

3.0 AFFECTED ENVIRONMENT

The following sections include discussions of the local environment currently and potentially affected by the construction and operation of the TCR Project. The resource areas described are specific to SNL/NM site-wide conditions, and where applicable, specific to the proposed project area located in TA-I, TA-III, and the Coyote Test Field.

Other resources, summarized below, were considered but are not discussed in detail because they would not be substantially impacted by either the Proposed Action or the No Action Alternative. The buildings and facilities that would be constructed and/or modified under the Proposed Action are located in industrially developed areas of TA-I, TA-III, and the Coyote Test Field at SNL/NM. Surrounding areas have been disturbed as a result of development of each area.

- *Geology and Soils* – Previous surveys discussed in the Environmental Information Document and the SNL/NM SWEIS identified no impacts to the geology and soils in the areas of TA-I, TA-III, and the Coyote Test Field area where the facilities are located or on previously disturbed land in the case of the proposed new ESC. No prime farmlands exist at SNL/NM.
- *Surface Water* – Natural water flow has already been interrupted by the previous site disturbances. Stormwater would be handled in accordance with best management practices.
- *Groundwater* – The project would involve potential installation of a small-casing (6-inch) well at the Aerial Cable Facility Central Services Building to support two toilets and three sinks for use by employees when present at the facility. The facility will be used only during testing at the Aerial Cable Test Facility; therefore, extraction of groundwater at the site would be sporadic and minimal. No other new withdrawals from or discharges to groundwater resources are anticipated, and no sources of potential groundwater contamination would be created or altered. No substantial sources of potential groundwater contamination would be created or altered.
- *Biological Resources* - Under the Proposed Action, impacts to terrestrial resources are anticipated to be minimal. Under the Proposed Action, no impacts to any Federal or State of New Mexico threatened, endangered, or candidate species are anticipated based on a preliminary project screening survey that was conducted (Salinas 2002). However, prior to construction, a clearance survey by a qualified biologist will be conducted to ensure that no impacts occur to species protected by the *Endangered Species Act* and *Migratory Bird Treaty Act*. Additionally, the clearance survey will ensure that soil erosion and sedimentation control measures for construction activities are adequate to protect wetlands.
- *Socioeconomics* – Construction of the facility would require the services of architectural, engineering, and construction firms; however, such support would be temporary. New and upgraded facilities would be staffed primarily with existing personnel. No substantial long-term increases in employment or substantial increases in funding would result from the Proposed Action or the No Action Alternative.

3.1 General Site Description

The TCR Project would be located at SNL/NM's TA-I, TA-III, and the Coyote Test Field near Albuquerque, New Mexico.

3.1.1 Albuquerque

Albuquerque is located in Bernalillo County, in north-central New Mexico, and is in the state's largest city with a population of approximately 420,000. The Sandia Mountains rise steeply immediately north and east of the city, with the Manzanita Mountains extending to the southeast. The Rio Grande runs southward through Albuquerque and is the primary river traversing central New Mexico. Nearby communities include Rio Rancho and Corrales to the northwest, the Pueblo of Sandia and town of Bernalillo to the north, and the Pueblo of Isleta and towns of Los Lunas and Belen to the south (DOE 1999).

3.1.2 SNL/NM

SNL/NM is located within KAFB, approximately 7 miles southeast of downtown Albuquerque. KAFB, including SNL/NM, is situated on a high, arid alluvial fan in the foothills of the Manzano Mountains. The alluvial fan slopes gently to the west to the Rio Grande.

There are 5 SNL/NM TAs that cover approximately 2,560 acres of DOE-owned land. TAs-I, -II, and -IV encompass approximately 645 acres. TA-III encompasses approximately 1,890 acres, and TA-V encompasses approximately 25 acres.

3.1.3 TA-I

TA-I is a relatively small research area consisting of about 370 closely grouped structures consisting primarily of indoor laboratories, office space, and maintenance facilities. TA-I is located adjacent to the various Kirtland AFB structures east of Wyoming Boulevard, west of Eubank Avenue, and north of Tijeras Arroyo (DOE 1999). The preferred site for the ESC is the parking lot north of Building 861 (DOE 2002a).

In addition to the ESC, key facilities located in TA-I include the following (DOE 1999):

- Neutron Generator Facility
- Microelectronics Development Laboratory
- Advanced Manufacturing Processes Laboratory
- Integrated Materials Research Laboratory
- Explosive Components Facility

TA-I also includes support buildings for these facilities, storage, light laboratories, and administrative/office space.

3.1.4 TA-III

TA-III is located approximately 5 miles south of TA-I. The facilities located in this technical area are devoted to violent physical testing and simulating a variety of natural and induced environments. Most of the structures in TA-III are grouped together in small units (organized by testing facility) and separated by extensive open spaces. An administrative building and mobile office trailers provide space for administrative, office, and light laboratory functions. Other key

facilities exist in TA-III in addition to the Rocket Sled Track, the Centrifuge Complex, the Mechanical (Dynamic) Shock, the Thermal Radiant Heat Facility, and the Central Services Building. These include the following (DOE 1999):

- Hot Gas Facility
- Terminal Ballistics Facility
- Static (Force and Pressure) Facility
- Drop Tower
- Water Impact Facility

3.1.5 Coyote Test Field

The Coyote Test Field is a large area within KAFB that contains a variety of remote testing sites and facilities. The area is comprised of mostly open, flat to undulating, grassland terrain in the west, to more mountainous topography in the east. The Aerial Cable Test Facility, Burn Site, and FLAME are located in the Coyote Test Field on land permitted to the DOE by the USAF. Other SNL/NM facilities include the Explosives Applications Laboratory, Containment Technology Test Facility-West, and Thunder Range Complex (DOE 1999).

3.2 Air Quality

3.2.1 Meteorological Conditions

SNL/NM is located along the eastern margin of the regional area known as the Albuquerque Basin. The geography of this area, which consists of mountains, canyons, and the Rio Grande Valley, greatly influences the meteorological conditions. Temperature inversions occur during the winter months, restricting dispersion and dilution of air pollutants in the basin area by trapping the pollution near the surface. The most important implication of meteorological variation across SNL/NM is the effect of wind variability on transport and dispersion of pollutants. Wind characteristics vary across SNL/NM based on proximity to topographical and urban features. The mountains and canyons to the east create the predominant wind directions at SNL/NM. Dispersion occurs as a result of wind patterns developing from the complex interactions of the numerous geographic features. When constituents are emitted to the atmosphere, they are carried away from the source by wind transport and diluted by mixing with the ambient air.

3.2.2 Meteorological Monitoring

Meteorological monitoring commenced at SNL/NM in January 1994. The eight-tower meteorological monitoring network consists of six 10-m towers, one 50-m tower, and one 60-m tower. All towers are instrumented at the 3- and 10-m levels. Instrumentation is also installed at the top of the tall towers. Meteorological variables measured at all tower levels include wind speed, wind direction, and temperature. Relative humidity, precipitation, and atmospheric pressure are also measured.

3.2.3 *Air Quality Standards*

SNL/NM is located in the Albuquerque Middle Rio Grande Intrastate Air Quality Control Region. Under the National Ambient Air Quality Standards (NAAQS), Bernalillo County is currently in maintenance status for the CO NAAQS. Depending on emission levels, modification to existing sources or construction of new sources emitting CO may require a general or transportation conformity analysis as well as additional levels of controls to comply with the NAAQS. In addition, modification to existing sources or construction of new sources emitting the other criteria pollutants (sulfur dioxide, nitrogen dioxide, ozone, PM-10, and lead) for which a pre-construction permit must be obtained are required to comply with the NAAQS.

NESHAP compliance support is provided to all SNL/NM source owners subject to radionuclide air emissions regulations. The EPA regulates radionuclide air emissions in accordance with 40 CFR 61, Subpart H. Dose is calculated using the CAP-88 computer code. NESHAP regulations stipulate that direct stack or diffuse monitoring is only required if a facility has the potential to produce an effective dose equivalent to the maximally exposed individual of greater than 0.1 mrem/yr. Currently there are no facilities with this potential, and therefore, no stack monitoring is required at SNL/NM. However, while not required by regulation, stack monitoring and calculations based on measured parameters are performed as a best management practice at several facilities. All emissions based on measurements (i.e., continuous monitoring, periodic monitoring, and calculations based on measured parameters) are used to calculate the doses.

There are currently 20 NESHAP sources at SNL/NM that reported radionuclide releases in 1999 (SNL/NM 2001). Facilities located in TA-V that are among the 20 sources include the Annular Core Research Reactor, the Hot Cell Facility, and the Sandia Pulsed Reactor Facility. The NESHAP sources estimate their potential radionuclide air emissions. The EPA has set a maximum individual public dose limit of 10 mrem/yr resulting from the combined radiological emissions produced from any DOE facility. Historically, radioactive releases from SNL/NM have been, and continue to be, several orders of magnitude below this maximum allowable standard.

3.3 Land Use

3.3.1 *Land Ownership*

Land ownership on KAFB is divided primarily among the U.S. Air Force (USAF), the DOE, the Bureau of Land Management, and the U.S. Forest Service (USFS). The USAF and the DOE are the principal land users within KAFB. Land use is established through coordination and planning agreements between these agencies. DOE owns only a small portion of the land it needs, including SNL/NM, that uses approximately 17 % of Federal land on KAFB (DOE 1999). The TCR Project sites in TA-I and TA-III would be located entirely on DOE-owned land, while the Aerial Cable Test Facility, Burn Site, and existing FLAME facilities are located on USFS withdrawn land.

The location of the new or renovated facilities included in the Proposed Action is provided in Table 3.1. These structures are designed to upgrade the condition of existing structures where similar research is currently conducted in TA-I, TA-III, or the Coyote Test Field.

Table 3.1. Test Capabilities Sites and Locations

Site #	FACILITY	LOCATION
Mechanical		
1	10,000-ft Rocket Sled Track	TA-III
2	Aerial Cable	Coyote Test Field
3	Centrifuge Complex	TA-III
4	Mechanical (Dynamic) Shock	TA-III
5	Vibration and Acoustics	TA-III
Thermal		
6	Burn Site	Coyote Test Field
6a	FLAME Facility	Coyote Test Field
7	Thermal Test Complex	TA-III
7a	Crossflow Test Fire Facility	TA-III
7b	FLAME II	TA-III
7c	Radiant Heat Facility	TA-III
Other		
8	Central Services Building	TA-III
9	Experimental Sciences Complex	TA-I
10	Cask Test Facility	TA-III

3.3.2 Environmental Restoration Site

With the exception of the Sled Track in TA-III, environmental restoration (ER) sites associated with the TCR Project have either been approved or are pending review and approval for No Further Action (NFA) status with the NMED. In such areas where project-related activities would occur, close coordination with the ER Project personnel is planned to address any issues. The south area of the Sled Track is currently listed as an active ER site. Project related activities at the Sled Track would require close coordination with the ER Project personnel prior to any construction activities. In addition, although an ER site associated with the Centrifuge Facility has been approved by NMED as an NFA, samples will be taken by SNL's ER Project personnel and analyzed for potential contaminants (due to a rupture of an underground piping system) prior to disposal of material (DOE 1996).

3.4 Waste Management

SNL/NM waste management activities consist of managing, storing, and preparing for offsite disposal of all wastes in accordance with applicable Federal and state regulations, permits obtained under these regulations, and DOE Orders.

Typical waste categories generated onsite include:

- Radioactive waste includes LLW, low-level mixed waste (LLMW), transuranic (TRU) waste, and mixed transuranic (MTRU) waste.
- Hazardous waste includes RCRA listed waste (chemical), Toxic Substances Control Act (TSCA)-listed waste, and biohazardous waste (medical).

- Non-hazardous waste includes solid waste deposited in local landfills (trash and debris) and sewage waste.
- Recyclable material includes lead, ignitable liquids, solvents, oils, scrap metal, paper and plastics.
- Spent nuclear fuel.

All current waste management operations are being implemented following SNL/NM policies established to ensure worker and public safety and compliant management of regulated waste. These policies clearly define waste acceptance criteria, limit the number of workers who handle wastes, provide appropriate waste-specific training, and centralize waste handling areas.

3.5 Cultural Resources

Cultural resources are prehistoric or historic archaeological sites, buildings, structures, districts or other places or objects considered to be important to a culture, subculture, or community for scientific, historical, traditional, religious, or other reasons. The SNL/NM SWEIS (DOE 1999) and the SNL/NM Environmental Information Document (SNL/NM 1999) provide an overview of the types and distribution of cultural resources and a discussion of previous investigations at SNL/NM.

DOE's cultural resource responsibilities are defined in a variety of Federal laws, regulations, and executive orders. The principal Federal law addressing cultural resources is the National Historic Preservation Act (NHPA) of 1966, as amended (16 United States Code [USC] Section 470), and implementing regulations (36 CFR 800), that describe the process for identification and evaluation of historic properties; assessment of the effects of Federal actions on historic properties; and consultation to avoid, reduce, or minimize adverse effects. The term "historic properties" refers to cultural resources that meet specific criteria for eligibility for listing on the National Register of Historic Places (NRHP). This process does not require preservation of historic properties but does ensure that the decisions of Federal agencies concerning the treatment of these places result from meaningful consideration of cultural and historic values and of the options available to protect the properties.

3.5.1 TA-I

TA-I is the highly developed main facility area at SNL/NM. A cultural resource inventory has been conducted of all of TA-I (Hoagland 1990a) and portions have been examined in project-specific surveys conducted more recently. No archaeological resources have been located; and no building, structures, or objects have been recommended or determined eligible for NRHP listing. No specific locations of Traditional Cultural Properties (TCPs) in TA-I were identified during consultations with Native American groups conducted for the SWEIS (DOE 1999). The portion of TA-I inside the security fence was first developed during World War II, although no structures remain in the area from the time period. During 1998 and 1999, SNL/NM conducted an inventory of buildings in TA-I, assessing them in the Cold War context. None were found to be of historic interest at this time.

3.5.2 TA-III

Environmental testing facilities were developed in TA-III beginning in 1953. A cultural resource inventory conducted of TA-III identified no NRHP-eligible archeological sites and recommended further assessment of buildings and structures (Hoagland 1990b). No TCP locations have been identified in TA-III (DOE 1999). In support of the TCR effort, a historical assessment has been conducted of buildings and structures at existing test facilities that would be potentially affected by TCR activities (Ullrich 2002).

10,000-ft Rocket Sled Facility. A potential historic district at the 10,000-ft Rocket Sled Facility has been identified. Buildings 6740 (the track) and 6741 (the control building) are the key elements of the facility and are recommended by SNL/NM as NRHP-eligible as individual properties. The district should also include as contributing elements support Buildings 6742, 6743, 6744, 6745, and 6746. While not of historic interest in their own right, they are important in understanding the sled track's test operations and capabilities.

Centrifuge Complex. The Centrifuge Complex consists of the 35-ft and 29-ft centrifuges and their supporting structures. Four of the buildings have been recommended by SNL/NM as NRHP-eligible as an historic district. Buildings 6520 and 6526, the 35-ft and 29-ft centrifuge facilities respectively, are of historic interest as individual properties while Buildings 6523 and 6523B are essential support structures and contributing elements to the potential district. The other structures at this facility play less important supporting roles, most of which are not essential to the operation of the centrifuges and are therefore of not of historic interest.

Mechanical (Dynamic) Shock Facility. The shock facility is one of the oldest of SNL/NM's environmental test facilities and consists of Building 6570 and the 18-inch actuator track it houses. The actuator is the largest of SNL/NM's shock facilities and provides a variety of test design options. Building 6570 is of historic interest within the Cold War context for the period 1956-1990 and is recommended by SNL/NM as NRHP-eligible as an individual property.

Vibration and Acoustics Facility. Vibration and acoustical environmental testing has been conducted in Buildings 6560 and 6610 since 1955 and 1959, respectively. Each are of historic interest and are recommended as NRHP-eligible as individual properties, because they do not appear to be sufficiently associated with one another to form a potential historic district.

Radiant Heat Facility. None of the structures at the Radiant Heat Facility are of historic interest. DOE consulted with the New Mexico State Historic Preservation Office (SHPO) regarding the two main buildings (Buildings 6536 and 6536B) in the facility. The SHPO concurred with DOE that these structures have lost historic integrity due to the extensive facility and equipment modification.

Air Gun Test Facility. Buildings 6710 and 6711 together housed and operated the air gun test facility. They are not recommended as NRHP-eligible as a historic district within the Cold War context established for SNL/NM. Neither is considered NRHP-eligible as an individual property (Ullrich 2002).

3.5.3 Coyote Test Field

Outdoor environmental testing is conducted by SNL/NM at remote facilities on the western portion of the Kirtland Federal Complex. Cultural resource inventories have not been conducted for the entire test field; however, inventories have been conducted for the individual test

facilities. No significant archaeological resources have been identified in the areas of potential effect for TCR activities (Hoagland 1992, Hoagland and Dello-Russo, 1995a, 1995b). No specific TCPs have been identified in the vicinity of the proposed facilities (DOE 1999). The results of the historical assessment of existing test facilities that would be potentially affected by TCR activities follow.

Aerial Cable Test Facility. Although it was built in 1971, the Aerial Cable Test Facility appears to meet the requirement of “exceptional significance” required for finding properties that are less than 50 years old eligible for NRHP listing. A historic district has been recommended by SNL/NM consisting of the aerial cables themselves and Buildings 9831, 9832, and 9834. The cables and Building 9831 are essential for the facility and are recommended as NRHP-eligible as individual properties, while Buildings 9832 and 9834 are contributing elements to the potential proposed district.

Lurance Canyon Burn Site. Burn testing began in Lurance Canyon in 1968 using open pits. The early test facilities were abandoned, and new facilities were constructed in the 1970s and 1980s including the FLAME facility. There are no historic properties present (Ullrich 2002).

3.6 Site Services

3.6.1 Security

Security is provided by the SNL/NM Protective Services Department, which consists of dispatchers, an offensive force, and a defensive force. In addition, the SNL/NM Emergency Management Team provides planning for emergency preparedness and response, including the analysis of potential impacts of unmitigated and mitigated releases of chemicals and radioactive materials from accidents that could affect SNL/NM personnel and operations, natural phenomenon events, and security-related events. Fire protection is provided by the USAF, which operates five fire stations located throughout KAFB.