2.0 NO ACTION AND PROPOSED ACTION ALTERNATIVES

This chapter describes the No Action Alternative, the Proposed Action, and alternatives considered but eliminated from detailed consideration. The No Action Alternative (Section 2.1) would involve continued operations as described for the Expanded Operations Alternative in the Site-Wide Environmental Impact Statement for Sandia National Laboratories/New Mexico (SWEIS; DOE 1999). The Proposed Action (Sections 2.2 and 2.3), designated Test Capabilities Revitalization (TCR), would consist of the upgrade of existing facilities and construction of new facilities that would satisfy the stated Purpose and Need. The Proposed Action was also described as an alternative configuration in the Expanded Operations Alternative in the SWEIS.

Alternatives considered but not evaluated in detail include the following:

Conducting TCR-related activities at another DOE facility – No DOE facilities currently exist that could provide the capabilities to conduct the required test activities. Therefore, this alternative would not meet the purpose and need for agency action and was not evaluated in detail.

Outsourcing activities – No facilities owned by private-sector firms or other government agencies with the necessary capabilities currently exist. Therefore, this alternative would not meet the purpose and need for agency action and was not evaluated in detail.

Discontinue activities – Discontinuation of the site would eliminate the ability of DOE to conduct critical testing. Therefore, this alternative would not meet the purpose and need for agency action and was not evaluated in detail.

2.1 Existing Facilities

The TCR Project would involve the renovation and upgrade of several existing facilities located in Technical Areas (TAs): TA-I, TA-III, and Coyote Test Field, as shown in Figure 2.1. These facilities are briefly described below.

Current activities at the TCR-related facilities involve the occasional non-destructive testing of articles containing a variety of radioactive materials including, but not limited to, special nuclear materials. Non-destructive testing limits are determined by initial testing of articles from which the material has been removed and/or replaced by suitable substitute materials. Test articles are not subjected to a testing environment or conditions above potential failure limits determined by initial testing. Neither the No Action Alternative nor the Proposed Action would involve any testing of articles containing special nuclear materials in any of the thermal test facilities, including the Thermal Test Complex (TTC) and the Cask Testing Facility (CTF).

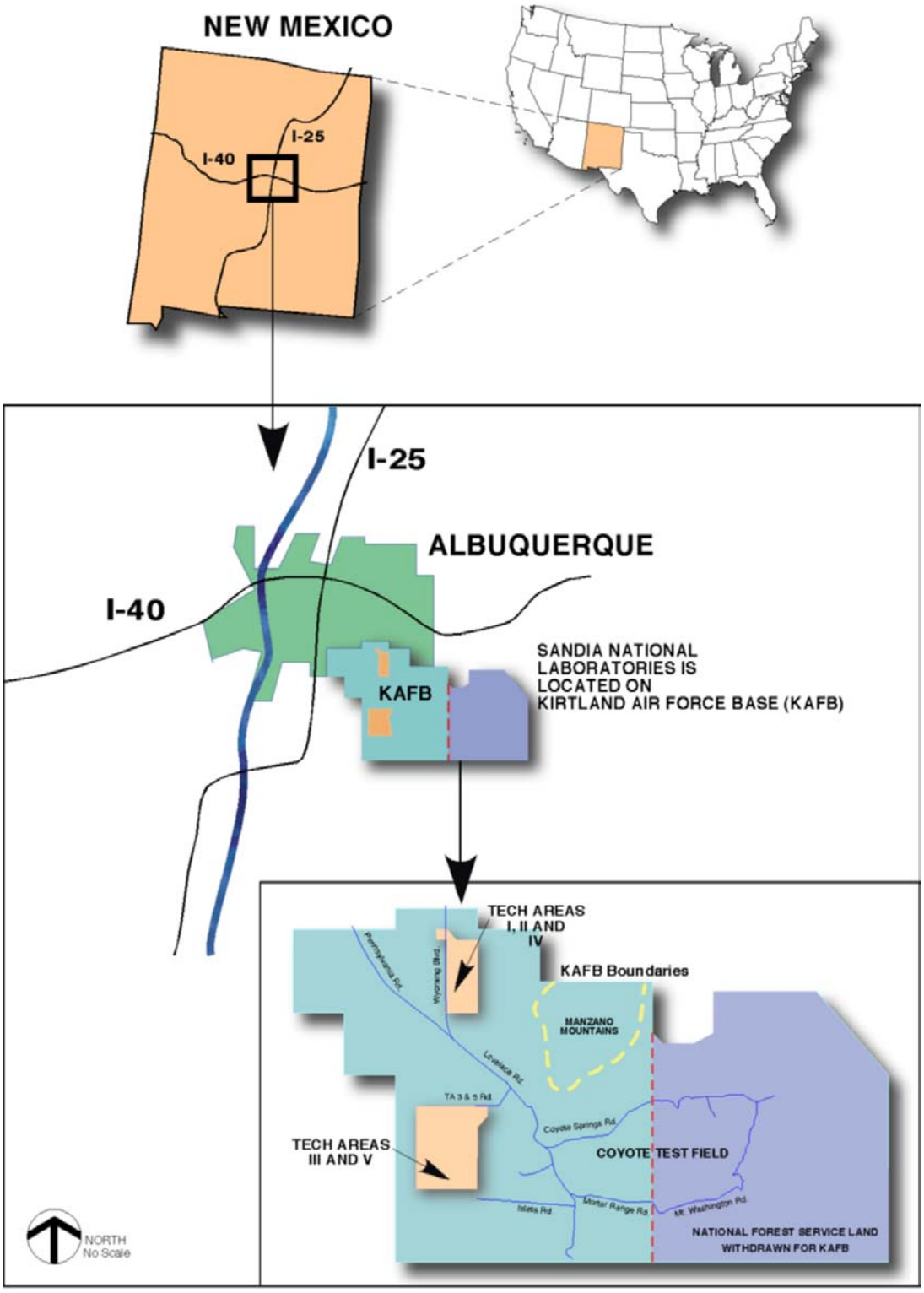

Figure 2.1
Location Map of the SNL/NM Technical Areas

Sled Track Complex

The 10,000-ft sled track, located in TA III, supports weapons system qualification testing and weapons development efforts that must simulate penetration, flight, high-acceleration, and high-shock environments. The simulated environment may be provided through impact, reverse ballistic, or ejection testing. This testing includes shock/laydown tests for bombs, sled ejection tests to verify parachute and laydown performance, impact tests on transportation and container systems, impact fuze tests for reentry vehicles, and a variety of other DOE and Department of Defense (DoD) system tests that require high-speed impacts (SNL 2002).

Operations at the sled track also include the following (DOE 1999):

- Receiving, storing, and handling explosives; pyrotechnics; propellants; and nuclear, radioactive, and chemical materials;
- Fabricating and assembling rocket sleds including payloads and rockets;
- Setting up explosive tests, electronic instrumentation, and data recording and special equipment including lasers, tracking equipment, and X-ray;
- Reducing hazards through area, systems, and personnel control;
- Disposing of explosives; and
- Recovering radioactive and chemical materials.

Small amounts of chemicals are maintained for use in assembling rocket sleds and test payloads in Buildings 6741, 6743, and 6736. For example, various adhesives and epoxies are used to fasten transducers and similar items. Cleaners, lubricants, solvents, paints, and other such agents may also be used in small quantities. Compressed gases are used in the assembly areas, including acetylene and oxygen (for welding), argon, and helium; dry nitrogen and carbon dioxide are used for pneumatic actuators (DOE 1999).

Aerial Cable Test Facility

The Aerial Cable Test Facility, located in the Coyote Test Field, performs gravity drop and accelerated pull-down tests in support of bomb qualification tests and weapons development activities. This test capability provides controlled simulations of the worst-case impact environments experienced by weapons systems and shipping containers. Gravity drop tests are performed from a cable suspended between two peaks, giving up to a 600-foot (ft) vertical distance for acceleration. A rocket-assisted (320-ft sled track) pull-down technique is used to provide higher impact velocities when gravity tests are not adequate (SNL 2002).

Operations require the use of a variety of chemicals (corrosives, solvents, organics, and inorganics) in gaseous, liquid, and solid forms, in relatively small quantities. No radioactive emissions are routinely produced at this facility. Compressed gases used in the assembly areas include acetylene and oxygen (for welding), argon, and helium. There are some chemical emissions, including alcohols, ketones, and other solvents. Small amounts of airborne emissions, including carbon monoxide and lead, are released during explosives tests. Operations associated with preparation of test payloads, fixtures, and rocket sleds involve machining that generates residues, bonding of parts with epoxies, cleaning of parts, and wiping of excess materials (DOE 1999).

Centrifuge Complex

The centrifuges in TA-III generate high-acceleration environments to certify weapons components and systems, satellite systems, guidance systems, and transportation containers. The 35-ft (indoor) and 29-ft (outdoor) centrifuges simulate Reentry Vehicle (RV) launch and reentry environments, aircraft maneuvering accelerations, crash and impact decelerations, and other acceleration environments within the Stockpile-to-Target Sequence (STS) envelope, and support environmental sensing device testing on bomb and missile systems (SNL 2002).

The Centrifuge Complex contains a small chemical inventory but no radioactive materials. Cleaners, lubricants, solvents, paints, and agents are used in small quantities. Compressed gases used in the assembly areas include acetylene and oxygen (for welding), argon, and helium. Chemical emissions, including alcohols, ketones, and other solvents, are associated with various aspects of surface preparation, cleaning, and material processing, including quality control. Small amounts of airborne emissions, including carbon monoxide and lead, are released during explosives tests. Radioactive air emissions are not produced at this facility. Noise from centrifuge operation, collision impacts, and explosive testing does occur. Fragments resulting from centrifuge-launched explosives are recovered shortly after test events (DOE 1999).

Mechanical Shock Facility

The Mechanical Shock Facility in TA-III provides controlled impact and shock environments to support subsystem- and component-level development and qualification testing and to model development and validation activities. This facility houses two horizontal pneumatic actuators (18-inch and 12-inch) and their associated sled tracks (95 ft and 75 ft, respectively) and two bungee-assisted vertical shock machines. Each actuator can support sled and reverse ballistic speeds up to 250 Feet per second (ft/sec) (SNL 2002).

Vibration-Acoustics and Mass Properties Facilities

The large-scale vibration-acoustics facilities in TA-III, which also house Mass Properties operations, provide system-level vibration and shock environment testing capabilities to certify weapons systems (bombs, missile warheads, and reentry systems) to the normal STS environment specifications and to support model development and validation activities. These environmental requirements include transportation, launch, flight, and reentry shock and vibration simulations on full-scale weapons systems. The test capabilities include normal shock and vibration, combined vibration and acoustics, and combined thermal and vibration environments (SNL 2002).

Thermal Radiant Heat Facility

The Thermal Radiant Heat Facility in TA-III provides controlled temperature and heat flux environments using quartz lamps (up to 5,432 °F [3,000° C]) to develop and validate thermal response models and to certify the performance of transportation containers and weapons components, assemblies, and systems for both normal and abnormal thermal environments (SNL 2002).

2.2 No Action Alternative

Under the No Action Alternative, current operations would the facility. No new facilities would be constructed, and existing facilities would not be upgraded. Operations would continue as analyzed in the Expanded Operations Alternative of the SNL/NM SWEIS (DOE 1999).

Following is a description of environmental and human health and safety resources that would be routinely potentially affected under the No Action Alternative.

2.2.1 Air Emissions

Under the No Action Alternative, chemical air emissions would continue as described in the Expanded Operations Alternative in the SWEIS. The emissions include hazardous air pollutants (HAPs), volatile organic compounds (VOCs), and criteria pollutants that are regulated by Federal and local laws. SNL/NM is not a major source for HAPs as described in Title 20 New Mexico Administrative Code (NMAC) Chapter 11 Part 42 section 7.18, *Major Source*. Air emissions for existing facilities associated with the TCR were included in the SNL/NM SWEIS (DOE 1999) air quality analyses.

2.2.2 Water Use and Liquid Effluents

Potable and process water use under the No Action Alternative would be approximately as follows:

- Potable water use – 529,000 gallon per year (gal/yr) (2,002,483 liters per year (ℓ/yr)
- Process water use – 810,000 gal/yr (3,066,184 ℓ/yr)
- Total water use – 1,339,000 gal/yr (5,068,666 ℓ/yr)

Potable and process water would continue to be provided for the entire project under the No Action Alternative, and the baseline rate of water use and wastewater discharge would be the same as that evaluated in the Expanded Operations Alternative of the SWEIS (DOE 1999).

Wastewater generation under the No Action Alternative would be approximately as follows:

- Potable wastewater – 529,000 gal/yr (2,002,483 ℓ/yr)
- Process wastewater – 10,300 gal/yr (38,990 ℓ/yr)
- Total wastewater - 539,300 gal/yr (2,041,473 ℓ/yr)

Sanitary wastewater would continue to be discharged either to the City of Albuquerque sewer system or to septic systems (for remote facilities) or removed from portable toilets and disposed of appropriately. Process wastewater discharged by the facilities would continue to be examined to ensure compliance with City of Albuquerque discharge standards for discharges to the sanitary sewer system or New Mexico Environment Department (NMED) water quality standards for discharges onto the ground.

2.2.3 Waste Management

Current operations generate non-hazardous and hazardous wastes. Non-hazardous waste consists of materials such as office paper, cardboard, plastic, glass, scrap metal, packaging materials, and wood. Under the No-Action Alternative, TCR-related operations would continue to generate solid waste at a rate of approximately 851,504 pounds (lb) (387,047 kilograms (kg) annually. The majority of these waste materials are recycled through SNL/NM's recycling program. Remaining non-hazardous waste is removed and taken to the SNL/NM Solid Waste Transfer Facility where it is sorted, baled, and transported for disposal in local commercial and municipal landfills.

Under the No Action Alternative, operations would continue to generate a total of approximately 4,715 lb/yr (2,143 kg/yr) of hazardous waste. Hazardous waste is stored at or near the point of generation, as designated by the Resource Conservation and Recovery Act (RCRA), 40 Code of Federal Regulations (CFR) 262.34, prior to being transported to the hazardous waste management facility. These quantities are included in the analysis of the Expanded Operations Alternative in the SWEIS (DOE 1999). No radioactive or mixed wastes are currently generated by TCR-related activities.

2.2.4 Human Health and Safety

Worker health and safety precautions and controls for current operations are implemented according to the SNL Environment, Safety, and Health (ES&H) Manual (SNL 2000) and supplemental job-specific procedures. Each major piece of process equipment has an operating procedure.

Operations that employ laser and x-ray hazards are performed using appropriate administrative controls and engineered barriers. These controls include, but are not limited to, operator training and shielding of personnel according to current requirements, including equipment housing that shields operators from laser beam or x-ray exposure. Workers involved in operations connected with potential radiological hazards are protected by engineered controls such as radiation barriers, lead shielding, and alarm systems. Administrative controls, including use of dosimeters and training, are also employed as part of an as-low-as-reasonably-achievable (ALARA) program. The dose rate to employees would be less than 10millirem (mrem) an hour and less than 100 mrem total effective dose equivalent (EDE) a year.

2.3 Proposed Action Construction, Renovation, and Demolition Activities

Construction activities under the Proposed Action would include construction and renovation of the facilities described in the following sections, as well as construction of infrastructure elements in support of these facilities (roads, sidewalks, utility hook-ups, etc.). The Proposed Action construction, renovation, and demolition activities are presented as described in the Conceptual Design Report (CDR) for TCR (SNL 2002) as well as initial planning documents for the CTF.

2.3.1 Sled Track Complex

Under the Proposed Action, the following construction/renovation activities would be conducted at the Sled Track Complex:

- Replace the track-side cabling and provide the target handling area.
- Renovate multiple buildings to extend their useful life 25 years and remove substandard buildings.
- Upgrade of test and site infrastructure, including instrumentation, data acquisition capabilities, and power and communications.
- Complete site improvements, including drainage, grading, and paving along south 5,000 ft of track) and track repairs (concrete, clamps, rails, and alignment.

2.3.2 Aerial Cable Test Facility

Construction and renovation activities would be performed at the Aerial Cable Test Facility under the Proposed Action:

- Site improvements, including drainage, grading, road upgrades, security enhancements, water and sewer, installation of a permanent power, communications, and a data connectivity infrastructure.
- Test infrastructure upgrades, including repairs and replacements to pulleys, cables, winch facilities, anchors, and the sled catch box.
- Construct an approximately 5,000- square feet (ft^2) support facility (the Aerial Cable Test Site Central Support Facility) to provide physically secure storage, data acquisition and control, and work space for personnel assigned to the test site. Construction of this facility would include installation of a small-casing (6-inch) water well to provide water to two toilets and sinks which would replace the portable toilets currently used at the Aerial Cable Test Site and Burn Site during testing. The facility would not include a water fire-suppression facility. The maximum water use for this facility would be approximately 28,800 gal/yr, which is included in the total presented in Section 2.4.2.
- Renovations to multiple buildings to extend their useful life 25 years and removal of substandard buildings.

2.3.3 Centrifuge Complex

The following construction and renovation activities would be conducted at the Centrifuge Complex under the Proposed Action:

- Improvements to data acquisition capabilities.
- General site and infrastructure improvements to address water and sewer needs, paving, soil contamination (hydraulic fluid), and demolition of substandard buildings.
- Major renovations to Building 6526, which houses a 29-ft centrifuge, to include security and code compliance upgrades.
- Construct a 2,500 ft^2 addition to Building 6526 to consolidate work/storage spaces now located in substandard buildings that will be demolished.

2.3.4 Mechanical Shock Complex

Under the Proposed Action, the following construction and renovation would be performed at the Mechanical Shock Complex:

- Upgrade and extend the 18-inch actuator track to support higher-speed (400 ft/sec) testing.
- Renovate Building 6570 to extend its useful life 25 years.
- Replace the compressor equipment (Building 6571).
- Restore the pneumatic power system.
- Provide test equipment enhancements (a velocity measurement system and data acquisition system).
- General site and infrastructure improvements to control erosion, paving, and perimeter fencing.

2.3.5 Vibration-Acoustics and Mass Properties Complex

The following construction and renovation activities would be conducted at the Vibration-Acoustics and Mass Properties Complex under the Proposed Action:

- Renovate Buildings 6560 and 6610 to extend their useful life 25 years.
- Provide site improvements, including grading, drainage, and paving.
- Construct a 2,600 ft^2 addition to Building 6560 to house the facility mechanical systems and to provide a test article handling and staging area.
- Restore the pneumatic power system.
- Replace aging test equipment, controls, and data acquisition systems.

2.3.6 Thermal Test Complex (With new Fire Laboratory for Accreditation of Modeling by Experiment (FLAME)-II test cell and Crossflow Test Fire Facility [XTF])

The following construction and demolition activities would be conducted at the new Thermal Test Complex under the Proposed Action:

- Demolish existing Radiant Heat Facility.
- Construct a new, approximately 22,700 ft^2 facility (the Thermal Test Facility [TTF]) that would house the following operations:
  - A new FLAME-II test cell, approximately 3,400 ft^2, used to investigate the properties of fire environments in an enclosed, flow-controlled, and temperature-controlled structure. Only fuels would be burned in this cell.
  - A radiant heat test cell (new Radiant Heat Facility), approx. 1,600 ft^2.
  - Approximately 2,200 ft^2 to be used for table-top scale abnormal thermal environments laboratory for physics model development and validation and the development of fire sciences diagnostics technologies.

  - A new XTF structure, approximately 4,700 ft^2, including air intake plenum, designed to perform indoor burn tests of test articles that contain explosives and other materials.
  - Approximately 8,500 ft^2 of additional indoor space for a control room, secure storage, light laboratories, environmental chambers, office space (6-8 offices), and support areas.
  - A new Central Utility Building (CUB), approximately, 2,300 ft^2, to provide much of the electrical, mechanical, and controls related to the TTC as well as the test cells in a central location. The CUB also includes the intake plenum for the FLAME-II test cell.
- Construct 2,000 ft^2 of external covered storage next to the TTC.

2.3.7 TA-III Central Services Building

Under the Proposed Action, the following construction and renovation would be performed at the TA-III Central Services Building:

- Renovate and remodel existing Building 6710 to provide a conference area, office space, light laboratory, restroom upgrades, a machine shop, and storage.
- Renovate existing Buildings 6711 (primarily replacement of aged building components) and 6712 (primarily repainting and floor repair).
- Provide site upgrades, including drainage, paving, and parking improvements.
- Demolish storage structure OSB22 (180 ft^2) and remove 21 storage transportainers.
- Relocate and consolidate the machine shop capabilities and long-term storage currently dispersed in TA-III into Building 6710.

2.3.8 Experimental Sciences Center (ESC)

The ESC would be constructed in TA-I, and would provide for the consolidation of operations currently conducted in Buildings 860 and 865. Such operations include machine shops, electronics laboratories, and physical measurements laboratories. Wind tunnels would also be relocated into the ESC. Construction of the ESC under the Proposed Action would include the following:

- A 67,000 ft^2 facility, to be sited in TA-I, which will house 15 labs (including 5 new labs), wind tunnels, and approximately 72 people. The five new laboratories would be similar in nature to those currently in use. The ESC staff will include seven new employees, visiting researchers and students, and existing SNL personnel to be relocated from Buildings 860, 865, and 880.
- Demolish Building 865.

2.3.9 Cask Testing Facility (CTF)

Construction of the new test facility would include the following:

- A 320 ft drop tower to support dropping railroad casks weighing up to 140 tons from a height of 270 ft onto a 3,000,000 lb target.
- A pre- and post-test inspection facility.
- An open burn pool for tests of casks and rail cars.
- An onsite rail system for transportation of casks between the buildings comprising the CTF.

2.3.10 Construction/Demolition Air Conformity

Bernalillo County has been designated as a maintenance area for carbon monoxide (CO) and is in attainment for other Federally regulated pollutants. Trucks and construction equipment would generate CO emissions.

The 20 NMAC 11.04, *General Conformity*, implements Section 176(c) of the Clean Air Act, as amended (42 U.S.C 7401 et seq.), and regulations under 40 CFR 51, Subpart W, with respect to conformity of general Federal action in Bernalillo County. Regulation 20 NMAC Part 11.04.11.1.2, paragraph B, establishes the emission threshold of 100 tons per year (TPY) of CO at SNL/NM that would trigger the requirement to conduct a conformity analysis. Based on anticipated hours of operation of construction equipment, it is estimated that CO emissions throughout the life of the project would be less than 2 tons; therefore CO releases in any given year are anticipated to be substantially below the 100 TPY threshold; therefore a conformity analysis is not required.

2.3.11 Construction/Demolition Water Use and Liquid Effluents

Water use would increase slightly during Proposed Action construction activities due to additional construction personnel onsite and water requirements related to installation and adjustments in the mechanical and plumbing systems of the buildings proposed for modification. Some water would also be required for dust control during the construction effort. Between 20,000 and 50,000 gal/day could be used in the heat of the summer.

2.3.12 Construction/Demolition Waste Management

It is anticipated that construction activities would result in the generation of non-hazardous wastes (primarily construction debris and sanitary wastewater). Construction debris would consist of packaging material including wood crates, cardboard, and plastic; scrap material such as electrical wire, insulation, gypsum drywall, floor tile, carpet, scrap metal, and empty adhesive and paint containers; and concrete debris resulting from the wash-down process following pours. Approximately 1608 tons (1.46 million kg) of construction waste would be generated by construction activities related to the Proposed Action.

Demolition and renovation activities are anticipated to generate approximately 6,500 tons (5.9 million kg) of standard construction waste, primarily concrete, steel, and plastics, bringing the total non-hazardous solid waste generated by the proposed construction, demolition, and renovation to approximately 8,108 tons (7.4 million kg). Current plans are to dispose of this waste in the Kirtland Air Force Base construction waste landfill; alternatively, the waste could be

transported to the City of Albuquerque Cerro Colorado or Rio Rancho construction waste landfills. Materials would be recycled as appropriate.

The TCR-related demolition activities would also generate approximately 117 cubic yards (yd^3) or 47,385 lb (89 cubic meters (m^3) or 21,539 kg) of asbestos waste, which would be removed and managed according to existing SNL/NM asbestos management processes. Asbestos waste would be transported to the Kerrs Mountainair Monofill facility for disposal.

2.3.13 Construction Worker Health and Safety

Construction activities would incorporate all applicable health and safety standards common to each of the construction disciplines employed in the project and would follow all Occupational Health and Safety Administration (OSHA) standards for health and safety practices. The potential for worker exposure to hazardous materials is anticipated to be minimal.

2.4 Proposed Action Operations

Under the Proposed Action, the operations currently conducted at the TCR-associated facilities (described in Section 2.1) would continue with upgraded and updated equipment and facilities. Approximately 171 employees would be involved in TCR-related operations, an increase of 10 employees when compared to the No Action Alternative.

Some existing operations would be relocated (primarily from Buildings 860 and 865) to the ESC in TA-I. Activities at the ESC would include research in thermal/fluid science, material characterization, and optical diagnostics; mechanical testing; and wind tunnel research.

- New operations at the TTC in TA-III would include thermal testing performed at the XTF and fire analyses conducted at the FLAME-II facility, both of which are indoor facilities. The XTF would be an indoor burn facility for fire tests of articles that may contain explosives and other materials. Research in the FLAME would involve tests using a variety of fuels to investigate the properties of fire environments in an enclosed, flow-controlled, and temperature-controlled structure. Preliminary design recommendations include an electrostatic precipitation system for controlling air emissions from these facilities.

It is estimated that the following types and quantities of fuels would be used at the TTC:

- Methanol – 26,800 gal/yr (101,438 ℓ/yr) up to 40 tests per year.
- Acetone – 4,000 gal/yr (15,142 ℓ/yr) up to 80 tests per year.
- Hydrogen – 6.4 million ft^3 (181,228 m^3) up to 40 tests per year.
- Methane – 2 million ft^3/yr (56,634 m^3/yr) up to 40 tests per year.
- JP-8 – 25,000 gal/yr (94,635 ℓ/yr) up to 120 tests per year.

The new, outdoor CTF would support non-destructive certification testing of railroad shipping casks for radioactive materials, including drop and pool-fire testing. Casks would be transported to the facility by truck and would be moved between the testing and analysis locations using an onsite rail system. Tests at the CTF would be for cask characterization only and not certification for failure; therefore, radiation exposure would not be a hazard. Tests would be performed on

new, empty casks only; no hazardous or radioactive materials would be contained within the casks. No items other than casks would be tested at the CTF. Simulations and tests would have been done on these casks before they arrive at SNL to check for any signs of seal leakage. The proposed tests would be well within the established limits of the casks to maintain structural integrity. The casks would not be opened while at SNL.

The cask testing facility will occasionally test waste transportation containers that have internal depleted uranium (DU) shielding. However, the DU will not be released in any form as a result of the performance characterization testing that will be conducted. A pathway for the potential release of the solid DU shielding could not be created unless the transportation container experienced multiple system failures. The planned testing would only involve performance characterization, not limits testing. The planned testing would not include testing to failure. Pool fire testing capabilities would be maintained at the Lurance Canyon Burn Site, which would be maintained as a backup facility for the new Cask Testing Program, which would involve one to two series of tests per year.

2.4.1 Air Emissions

Criteria Pollutants and Hazardous Air Pollutants. An initial estimate of air emissions data related to the Proposed Action was evaluated in the SNL/NM SWEIS (DOE 1999). The CDR for TCR (SNL 2002) and process-specific information were used by SNL/NM to make more refined estimates of the chemical inventories and potential emissions.

For the purpose of this assessment, air emissions at the CTF and the TTC were evaluated according to the same methodology used for the SNL/NM SWEIS (Section 2.3.1). The air quality assessment determined that all criteria air pollutants (i.e., NOx, SOx, CO, and particulate matter smaller than 10 microns in diameter [PM-10]) would comply the Ambient Air Quality Standards. For HAP emissions, chemicals were screened assuming 100% of the inventory was emitted to the air, and 19 chemicals were determined to require modeling. The modeling results were compared to the Occupational Exposure Limit (OEL) divided by 100. The evaluation identified 16 chemicals at the CTF and 3 chemicals at the TTC that did not pass the initial screen. Refined analysis was performed using emission factors developed from knowledge of the testing activities and the physical form of the materials. The results of the refined modeling demonstrated that all 19 constituents passed the screening, i.e., emission were below the OEL divided by 100. This refined modeling did not take credit for control equipment. The results are provided in Table 2.1 and Table 2.2.

Control Equipment. Control equipment in the form of an electrostatic precipitator (ESP) will be installed for the TTC. The ESP collection efficiency will be a minimum 80%.

Radiological. Under the Proposed Action, annual air emissions of depleted uranium, resulting from the operations at the TTC, were below the OEL divided by 100 for hazardous air pollutants. In addition to a HAP concern, DU also has a radiological component. The National Emission Standards for Hazardous Air Pollutants (NESHAP), National Emission Standards for Emission of Radionuclides Other Than Radon From Department of Energy Facilities, requires that emissions from DOE facilities not exceed 10 mrem/yr to the maximally exposed individual (MEI). The potential radiological dose to members of the public was evaluated using the U. S. Environmental Protection Agency (EPA) approved CAP-88PC computer model. The ESP collection efficiency was utilized in the assessment. The resulting dose to the MEI was

Table 2.1 – Dispersion Modeling Results (Hazardous Air Pollutants) at the Cask Testing Facility

Compound	OEL/100 (ug/m^3)	Maximum Impact (ug/m^3)
Benzene	31.9	2.47
Benzyl Chloride	50.0	0.0333
1,3-Butadiene	22.1	0.296
p-Dichlorobenzene	4500	0.506
Napthalene	500	1.48
Styrene	4260	0.358
1,1,2-Trichloroethane	450	0.0728
1,2,4-Trichlorobenzene	400	2.47
Vinyl Chloride	25.6	0.0272
Arsenic	5.00	0.136
Cadmium	0.05	0.0121
Chromium	5.0	0.132
Lead	0.5	0.127
Nickel	15.0	0.0120
Selenium	2.00	0.0132

Table 2.2 – Dispersion Modeling Results (Hazardous Pollutants) at the Thermal Test Complex

Compound	OEL/100 (ug/m^3)	Maximum Impact (ug/m^3)
Beryllium	0.0200	0.000252
Depleted Uranium	2.50	0.000327
Lithium	0.250	0.00395

estimated to be a maximum of 0.00018 mrem/yr, well below the standard. The historic average annual dose to the MEI, resulting from all radiological air emission at SNL/NM is approximately 0.003 mrem/yr.

2.4.2 Water Use and Liquid Effluents

Potable and process water use under the Proposed Action would be approximately as follows:

- Potable water use – 620,000 gal/yr (2,347,712 ℓ/yr)

- Process water use – 1,510,000 gal/yr (5,715,972 ℓ/yr)
- Total water use – 2,130,000 gal/yr (8,063,684 ℓ/yr)

This represents an increase of approximately 791,200 gal/yr (2,649,788 ℓ/yr) as compared to the No Action Alternative. Water use at existing facilities would not increase substantially as a result of operations under the Proposed Action. Much of the increase would be the result of new process water use at the TTC and the CTF.

Wastewater generation under the Proposed Action would be approximately as follows:

- Potable wastewater – 620,200 gal/yr (2,347,712 ℓ/yr)
- Process wastewater – 250,300 gal/yr (947,489 ℓ/yr)
- Total wastewater - 870,500 gal/yr (3,295,201 ℓ/yr)

Sanitary wastewater would be discharged either to the City of Albuquerque sewer system or to septic systems (for remote facilities), or removed from portable toilets and disposed of appropriately. Process wastewater discharged by the facilities would be examined to ensure compliance with City of Albuquerque discharge standards for discharges to the sanitary sewer system or NMED water quality standards for discharges onto the ground.

2.4.3 Waste Management

Operations under the Proposed Action would generate non-hazardous and hazardous wastes as well as very minor quantities of low-level radioactive wastes (LLW). Non-hazardous waste consists of materials such as office paper, cardboard, clean room attire, plastic, glass, scrap metal, packaging materials, and wood. Under the Proposed Action, personnel would generate approximately 857,684 lb/yr (389,856 kg/yr). This represents an increase of approximately 6,180 lb/yr (2,809 kg/yr), or approximately 0.73 % compared to the No Action Alternative. Materials would be recycled as appropriate.

Under the Proposed Action, operations at TCR-related facilities would generate approximately 6,717 lb/yr (3,053 kg/yr) of hazardous waste, an increase of approximately 42% over the amount that would be produced under the No Action Alternative. Much of this increase would result from new operations at the TTC and the CTF.

Under the Proposed Action, up to 2,100 lb/yr (955 kg/yr) of mixed waste could be generated in the form of decontamination waste, personnel protective equipment, and melted components of test articles. Up to 1,000 lb/yr (455 kg) of radioactive waste could be generated from decontamination activities at the TTC. These wastes would be appropriately characterized, packaged, and disposed of in accordance with the existing SNL/NM waste management process.

2.4.4 Human Health and Safety

Worker health and safety protection would include modernized engineered controls in addition to the worker health and safety measures discussed in section 2.2.4.