (ftgs)	VOCs Method 8240										SVOCS, Method 8270	Cyanide, Method 9010/9012	TNT Screen, Colorimetric method based on EPA 8515	Units
						Acetone	2- Hexanone	MEK	Meth. Chloride	MIBK	Toluene	Total Xylenes							
018909-1,2	Soil	Field	1/11/95	S146-DW1-1	4	8.8 J	ND	4.7 J	1.7 J	ND	ND	ND	ND	ND	ND	ND	ND	ug/kg	
018910-1,2	Soil	Field	1/11/95	S146-DW1-1	14	9.5 J	ND	ND	1.4 J	ND	ND	ND	ND	ND	ND	ND	ND	ug/kg	
018911-1,2	Soil	Field	1/11/95	S146-DW1-2	4	13	ND	ND	2 J	1.3 J	ND	ND	ND	ND	ND	ND	ND	ug/kg	
018912-1,2	Soil	Dupl.	1/11/95	S146-DWD1-2	4	12	ND	ND	2.2 J	1.3 J	ND	ND	ND	ND	ND	ND	ND	ug/kg	
018913-1,2	Soil	Field	1/11/95	S146-DW1-2	14	13	ND	ND	1.1 J	ND	ND	ND	ND	ND	ND	ND	ND	ug/kg	
018914-1	Water	EB	1/11/95	Site 146	NA	ND	ND	ND	3.7 B,J	ND	ND	ND	ND	ND	ND	NS	NS	ug/L	
021453-1	Soil	TB	1/12/95	Site 146	NA	47	1.6 J	19	4.3 J	ND	2.3 J	1.4 J	1.4 J	NS	NS	NS	NS	ug/kg	
Laboratory Detection Limit For Soil						10	10	10	5	10	5	5	5	330, 1600	0.5	1000	ug/kg		
Proposed Subpart S Action Level For Soil						8E+06	None	5E+07	9E+04	None	2E+07	2E+08	NA	2E+06	4E+04	ug/kg			

Notes

- B = Compound detected in associated blank sample
- Dupl. = Duplicate soil sample
- EB = Equipment rinsate blank
- ftgs = Feet below ground surface
- J = Result is detected below the reporting limit or is an estimated concentration.
- MEK = Methyl ethyl ketone
- Meth. Chloride = Methylene chloride
- SVOC = Semivolatille organic compounds
- VOC = Volatile organic compounds
- MIBK = Methyl isobutyl ketone
- NA = Not applicable
- ND = Not detected
- None = No Subpart S action level proposed for this constituent
- NS = No sample
- TB = Trip Blank
- TNT = Trinitrotoluene
- ug/kg = Micrograms per kilogram
- ug/L = Micrograms per liter

Table 3
ER Site 146
Summary of RCRA Metals and Hexavalent Chromium Analytical Results for Confirmatory Soil Samples
Collected Around the Drywell

Sample Number	Sample Matrix	Sample Type	Sample Date	Sample Location (Figure 2)	Top of Sample Interval (fbgs)	RCRA Metals, Methods 6010 and 7471								Other Metals:	
						As	Ba	Cd	Cr, total	Pb	Hg	Se	Ag	Cr ⁶⁺ Method 7196	Units
018909-2	Soil	Field	1/11/95	S146-DW1-1	4	2.8	116	ND	4.7	3.6 J	ND	ND	ND	ND	mg/kg
018910-2	Soil	Field	1/11/95	S146-DW1-1	14	2.4	110	ND	6.8	4.5 J	ND	ND	ND	ND	mg/kg
018911-2	Soil	Field	1/11/95	S146-DW1-2	4	2.7	185	ND	4.6	4.4 J	ND	ND	ND	ND	mg/kg
018912-2	Soil	Dupl.	1/11/95	S146-DWD1-2	4	2.2	116	ND	5.1	3.5 J	ND	ND	ND	ND	mg/kg
018913-2	Soil	Field	1/11/95	S146-DW1-2	14	2.2	75.2	ND	4.7	4.8 J	ND	ND	ND	ND	mg/kg
018914-3	Water	EB	1/11/95	Site 146	NA	ND	ND	ND	ND	ND	ND	ND	ND	NS	mg/L
Laboratory Detection Limit For Soil						1	1	0.5	1	5	0.1	0.5	1	0.05	mg/kg
SNL/NM Soil Background Range *						U	0.13-730	0.1-8.5	0.01-58.1	1-110	U	U	0.05-10	ND	mg/kg
SNL/NM Soil Background UTL, 95th %tile *						U	407.9	3.51	22.9	15	U	U	4	ND	mg/kg
Proposed Subpart S Action Level For Soil						20	6,000	80	80,000**	400***	20	400	400	400**	mg/kg

Notes

- As = Arsenic
- Ba = Barium
- Cd = Cadmium
- Cr = Chromium
- Pb = Lead
- Hg = Mercury
- Se = Selenium
- Ag = Silver
- Dupl. = Duplicate soil sample
- EB = Equipment rinsate blank
- fbgs = Feet below ground surface
- mg/kg = Milligrams per kilogram
- mg/L = Milligrams per liter
- J = Result is detected below the reporting limit or is an estimated concentration.
- NA = Not applicable
- ND = Not detected
- NS = No sample
- U = Undefined for SNL/NM soils.
- UTL = Upper Tolerance Limit
- * IT Corp., October 1994
- ** 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 4

ER Site 146
 Summary of Isotopic Uranium and Tritium Analyses of Composite Confirmatory Soil Samples
 Collected From Around the Drywell

Sample Number	Sample Matrix	Sample Type	Sample Date	Sample Location (Figure 2)	Top of Sample Interval (fbgs)	Analytical Method	Compound Name	Results	+/- 2 Sigma Uncertainty	Detection Limit	Background UTLL Activity *	Units
018909-5	Soil	Compos.	1/11/95	S146-DW1-1/2	4	HASL-300	Uranium-238	0.66	0.13	0.036	1.1	pCi/g
018909-5	Soil	Compos.	1/11/95	S146-DW1-1/2	4	HASL-300	Uranium-235	0.018 J	0.021	0.031	0.168	pCi/g
018909-5	Soil	Compos.	1/11/95	S146-DW1-1/2	4	HASL-300	Uranium-233/234	0.79	0.14	0.026	1	pCi/g
018912-5	Soil	Dupl. Comp.	1/11/95	S146-DWD1-1/2	4	HASL-300	Uranium-238	0.7	0.13	0.011	1.1	pCi/g
018912-5	Soil	Dupl. Comp.	1/11/95	S146-DWD1-1/2	4	HASL-300	Uranium-235	0.023 J	0.022	0.025	0.168	pCi/g
018912-5	Soil	Dupl. Comp.	1/11/95	S146-DWD1-1/2	4	HASL-300	Uranium-233/234	0.77	0.14	0.03	1	pCi/g
018910-5	Soil	Compos.	1/11/95	S146-DW1-1/2	14	HASL-300	Uranium-238	0.75	0.16	0.062	1.1	pCi/g
018910-5	Soil	Compos.	1/11/95	S146-DW1-1/2	14	HASL-300	Uranium-235	0.042 J	0.039	0.054	0.168	pCi/g
018910-5	Soil	Compos.	1/11/95	S146-DW1-1/2	14	HASL-300	Uranium-233/234	0.85	0.18	0.11	1	pCi/g
018914-6	Water	EB	1/11/95	Site 146	NA	HASL-300	Uranium-238	0.055 J	0.051	0.068	NA	pCi/L
018914-6	Water	EB	1/11/95	Site 146	NA	HASL-300	Uranium-235	0.034 J	0.041	0.059	NA	pCi/L
018914-6	Water	EB	1/11/95	Site 146	NA	HASL-300	Uranium-233/234	0.11	0.073	0.087	NA	pCi/L
018909-4	Soil	Compos.	1/11/95	S146-DW1-1/2	4	EPA 600 906.0	Tritium	150 J	170	280	U	pCi/L
018910-4	Soil	Compos.	1/11/95	S146-DW1-1/2	14	EPA 600 906.0	Tritium	250	150	250	U	pCi/L

Notes

- Compos. = Composite sample
- Dupl. Comp. = Duplicate composite sample
- EB = Equipment rinsate blank
- fbgs = Feet below ground surface
- J = Result reported is an estimated activity level below the method practical quantitation limit.
- NA = Not applicable
- NID = Not detected
- pCi/g = Picouries per gram
- pCi/L = Picouries per liter
- U = Undefined for SNL/NM soils
- UTLL = Upper Tolerance Limit
- * IT Corp., October 1994

and methyl isobutyl ketone [MIBK]) that were detected in the drywell soil samples were for the most part identified at below-reporting-limit concentrations, and are common laboratory contaminants (Table 2). As shown in Table 2, no SVOC constituents, cyanide, or TNT compounds were identified in these soil samples. Soil sample analytical results also indicate that, except for arsenic, the nine heavy metals that were targeted in the Site 146 soil investigation were either not detected, or were detected in concentrations below the background UTL concentrations of metals presented in the draft SNL/NM study of naturally-occurring constituents (IT October 1994). Arsenic concentrations were therefore compared to, and were found to be much lower than, the Subpart S soil action level for that metal (Table 3). In addition, isotopic uranium activity levels detected in the three composite soil samples were less than corresponding background UTL activity levels for those nuclides (Table 4). As shown in Table 4, the highest tritium activity level detected in sample soil moisture was at the detection limit for this constituent, and indicates that tritium contamination is not present at this site. Finally, the gamma spectroscopy semiquantitative screening detected very low activity levels of a few radionuclides, and did not indicate the presence of contamination from other radionuclides in soils at this site (Tables A.2 and A.3 of Appendix A).

4. Conclusion

Sample analytical results generated from this confirmatory sampling investigation show that detectable or significant concentrations of COCs are not present in soils at ER Site 146, and that additional investigations are unwarranted and unnecessary.

Based on archival information and chemical and radiological analytical results of soil samples collected at the likely points of release of effluent from the Building 9920 drywell, SNL/NM has demonstrated that hazardous waste or COCs have not been released from this SWMU into the environment (Criterion C of Section 1.2), and the site does not pose a threat to human health or the environment. Therefore, ER Site 146 is recommended for an NFA determination.

5. References

5.1 ER Site 146 References

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October 13, 2003

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