Sandia National Laboratories / New Mexico

PROPOSAL FOR NO FURTHER ACTION ENVIRONMENTAL RESTORATION PROJECT SITE 92, PRESSURE VESSEL TEST SITE (COYOTE CANYON BLAST AREA) OPERABLE UNIT 1333

FY 1995

August 1995

Environmental Restoration Project

United States Department of Energy
Albuquerque Operations Office

PROPOSAL FOR
NO FURTHER ACTION
Environmental Restoration Project

Site 92, Pressure Vessel Test Site (Coyote Canyon Blast Area)
OU 1333

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

Prepared for the
United States Department of Energy

TABLE OF CONTENTS

LIST OF FIGURES

1. INTRODUCTION

1.1 ER Site Identification Number and Name

Sandia National Laboratories/New Mexico (SNL/NM) is proposing an administrative no further action (NFA) decision for Environmental Restoration (ER) Site 92, Pressure Vessel Test Site, Operable Unit (OU) 1333. ER Site 92 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 Administrative NFA Process

This proposal for a determination of an administrative NFA decision has been 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 will "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 264.51[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).

In requesting an administrative NFA decision for ER Site 92, Pressure Vessel Test Site, this proposal is using existing administrative/archival information to satisfy the permit requirements. This unit is eligible for an administrative 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 (COCs).
- 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 92 is being proposed for an administrative NFA decision because the site clearly has not released hazardous waste or constituents 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 nuclear activities since 1945.

ER Site 92 (Figure 1-1) lies on land owned by the United States Air Force and permitted to DOE (SNL/NM July 1994). The site is located near the eastern boundary of KAFB, approximately 0.75 mile northeast of Coyote Springs. Access to the site is provided by Pendulum Road (92-23) by Coyote Springs Road. The site covers approximately 6.1 acres at a mean elevation of 6,000 feet above sea level (SNL/NM April 1995). Immediate topographic relief around the site is approximately 40 feet (Figure 1-1).

ER Site 92 is located adjacent to an arroyo channel on gentle slopes comprised of soils of the Salas Complex (USDA June 1977) that are underlain by igneous and metamorphic Precambrian rocks (IT May 1994). The soils are derived from coarse-grained decomposed igneous and metamorphic Precambrian rock, and they are well-drained with moderately deep to deep profiles developed on alluvial fan surfaces (USDA June 1977). The arroyo channel is located to the immediate west of ER Site 92 and is a tributary channel to Arroyo del Coyote. There are no channel gauging stations in this arroyo channel or documented channel discharges in the vicinity of ER Site 92. The depth of the alluvial-fan and channel deposits at ER Site 92 is unknown.

The Greystone Manor and TSA-1 Wells are the nearest monitoring wells, lying approximately 1.2 miles and 1.5 miles southwest and southeast of ER Site 92, respectively (Figure 1-1). Ground water conditions at the TSA-1 Well are probably more representative of conditions at ER Site 92, because ER Site 92 and the TSA-1 Well lie east of the Coyote Fault on thin alluvial deposits underlain by igneous and metamorphic Precambrian rocks (IT May 1994). At the TSA-1 Well, ground water is encountered in fractured Precambrian bedrock at a depth of 180 feet below the surface under semiconfined to confined hydraulic conditions (IT May 1994). Local ground water flow in the vicinity of ER Site 92 may be complicated due to abundant fractures and faults in the area.

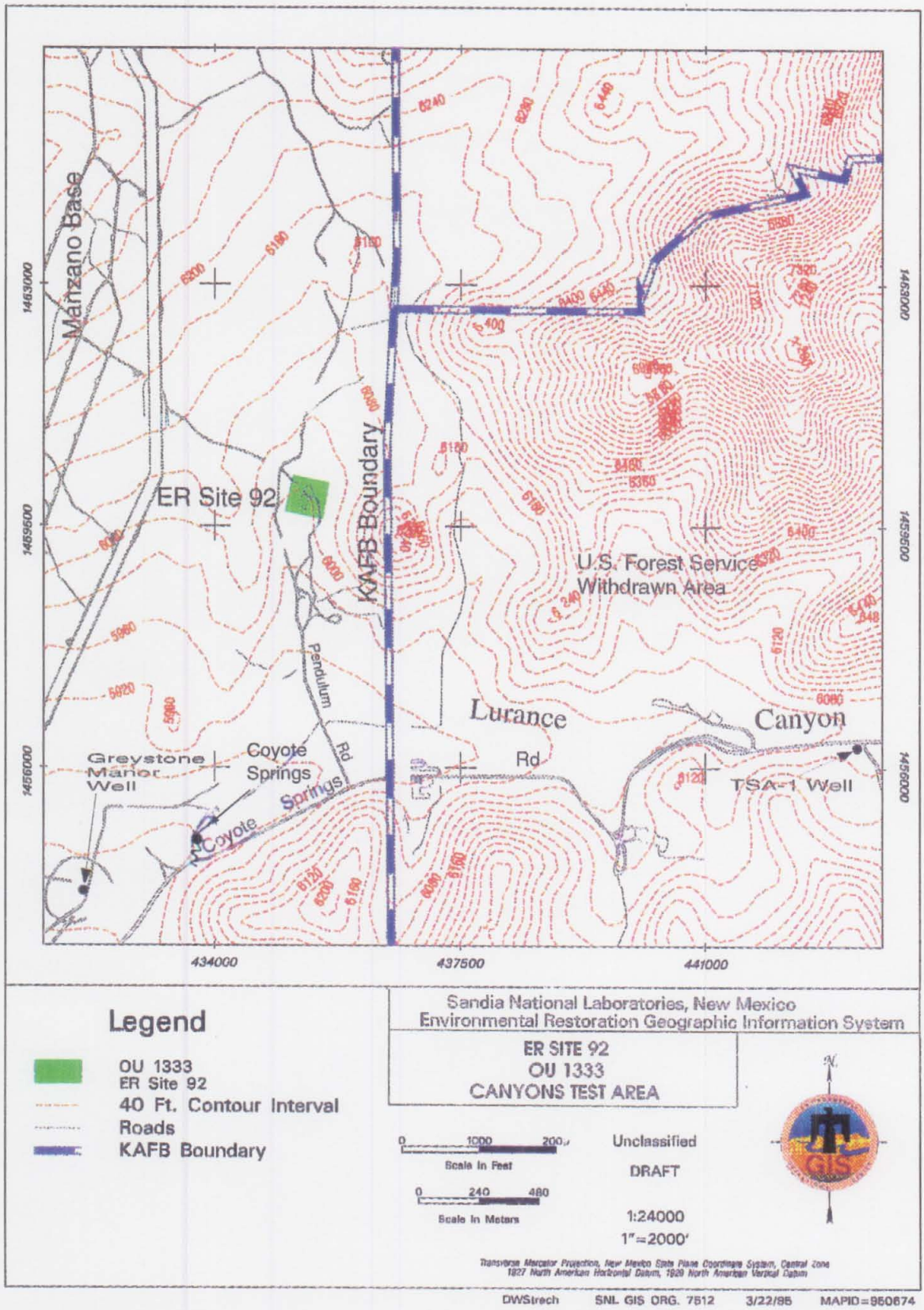

Figure 1-1
Location of ER Site 92, Pressure Vessel Test Site

2. HISTORY OF THE SWMU

2.1 Sources of Supporting Information

In preparing to request an administrative NFA decision for ER Site 92, a background study was conducted to collect available and relevant site information. Background information sources included existing reports and records of site activity. Interviews were conducted with SNL/NM staff as well as with contractors familiar with site operational history. The study was completely documented and has provided traceable references that sustain the integrity of this proposal.

The following information sources, hierarchically listed with respect to assigned validity, were available for use in the evaluation of ER Site 92:

- Two preliminary survey reports, including data from one radiation survey and one unexploded ordnance/high explosives (UXO/HE) survey
- Six historical aerial photographs spanning 10 years (1982 to 1992)
- One interview with two former SNL/NM site personnel
- Photographs and field notes from numerous site inspections conducted by SNL/NM staff
- Miscellaneous information sources, including the SNL/NM Geographic Information System and SNL/NM personnel correspondence (memoranda, letters, and notes) regarding ER Site 92
- The Comprehensive Environmental Assessment and Response Program (CEARP) Phase I report (DOE September 1987) and CEARP records contained in the Environmental Operations Record Center
- The RFA report (EPA April 1987)

Using this information, a brief history of ER Site 92 and a discussion of all relevant evidence regarding past practices and releases at the site have been prepared and are presented in this proposal for an administrative NFA decision.

2.2 Previous Audits, Inspections, and Findings

ER Site 92 was first listed as a potential release site based on the CEARP interviews in 1985 (DOE September 1987). There were no hazardous materials associated with past tests conducted at this site, and the CEARP finding was negative for RCRA-regulated hazardous waste. Therefore, no further action was planned for this site under the CEARP.

Subsequent to the CEARP inspection, the Environmental Protection Agency conducted an RFA (EPA April 1987). The RFA report stated that, because the site managed nonhazardous waste, the potential for release of hazardous constituents to the environment was low.

2.3 Historical Operations

Historical aerial photographs indicate that the construction of ER Site 92 began prior to October 1982 (SNL/NM August 1994). ER Site 92 (Figure 2-1) was historically used by SNL/NM Organization 6449 between 1981 and 1987 to conduct tests of nuclear reactor containment structures to determine their tolerance for extreme internal pressure (92-2). The testing, sponsored by the Nuclear Regulatory Commission, involved subjecting scale models of nuclear reactor pressure vessels to overpressure conditions (92-2, 92-14, 92-23).

Test activities were initially conducted with 1/32- and 1/8-scale models (Figures 2-2a and 2-2b) (92-2). The model pressure vessel currently on site is a 1/6-scale model (Figure 2-2c) (92-2). Tests on a 1/8-scale model were performed at the current location of the 1/6-scale model (92-2). Pressure vessel tests with the 1/32-scale model were conducted in the inactive area of ER Site 92, in the proximity of the present location of the model (92-2). The exact location of the 1/32-scale model tests is unknown. An office trailer, a workshop trailer, and storage trailers associated with the pressure vessel tests are still present at ER Site 92 (Figure 2-1). Building 9801 was reported to be the control point for the pressurization tests and Building 9806 housed instrumentation for tests conducted at the site (92-2) (Figure 2-1).

In a typical overpressure test, the concrete and steel model pressure vessels were pressurized to beyond design specifications with nitrogen gas (92-2, 92-14). Failure of the model pressure vessel was the desired test result (92-2, 92-14). Some models fractured along welds or other weak points, while others failed explosively (92-2). No hazardous materials were used in the testing (92-2, 92-18, 92-23). In November 1984, the 1/8-scale-model pressure vessel exploded (92-28), and the resulting metal scrap was removed to a roped area approximately 500 feet south of Building 9806 (Figure 2-1). Metal scrap from other tests was removed during a "directorate clean-up day" (92-2), which occurred prior to the DOE Headquarters Tiger Team audit of SNL/NM in the fall of 1991 (92-28).

The main area at ER Site 92 (Figure 2-1) holds the 1/6-scale-model nuclear reactor pressure vessel covered by a corrugated roof and trailers, transformers, compressors, camera bunkers, and a water tank associated with the pressure vessel's use. Building 9806 housed the instruments used in testing activities conducted at the site (Figure 2-1) (92-27). ER Site 92 was used by SNL/NM Organization 6642 in 1992 to conduct Direct Containment Heating Experiments (92-2, 92-23, 92-25, 92-27). The 1/6-scale model was pressurized with steam, or occasionally nitrogen gas, prior to igniting a thermite heat source within the vessel. The thermite heat source simulated the melting of the nuclear core due to coolant loss and consists of an iron/aluminum oxide-based material (92-2, 92-23, 92-25). No hazardous materials were used in these experiments (92-25).

The inactive area at ER Site 92 (Figure 2-1) holds the 1/32-scale-model pressure vessel (Figure 2-2a) and metal scrap originating from the failure of the 1/8-scale-model pressure

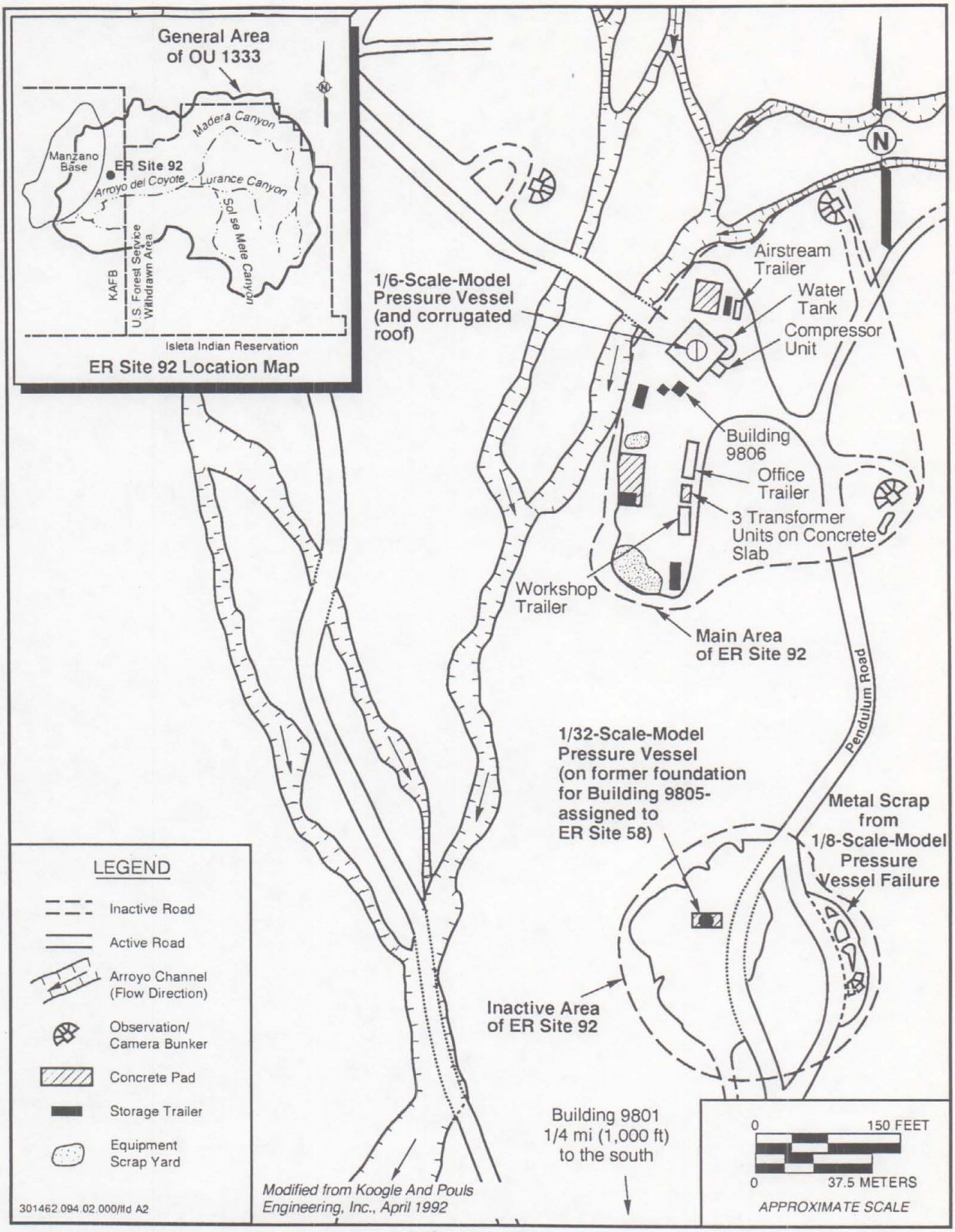

Figure 2-1
Site Map of ER Site 92, Pressure Vessel Test Site

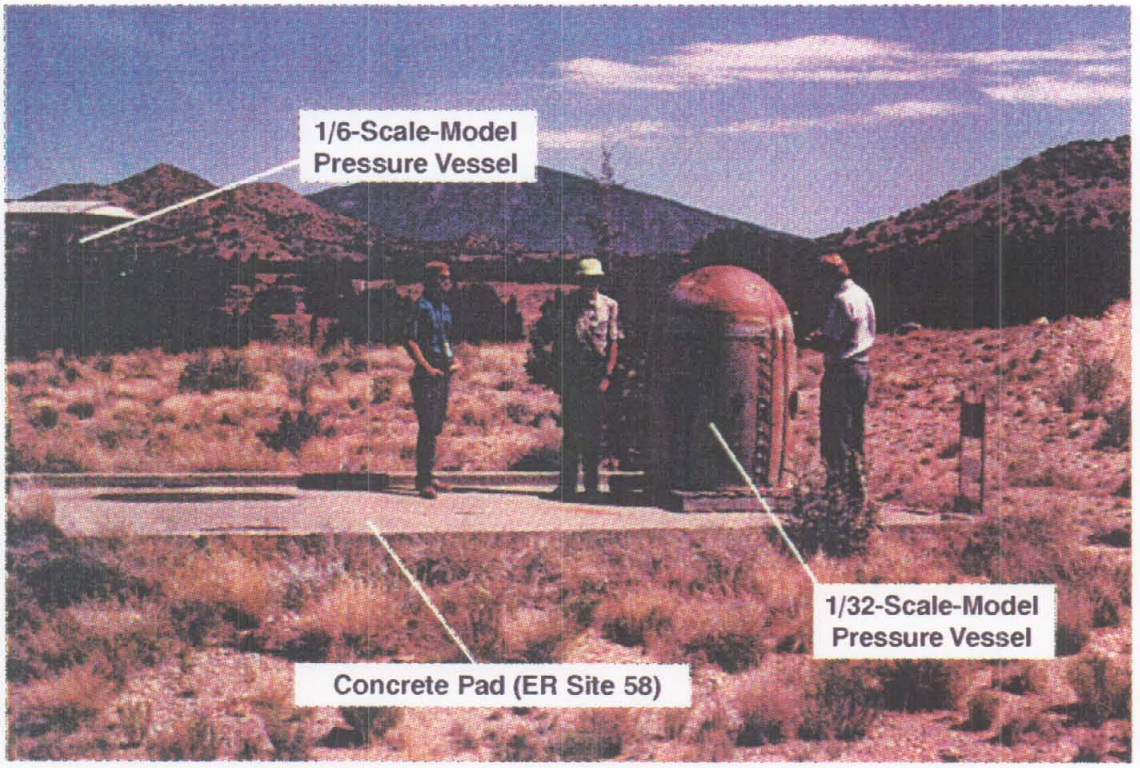

Figure 2-2a. Photograph of the inactive area of ER Site 92 in July 1993. The 1/32-scale-model pressure vessel rests on a concrete pad (associated with ER Site 58). View is to the northeast.

Figure 2-2b. Photograph of the inactive area of ER Site 92 in July 1993. Metal scrap from the 1/8-scale-model pressure vessel that failed is identified. View is to the northwest.

Figure 2-2
ER Site 92 Photographs

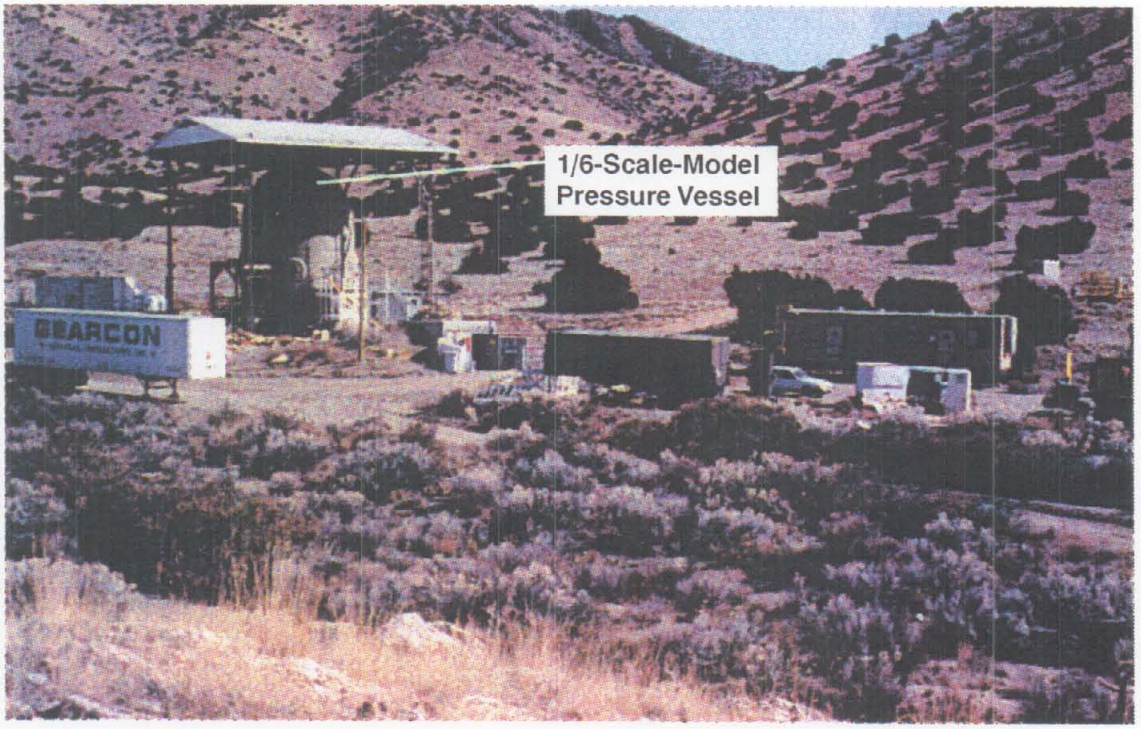

Figure 2-2c. Photograph of the main area of ER Site 92 in November 1992. The 1/6-scale-model pressure vessel is shown under the corrugated roof. View is to the northeast.

Figure 2-2 (Concluded)
ER Site 92 Photographs

vessel (Figure 2-2b). These materials are located approximately 500 feet south of the main area of ER Site 92 (Figure 2-1). The inactive 1/32-scale model is located on a wooden pallet situated on a concrete pad that was formerly the foundation for Building 9805 (92-2, 92-23), which no longer exists at the site. Building 9805 is believed to have been an HE assembly building (92-10) associated with ER Site 58 activities. The concrete pad will be addressed with ER Site 58 contained in OU 1332.

Although the main area of ER Site 92 is capable of supporting additional testing operations, the site has not been used by SNL/NM Organization 6642 since 1992 (92-2, 92-27). Pressure vessel testing is currently conducted at Technical Area III, although ER Site 92 remains in a stand-by mode to accommodate future test activities should a need arise.

3. EVALUATION OF RELEVANT EVIDENCE

3.1 Unit Characteristics

ER Site 92 was used between 1981 and 1992 to perform pressure tests on 1/32-, 1/8-, and 1/6-scale-model nuclear reactors constructed of steel and concrete. The tests were conducted to determine the vessel tolerance for extreme internal pressure. No hazardous materials were used during historical test operations, as only nitrogen gas or steam was used to pressurize the vessels (92-2, 92-9, 92-23). The thermite heat source used in the 1992 testing operations was an iron/aluminum-oxide material (92-25) that contains no hazardous constituents. Currently, the main area of ER Site 92 is in a stand-by status.

3.2 Operating Practices

ER Site 92 was used for testing models of nuclear reactor pressure vessels from 1981 through 1992 (92-2, 92-18, 92-27, DOE September 1987). The tests consisted of overpressurizing the models with nitrogen gas to beyond design capacity (i.e., until failure) (92-2, 92-18, 92-23, DOE September 1987).

In November 1984, a 1/8-scale model failed explosively (92-2, 92-23, 92-28). The remains of this model were collected and are currently located in the inactive area of ER Site 92 approximately 500 feet south of the main area (92-2). Since no hazardous materials were used in the test activities at ER Site 92 (92-2, 92-18, 92-23), this vessel failure did not cause a release of hazardous waste or constituents to the environment.

3.3 Presence or Absence of Visual Evidence

All features associated with the main area of ER Site 92 are currently present at the site. They include a 1/6-scale-model pressure vessel covered by a corrugated metal roof and associated features (trailers, transformers, compressors, camera bunkers, and water tanks). The features associated with the inactive southern area of the site include a 1/32-scale-model pressure vessel and metal scrap derived from the explosive failure of the 1/8-scale-model pressure vessel. These are the only physical structures associated with ER Site 92 activities, as evidenced by historical aerial photographs that indicate no other activities or structures were present at ER Site 92 (SNL/NM August 1994).

3.4 Results of Previous Sampling/Surveys

3.4.1 UXO/HE Survey

In October 1993, KAFB Explosive Ordnance Disposal (EOD) conducted a visual survey for UXO/HE on the ground surface of ER Site 92. No UXO/HE or ordnance debris was identified by the survey (92-22).

3.4.2 Gamma Radiation Survey

In October and November of 1993, RUST Geotech Inc. conducted a surface gamma radiation survey of ER Site 92. No areas of gamma activity greater than 30% above natural background levels (10 to 13 microroentgen per hour [μR/hr]) were found (RUST Geotech Inc. December 1994).

3.5 Assessment of Gaps in Information

There are no records that indicate hazardous waste was released or disposed of at ER Site 92. No radioactive, explosive, or hazardous components were historically used in ER Site 92 testing.

3.6 Rationale for Pursuing an Administrative NFA Decision

SNL/NM is proposing an administrative NFA decision for ER Site 92 because the site clearly has not released hazardous waste or constituents into the environment (Criterion C). The site was historically used to conduct pressure tests on scale-model nuclear reactor pressure vessels to determine their tolerance to extreme internal pressures. The scale models were constructed of concrete and steel and pressurized with steam or nitrogen gas. Direct containment heating experiments with the 1/6-scale model (currently present at the main area of the site) used thermite, an iron/aluminum-oxide based material that served as a heat source. No radioactive, explosive, or hazardous components were used, nor are currently used, in ER Site 92 activities.

An investigation conducted under the CEARP indicated that no hazardous materials were used at the site, and the CEARP finding was negative for RCRA-regulated hazardous waste (DOE September 1987). Subsequent interviews with test personnel have confirmed the findings of the CEARP investigation (92-23).

In October 1993, a UXO/HE survey conducted by KAFB EOD found no live ordnance at the site (92-22). In October and November of 1993, RUST Geotech Inc. conducted a surface gamma radiation survey of ER Site 92 and found no areas of gamma activity greater than 30% above natural background levels (10 to 13 μR/hr) (RUST Geotech Inc. December 1994). Therefore, based on recent surveys and newly obtained historical information, ER Site 92 is recommended for an administrative NFA decision because the site clearly has not released hazardous waste or constituents into the environment (Criterion C).

4. CONCLUSION

Based upon the evidence presented, no potential exists for a release of hazardous waste (including hazardous constituents) which may pose a threat to human health or the environment. Therefore, ER Site 92 is recommended for an NFA determination.

5. REFERENCES

5.1 ER Site References

Section 5.1 contains a comprehensive bibliographical list of the documents relating to ER Site 92. This list is arranged numerically by the numbers assigned to each document.

ER Site Reference Number	Reference
92-1.	Sandia National Laboratories/New Mexico, July 1993. Environmental Operations Records Center Record Number ER/1333 092/INT/95-001, Sandia National Laboratories, Albuquerque, New Mexico.
92-2.	Sandia National Laboratories/New Mexico, [n.d.]. Environmental Operations Records Center Record Number ER/1333 092/INT/95-002, Sandia National Laboratories, Albuquerque, New Mexico.
92-3.	Sandia National Laboratories/New Mexico, July 1993. Environmental Operations Records Center Record Number ER/1333 092/INT/95-003, Sandia National Laboratories, Albuquerque, New Mexico.
92-4.	Sandia National Laboratories/New Mexico, September 1985. Environmental Operations Records Center Record Number ER/1333 092/INT/95-004, Sandia National Laboratories, Albuquerque, New Mexico.
92-5.	Sandia National Laboratories, May 1986. "CEARP Phase I, Draft," Sandia National Laboratories, Albuquerque, New Mexico.
92-6.	Notes Relating to Site 92, [n.d.]. Location Plan—Areas 9800 & 9806, Sandia National Laboratories, Albuquerque, New Mexico.
92-7.	Sandia National Laboratories/New Mexico, March 1987. "CEARP Phase I, Preliminary Draft," Sandia National Laboratories, Albuquerque, New Mexico.
92-8.	Notes Relating to Site 92, [n.d.]. Sandia National Laboratories, Albuquerque, New Mexico.
92-9.	Sandia National Laboratories/New Mexico, July 1993. Environmental Operations Records Center Record Number ER/1333 092/INT/95-005, Sandia National Laboratories, Albuquerque, New Mexico.
92-10.	Site 92 Photographs. 1993, Sandia National Laboratories, Albuquerque, New Mexico.

92-11. Sandia National Laboratories/New Mexico, January 1994. Environmental Operations Records Center Record Number ER/1333 092/INT/95-006, Sandia National Laboratories, Albuquerque, New Mexico.

92-12. Sandia National Laboratories/New Mexico, July 1993. Environmental Operations Records Center Record Number ER/1333 092/INT/95-007, Sandia National Laboratories, Albuquerque, New Mexico.

92-13. Sandia National Laboratories/New Mexico, July 1993. Environmental Operations Records Center Record Number ER/1333 092/INT/95-008, Sandia National Laboratories, Albuquerque, New Mexico.

92-14. Sandia National Laboratories/New Mexico, January 1993. Environmental Operations Records Center Record Number ER/1333 092/INT/95-009, Sandia National Laboratories, Albuquerque, New Mexico.

92-15. Sandia National Laboratories/New Mexico, May 1993. Environmental Operations Records Center Record Number ER/1333 092/INT/95-010, Sandia National Laboratories, Albuquerque, New Mexico.

92-16. Notes Relating to Site 92, [n.d.]. Sandia National Laboratories, Albuquerque, New Mexico.

92-17. Sandia National Laboratories/New Mexico, January 1994. Environmental Operations Records Center Record Number ER/1333 092/INT/95-011, Albuquerque, New Mexico.

92-18. Sandia National Laboratories/New Mexico, Environmental Operations Records Center Record Number ER/1333 092/INT/95-012, Sandia National Laboratories, Albuquerque, New Mexico.

92-19. Sandia National Laboratories/New Mexico, November 1992. Environmental Operations Records Center Record Number ER/1333 092/INT/95-013, Sandia National Laboratories, Albuquerque, New Mexico.

92-20. Reference removed/not applicable to site.

92-21. Sandia National Laboratories, March 1994. "Planimetric Map Atlas—Sheet MAP-82," Facilities Geographic Information System, Sandia National Laboratories, Albuquerque, New Mexico.

92-22. Sandia National Laboratories/New Mexico, September 1994. Environmental Operations Records Center Record Number ER/1333 092/INT/95-014, Sandia National Laboratories, Albuquerque, New Mexico.

92-23. Sandia National Laboratories/New Mexico, November 1994. Environmental Restoration Project Information Sheet for ER Site 92, Pressure Vessel Test Site, Sandia National Laboratories, Albuquerque, New Mexico.

92-24. Sandia National Laboratories/New Mexico, [n.d.]. Environmental Operations Records Center Record Number ER/1333 092/INT/95-015, Sandia National Laboratories,Albuquerque, New Mexico.

92-25. Sandia National Laboratories/New Mexico, February 1995. Environmental Operations Records Center Record Number ER/1333 092/INT/95-016, Sandia National Laboratories, Albuquerque, New Mexico.

92-26. Reference removed/not applicable to site.

92-27. Sandia National Laboratories/New Mexico, April 1995. Environmental Operations Records Center Record Number ER/1333 092/INT/95-017, Sandia National Laboratories, Albuquerque, New Mexico.

92-28. Sandia National Laboratories/New Mexico, May 1995. Environmental Operations Records Center Record Number ER/1333 092/INT/095-018, Sandia National Laboratories, Albuquerque, New Mexico.

5.2 Reference Documents

Department of Energy (DOE) September 1987, draft. "Comprehensive Environmental Assessment and Response Program (CEARP) Phase I: Installation Assessment, Sandia National Laboratories, Albuquerque," Department of Energy, Albuquerque Operations Office, Environmental Safety and Health Division, Environmental Program Branch, Albuquerque, New Mexico.

IT Corporation (IT) May 1994. "Hydrogeology of the Central Coyote Test Area OU 1334," IT Corporation, Albuquerque, New Mexico.

RUST Geotech Inc., December 1994. "Sandia Surface Radiological Survey," prepared for Sandia National Laboratories/New Mexico, Environmental Restoration Project, Albuquerque, New Mexico.

Sandia National Laboratories/New Mexico (SNL/NM), April 1995. "Mean Elevation and Acreage Computation Report," Sandia National Laboratories/New Mexico, GIS Group, Environmental Restoration Department, Albuquerque, New Mexico.

Sandia National Laboratories/New Mexico (SNL/NM), February 1995, draft. "Program Implementation Plan for Albuquerque Potential Release Sites," Sandia National Laboratories, Albuquerque, New Mexico.

Sandia National Laboratories/New Mexico (SNL/NM), August 1994. "Historical Aerial Photo Interpretation of the Canyons Test Area, OU 1333," Sandia National Laboratories/New Mexico, Environmental Restoration Project, Albuquerque, New Mexico.

Sandia National Laboratories/New Mexico (SNL/NM), July 1994. "Ownership (Land Use), Canyons Test Area—ADS 1333," Sandia National Laboratories, GIS Group, Environmental Restoration Department, Albuquerque, New Mexico.

United States Department of Agriculture (USDA), June 1977. "Soil Survey of Bernalillo County and Parts of Sandoval and Valencia Counties, New Mexico," Soil Conservation Service, U.S. Department of Agriculture, Washington DC.

United States Environmental Protection Agency (EPA), August 1993. Module IV of RCRA Permit No. NM 5890110518, EPA Region 6, issued to Sandia National Laboratories, Albuquerque, New Mexico.

United States Environmental Protection Agency (EPA), August 1992. Hazardous Waste Management Facility Permit No. NM 5890110518, EPA Region 6, issued to Sandia National Laboratories, Albuquerque, New Mexico.

United States Environmental Protection Agency (EPA), July 1990. "Corrective Action for Solid Waste Management Units (SWMU) at Hazardous Waste Management Facilities, Proposed Rule," *Federal Register*, Vol. 55, Title 40, Parts 264, 265, 270, and 271.

United States Environmental Protection Agency (EPA), April 1987. "Final RCRA Facility Assessment Report of Solid Waste Management Units at Sandia National Laboratories, Albuquerque, New Mexico," Contract No. 68-01-7038, EPA Region 6.

United States Environmental Protection Agency (EPA), October 1986. "RCRA Facility Assessment Guidance," EPA/530-86-053, PB87-107769, Washington, DC.

5.3 Aerial Photographs

Koogle and Pouls Engineering, Inc., April 1992. Historical Aerial Photograph, KAFB 1-2-5, Albuquerque, New Mexico.

United States Geological Survey (USGS), May 1991. Historical Aerial Photograph, NAPP 3534-184, Albuquerque, New Mexico.

United States Geological Survey (USGS), June 1987. Historical Aerial Photograph, NHAP-2 419-75, Albuquerque, New Mexico.

United States Geological Survey (USGS), September 1984. Historical Aerial Photograph, NHAP 84 249-157, Albuquerque, New Mexico.

United States Geological Survey (USGS), June 1983. Historical Aerial Photograph, USDA-F 1382-176, Albuquerque, New Mexico.

United States Geological Survey (USGS), October 1982. Historical Aerial Photograph, NHAP81 367-51, Albuquerque, New Mexico.