SAND2010-6117P

Historic Building Survey and Assessment
Sandia National Laboratories
New Mexico Site
Albuquerque, New Mexico

Volume I: Survey and Assessment

SAND2010-6117P

Rebecca A. Ullrich
Corporate History Program
Sandia National Laboratories

Cynthia Martin
Dick Gerdes
Sandia Staffing Alliance, LLC

August 2, 2010

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Executive Summary

In Fiscal Year 2010, SNL/NM launched a site-wide historic building survey and assessment in support of DOE compliance with Section 110 of the National Historic Preservation Act. Personnel from the SNL Corporate Archives and History Program and Sandia Staffing Alliance undertook the survey and subsequent report preparation.

The goal of the survey and assessment was to determine what, if any, properties at SNL/NM should be recommended to DOE as eligible for the National Register of Historic Places (NRHP), whether as individual buildings or historic districts. The criteria for eligibility to the NRHP were reviewed and applied in the analysis of SNL/NM's built environment.

The 1207 SNL/NM properties listed in the December 22, 2009 report from the Facilities Information Management System formed the initial scope for the survey. The list was reduced to 825 buildings and structures once properties not eligible by NRHP-criteria or the understanding of the SNL historic context and resulting historic themes were removed. New Mexico Historic Cultural Properties Inventory forms were prepared for buildings over 1,000 square feet and significant test structures. Buildings under 1,000 square feet and smaller structures were included in the assessment of the buildings or larger structures with which they are associated.

Once the forms were prepared, decisions were made regarding which buildings and structures could be grouped into historic districts based on their overall representation of specific SNL activities and time periods. The resulting recommendations for eligibility include three buildings eligible without being associated with any of the historic districts and eight historic districts. In the end, each of SNL/NM's technical areas included a historic district, while three were defined in the Coyote Test Field. The three eligible buildings are in Technical Area I.

Figure 1 provides a list of the SNL/NM technical areas and the historic districts within them. The period of significance for each historic district is provided. Information provided for the properties within the historic district includes whether the property is eligible for the NRHP or just a contributing element to the historic district. For eligible properties, the period of significance is indicated, as are the criteria and historic themes within which the property qualifies. The three individually eligible buildings are listed after the Early Sandia National Laboratories Historic District in the Technical Area I section.

Figure 1. Proposed SNL/NM Historic Districts and NRHP-Eligible Buildings

Building Number	Name	Year Acquired	Eligible	Contributing Element	Period of Significance	Criteria & Theme(s)
TECH AREA I						
Early Sandia National Laboratories Historic District					**1948-1958**	
800	Administration	1948	X		1948-Present	A & C Administration/ Community
801	Security Offices	1951	X		1951-Present	A & C Administration/ Community
802	Admin/DOE	1951	X		1951-Present	A & C Administration/ Community
803	Administration	1957	X		1957-1989	A & C Environmental Testing
804	Library	1951	X		1949-1961	A & C Military Liaison
808	R&D Labs	1949	X		1949-1989	A & C Weapon Design
8809	Storage Basement	1956		X		
8810	Impact Test Structure	1956		X		
809	High Bay Lab	1958	X		1958-1989	A & C Environmental Testing & Stockpile Surveillance
835	Weapons Sys Labs	1951	X		1951-1989	A & C Weapon Design
836	Weapons Systems	1957		X		
840	Development Shops	1951	X		1951-1989	A & C Weapon Design
849	Research Materials	1948	X		1948-1958	A & C Administration/ Community
851	Energy Development	1948	X		1948-1958	A & C Administration/ Community
860	Environmental Testing Lab	1949	X		1949-1989	A & C Environmental Testing
862	Standby Power	1951		X		
864	Glass Development Labs	1957		X		
865	Aerothermodynamics Building	1954		X		
868	Systems Research	1950		X		

Building Number	Name	Year Acquired	Eligible	Contributing Element	Period of Significance	Criteria & Theme(s)
874	Computer Building, Motor Pool	1971		X		
875	Motor Pool Shops	1948		X		
876	Motor Pool Shops	1951		X		
885	Facilities Mgmt & Purchasing	1953		X		
892	Military Liaison, Training, QA, Waste Mgmt	1950	X		1972-2009	A Military Liaison
894	Mail Services, Inspection and Power Development	1950		X		
952	LAZAP	1957	X		1957-1989	A Non-Weapons Research
952A	LAZAP	1956	X		1957-1989	A Non-Weapons Research
953	Storage	1953		X		
TECH AREA I						
Eligible Buildings, not in historic district						
869	Environmental Health Laboratory	1971	X		1971-Present	A & C Administration/ Community
871	Electro-Magnetic Environmental Simulation	1978	X		1978-Present	A & C Environmental Testing
884	Ion Physics Lab	1956	X		1961-1989	A Environmental Testing
TECH AREA II						
Old Centrifuge Historic District, Sandia National Laboratories					**1952-1954**	
	Old Centrifuge	1953	X		1952-1954	A & C Environmental Testing
	Centrifuge Equipment Protection Structure	1953		X		
TECH AREA III						
Technical Area III Historic District, Sandia National Laboratories					1954-1989	
6501	Non-hazardous Assembly	1956		X		
6502	Storage & Assembly	1958		X		

Building Number	Name	Year Acquired	Eligible	Contributing Element	Period of Significance	Criteria & Theme(s)
6506	Explosive storage	1954		X		
6507	Explosive Storage Igloo	1948		X		
6508	Explosive Storage Igloo	1948		X		
S6510	300' Drop Tower	1957	X		1957-1989	A Environmental Testing
S6511	Variable Angle Launcher	1984		X		
S6515	185' Drop Tower	1960	X		1960-1989	A Environmental Testing
6520	Hydraulic Centrifuge	1954	X		1954-1989	A & C Environmental Testing
S6522	Observation Tower	1985		X		
6523	Pump Building	1954	X		1954-1982	A Environmental Testing
6523B	Pump Bldg for 6526	1982	X		1982-1989	A Environmental Testing
6525	Equipment Building	1954		X		
6526	25' Centrifuge Facility	1966	X		1966-1989	A & C Environmental Testing
6527	Equipment Building for 6526	1968		X		
6530	Radiant Heat	1960	X		1960-1989	A Environmental Testing
6540	Aerosol Research	1954	X		1959-1989	A & C Environmental Testing
6542	Aerosol Research	1956	X		1956-1989	A & C Environmental Testing
S6550	Old 2000' Sled Track	1954	X		1954-1976	A & C Environmental Testing
S6554	Test Stand	1954	X		1954-1976	A & C Environmental Testing
6560	Vibration Test Facility	1955	X		1955-1989	A Environmental Testing
6562	Metal Storage Building	1956		X		

Building Number	Name	Year Acquired	Eligible	Contributing Element	Period of Significance	Criteria & Theme(s)
6563	Equip Bldg for 6560	1958		X		
6570	Dynamic Shock	1956	X		1956-1989	A Environmental Testing
6610	Complex Wave Test	1959	X		1959-1990	A Environmental Testing
6610A	Shed	1956		X		
6620	Hazardous Assembly	1958		X		
6622	Operational Storage Igloo	1959		X		
6622A	Storage Igloo	1965		X		
6625	Instrument Shelter	1956		X		
6630	Climatic Test Facility	1959	X		1959-1989	A & C Environmental Testing
6631	Control Building	1959	X		1959-1989	A & C Environmental Testing
6640	Acoustical Test Facility	1959	X		1959-1989	A Environmental Testing
6710	Air Gun Test Facility	1958		X		
6720	Explosive Loading	1969	X		1959-1989	A Environmental Testing
6733	Explosive Storage	1964		X		
S6740	10,000' Sled Track	1966	X		1966-Present	A & C Environmental Testing
6741	Control Building	1966	X		1966-1989	A Environmental Testing
6741A	Storage/Quonset	1966		X		
6741C	Storage	1966		X		
6742	Instrumentation Bunker	1968	X		1966-1989	A Environmental Testing
6743	Rocket Motor Conditioning Bldg	1967	X		1967-1989	A Environmental Testing
6743A	Storage	1966		X		
6743B	Storage	1948		X		

Building Number	Name	Year Acquired	Eligible	Contributing Element	Period of Significance	Criteria & Theme(s)
6744	Observation Tower	1966	X		1966-1989	A Environmental Testing
6745	Observation Tower	1966	X		1966-1989	A Environmental Testing
6746	Observation Tower	1966	X		1966-1989	A Environmental Testing
6747	Operational Storage Igloo	1968		X		
6750	Impact Test Facility	1966	X		1966-1989	A & C Environmental Testing
6750E	Storage Building	1956		X		
6751	Observation Tower	1966	X		1966-1989	A Environmental Testing
6753	Gun Charge Assembly Building	1970		X		
6753A	Explosive Storage	1970		X		
6753B	Explosive Storage	1970		X		
6921	Rad Prototype - RMWMF	1956	X		1956-1989	A Environmental Testing
6922	Molten Core Lab	1955	X		1955-1989	A Environmental Testing
6923	Explosive Test Facility	1955	X		1955-1989	A Non-Weapons Research
TECH AREA IV						
Pulsed Power Historic District, Sandia National Laboratories					1979-Present	
	Particle Beam Sculpture "Starburst"			X		
960	Reactor Support Facility	1983		X		
961	Reactor Support Facility	1983		X		
962	Strategic Defense Facility	1989		X		
963	Strategic Defense Facility	1995		X		
965	Strategic Defense Facility	1995		X		
966	Process Support Facility	1995		X		
970	Simulation Technical Lab	1984	X		1984-2004	A & C

Building Number	Name	Year Acquired	Eligible	Contributing Element	Period of Significance	Criteria & Theme(s)
						Stockpile Surveillance, Environmental Testing, & Non-Weapons Research
970A	Simulation Support	1987		X		
981	Particle Beam Fusion	1979	X		1979-Present	A & C Environmental Testing & Non-Weapons Research
983	Particle Beam Accelerator	1983	X		1983-Present	A & C Environmental Testing & Non-Weapons Research
983A	Beam Accelerator Support	1985		X		
983B	Beam Accelerator Phase B	1985	X		1985-Present	A & C Environmental Testing & Non-Weapons Research
984	Neutron Measurement Lab	1990	X		1990-Present	A Environmental Testing
986	Components Develop. Lab	1983	X		1985-Present	A & C Environmental Testing
TECH AREA V						
Reactor Complex Historic District, Sandia National Laboratories					1961-1989	
6577	Perimeter Control Building	1990		X		
6580	HCF	1963	X		1963-1989	A & C Environmental Testing
6580A	HCF	1956		X		
6580B	HCF	1956		X		
6580C	HCF	1956		X		
6580D	HCF	1956		X		
6581	Security Services Building	1975		X		
6582	Evacuation Building	1963	X		1963-1989	A Administration/ Community
6586	GIF	1995		X		
6588	ACRR	1963	X		1963-1989	A Environmental

Building Number	Name	Year Acquired	Eligible	Contributing Element	Period of Significance	Criteria & Theme(s)
						Testing
6590	SPR	1961	X		1966-1989	A Environmental Testing, & Non-Weapons Research
6591	Reactor Control	1961	X		1961-1989	A Environmental Testing
6592	SPR Lab	1966	X		1966-1989	A Environmental Testing & Non-Weapons Research
6593	SPR Equipment Building	1961	X		1961-1989	A Environmental Testing & Non-Weapons Research
6594	Low Level Counting Lab	1964	X		1964-1989	A & C Environmental Testing
6595	Irradiated Materials Storage	1965		X		
6597	AHCF	1971	X		1971-1989	A & C Environmental Testing
COYOTE TEST FIELD: EAST WITHDRAWN AREA					1965-1989	
Aerial Cable Historic District, Sandia National Laboratories						
9831	Instrumentation Control	1965	X		1965-Present	A Environmental Testing
9832	Explosive Assembly	1965	X		1965-1989	A Environmental Testing
9834	Instrumentation Control	1965	X		1965-1989	A Environmental Testing
COYOTE TEST FIELD						
National Solar Thermal Test Facility Historic District, Sandia National Laboratories					1980-2010	
9980	Solar Power Tower	1978	X		1978-2010	A & C Non-Weapons Research
9981	5MW Solar Control Building	1980	X		1980-2010	A Non-Weapons

Building Number	Name	Year Acquired	Eligible	Contributing Element	Period of Significance	Criteria & Theme(s)
						Research
9982	5MW Solar Assembly Building	1978	X		1978-2010	A Non-Weapons Research
9984	Engine Test Facility	1989	X		1989-2010	A Non-Weapons Research
COYOTE TEST FIELD: WEST						
Explosive Testing Historic District, Sandia National Laboratories					1959-1989	
9920	Explosive Test Facility Complex	1959	X		1959-1989	A & C Environmental Testing
9921A	Explosive Storage Igloo	1982		X		
9921B	Explosive Storage Igloo	1982		X		
9921C	Explosive Storage Igloo	1982		X		
9921D	Explosive Storage Igloo	1982		X		
9924	Storage	1984		X		
9926	Explosive Research Lab	1968	X		1968-1989	A & C Environmental Testing
9926M	Quonset Storage Building	1956		X		
9926S	Storage Building	1956		X		
9930	Explosive Test and Lab	1961	X		1961-1989	A & C Environmental Testing
9931	Explosive Storage Bunker	1961		X		
9932	Explosive Storage Bunker	1961		X		
9933	Explosive Storage Bunker	1961		X		
9933A	Storage Magazine	1961		X		
9934	Explosive Storage Igloo	1962		X		
9934A	Storage Magazine	1962		X		
9937	Explosive Storage Bunker	1965		X		
9938	Explosive Facility Test Cells	1974		X		
9939	Laboratory/Explosive Control Building	1974		X		
9940	Explosive Devices Test	1963	X		1963-1989	A Environmental Testing

Building Number	Name	Year Acquired	Eligible	Contributing Element	Period of Significance	Criteria & Theme(s)
9958	Explosive Storage Igloo	1967		X		
9959	Explosive Storage Igloo	1967		X		
9960	Explosive Preparation	1965	X		1965-1989	A & C Environmental Testing
9961	Storage Bunker	1981		X		
9962	Explosive Storage Magazine	1981		X		

Acronyms and Abbreviations

ACRR	Annular Core Research Reactor
AHCF	Auxiliary Hot Cell Facility
AMPL	Advanced Manufacturing Processes Laboratory
CINT	Center for Integrated Nanotechnology
CMU	Concrete Masonry Unit
CTF	Coyote Test Field
DETL	Distributed Energy Technologies Laboratory
DOE	US Department of Energy
ECF	Explosive Components Facility
EM	energetic materials
EMES	Electro-Magnetic Environmental Simulation
FIMS	Facilities Information Management System
GIF	Gamma Irradiation Facility
gsf	gross square feet
HCF	Hot Cell Facility
HCPI	New Mexico Historic Cultural Properties Inventory
HE	high explosive
HERMES	High Energy Raditation Megavolt Electron System
IMRL	Integrated Materials Research Laboratory
KAFB	Kirtland Air Force Base
LANL	Los Alamos National Laboratory
LEED	Leadership in Energy and Environmental Design
LLNL	Lawrence Livermore National Laboratory
MESA	Microsystems and Engineering Sciences Applications
NGPF	Neutron Generator Production Facility
NHPA	National Historic Preservation Act
NISAC	National Infrastructure Simulation & Analysis Center
NNSA	National Nuclear Security Administration
NRHP	National Register of Historic Places
NSTTF	National Solar Thermal Test Facility
R&D	Research and Development
RMWMF	Radioactive and Mixed Waste Management Facility
SHPO	State Historic Preservation Officer
SNL/NM	Sandia National Laboratories/New Mexico
SPR	Sandia Pulsed Reactor Facility
SPRF-CX	Sandia Pulsed Reactor Facility—Critical Experiment
SSO	Sandia Site Office
SURTSEY	Pressure vessel at the Nuclear Energy and Work Complex
TA	Technical Area
USAF	United States Air Force
USFS	United States Forest Service
Z-Machine	Z Accelerator

1. Introduction

Sandia National Laboratories (SNL) is a government-owned, contractor-operated (GOCO) facility. Sandia Corporation, a Lockheed Martin company, manages Sandia for the U.S. Department of Energy/National Nuclear Security Agency (DOE/NNSA). SNL was created to provide ordnance engineering design and support for nuclear weapons designs. Over time, this mission evolved and expanded, particularly in the post-Cold War era. Currently, SNL's mission is to meet national needs in the five key areas of nuclear weapons; defense systems and assessments; energy, climate, and infrastructure security; international, homeland, and nuclear security; and homeland security and defense.

SNL has two primary facilities, one in Albuquerque, New Mexico, and one in Livermore, California. The lab also operates test ranges at the Kauai Test Facility in Hawaii and the Tonopah Test Range in Nevada. The majority of employees work at the Sandia National Laboratories/New Mexico (SNL/NM) site located within the boundaries of Kirtland Air Force Base (KAFB) in Albuquerque. The SNL/NM site's properties are predominantly permanent in design and construction, and contain about 5.8 million square feet of space.[1] Figure 2 is a map indicating the boundaries of KAFB and the location of SNL/NM's technical areas within it.

The majority of SNL/NM facilities are located within five technical areas on DOE/NNSA-owned land within KAFB. However, some DOE/NNSA-owned SNL/NM facilities are located on land owned by the U.S. Air Force (USAF) and on the U.S. Forest Service's (USFS) Cibola National Forest lands withdrawn from public use by the Air Force, and are used by SNL/NM under interagency agreement. The DOE/NNSA manages resources on lands that it owns and properties it owns on other agency land; the Air Force and Cibola National Forest retain responsibility for their lands.

1.1 Scope

In Fiscal Year 2010, SNL/NM launched a site-wide historic building survey and assessment in support of DOE compliance with Section 110 of the National Historic Preservation Act (NHPA). Personnel from the SNL Corporate Archives and History Program and Sandia Staffing Alliance undertook the survey and subsequent reports.

[1] Sandia National Laboratories, *Facts and Figures* (Albuquerque: Sandia National Laboratories, Internet edition, 2010).

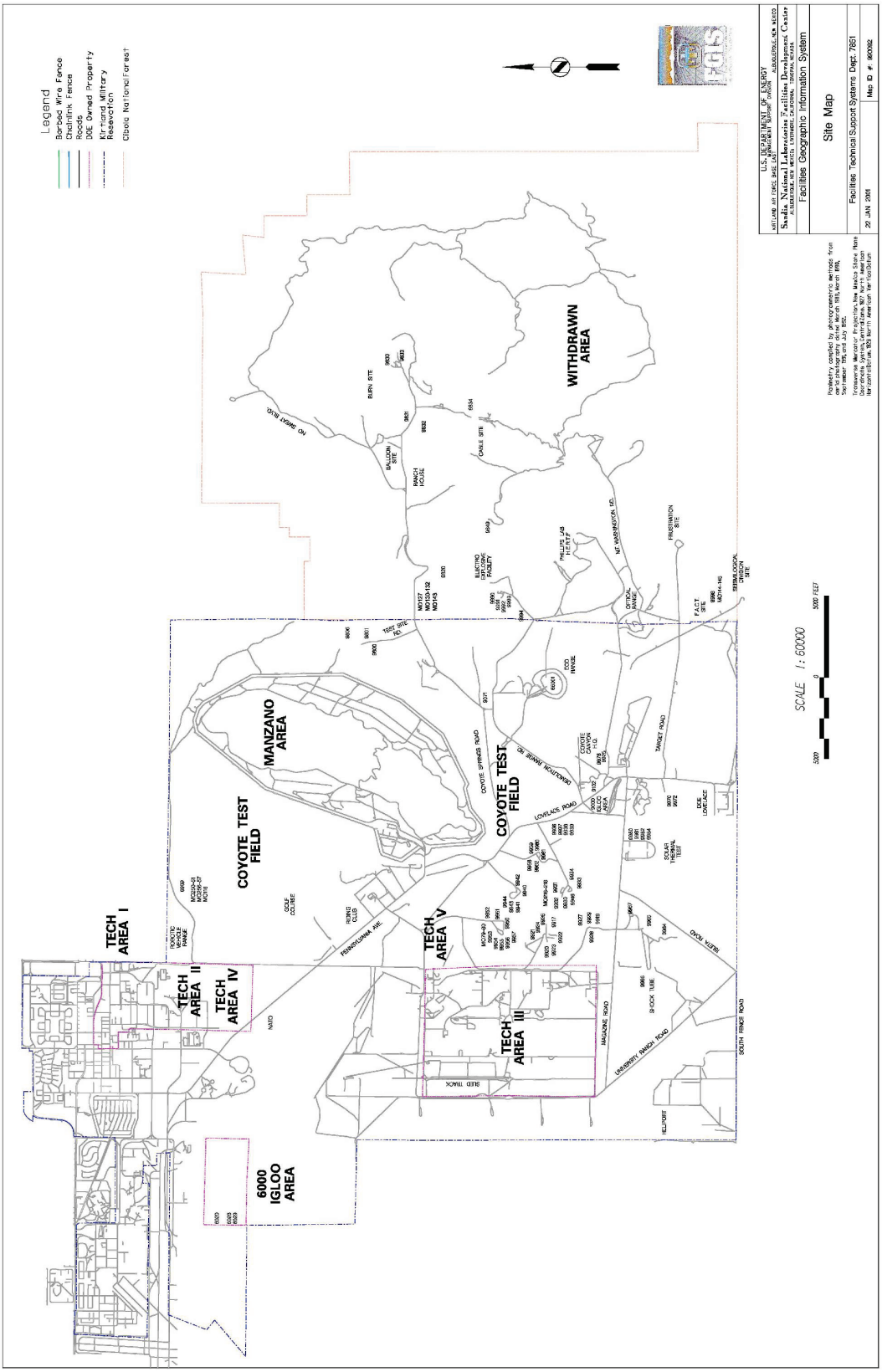

Figure 2. Map of KAFB indicating SNL Technical Areas and Coyote Test Field.

The survey was confined to the built environment in the historic era. SNL/NM's properties all date from the 1940s or later. SNL and KAFB sponsored previous archaeological surveys with the results documented in written reports. No archaeological sites were identified within SNL/NM's five technical areas.[2] An extensive survey of KAFB, including both USAF and USFS land withdrawn for use by KAFB, was completed in 2003. The survey identified many archaeological sites within the boundaries of KAFB.[3] They are not part of the historic districts proposed as a result of this historic building survey.

The extent of the built environment overseen by the SNL/NM Facilities organization is listed in the Facilities Information Management System (FIMS). FIMS lists all properties DOE owns, leases, or has permitted to it for SNL's use, and tracks the size, age, ownership, and location of each. The FIMS list of the SNL/NM built environment as of December 22, 2009, is included as Appendix A of this report.[4] That list served as the initial broad scope of the historic building survey and assessment.

1.2 Organization

This survey and assessment report is presented in six sections. Section 1 is this introduction, which introduces the project, the site, and the report. The second section covers the project methodology, including discussions of the research approach and the elements of any historic building survey: historic context, historic themes, the NRHP criteria, and integrity of eligible properties.

Section 3 describes the areas surveyed and the resulting historic districts and individually eligible facilities in each. This section provides the narrative explication that ties together the information assembled on the New Mexico Historic Cultural Properties Inventory (HCPI) forms, offering further discussion of the historically significant facilities.

Section 4 summaries and concludes the narrative portion of the report. The bibliography forms Section 5. The appendices for the report are the final section and are found in a second volume of the document. The four appendices provide the list of all SNL/NM properties, a table of all buildings and structures included in the survey, a list of the recommendations for historic districts and individually eligible buildings, and the NM HCPI forms prepared during the survey.

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[2] Steve Hoagland and Robert Dello-Russo, *Cultural Resource Investigation for Sandia National Laboratories/New Mexico Environmental Restoration Program, Kirtland Air Force Base, New Mexico,* 2 vols, NMCRIS Report No. 47604 (Albuquerque: Butler Service Group, 1995).

[3] James D. Gallison, David Wilcox, and Roberto Herrera, *The Archaeology of the Manzanita Mountains: 2002 Survey of the Eastern Portion of Kirtland Air Force Base and Department of Energy Lands Withdrawn from the U.S. Forest Service, Bernalillo County, New Mexico.* Submitted to the Environmental Management Division, Kirtland Air Force Base, New Mexico, Contract DACA45-02-D-0010, NMCRIS Report No. 81201 (Albuquerque: engineering-environmental Management, Inc., 2003).

[4] The FIMS list includes dates for both Year Acquired and Year Built. Year Acquired indicates the date SNL took ownership of and began using the property—in a few cases this is a date later than the Year Built as the property was acquired from a previous owner. It is worth noting that, in some cases, if the dates are unknown, Facilities has recorded the date as 1956. This results in a few of the other lists provided in this report and the NM HCPI forms having different dates than the original FIMS list.

2. Project Methodology

After a series of introductory site tours and an initial review of the FIMS list of SNL/NM properties, the NRHP criteria and criteria considerations, an existing draft of a context statement for the SNL/NM site, and available archival and published resources, the survey and assessment proceeded.

The basic project methodology followed standard history research approaches. Research in the archives and in the building drawings available in the SNL/NM Facilities Library deepened the understanding of the historical context for the site. The context statement, including the historic themes, was finalized based on that research and on visits to the properties included in the survey.

The large FIMS list of 1207 properties was re-evaluated once a broad understanding of the SNL/NM site and its historic context was in place. The list was reduced to 825 buildings and structures once properties not eligible by NRHP-criteria or the understanding of the SNL historic context and resulting historic themes were removed. Further details are given in Section 2.1, below.

The survey included visits to each of the properties. The properties were photographed using a digital camera, with the resulting images stored in the SNL CSandia Collection, an on-line repository of SNL's archival photographs. The site visits also produced written architectural descriptions and indications of modifications from original designs. Occasionally, building occupants provided information regarding the activities it houses.

NM HCPI forms were prepared for properties over 1,000 sq. ft. using information and photographs from the site visits. If necessary, additional research was then undertaken to establish details of the property's history. The property was evaluated based on the established SNL/NM Cold War and post-Cold War historic context and the themes previously identified for the site. Any associated smaller buildings or structures were included on the forms.

Once the forms were prepared, decisions were made regarding which buildings and structures could be grouped into historic districts based on their overall representation of specific SNL activities and time periods. The resulting recommendations for eligibility include three buildings eligible without being associated with any of the historic districts and eight historic districts. In the end, each of SNL/NM's technical areas included a historic district, while three were defined in the Coyote Test Field. The three eligible buildings are in Technical Area I.

2.1. Properties Included in the Survey

The SNL/NM Facilities organization provided the list of all properties it oversees, including everything DOE owns, leases, or has permitted to it for SNL/NM's use. That list included 1207 individual properties. In addition to buildings and structure, this list included all SNL/NM infrastructure (roads, lighting, fencing, sewers, storm drains, water

lines, communications, fire protection, natural gas lines, steam lines, landscaping, fuel tanks, wells, and landfill). The list also includes as separate items some large building additions and structure extensions. These have been consolidated into one building or structure for the survey.

The initial analysis of potentially eligible properties eliminated the following as not likely to be historically significant unless directly associated with a building or structure that fits within the site's historic themes:

- Leased and permitted facilities, as DOE is not the agency responsible for them,
- Trailers, mobile buildings, and transportainers, as they are moveable,
- Buildings built and used solely for storage, unless associated with an eligible building or historic district,
- Infrastructure (roads, lighting, fencing, sewers, storm drains, water lines, communications, fire protection, natural gas lines, steam lines, fuel tanks, wells, and landfill),
- Tents, and
- Landscaping, unless it is included in a historic district.

The remaining 825 buildings and structures were surveyed and assessed. New Mexico HCPI forms were prepared for all buildings over 1,000 gsf and significant test structures. Buildings under 1,000 gsf and smaller structures are referenced on the forms of the buildings or larger structures with which they are associated. Appendix D contains the 237 HCPI forms completed for the survey.

2.2. Historic Context

The SNL/NM historic context statement is a separate report.[5] SNL/NM's early history directly parallels and reflects the development of the U.S. nuclear weapons complex in the immediate postwar environment. SNL/NM's initial growth and expansion was a result of the push for a larger, more varied nuclear stockpile. In turn, the research, design, and testing capabilities SNL/NM honed in its early years contributed to the shape and size of the stockpile and therefore to U.S. Cold War policy. Further, the nuclear weapons-related research eventually led to other lines of research, which in turn proved significant. The key elements of SNL's Cold War nuclear weapon mission continued into the post-Cold War period.

2.3. Historic Themes

The SNL/NM historic context statement identified eight historic themes for the Cold War and post-Cold War periods. These represent the elements of the historic events with which SNL is associated and within which its properties may be found eligible under Criterion A.

[5] Rebecca A. Ullrich, Michael Anne Sullivan, Cynthia Martin, and Dick Gerdes, *Sandia in the Cold War and Post-Cold War Periods: A Statement of Historic Context for Sandia National Laboratories/New Mexico,* SAND2010-4971P (Albuquerque: Sandia National Laboratories, 2010).

2.3.1 Weapon Design

SNL/NM's primary mission during the Cold War was the design of the non-nuclear components of a nuclear weapon. Components included arming, fuzing, and firing systems; batteries; electrical systems; ballistic casings; and later, parachutes; and safety devices. Very few properties proved eligible within this theme, in spite of its place as a significant part of SNL's mission. This is largely because design, by its very nature, is not reflected in the built environment and it is difficult to pinpoint the precise physical location in which it occurs as a historic event.

2.3.2 Field Testing

Including both support for full-scale nuclear testing and non-nuclear testing of atomic weapons in support of ordnance development. Field Testing includes four main types of activities: instrumentation development, field test project activity, instrumentation services, and test data reduction. No properties proved eligible within this theme at SNL/NM as the work was conducted at test sites beyond the boundaries of KAFB.

2.3.3 Environmental Testing

Environmental testing of all manner of components and system designs is one of SNL/NM's most expansive capabilities. Since the Lab's earliest days, SNL/NM has maintained a vast array of test facilities to freeze, crush, burn, accelerate, shock, drop, explode, and generally abuse a piece of engineering. SNL/NM's environmental testing capabilities expanded over time as new weapon and component designs fed through the system. Environmental testing assists in the design choices made for components and weapon systems. It also helps to ensure the safety and reliability of weapons in the stockpile as it allows for predictions of what might occur under different circumstances. The majority of the properties recommended as eligible at SNL/NM fall into the Environmental Testing theme.

2.3.4 Weapon Assembly

Weapon assembly was one of SNL/NM's earliest assignments. In the earliest weapons designs, final assembly of a nuclear core into the center of the HE sub-assembly did not take place until the weapon was going to be used. Nuclear cores were stored separately from the rest of the assembled weapon. Between 1948 and 1952, SNL/NM was the primary site for the non-nuclear assembly of nuclear weapons. As the rest of the weapons complex was created, SNL/NM no longer participated in weapon assembly and this particular theme is linked only to that very early period in SNL/NM's history. There are no extant buildings at SNL/NM that fit within this theme.

2.3.5 Military Liaison

SNL/NM's Military Liaison Group trains the military to assemble the weapons and writes manuals that explain assembly procedures. Successful ordnance design of the devices also depended on an understanding of the delivery system involved for each device. SNL/NM's responsibility for military liaison goes back to its earliest days and continues to the present. It is a key element in SNL/NM's role in the Cold War as it is the point at which the nuclear weapon is again connected with the military after the initial design and

production of the device. Two SNL/NM buildings appear eligible under this theme: Building 804 and Building 892.

2.3.6 Stockpile Surveillance

Since 1948, one of SNL/NM's principal activities has been the continual assessment of the nuclear stockpile's performance capabilities. SNL/NM relied on extensive testing of both inert and live weapons to ensure their reliability. More recently, stockpile surveillance includes computer simulation of weapon components in various environments, as well as materials and component testing in environmental test facilities. A small number of SNL/NM properties appear to represent this theme.

2.3.7 Non-Weapons Research

The bulk of the work performed at SNL/NM throughout its history was related to nuclear weapons. However, there were spin-offs from the core mission into satellite research and design, sensor technologies, and Plowshare by the early 1960s; waste management and physical security in the 1970s. Further, there was a move into fundamental research, primarily in the area of materials research, that built on the needs of the weapon component designers. SNL's initial move into reactor and accelerator research in the 1960s was a direct result of the push for a research capability. SNL developed significant expertise in these areas and it is part of its Cold War contributions. In the 1970s, the lab began work in both alternative energy and anti-terrorism, lines of research that continued into the post-Cold War period. Both areas are defined as part of the overall national security mission at this point. The lab's work in both anti-terrorism and alternative energy also falls under this umbrella. It is part of SNL's vision of service to the nation, part of being a national laboratory. Several research facilities, as well as the some of the accelerators and reactors in Technical Areas IV and V fall under this theme.

2.3.8 Administration/Community

To function efficiently and effectively SNL/NM required a number of services and functions that were not directly related to its core mission of producing non-nuclear ordnance for nuclear weapons. People and services essential to the Lab's running smoothly include administrative, outreach to the community, and services for the SNL personnel. Many of these functions and services are of no historic interest in and of themselves. However, some buildings that housed administrative or community services do represent SNL/NM and its work in its entirety. They reflect to the greater Albuquerque community or the community of SNL employee's the laboratory and its mission. Very few SNL/NM properties proved eligible under this theme.

2.4. National Register Criteria

The SNL/NM properties were assessed according to the established criteria for NRHP-eligibility. Properties are eligible for the NRHP if they

> **A.** …are associated with events that have made a significant contribution to the broad patterns of our history; or

> **B.** …are associated with the lives of significant persons in or past; or
>
> **C.** …embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
>
> **D.** …have yielded or may be likely to yield, information important in history or prehistory.[6]

Of the four criteria, A and C proved of most relevance to SNL/NM properties. The Cold War is the primary historic event with which SNL/NM is associated. Buildings and structures sufficiently representing the themes identified within SNL's Cold War and post-Cold War context and retaining integrity are considered eligible under Criterion A.

Similarly, while the SNL/NM site is not often credited with high artistic values in its architecture, a few notable architects were involved in building designs and the resulting properties reflect their particular approaches, as well as their influence on SNL/NM's appearance. In addition, the designs of some buildings and structures at the site do include features that directly represent and enable the work they housed, reflecting creativity and distinctive characteristics. Such buildings and structures are considered eligible under Criterion C.

Although individuals of recognized significance have worked at or been associated with SNL, they did not do the work for which they are noted while at the lab.[7] Buildings and structures within SNL therefore do not appear to be eligible based on Criterion B at this time.

SNL/NM is a relatively young facility in historical terms. Its activities and facilities are well-documented. Criterion D generally applies to archaeological sites and historic sites that have little or no written documentation available. No buildings or structures at SNL/NM appear to be eligible based on Criterion D.

2.5. Criteria Considerations

In general, NRHP excludes cemeteries, birthplaces and graves of historical figures, properties owned by religious purposes, structures that have been moved from their original locations, reconstructed historic buildings, properties primarily commemorative in nature, and properties that have achieved significance within the past 50 years.

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[6] U.S. Department of the Interior, National Park Service, Interagency Resource Division, *National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation* (Washington, DC: USGPO, 1991, Internet edition 2002).

[7] For example, Morgan Sparks, noted for his role in creating junction transistors while at Bell Laboratories, served as Sandia Corporation president October 1, 1972-July 31, 1981. He came to SNL well after the work for which he is recognized and SNL therefore does not reflect his significance.

SNL/NM does not have cemeteries, birthplaces or graves of historic figures, religious properties, or reconstructed historic buildings. It does have properties moved from their original locations, commemorative properties, and properties less than 50 years of age. None of the properties moved from their original locations were of historic importance. However, one commemorative property and several properties less than 50 years old do appear eligible. NRHP Criteria Considerations F and G were applied to these, respectively.

> **f.** A property primarily commemorative in intent if design, age, tradition, or symbolic value has invested it with its own exceptional significance; …
>
> **g.** A property achieving significance within the past 50 years if it is of exceptional importance.[8]

SNL/NM only has one commemorative property tied to a historic district and that is the Particle Beam Structure in Tech Area IV. A piece of the Particle Beam Fusion Accelerator, it was deliberately saved and turned into a sculpture when the machine was disassembled. It stands at the front of the area and is an integral part of the historic district. Per Criteria Consideration F, it appears to qualify.

SNL/NM has several properties under 50 years of age that appear to demonstrate exceptional importance. Their significance and role within their respective historic districts appears to meet Criteria Consideration G's requirement.

2.6. Period of Historic Significance

A property is rarely found to be significant for its entire history. For all eligible buildings and historic districts, a period of significance has been assigned, as indicated in figure 1 and in the discussion in Section 3, below. The period of significance identifies the time period for which the property housed significant events or activities.[9]

2.7. Integrity

To be eligible for the NRHP, a building or structure must possess not only historic significance within a recognized context and theme during an identified period but also integrity from that period.[10] Integrity is the ability of a property to convey its significance. The NRHP criteria recognize seven qualities or aspects that, in various combinations, define integrity in a building. To retain its historic integrity a property will possess the majority of the following aspects:

- Location—the place where a property was constructed or an event occurred

[8] *National Register Bulletin 15.*
[9] Eleanor O'Donnell, Eleanor, *National Register Bulletin 39: Researching a Historic Property* (Washington, DC: National Register of Historic Places, National Park Service, U.S. Department of the Interior, 1995).
[10] The following discussion on integrity is taken from *National Register Bulletin 39,* 46.

- Design—the combination of elements that create the form, plan, space, structure, and style of a property. Design reflects historic functions, technologies, and aesthetics
- Setting—the physical environment of a historic property
- Materials—the physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration to form a historic property
- Workmanship—the physical evidence of the crafts of a particular culture or people during a given period of history or prehistory
- Feeling—a property's expression of the aesthetic or historic sense of a particular time period, and
- Association—the direct link between an important historic event or person and a historic property.

Due to the consistency of the nuclear weapons design mission and that test and research facilities retained the same purpose over time, SNL/NM's properties generally retain integrity of location, setting, materials, and workmanship. Thus, the main concerns in assessing the integrity of historically important properties at SNL/NM are design, felling, and association. The thresholds used to determine whether potentially eligible building retain integrity are:

- The building must remain in the same location as it was during the period of significance;
- The building must not have more than fifty per cent of its original design and construction modified, including the increase or the decrease of gross square footage, during the period of significance;
- The building must reflect, look, and feel, as it did during its period of significance; and
- The building must be the actual place where a historic event occurred, or where a historic person worked during his or her productive life.

The issue of a specific property's integrity is addressed on the relevant NM HCPI form.

3. Assessment: Eligible Properties and Districts

The survey included properties in all five SNL technical areas and the Coyote Test Field within KAFB, as well as one building outside of KAFB. The resulting information and HCPI forms were reviewed, with the assessment concluding in a proposal for three individually eligible buildings and eight historic districts, containing both eligible and contributing elements.

Each SNL/NM technical area includes one historic district and the Coyote Test Field has three districts. The three eligible buildings not associated with a historic district are in Technical Area I. This section describes the areas and the eligible properties and districts they contain.

3.1. Technical Area I

Technical Area I (Tech Area I or TAI) is the location of both the oldest and the most contemporary buildings and facilities at SNL. The beginnings of SNL are represented in the built environment at the northern section of TAI, with the oldest buildings dating to 1948, when Sandia was a branch of Los Alamos National Laboratory (LANL).[11] It is the administrative and technological hub of the laboratory, and features perhaps the most architecturally important buildings at SNL, with several key historic buildings designed by noted regional architects W. C. Kruger and Associates; Max Flatow-Jason Moore; and Ferguson, Stevens, Mallory and Pearl. Several recent new buildings have demonstrated a dedication to enhancing the SNL campus with an increased emphasis upon interesting and beautiful architectural design married to the pragmatics required of major research and development laboratories. Five new buildings have also been LEED certified, demonstrating SNL's commitment to green building practices.

Facilities in TAI represent a broad array of activities. In addition to administrative and other support functions, facilities include several assembly/manufacturing areas and various laboratories, such as the Advanced Manufacturing Processes Laboratory (AMPL), the Neutron Generator Production Facility (NGPF), the Distributed Energy Technologies Laboratory (DETL), The Integrated Materials Research Laboratory (IMRL), and the Microsystems and Engineering Sciences Applications (MESA) Complex. AMPL, NGPF, DETL, IMRL, and MESA are relatively new facilities, too young to be NRHP eligible. Other activities performed in TAI are dedicated to design, research and development of weapon systems, the limited production of weapon systems components, and energy research programs.

[11] Like SNL, the names of Los Alamos National Laboratory (LANL) and Lawrence Livermore National Laboratory (LLNL) have evolved over time. Throughout this report they are referred to by they current names.

3.1.1. SNL and the "temporary" building

Reflected in the built environment in Tech Area I is SNL's early history. SNL effectively began contemporaneously with the Trinity Test in July 1945. In the immediate postwar period and the onset of the Cold War, the push to develop a nuclear weapons stockpile drove a rapid expansion of the nuclear weapons complex, including SNL. Coming at the end of the World War II, with construction material shortages, and located within a military base, SNL relied on construction of numerous "temporary" structures. These were erected quickly and cheaply at the new site. Architectural beauty was trumped by cost efficiency and pragmatics in these building efforts. Thus the built environment quickly reflected a newly developing SNL culture that grew directly out of WWII economics, coupled with the rapid expansion and development of the nuclear weapons industry.

It was a few years before SNL embarked on the construction of permanent buildings. Building 800, the flagship administration building designed by W. C. Kruger and Associates of New Mexico was completed in 1948, as was Building 804, for military liaison and training. Several other permanent buildings soon followed. However, SNL continued, and continues, to rely upon the construction and utilization of temporary buildings, with many of these structures serving well beyond the original intention and still standing and in use to this day (Buildings 849 and 851 are good examples of this.) This culture of temporary structures is a key component of the built environment at SNL and is still reflected in every technical area, with a heavy emphasis upon Butler and Butler-type buildings, trailers, foundationless modular buildings and movable storage units.

Figure 3. Building 851, a Butler Mfg. building installed in 1949. Cynthia Martin photographer, 02/16/2010.

3.1.2. The Butler and Butler-type building

For the purposes of this survey, foundationless buildings and trailers are not considered. However, those temporary structures, such as Butler buildings, which do have foundations, have been assessed for eligibility, for several reasons.

First and foremost, Butler and Butler-type buildings (Apache, ABC, A&M, etc.) are ubiquitous in the built environment at SNL, heavily influencing the character of the visual landscape, reflecting an emphasis upon pragmatics and the fluxing needs of a laboratory that is constantly in a state of change with regard to its research, development, and testing missions. More so than any permanent building, these structures are physical representations of this particular cultural value and dynamic at SNL.

Butler-type buildings also are representative of the rapidity with which SNL was developed and expanded. They are also a testament to the utilitarianism and pragmatics of the Butler-type building itself, an American-manufactured structure of prefabricated corrugated metal that goes up quickly and cheaply, can be attached to other Butlers for additions and expansions, provides great versatility of use (from office buildings to explosives labs) and lasts longer than many traditionally constructed buildings of mid-century. For all these reasons, they continue to be erected at SNL. Finally, they are something of a corporate legend at SNL, with numerous humorous references made to the "temporary" buildings that have been in use for over 50 years. In many respects, if one building type best represented Cold War SNL, it might well be the Butler corrugated metal structure. Figures 3 and 4 illustrate a very early Butler still in use at SNL/NM and a slightly younger one.

Figure 4. Building 842, Tech Area I, installed in 1982. Cynthia Martin photographer, 02/26/2010.

3.1.3. The Kruger Complex (1948–1951)

The early permanent buildings in Tech Area I also reflect a particular design aesthetic, the international industrial, married to Frank Lloyd Wright's "prairie style," as interpreted by W.C. Kruger and Associates. These buildings were previously determined by the DOE to be eligible for listing, and comprise a mini-district now known as the Kruger Complex: 800, 801, 802, 808, 835, 840 and 860. Foregoing the Spanish-Pueblo revivalism which was so popular in the Southwest during this era, best represented at the University of New Mexico campus just down the road from SNL, the Kruger-designed buildings at SNL are typically (though not always) made of red brick and sometimes include hollow clay tile, single- or two-story, with flat roof overhangs, and ribbon or banded windows—many utilizing glass block—all features emphasizing a low horizontality that reflects the dramatic horizon line along the west mesa of Albuquerque. This aspect is illustrated in figure 5. The early Kruger buildings also display a particular thematic device around entrances that is picked up again and again by later architects at SNL: a simple, flat-roofed approach to porticos and canopied entrances that often features angled columns or support reflecting design aesthetics of mid-century, now associated with the "atomic age" vernacular. Figures 6, 7, and 8 illustrate entrance details.

Figure 5. Building 840, built in 1951. Cynthia Martin photographer, 02/25/2010.

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Figure 6. Original entry, Building 840, completed 1951. Cynthia Martin photographer, 03/01/2010.

Figure 7. Original entry, Building 808, completed 1949. Cynthia Martin photographer, 02/23/2010.

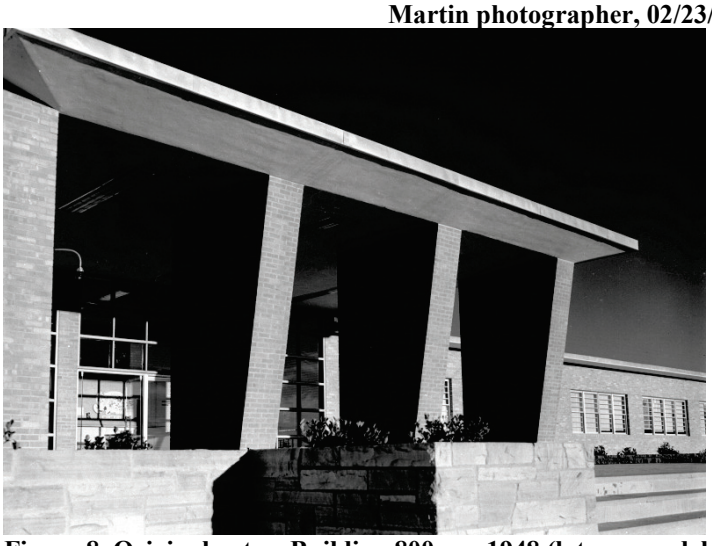


Figure 8. Original entry, Building 800, ca. 1948 (later remodeled).

3.1.4. Early Sandia National Laboratories Historic District

The period 1948-1958 represents SNL's initial period of permanent construction and the growth of the lab from its origins as part of LANL to a mature institution with a clearly defined mission. After 1958, the pace of new construction dropped off, as did the pace of new nuclear weapons designs. Although new designs were being introduced and new components developed and tested, the basic operations within SNL were established. After this point, SNL would witness spin-offs from its original mission, ultimately resulting in diversification of both assignments and capabilities.

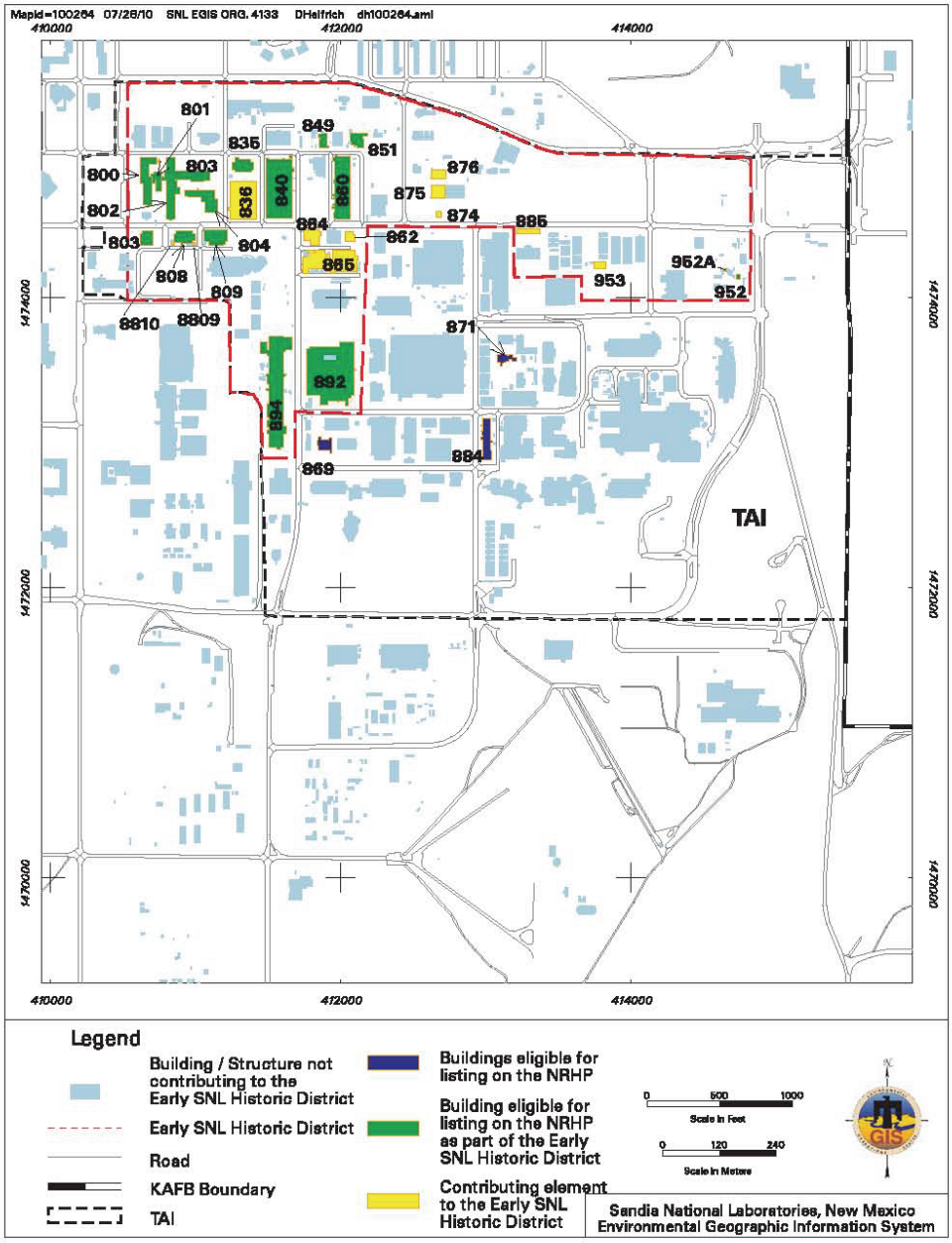
Although many of the properties in use in this early period have been removed and new construction surrounds and is interspersed with the original buildings, a distinct district is still visible in the northwestern section of TAI. This district, identified as the Early Sandia National Laboratories Historic District, includes both early Butler buildings and the first permanent buildings constructed for SNL. Their purposes include administration, weapon design, military liaison, environmental testing, and non-weapons research—all themes within the established historic context for SNL/NM. The period of significance for the district is 1948-1958. Not all of the buildings extant from that era are eligible, as some have had their integrity undercut by extensive renovation.

Figure 9 lists all of the properties in the Early Sandia National Laboratories Historic District, their name, whether they are eligible on their own (the others are contributing elements), the period of significance for which they are eligible, and the criteria and themes under which they are eligible. For the contributing elements, the Criteria & Themes column is used to indicate their contribution to the historic district. They all retain an exterior look-and-feel sufficient to invoke the time period. Figure 10 is a map of the district.

Figure 9. Early Sandia National Laboratories Historic District.

Building Number	Name	Year Acquired	Eligible	Period of Significance	Criteria & Theme(s)
800	Administration	1948	X	1948-Present	A & C Administration/ Community
801	Security Offices	1951	X	1951-Present	A & C Administration/ Community
802	Admin/DOE	1951	X	1951-Present	A & C Administration/ Community
803	Administration	1957	X	1957-1989	A & C Environmental Testing
804	Library	1951	X	1949-1961	A & C Military Liaison
808	R&D Labs	1949	X	1949-1989	A & C Weapon Design

Building Number	Name	Year Acquired	Eligible	Period of Significance	Criteria & Theme(s)
8809	Storage Basement	1956			(part of 808)
8810	Impact Test Structure	1956			(part of 808)
809	High Bay Lab	1958	X	1958-1989	A & C Environmental Testing & Stockpile Surveillance
835	Weapons Sys Labs	1951	X	1951-1989	A & C Weapon Design
836	Weapons Systems	1957			(weapon design)
840	Development Shops	1951	X	1951-1989	A & C Weapon Design
849	Research Materials	1948	X	1948-1958	A & C Administration/ Community
851	Energy Development	1948	X	1948-1958	A & C Administration/ Community
860	Environmental Testing Lab	1949	X	1949-1989	A & C Environmental Testing
862	Standby Power	1951			(appearance)
864	Glass Development Labs	1957			(appearance)
865	Aerothermodynamics Building	1954			(appearance)
868	Systems Research	1950			(appearance)
874	Computer Building, Motor Pool	1971			(appearance)
875	Motor Pool Shops	1948			(appearance)
876	Motor Pool Shops	1951			(appearance)
885	Facilities Mgmt & Purchasing	1953			(appearance)
892	Military Liaison, Training, QA, Waste Mgmt	1950	X	1972-2009	A Military Liaison
894	Mail Services, Inspection and Power Development	1950			(appearance)
952	LAZAP	1957	X	1957-1989	A Non-Weapons Research
952A	LAZAP	1956	X	1957-1989	A Non-Weapons Research
953	Storage	1953			(appearance)



Eligible or Contributing Buildings within the Early Sandia National Laboratories Historic District and Eligible Buildings not in a Historic District, TAI, Sandia National Laboratories

Figure 10. Map of Early Sandia National Laboratories Historic District. Drawn by Don Helfrich.

3.1.5. Individual Buildings Eligible in Tech Area I

Three buildings in TAI appear eligible, but are not part of the Early Sandia National Laboratories Historic District. These are Buildings 869, 871, and 884.

Building 869

Built in 1971, Building 869 displays a strong 1960s-era architectural influence in the unusual features on the front of the building, particularly the entry and window cell shaping, which were designed to undercut harsh summer sunlight, as shown in figure 11. Building 869 was built as a radiation safety and surveillance laboratory, reflecting activities at the lab, and displays some design features supportive of that role, including glass plumbing to allow for visual inspection of the chemical drains, built-in downdraft hoods for the chemistry labs in the basement, and an installation on the roof to allow for air sampling activities. Although the building no longer houses the laboratories, it has retained its integrity. The period of significance is 1971-2010, it is eligible under Criteria A and C, and the relevant theme is Administration/Community.

Figure 11. South and east sides of Building 869, showing entry and window cell design. Cynthia Martin photographer, 02/19/2010.

Building 871

Building 871, the Electro-Magnetic Environmental Simulation (EMES) facility, was built in 1978 and is relatively young for an eligible building within SNL/NM. However, the property demonstrates exceptional historic importance under both Criterion A, for its contributions in environmental testing, and Criterion C, for the building's design, which is configured to support and enable the testing it houses, as is partially illustrated in figure 12.

EMES is a large, transverse, electro-magnetic cell that propagates a uniform, planar electromagnetic wave through the area where test items are placed. Used to create either a continuous wave of electromagnetic radiation or an electromagnetic pulse, the testing simulates potential electromagnetic environments a test item might encounter in reality.

The period of significance for Building 871 is 1978-2010, for which it retains integrity. It is eligible within Criteria A and C, within the established SNL theme of Environmental Testing.

Figure 12. Exterior design of the Electro-Magnetic Environmental Simulation Facility, south side.

Building 884

SNL/NM recently completed construction on a new Ion Beam Materials Research Laboratory (Building 720) to replace its older Ion Physics Lab, Building 884. Prior to the move out of Building 884, DOE determined, in consultation with the NM State Historic Preservation Officer (SHPO), that the building is eligible for the NRHP. The current survey and assessment re-evaluated Building 884 and came to the same conclusion.

Building 884, built in 1956, was built to serve as a warehouse; its underlying structure is a Butler building. The building proceeded to house several different activities, including the weapons-related Parachute Lab and SNL's motion picture production elements. In 1959, a Cockcroft-Walton accelerator was installed and became operational in 1961, after which the building continued to expand its materials research capability. A Van de Graaff accelerator was added in the 1960s and focused initially on radiation-hardened materials studies. From those very focused beginnings, the research has expanded to include a variety of accelerator research, including ion implantation, ion beam analysis, radiation effects, semiconductor defects, and nuclear microscopy.

The building is eligible under Criterion A for its contributions under the theme of Environmental Testing. Its period of significance is 1961-1989. Its exterior design is shown in Figure 13; its original Butler building was covered with a decorative stucco interior. It is not eligible under Criterion C.

Figure 13. North and west sides of Building 884 exterior. Dick Gerdes photographer, 02/19/2010.

3.2 Technical Area II

Technical Area II (TAII or Tech Area II) is approximately 206 acres located just south of TAI in the north central portion of KAFB. One element of SNL's original assignment when it was still part of LANL was weapons assembly. To accommodate the assembly activity and to meet safety requirements for handling large amounts of high explosives (HE), new facilities were constructed in an area to the south of TAI. At the time, assembly included bringing together all of the components and sub-systems (everything except the physics package) into complete sub-assemblies for storage. Buildings 904 and 907 housed the actual assembly, while other buildings in the area provided support. DOE, in consultation with NM SHPO, determined that the assembly activity was historically important and that the area was a historic district.[12] The buildings associated with the early assembly activities were preserved through documentation and demolished.

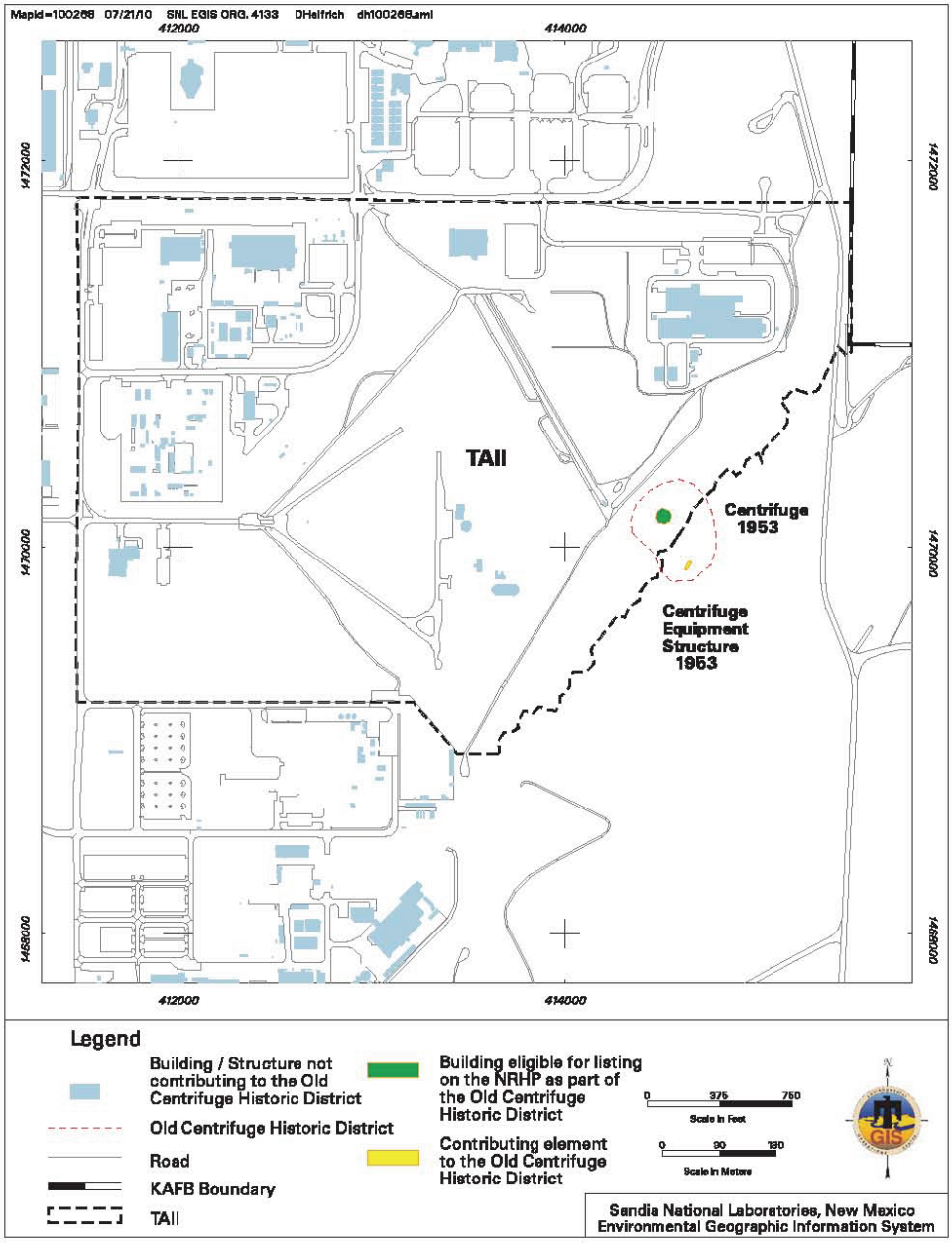
Presently TAII contains only two technical facilities, the Building 905, the Explosive Components Facility (ECF), and Building 1008, the National Infrastructure Simulation & Analysis Center (NISAC). Both ECF and NISAC are very young and not yet NRHP-eligible. The area also houses a smattering of support facilities—waste management, safeguards and security, the SNL Security Policy offices, and the shipping and receiving facility. These are not NRHP-eligible.

The assessment did conclude that there is one set of properties in TAII that appears eligible as a historic district. That is the Old Centrifuge and its associated equipment shelter. The Old Centrifuge represents SNL's first foray into large-scale environmental testing on-site. It was built in 1952 by SNL test engineers for testing the Mk7 Honest John warhead. It was rocket-powered. Although used very briefly, it was historically important as SNL's first foray into large-scale environmental testing at the SNL/NM site, an effort that expanded significantly in the following years, with the establishment of TAIII.

The period of significance for the Old Centrifuge and its associated equipment shelter is 1952-1954. It is eligible under Criteria A and C, for its association with the Environmental Testing theme and for its distinctive design, which precisely reflects its purpose, as shown in figure 14. Figure 15 provides a map of TAII, indicating the location of the Old Centrifuge Historic District.

[12] Rebecca Ullrich, *Tech Area II: A History,* SAND98-1617 (Albuquerque: Sandia National Laboratories, 1998).

Figure 14. Old Centrifuge Facility, view from east. Joseph Bonaguidi photographer, 02/26/2009.



Eligible or Contributing Buildings within the Old Centrifuge Historic District, TAII, Sandia National Laboratories

Figure 15. Map of Old Centrifuge Historic District, TAII, Sandia National Laboratories. Drawn by Don Helfrich.

3.3 Technical Area III

In 1954, SNL opened environmental testing facilities in Technical Area III (TAIII or Tech Area III).[13] TAIII occupies approximately 1,856 acres in the southwest portion of KAFB. The area houses a few support facilities not related to environmental testing, such as the Classified Destruction Facility (Building 6583), the Thermal Treatment Facility (Building 6715), and the Radioactive and Mixed Waste Management Facility (Buildings 6920, 6921, and 6925). With few exceptions, however, the area is devoted to environmental testing and has been since it was opened.

TAIII provides facilities testing in a variety of simulated environments originally designed for nuclear weapons design needs. Testing extends from replicating extreme conditions through full-scale experiments simulating both natural and induced environments. Currently, activities also include testing to verify the validity of computer models used to evaluate weapons systems. These facilities are associated with weapons testing in the Cold War and post-Cold War periods.

3.3.1 Landscape Overview

TAIII is noticeably different from TAI, in that these testing facilities require a great deal of space around them. Some of the facilities, such as the Rocket Sled Test Facility, require space in order to accommodate the needs of the testing facilities themselves, in this instance, a 10,000' sled track. Other testing facilities require space because explosives are involved. In general, distance is needed in order to ensure that one test does not cause a sympathetic response from other explosives stored or used in the area, or otherwise interfere with other test facilities. Thus the visual landscape in TAIII is dominated by the flat, open and treeless New Mexico high desert mesa, dotted with large and unique test facilities, as illustrated in figure 16.

[13] Leland Johnson, *Sandia National Laboratories: A History of Exceptional Service in the National Interest,* SAND97-1029 (Albuquerque: Sandia National Laboratories, 1997), 67.

Figure 16. The Dynamic Shock Facility dwarfed by the Manzanita foothills and dramatic sky. Cynthia Martin photographer, 02/11/2010.

The TAIII natural environment is an important component of the cultural landscape. Because the mesa has long been part of KAFB and SNL, it has, albeit unintentionally, been preserved in a way unusual in lands so closely situated to the urban sprawl of a city. In its Conservation Area Plan for 2010, the Ecology division of SNL's environmental department states:

> The SNL/NM and KAFB grasslands can be best described as fragments of historic grasslands in the region. They are now fragments due to the regional scarcity of the habitat and the relative isolation from other substantial grassland areas.[14]

TAIII also harbors an abundance of wildlife, including raptors, burrowing owls, eastern and western meadowlark, coyote, spadefoot toad, kangaroo rat, and the ever-present prairie rattlesnake. Thus another notable aspect of the built environment at TAIII is the level of human/wildlife interaction, which regularly occurs next to, on top of, and inside of the buildings themselves, as reflected in figure 17.

[14] Sandia National Laboratories, *Conservation Plan,* DRAFT (Albuquerque: Sandia National Laboratories, revised April 2010) p. 21.

Figure 17. Posted, "Warning--Beware of Rattlesnakes". Cynthia Martin photographer, 03/18/2010.

3.3.2 The Built Environment

The built environment at Tech Area III is dominated by flat roof CMU-constructed buildings; Butler-type metal corrugated buildings, many featuring high bays; and earth-bermed bunkers with concrete or thick steel faces and doors for explosives storage and protection. Figure 18 offers an example of both a flat-roofed CMU building and a corrugated metal-clad building. These building design features and materials are reflective of the highly pragmatic and utilitarian needs of an environmental testing laboratory environment. As in other locations at SNL, there is a prevalence of temporary buildings, sheds, and transport containers utilized in numerous different ways, frequently modified to fit the distinctive needs of a particular test.

Figure 18. Flat-roof CMU building and corrugated metal-clad building at the SURTSEY site. Cynthia Martin photographer, 02/11/2010.

Another notable aspect of Tech Area III is the various testing structures and apparatus that have been hammered, welded, wired, poured and fabricated by staff and contractors on-site in order to build according to the unique requirements of a newly developed test. Examples include the SURTSEY pressure vessel; the Drop Tower facility; an impact station at the Rocket Sled track, and a rail-car impact testing ramp. These examples are illustrated in figures 19, 20, 21, and 22.

Figure 19. SURTSEY pressure vessel. Cynthia Martin photographer, 03/05/2010.

Figure 20. Drop Tower facility. Cynthia Martin photographer, 03/02/2010.

Figure 21. Impact station at the Rocket Sled Test Facility. Dick Gerdes photographer, 05/18/2010.

Figure 22. Rail-car impact test structure. Cynthia Martin photographer, 03/02/2010.

3.3.3 Earth-Bermed Bunkers and Storage Igloos at TAIII

In terms of military wartime architectural history, the commonly used term "bunker" refers basically to a defensive military fortification, and while they are mostly below ground (compared to blockhouses which are mostly above ground), they were used extensively in World War I, World War II, and the Cold War. The architectural characteristics of these military structures as well as the geographical location and the historical context influenced and inspired the nature of the works that were produced. No matter their use, the bunker creates a challenging form of architecture, which is open to historical debate and aesthetic interpretation.

Bunkers were originally built to house front line defenses and command and control centers, but as a result of the Atomic Age, nuclear fallout shelters—or bomb shelters—became the main typology of defense architecture and a basic part of American culture during the Cold War; in essence, these structures are more than just military constructions: they are symbols.

At SNL bunkers are mainly above ground or dug into hillsides and are used for energetic materials (EM) or chemicals storage or within weapons testing facilities. Typically bunkers are single-story, roughly elliptical in design, arched-shaped, 150' x 80', made of reinforced concrete and covered with at least 2' of dirt over a 6" thick roof of waterproofed concrete. The surface above and around each bunker is sloped so water drains away from the bunker, and may consist of dirt, concrete or asphalt. The walls and roofs form a half cylinder, and ventilation shafts are located at the rear of each bunker chamber.

Features of the structures include a reinforced concrete entry façade with a reinforced concrete blast wall. The blast wall is constructed to contain an explosion in the bunker. The façade is a reinforced concrete wall with a flat parapet. There is usually a single leaf steel door centrally located on the façade. Ammo bunkers are good examples of typical utilitarian military support structures built at military bases during World War II. The bunkers are also significant in the area of engineering, as a specialized standardized design intended to store and protect explosive ammunition. Its overall design, use of materials, and methods of construction clearly convey its military origins. Equally important, however, many bunkers at SNL are industrial-type bunkers, which were built for control rooms of dangerous activities, such as tests of rocket engines and weapons, or to conduct explosive experiments. Figures 23, 24, and 25 provide examples of SNL's use of bunkered designs.

Figure 23. Building 6508, an explosives storage igloo built 1948. Cynthia Martin photographer, 02/11/2010.

Figure 24. Earth-bermed, asphalt-covered bunker at the Vibration Test Facility. Cynthia Martin photographer, 02/11/2010.

Figure 25. Complex Wave Test Facility. Cynthia Martin photographer, 02/11/2010.

3.3.4 Technical Area III Historic District, Sandia National Laboratories

Due to its consistent mission in providing environmental testing in support of the design of the U.S. nuclear stockpile, TAIII fully represents the Environmental Testing within the SNL/NM historic context. Most of the TAIII test facilities retain integrity for their nuclear weapons-related environmental testing activities. Their designs are distinctive and reflect the activities they house. As a result, a Technical Area III Historic District is proposed, to include those test facilities that retain integrity from the Cold War period. Several of the properties appear to be eligible for their individual contributions, but grouping them into a district allows for the full illustration of the relationship among test facilities, the repeated use of design elements, and the landscape of TAIII.

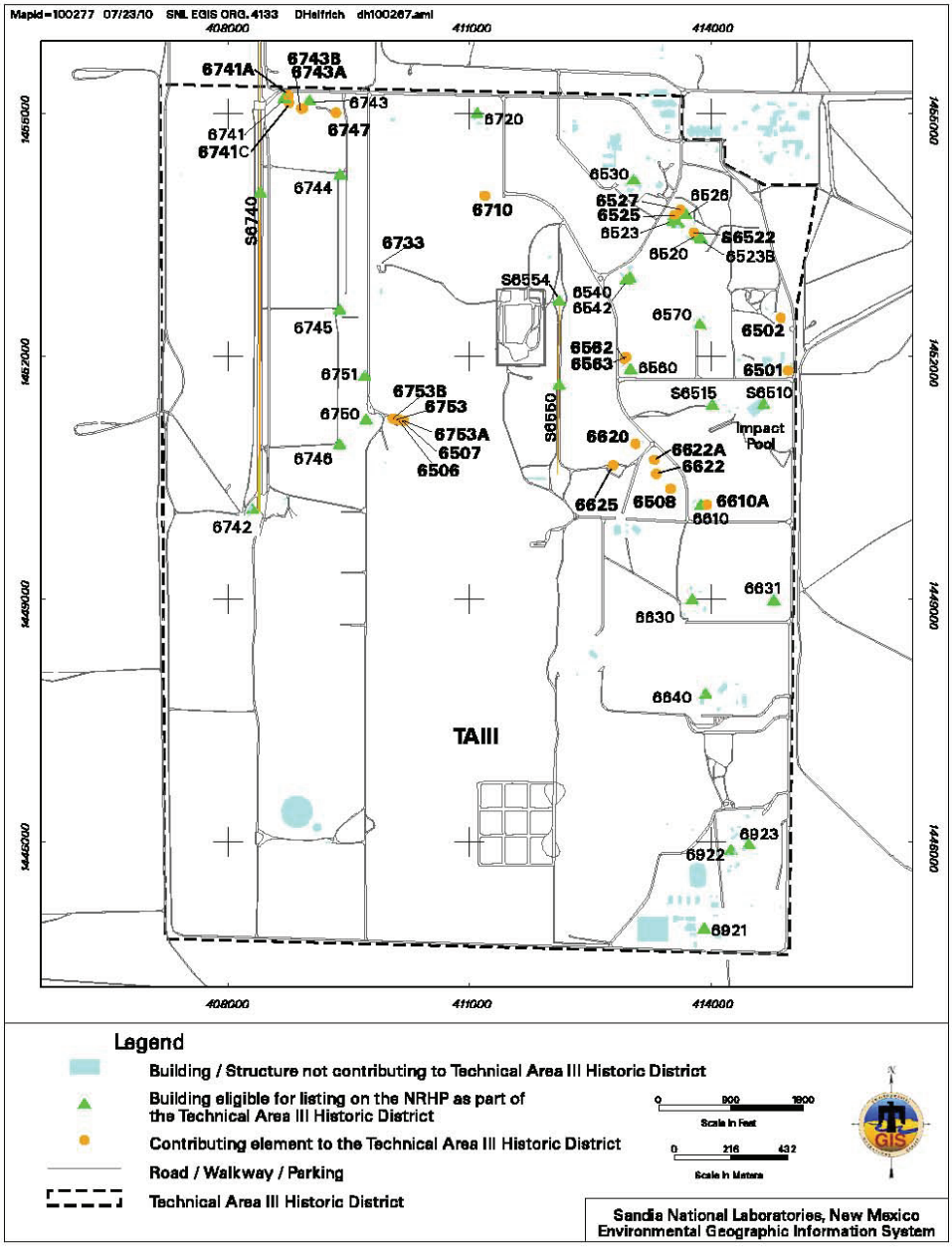
Figure 26 provides a list of the eligible and contributing elements to the Technical Area III Historic District. The list indicates all of the properties in the district, their name, whether they are eligible on their own (the others are contributing elements), the period of significance for which they are eligible, and the criteria and themes under which they are eligible. For the contributing elements, the Criteria & Themes column is used to indicate their contribution to the historic district. They all retain an exterior look-and-feel sufficient to invoke the time period. The district's period of significance is 1954-1989. Figure 27 is a map of the district.

Figure 26. Technical Area III Historic District, Sandia National Laboratories.

Building Number	Name	Year Acquired	Eligible	Period of Significance	Criteria & Theme(s)
6501	Non-hazardous Assembly	1956			(test support)
6502	Storage & Assembly	1958			(appearance)
6506	Explosive storage	1954			(test support)
6507	Explosive Storage Igloo	1948			(test support)
6508	Explosive Storage Igloo	1948			(test support)
S6510	300' Drop Tower	1957	X	1957-1989	A Environmental Testing
S6511	Variable Angle Launcher	1984			(appearance)
S6515	185' Drop Tower	1960	X	1960-1989	A Environmental Testing
6520	Hydraulic Centrifuge	1954	X	1954-1989	A & C Environmental Testing
S6522	Observation Tower	1985			(test support)
6523	Pump Building	1954	X	1954-1982	A Environmental Testing
6523B	Pump Bldg for 6526	1982	X	1982-1989	A Environmental Testing
6525	Equipment Building	1954			(test support)
6526	25' Centrifuge Facility	1966	X	1966-1989	A & C Environmental Testing
6527	Equipment Building for 6526	1968			(test support)
6530	Radiant Heat	1960	X	1960-1989	A Environmental Testing
6540	Aerosol Research	1954	X	1959-1989	A & C Environmental Testing
6542	Aerosol Research	1956	X	1956-1989	A & C Environmental Testing
S6550	Old 2000' Sled Track	1954	X	1954-1976	A & C Environmental Testing
S6554	Test Stand	1954	X	1954-1976	A & C Environmental Testing

Building Number	Name	Year Acquired	Eligible	Period of Significance	Criteria & Theme(s)
6560	Vibration Test Facility	1955	X	1955-1989	A Environmental Testing
6562	Metal Storage Building	1956			(test support)
6563	Equip Bldg for 6560	1958			(test support)
6570	Dynamic Shock	1956	X	1956-1989	A Environmental Testing
6610	Complex Wave Test	1959	X	1959-1990	A Environmental Testing
6610A	Shed	1956			(appearance)
6620	Hazardous Assembly	1958			(test support)
6622	Operational Storage Igloo	1959			(test support)
6622A	Storage Igloo	1965			(test support)
6625	Instrument Shelter	1956			(test support)
6630	Climatic Test Facility	1959	X	1959-1989	A & C Environmental Testing
6631	Control Building	1959	X	1959-1989	A & C Environmental Testing
6640	Acoustical Test Facility	1959	X	1959-1989	A Environmental Testing
6710	Air Gun Test Facility	1958			(appearance)
6720	Explosive Loading	1969	X	1959-1989	A Environmental Testing
6733	Explosive Storage	1964			(test support)
S6740	10,000' Sled Track	1966	X	1966-Present	A & C Environmental Testing
6741	Control Building	1966	X	1966-1989	A Environmental Testing
6741A	Storage/Quonset	1966			(test support)
6741C	Storage	1966			(test support)
6742	Instrumentation Bunker	1968	X	1966-1989	A Environmental Testing
6743	Rocket Motor Conditioning Bldg	1967	X	1967-1989	A Environmental

Building Number	Name	Year Acquired	Eligible	Period of Significance	Criteria & Theme(s)
					Testing
6743A	Storage	1966			(test support)
6743B	Storage	1948			(test support)
6744	Observation Tower	1966	X	1966-1989	A Environmental Testing
6745	Observation Tower	1966	X	1966-1989	A Environmental Testing
6746	Observation Tower	1966	X	1966-1989	A Environmental Testing
6747	Operational Storage Igloo	1968			(test support)
6750	Impact Test Facility	1966	X	1966-1989	A & C Environmental Testing
6750E	Storage Building	1956			(test support)
6751	Observation Tower	1966	X	1966-1989	A Environmental Testing
6753	Gun Charge Assembly Building	1970			(appearance)
6753A	Explosive Storage	1970			(test support)
6753B	Explosive Storage	1970			(test support)
6921	Rad Prototype - RMWMF	1956	X	1956-1989	A Environmental Testing
6922	Molten Core Lab	1955	X	1955-1989	A Environmental Testing
6923	Explosive Test Facility	1955	X	1955-1989	A Non-Weapons Research



Eligible and Contributing Buildings within the Technical Area III Historic District, TAIII, Sandia National Laboratories

Figure 27. Map of Technical Area III Historic District, Sandia National Laboratories. Drawn by Don Helfrich.

3.4 Technical Area IV

In the second half of the 1950s, SNL began a push to expand its fundamental research capabilities, in part to achieve a greater understanding of weapon effects. Of particular concern was the effect of a nuclear detonation on a nuclear weapon nearby. The initial effort resulted in the installation of a Van de Graaff accelerator in TAI's Building 803. The study of radiation of environments advanced from there, with the addition of more accelerators with different capabilities in TAI. Ion beam research expanded, as did research with X rays and neutrons, all in support of weapons effects studies. Reactors were also added SNL's mix of environmental test facilities investigating weapon effects—these were placed on the northeast edge of TAIII. The Sandia Engineering Pulsed Reactor Facility opened there in 1961, providing intense bursts of fast neutrons and gamma rays. The focus was on bursts and total dose effects of radiation on equipment and components.

The advance into pulsed beam research continued through the 1960s, with the ion physics laboratory in TAI and the reactor facilities in TAIII (eventually separated off to become TAV). By the 1970s, SNL pursued both particle beam fusion research and pulsed power systems and the research included both ongoing weapons and radiation effects studies as well as the research into fusion as an energy source.

Technical Area IV (TAIV or Tech Area IV), which occupies approximately 80 acres to the south of TAII on KAFB, was established in 1979 when ground was broken for a new Electron Beam Fusion Facility (soon renamed the Particle Beam Fusion Accelerator as its research parameters and configuration changed). The new area was dedicated to pulsed power systems research and particle beam fusion research. Also in 1979, DOE named SNL the lead laboratory for pulsed power development.

In TAIV, research with x-ray, gamma-ray, and particle-beam fusion accelerators is conducted to simulate nuclear weapons effects and to study inertial-confinement fusion and particle-beam weapons. Although the area and its facilities are not yet 50 years of age, this is clearly an area of historical importance for SNL/NM. Pulsed power research represents a significant line of work within the lab and the advances in the area have been significant.

The near forty-year evolution of accelerator design within the Cold and post-Cold War periods, has led to scientific breakthroughs for decades. Beginning with the HERMES I and II Radiation Science Mission in the 1960s, continuing with the Inertial Confinement Fusion Mission with PROTO I and II and PBFA I and II, and arriving at the Radiation Science and Inertial Confinement Fusion Mission of the Z-Machine.

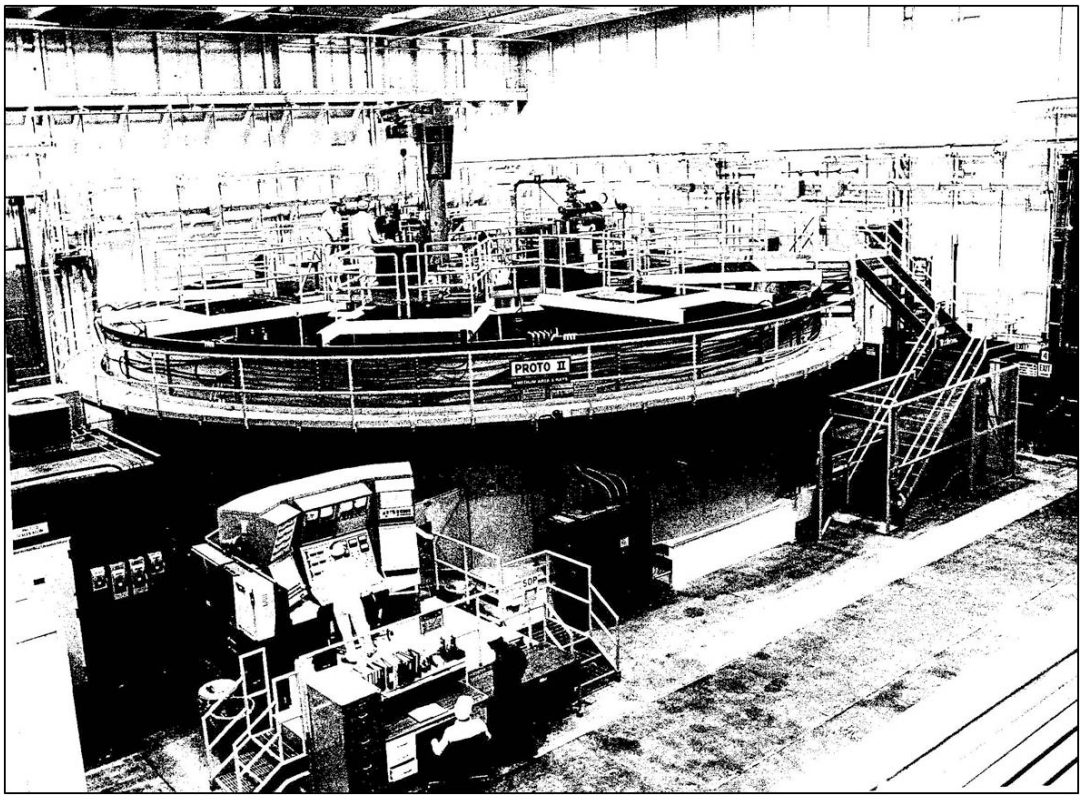


Figure 28. Interior of Building 970, Proto II, ca. 1984.

Figure 29. Part of the Particle Beam Fusion Accelerator (PBFA) now retired as a sculpture in TAIV. Titled "Starburst". Cynthia Martin photographer, 03/09/2010.

3.4.1 Pulsed Power Historic District, Sandia National Laboratories

The consistent design elements within TAIV, as well as the important role the pulsed power program plays within SNL/NM and its role in environmental testing (including weapons effects studies) for nuclear weapons design lead to a recommendation for a historic district. The district represents the environmental testing, the stockpile stewardship, and the non-weapons research themes, as the area has supported both weapon effects studies for weapon design and for testing related to stockpile stewardship. It is also a leader in the pursuit of fusion as an energy source. The Pulsed Power Historic District, Sandia National Laboratories, has a period of significance from 1979 to the present.

The district's external characteristics display an industrial vernacular style of machine-driven functionality and purpose (flat roof, aluminum frame-recessed windows, cement construction, exterior walls of pre-cast brown concrete double tees; striated pre-cast concrete texture-coated fascia panels surround roof's edge, glass breezeway linking office/labs to middle and high bay reactor areas, roll-up entrance doors for materials), while its building interiors combine the function of pure laboratory testing with data processing and analysis, all of which creates a significant combination of architectural practicality on the outside and consciously designed high-level scientific research and development on the inside. Figures 30 and 31 illustrate the exterior design look-and-feel of the area.

Figure 30. Building 970, Simulation Technology Lab, completed in 1984. Cynthia Martin photographer, 03/09/2010.

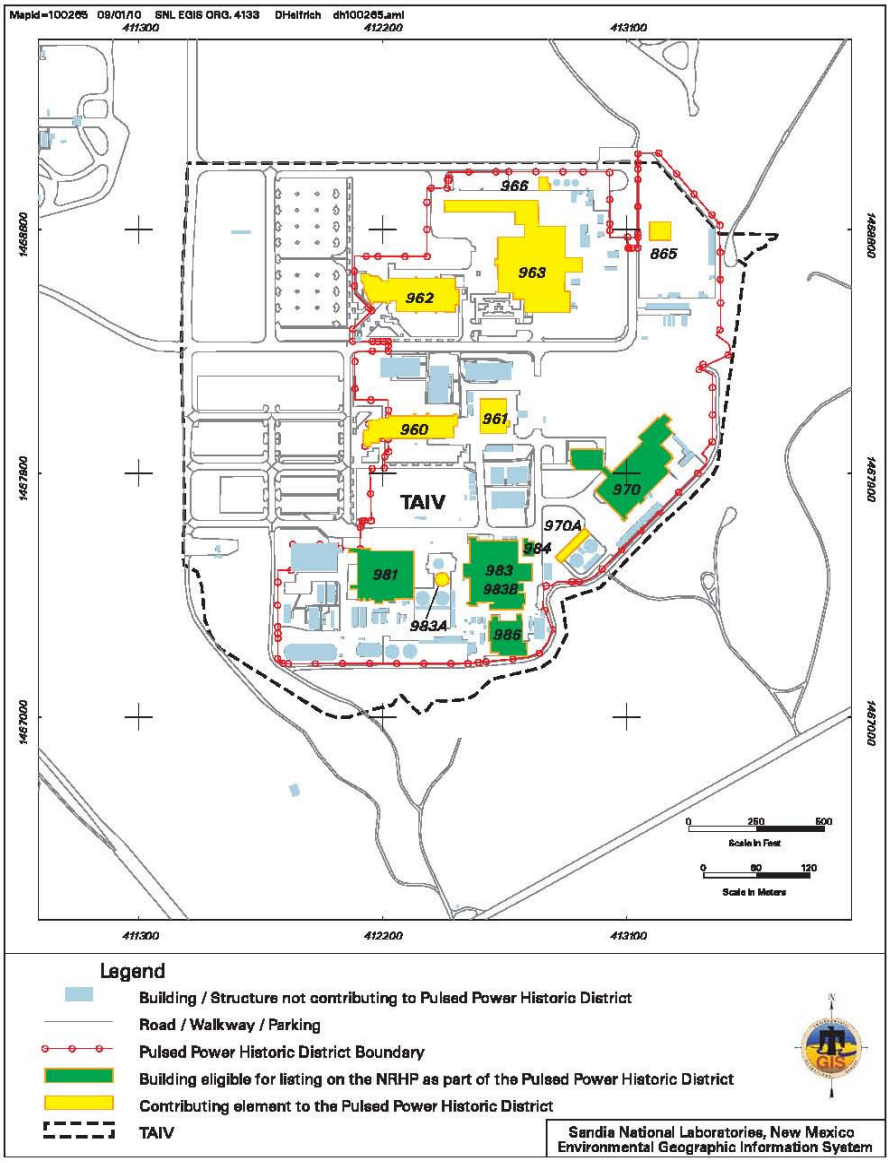
The district retains integrity, although new non-pulsed power buildings have been inserted into it in recent years. The integrity of the properties in the district is reflected in their location (a specifically designated well-protected enclave for specialized activities), and the consistency of their design (the buildings reflect exterior functionality and interior purpose). They retain their association (the direct link between an important historic event, in this case, the evolution of different types of fusion, and these historic facilities dedicated to maintaining a cutting edge in accelerator development) with the historic events with which they are associated. The overall architectural style at work in the Pulsed Power District—industrial vernacular—creates a feeling of function, purpose, efficiency, and even monumentality.

Figure 31. Building 983, Particle Beam Fusion Accelerator, completed in 1983. Cynthia Martin photographer, 03/09/2010.

Figure 32 provides a list of the properties included in the Pulsed Power Historic District. The list indicates all of the properties in the district, their name, whether they are eligible on their own (the others are contributing elements), the period of significance for which they are eligible, and the criteria and themes under which they are eligible. For the contributing elements, the Criteria & Themes column is used to indicate their contribution to the historic district. They all retain an exterior look-and-feel sufficient to invoke the time period. The district's period of significance is 1979-present. Figure 33 is a map of the historic district.

Figure 32. Pulsed Power Historic District, Sandia National Laboratories.

Building Number	Name	Year Acquired	Eligible	Period of Significance	Criteria & Theme(s)
	Particle Beam Sculpture				(appearance)
960	Reactor Support Facility	1983			(testing support)
961	Reactor Support Facility	1983			(testing support)
962	Strategic Defense Facility	1989			(testing support)
963	Strategic Defense Facility	1995			(testing support
965	Strategic Defense Facility	1995			(testing support
966	Process Support Facility	1995			(testing support
970	Simulation Technical Lab	1984	X	1984-2004	A & C Stockpile Surveillance, Environmental Testing, & Non-Weapons Research
970A	Simulation Support	1987			(testing support
981	Particle Beam Fusion	1979	X	1979-Present	A & C Environmental Testing & Non-Weapons Research
983	Particle Beam Accelerator	1983	X	1983-Present	A & C Environmental Testing & Non-Weapons Research
983A	Beam Accelerator Support	1985			(testing support
983B	Beam Accelerator Phase B	1985	X	1985-Present	A & C Environmental Testing & Non-Weapons Research
984	Neutron Measurement Lab	1990	X	1990-Present	A Environmental Testing
986	Components Develop. Lab	1983	X	1985-Present	A & C Environmental Testing



Eligible and Contributing Buildings within the Pulsed Power Historic District, TAIV, Sandia National Laboratories

Figure 1. Map of Pulsed Power Historic District, TAIV, Sandia National Laboratories. Drawn by Don Helfrich.

3.5 Technical Area V

SNL's nuclear reactor facilities are located in Technical Area V (TAV or Tech Area V). Growing out of the same initial push for facilities supporting weapon effects studies that resulted in the later creation of TAIV, TAV is a fenced area of approximately 33 acres located in the north central portion of KAFB. The primary facilities in TAV include

- Hot Cell Facility (HCF), capable of isotope production in Building 6580. Not in operation.
- Annular Core Research Facility (ACRR), an open pool reactor in Building 6588. It serves to provide neutron and gamma radiation environments in either pulsed or sustained modes for performing experiments, including component electronics testing.
- Gamma Irradiation Facility (GIF), a deep water pool reactor with three dry irradiation cells in Building 6586. The GIF provides highly specialized high-intensity gamma ray source experiment work using test cells for the irradiation of experiments.
- Auxiliary Hot Cell Facility (AHCF), in Building 6597 is responsible for disposing of legacy materials and radioactive waste.
- Sandia Pulsed Reactor Facility/Critical Experiment Facility (SPRF/CX), is located in Building 6590, 39' diameter, cylindrical, thick-walled, steel-reinforced concrete structure covered with a hemispherical shell and referred to as the Kiva. The original mission of the SPRF was to provide near-fission spectrum radiation environments for testing a wide variety of technologies that support both defense and non-defense activities. SPRF is not in use; the SPRF/CX is used for low-energy critical experiments.

The ACRR and SPR support stockpile stewardship activities, as well as external customers with research needs.

3.5.1 Reactor Complex Historic District, Sandia National Laboratories

The consistency of mission over the course of TAV's history from 1961 through the end of the Cold War leads to a historic district consideration. During the 1961-1989 period, the area had a singular focused mission providing nuclear reactor support for environmental testing of weapon components and materials in radiation environments and the support for weapons materials research at SNL.

TAV is a contained, secure environment, with a concrete landscape and an overall appearance of security and reactor design. The facilities tend to embody design elements that are linked directly to the function of nuclear reactors in close proximity to labs and offices. The overall industrial vernacular emphasis on machine-driven functionality and purpose is reflected in the exterior designs (flat roof, aluminum frame-ribbon windows, CMU construction, high bay reactor area, roll-up entrance for materials), while the interiors combine the function of pure laboratory testing with data processing and analysis, all of which creates a significant combination of architectural practicality on the

outside and consciously designed high-level scientific research and development on the inside. Figures 34, 35, and 36 provide examples of the practical exterior designs present within TAV. Figures 37 and 38 illustrate the levels of security in place during the Cold War; its replacement is planned.

The Reactor Complex Historic District appears to retain its integrity, as reflected in its location (a specifically designated well-protected location for nuclear activities), design (the buildings reflect exterior functionality and interior purpose), and clear association with its theme (the direct link between an important historic event, in this case, the Cold War). Its period of significance is 1961-1989.

Figure 34. Building 6588, Annular Core Research Reactor, Tech Area V, completed in 1963. Cynthia Martin photographer, 03/19/2010.

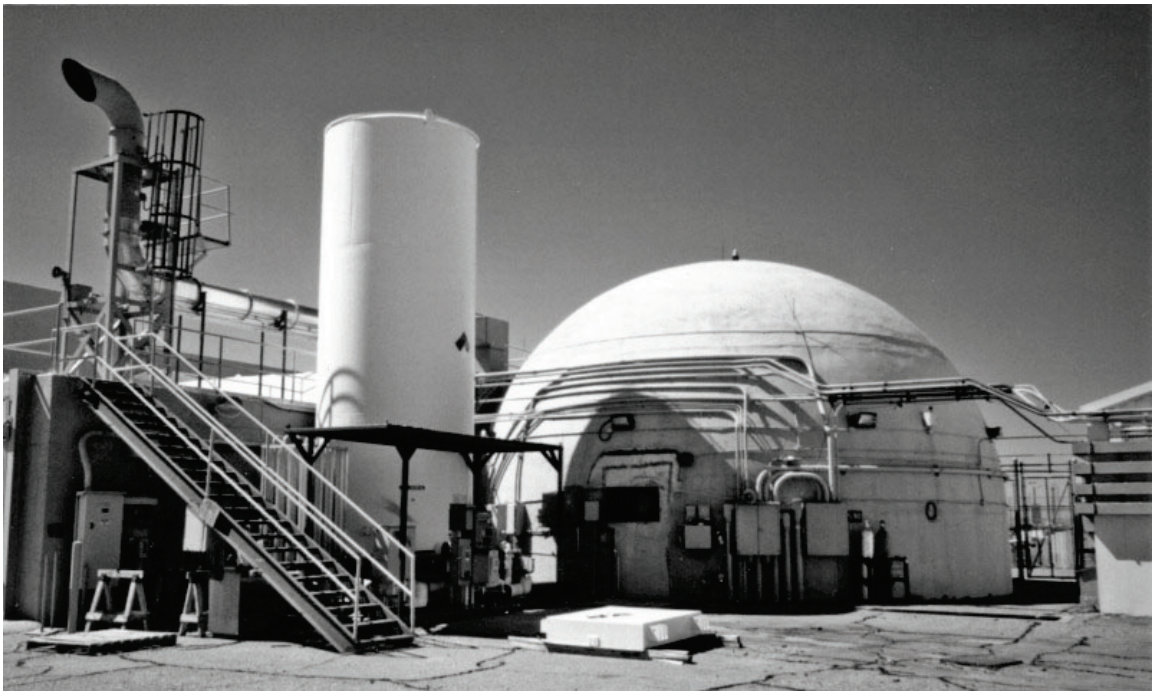


Figure 35. Sandia Pulsed Reactor, Tech Area V, ca. 1961. *Left to right:* Buildings 6593, 6590 (reactor), 6592.

Figure 36. Building 6580, Reactor Facility, Tech Area V. Cynthia Martin photographer, 03/19/2010.

Figure 37. Chin link around chain link, telephone poles, and lighting. All part of the heavy security protecting TAV's SPR. Cynthia Martin photographer, 05/17/2010.

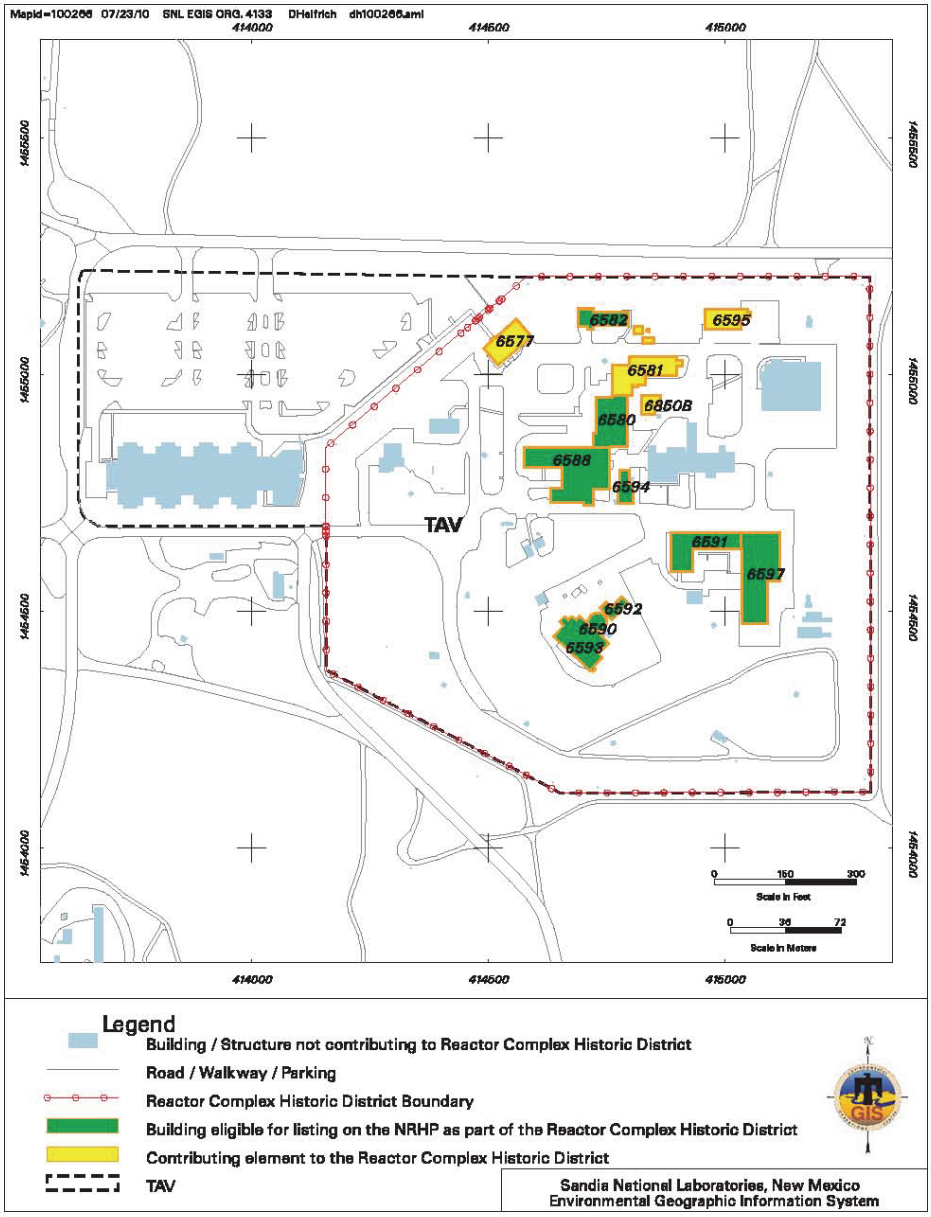
Figure 38. Closely spaced lighting, a double layer of chain link fencing, security cameras, and a wide concrete crash barrier--part of the security environment at TAV. Cynthia Martin photographer, 05/17/2010.

Figure 39 provides a list of the eligible and contributing elements in the Reactor Complex Historic District. The list indicates all of the properties in the district, their name, whether they are eligible on their own (the others are contributing elements), the period of significance for which they are eligible, and the criteria and themes under which they are eligible. For the contributing elements, the Criteria & Themes column is used to indicate their contribution to the historic district. They all retain an exterior look-and-feel sufficient to invoke the time period. The district's period of significance is 1961-1989. Figure 40 is a map of the district.

Figure 39. Reactor Complex Historic District, Sandia National Laboratories.

Building Number	Name	Year Acquired	Eligible	Period of Significance	Criteria & Theme(s)
6577	Perimeter Control Building	1990			(security)
6580	HCF	1963	X	1963-1989	A & C Environmental Testing
6580A	HCF	1956			(reactor support)
6580B	HCF	1956			(reactor support)
6580C	HCF	1956			(reactor support)
6580D	HCF	1956			(reactor support)
6581	Security Services Building	1975			(security)
6582	Evacuation Building	1963	X	1963-1989	A Administration/ Community
6586	GIF	1995			(appearance)
6588	ACRR	1963	X	1963-1989	A Environmental Testing
6590	SPR	1961	X	1966-1989	A Environmental Testing, & Non-Weapons Research
6591	Reactor Control	1961	X	1961-1989	A Environmental Testing
6592	SPR Lab	1966	X	1966-1989	A Environmental Testing & Non-Weapons Research
6593	SPR Equipment Building	1961	X	1961-1989	A Environmental Testing & Non-Weapons Research

Building Number	Name	Year Acquired	Eligible	Period of Significance	Criteria & Theme(s)
6594	Low Level Counting Lab	1964	X	1964-1989	A & C Environmental Testing
6595	Irradiated Materials Storage	1965			(appearance)
6597	AHCF	1971	X	1971-1989	A & C Environmental Testing



Eligible and Contributing Buildings within the Reactor Complex Historic District, TAV, Sandia National Laboratories

Figure 40. Map of Reactor Complex Historic District, TAV, Sandia National Laboratories. Drawn by Don Helfrich.

3.6 Coyote Test Field

The Coyote Test Field (CTF) is approximately 50,500 acres. It includes the withdrawn areas from Cibola National Forest permitted to DOE and KAFB, as well as a large central area of KAFB. Proximity fuze testing was done in CTF during World War II and the area has continued to house a variety of test and training facilities for DOE and KAFB. SNL has several test facilities in the area.

The assessment of surveyed properties resulted in a recommendation for three historic districts within CTF. The Aerial Cable Historic District, the National Solar Thermal Test Facility Historic District, and the Explosive Testing Historic District. They are outlined below.

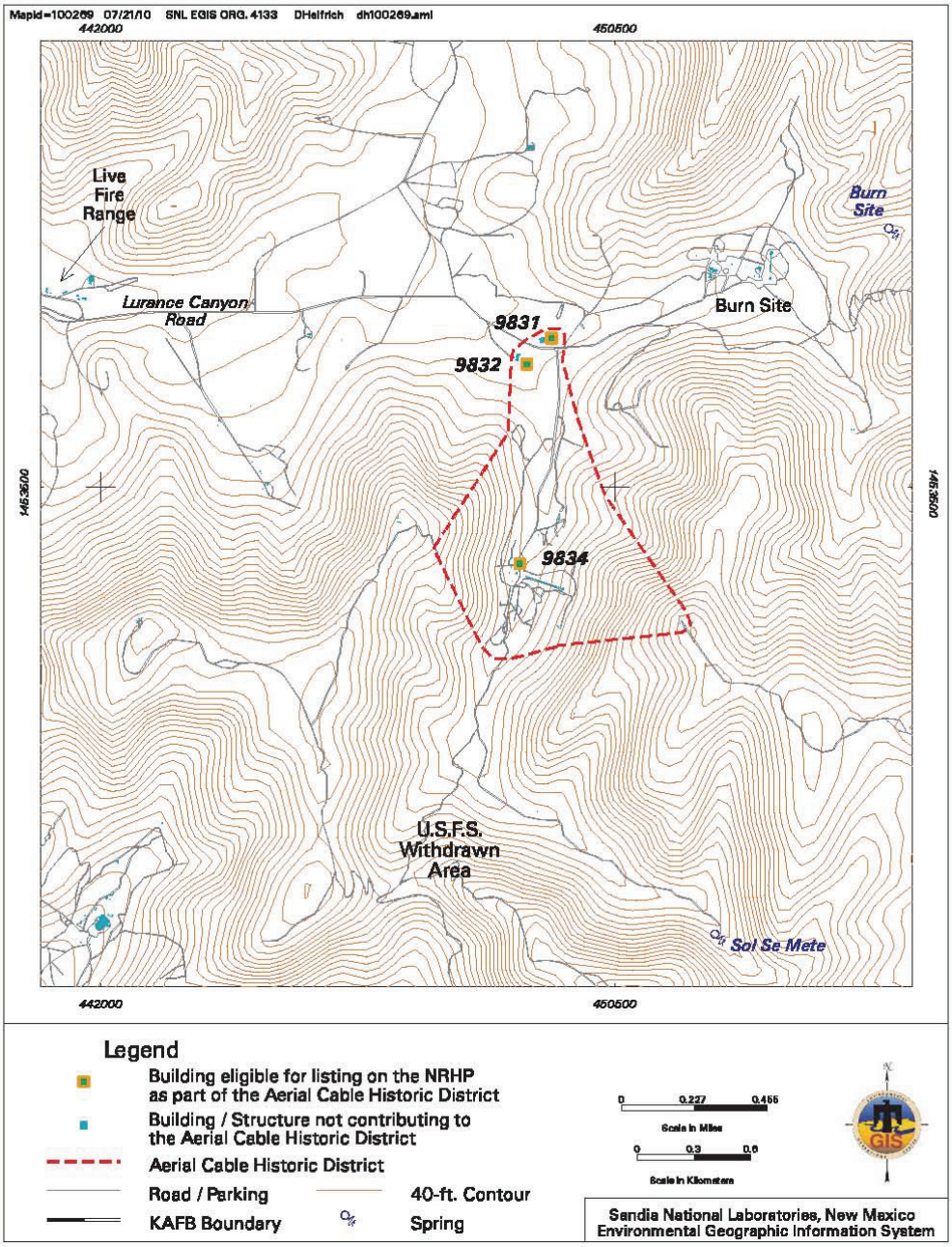
3.6.1 Aerial Cable Historic District, Sandia National Laboratories

The SNL Aerial Cable Facility was previously determined by DOE to be eligible for the NRHP; NM SHPO concurred on December 17, 2003. The re-evaluation done for this assessment determined that, in spite of clean-up activities at the facilities and the construction of a new control building (which is not eligible due to age), the Aerial Cable Historic District remains intact.

The facilities in the Aerial Cable Historic District are utilitarian in design, reinforced concrete, with a basic bunker-like appearance. Figure 41 lists the properties, their names, year built, period of significance, and the criteria and themes they qualify under. The period of significance for the district is 1865-1989. The district retains integrity for this period. Figure 42 is a map of the eastern withdrawn area that is the eastern edge of CTF.

Figure 41. Aerial Cable Historic District, Sandia National Laboratories.

Building Number	Name	Year Acquired	Eligible	Period of Significance	Criteria & Theme(s)
9831	Instrumentation Control	1965	X	1965-Present	A Environmental Testing
9832	Explosive Assembly	1965	X	1965-1989	A Environmental Testing
9834	Instrumentation Control	1965	X	1965-1989	A Environmental Testing



Eligible Buildings within the Aerial Cable Historic District, U.S.F.S. Withdrawn Area, Sandia National Laboratories

Figure 42. Map of the Aerial Cable Historic District, Sandia National Laboratories. Drawn by Don Helfrich.

3.6.2 National Solar Thermal Test Facility Historic District, Sandia National Laboratories

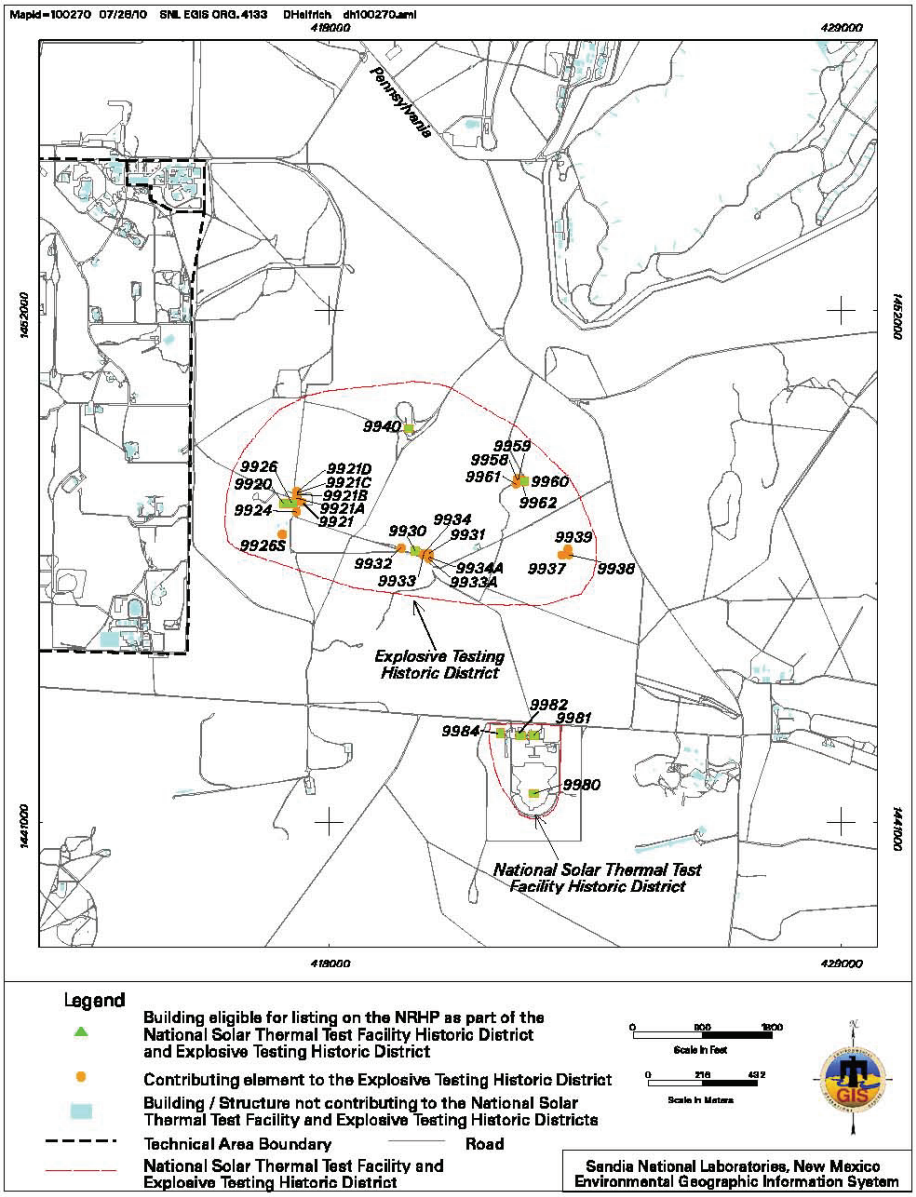
In the early 1970s, SNL was asked by the Atomic Energy Commission (AEC) to undertake research in alternative energy. SNL began programs in solar and wind energy. As part of that effort, later in the decade, the National Solar Thermal Test Facility (NSTTF) was established for the purpose of researching and developing reliable solar energy systems for large-scale power generation.

Research at the NSTTF has been notable for its interactions with external users, particular engine developers who test designs for engines that convert the solar energy into usable electricity. The program has had significant success in solar research and is about to upgrade its facilities for further advances.

Figure 43 provides a list of the eligible properties included in the proposed National Solar Thermal Test Facility Historic District Sandia National Laboratories. The list indicates the properties in the district, their name, the period of significance for which they are eligible, and the criteria and themes under which they are eligible. They all retain an exterior look-and-feel sufficient to invoke the time period and the purpose of the facilities. The district's period of significance is 1980-2010. Figure 44 is a map of the historic districts within CTF western half, including the NSTTF.

Figure 43. National Solar Thermal Test Facility Historic District, Sandia National Laboratories.

Building Number	Name	Year Acquired	Eligible	Period of Significance	Criteria & Theme(s)
9980	Solar Power Tower	1978	X	1978-2010	A & C Non-Weapons Research
9981	5MW Solar Control Building	1980	X	1980-2010	A Non-Weapons Research
9982	5MW Solar Assembly Building	1978	X	1978-2010	A Non-Weapons Research
9984	Engine Test Facility	1989	X	1989-2010	A Non-Weapons Research



Eligible and Contributing Buildings within the National Solar Thermal Test Facility Historic District and Explosive Testing Historic District, Coyote Test Field, Sandia National Laboratories

Figure 44. Map of National Solar Thermal Test Facility Historic District and Explosive Testing Historic District, Coyote Test Field, Sandia National Laboratories. Drawn by Don Helfrich.

3.6.3 Explosive Testing Historic District, Sandia National Laboratories

In 1950 SNL physicists began studying atomic blast wave effects in the effort to better understand their destruction capabilities. At that time the physics of blast wave effects was still a relatively new subject, and it was determined that high-scale conventional explosives could provide an effect similar enough to a nuclear blast for study purposes. Researchers turned to the Coyote Test Field as an available (and previously used) explosive test site, due to its relatively remote and spacious acreage, as well as easy-to-scale hills close in which offered good observation vantage points. The first explosive firing facility located in the CTF was constructed and put into operation in the early 1960s, with five separate sites each one-half mile apart. This distance was needed in order to ensure that other explosives in the vicinity are not triggered to detonate "sympathetically" as a result of an explosion nearby.

During the Cold War period the explosives facility was used in support of all the weapons programs authorized for development. In 1970 the facility began to support underground test events at the Nevada Test Site. In 1981 after almost 20 years of operation the facility underwent a renovation and technical updating to take advantage of what was at the time the latest available computer control and digital data acquisition and processing technology. The facilities lost integrity.

In the meantime, SNL developed an additional set of explosive test facilities in CTF, in the area just to the east of TAIII. These facilities used explosives in a variety of environmental tests in support of nuclear weapons design. Small, explosive components were tested, as were materials subjected to explosive environments. SNL developed considerable expertise in flyer-plate studies. The lab also made extensive advances in data capture techniques for explosives testing and in test definition to more accurately test items to their expected environments.

The facilities are rugged in design, made of reinforced concrete with explosive test pads either on the exterior or encased in cells on the interior of the buildings. Most were constructed in the 1960s and still display the industrial vernacular style used at SNL in the immediately post-war period. Some feature dirt bunker covering to contain blasts and all are completely utilitarian in design. Figures 45 and 46 illustrate the design philosophy of explosives testing

Figure 45. Building 9920, Explosive Test Facility Complex. Cynthia Martin photographer, 03/18/2010.

Figure 46. Building 9940, Explosive Devices Test Facility. Cynthia Martin photographer, 03/16/2010.

As with Tech Area III, the Explosive Testing Historic District includes storage bunkers for energetic materials and for occasional testing. Also similar to Tech Area III, is the district's location in a stunning natural environment, which, because it has not be grazed in over 40 years, features well-preserved New Mexico grassland, and a wealth of living creatures that populate the habitat.

Figure 47 provides a list of the eligible and contributing elements included in the proposed Explosive Testing Historic District, Sandia National Laboratories. The list indicates all of the properties in the district, their name, whether they are eligible on their own (the others are contributing elements), the period of significance for which they are eligible, and the criteria and themes under which they are eligible. For the contributing elements, the Criteria & Themes column is used to indicate their contribution to the historic district. They all retain an exterior look-and-feel sufficient to invoke the time period and the purpose of the facilities. The district's period of significance is 1959-1989. The map in figure 44 includes the Explosive Testing Historic District.

Figure 47. Explosive Testing Historic District, Sandia National Laboratories.

Building Number	Name	Year Acquired	Eligible	Period of Significance	Criteria & Theme(s)
9920	Explosive Test Facility Complex	1959	X	1959-1989	A & C Environmental Testing
9921A	Explosive Storage Igloo	1982			(test support & appearance)
9921B	Explosive Storage Igloo	1982			(test support & appearance)
9921C	Explosive Storage Igloo	1982			(test support & appearance)
9921D	Explosive Storage Igloo	1982			(test support & appearance)
9924	Storage	1984			(appearance)
9926	Explosive Research Lab	1968	X	1968-1989	A & C Environmental Testing
9926M	Quonset Storage Building	1956			(test support & appearance)
9926S	Storage Building	1956			(test support & appearance)
9930	Explosive Test and Lab	1961	X	1961-1989	A & C Environmental Testing
9931	Explosive Storage Bunker	1961			(test support & appearance)
9932	Explosive Storage Bunker	1961			(test support & appearance)
9933	Explosive Storage Bunker	1961			(test support & appearance)
9933A	Storage Magazine	1961			(test support &

Building Number	Name	Year Acquired	Eligible	Period of Significance	Criteria & Theme(s)
					appearance)
9934	Explosive Storage Igloo	1962			(test support & appearance)
9934A	Storage Magazine	1962			(test support & appearance)
9937	Explosive Storage Bunker	1965			(test support & appearance)
9938	Explosive Facility Test Cells	1974			(test support & appearance)
9939	Laboratory/Explosive Control Building	1974			(test support & appearance)
9940	Explosive Devices Test	1963	X	1963-1989	A Environmental Testing
9958	Explosive Storage Igloo	1967			(test support & appearance)
9959	Explosive Storage Igloo	1967			(test support & appearance)
9960	Explosive Preparation	1965	X	1965-1989	A & C Environmental Testing
9961	Storage Bunker	1981			(test support & appearance)
9962	Explosive Storage Magazine	1981			(test support & appearance)

3.7 SNL Buildings and Resources Outside of KAFB Boundaries

Most properties housing SNL/NM activities outside of the KAFB boundaries are leased and their historic significance and NRHP eligibility are not DOE's responsibility. They were not assessed in this effort. The only DOE-owned property outside of KAFB that was included in the assessment was Building 518, the Center for Integrated Nanotechnology (CINT). Built in 2006, CINT is too young to be found eligible for the NRHP.

CINT is one of five DOE/Office of Science Nanoscale Science Research Centers operating as a national user facility. Its mission is to determine the scientific principles governing the design, performance, and integration of nanoscale materials. CINT allows researchers to explore the continuum from scientific discovery to the integration of nanostructures on both micro and macro levels. The 97,000 square ft, one-story building has mechanical penthouses consisting of offices, conference rooms, laboratories and building services. It houses very interesting work and should be re-evaluated as it ages.

4. Survey Results: Summary and Conclusion

The survey and assessment provided a full review of the SNL/NM built environment. The final recommendations is for eight historic districts, containing both the properties that would be eligible on their own and contributing elements that would not be eligible without the surrounding district, but that clearly assist in the overall understanding of the district in that they reflect the work done and the appearance of the district for its period of significance. Each of SNL/NM's technical areas includes a historic district, while three were defined in the Coyote Test Field.

In addition to the eight historic districts, three buildings are recommended as eligible on their own, without an associated district. The three eligible buildings are in Technical Area I. Figure 1 lists the eligible properties and the districts.

4.1 HCPI Forms

The 237 NM HCPI forms completed during the survey are found in Appendix D. They provide architectural descriptions, construction completion dates, and other relevant details for buildings over 1,000 gsf and significant structures. Smaller, related buildings and structures are referenced on the HCPI form of their "host", or main building in the facility with which they are associated.

4.2 Future Actions and Approaches

In previous NHPA Section 106 consultations, DOE has taken the approach of retaining the set of Kruger buildings in TAI and maintaining their exterior appearance. For the most part, other eligible properties have been preserved through documentation when they face significant renovation or demolition.

SNL/NM is an active research and development laboratory with ever advancing scientific research and engineering practices. Its facilities and equipment are expected to change to meet needs in a timely fashion. Preservation in place would hamper such advances. As a result, SNL and Sandia Staffing Alliance, LLC, staffs have begun large-format documentation of facilities recommended as eligible in this assessment. This work is expected to continue.

DOE will also be developing a Cultural Resources Management Plan (CRMP) to further define strategies and tactics for addressing the properties found eligible as time goes on. The CRMP will also outline the timing and other expectations for re-evaluations of those properties found ineligible at this time.

In particular, properties currently too young to be found eligible should be re-evaluated as they near 50 years of age. In addition, Criterion B should be re-addressed in the future, as SNL staff members may prove historically significant as time passes.

5. Bibliography

5.1. Archival Sources

The primary archival sources used in the survey and assessment were copies of the SNL building drawings located in the Facilities Library; the Facilities Information Management System list of all properties overseen by Facilities at SNL/NM; and the environmental testing, development testing, pulsed power, and solar collections in the SNL Corporate Archives.

5.2. Published Sources

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