# 2.0 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

This section discusses the Proposed Action and a No Action Alternative. Section 2.1 describes the Proposed Action for the EA that would allow NNSA to meet its purpose and need for agency action. The No Action Alternative is presented in Section 2.2 as a baseline for comparison with the consequences of implementing the Proposed Action. Alternatives that were considered but dismissed from further analysis in this EA are discussed in Section 2.3, and related actions are discussed in Section 2.4.

Current DX facilities include offices and a research and development complex east of SR 501 (TA-6, TA-8, TA-9, TA-22, and TA-69) and high-explosive (HE) operational areas at several technical areas (TA-14, TA-15, TA-36, TA-39, and TA-40). The existing Two-Mile Mesa Complex contains offices, an exercise facility, crafts operations and other support activities, and experimental facilities including firing sites and non-firing site type activities. The existing Two-Mile Mesa Complex is shown in Photo 5.


**Photo 5.** Aerial view of the existing Two-Mile Mesa Complex in 2000.

## 2.1 Proposed Action

The Proposed Action is to construct and operate offices, laboratories, firing facilities, and shops within the Two-Mile Mesa Complex where work would be consolidated from other locations. The approximate locations of new structures, roads, and parking areas are shown in Figure 3. The Proposed Action would also remove or demolish certain vacated structures that are no longer needed. DX would vacate approximately 200,000 square feet ($ft^2$) (18,000 square meters [$m^2$]) of space in existing buildings.

The Proposed Action includes constructing 15 to 25 new buildings over about a 10-year time frame to replace about 59 structures currently used for DX operations. Two of the new buildings would be combined office and laboratory buildings (a Shock and Detonation Physics [SDP] Building and a Collaborative Energetics Research Laboratory [CERL] Building); three additional combination office and laboratory buildings may be constructed if DX staffing levels increase as anticipated. Laboratories combined with office buildings would involve only conducting research with low-hazard, non-HE, nonradioactive materials. Typical laboratory operations would involve electronic testing and development using small amounts of chemicals such as

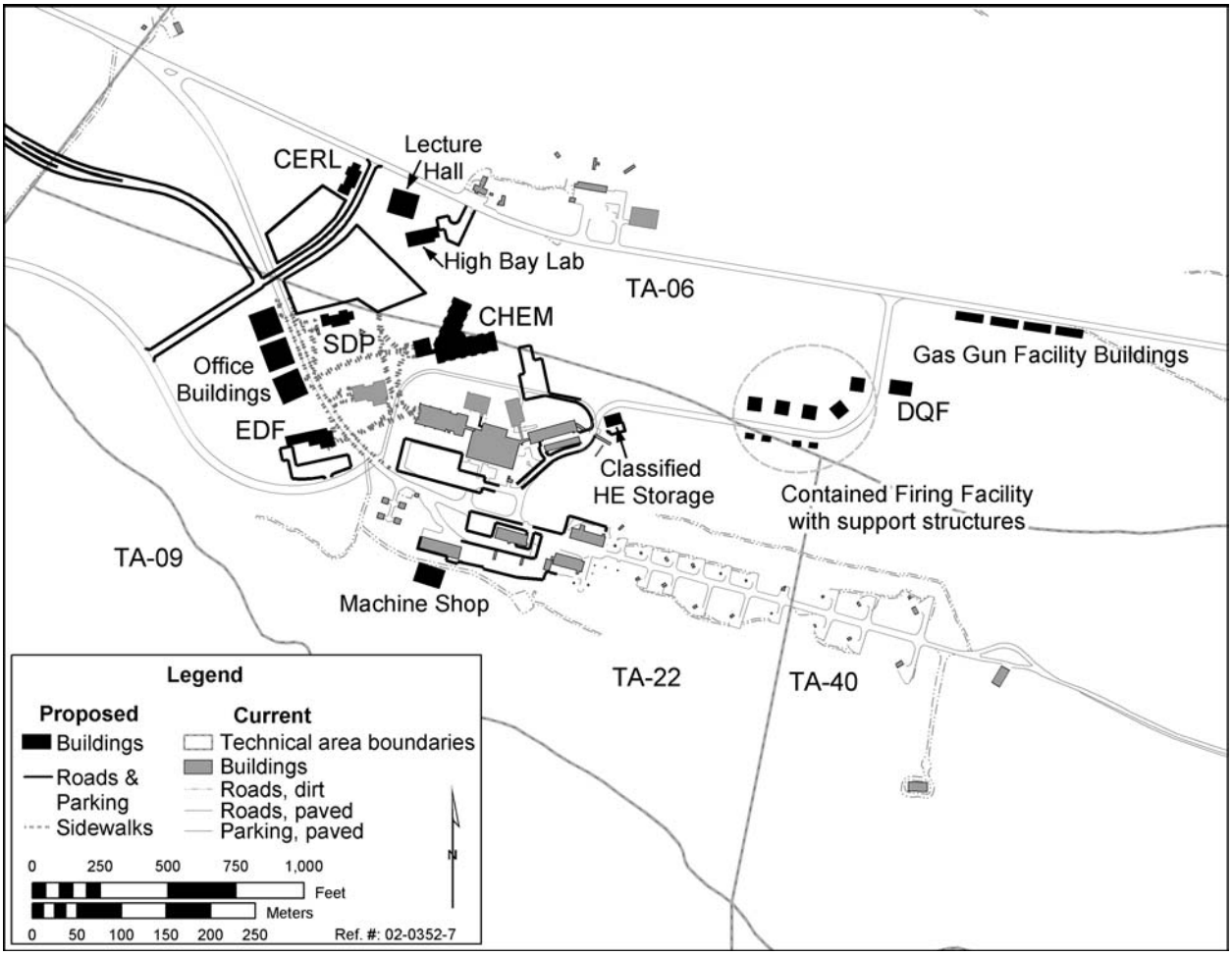


**Figure 3.** Conceptual drawing of the proposed Two-Mile Mesa Complex, the area of the Proposed Action (building locations and footprints approximate).

solvents. The other new buildings would consist of a Characterization of Highly Energetic Materials (CHEM) Laboratory, an Engineering Diagnostic Facility (EDF), five Contained Firing Capability buildings, a High Bay Laboratory, a Detonator Qualification Facility (DQF), two to four Gas Gun Facility buildings, a Machine Shop, a Classified HE Storage Building, and a lecture hall. The Proposed Action also involves upgrading or constructing new roads, parking, fencing, and utilities within the vicinity of the Two-Mile Mesa Complex, including construction of a new security gate and road entrance from SR 501 (Figure 4). As construction of new buildings is completed, the Two-Mile Mesa Complex would be landscaped. Many existing DX operations, personnel, and support staff would be relocated to the new buildings at the Two-Mile Mesa Complex and various buildings in other parts of LANL would be vacated. Temporary buildings (transportables) vacated as part of the relocations would be removed and made available for other LANL uses or eliminated from use through the LANL excess property program. According to LANL policy, permanent buildings that are vacated as part of the Proposed Action would also be made available for other uses under the LANL property management program. It is not expected that these buildings would have future uses and, consequently, this EA analyzes demolition of these structures. If other uses are identified, additional NEPA compliance reviews would be performed. Table 1 summarizes the buildings that would be vacated as part of the Proposed Action.

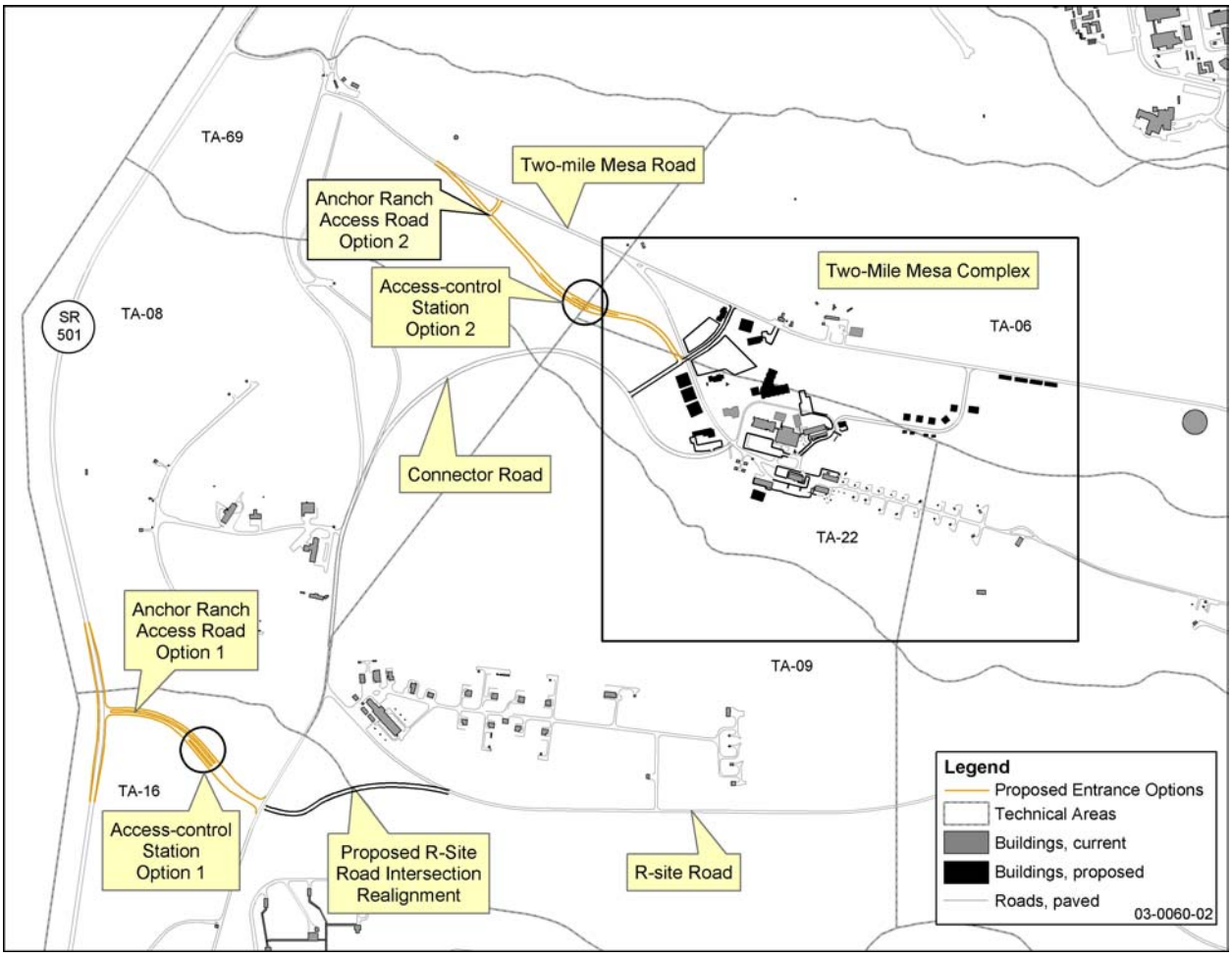


**Figure 4.** Proposed new access road and access-control station.

**Table 1.** Buildings to be Vacated as Part of the Proposed Action

| TA | Building | Current Use |
|---|---|---|
| TA-9 | 21 | HE Research and Development Laboratory and Office Building |
| TA-9 | 28 | Shop Building (Machine Shop) |
| TA-9 | 29 | Stock and Equipment building |
| TA-9 | 30 | Gas Storage |
| TA-9 | 31 | Solvent Storage |
| TA-9 | 32 | Laboratory and Offices |
| TA-9 | 33 | Laboratory Building |
| TA-9 | 34 | Process Laboratory |
| TA-9 | 35 | Process Laboratory |
| TA-9 | 36 | Magazine |
| TA-9 | 37 | Process Laboratory |
| TA-9 | 43 | Process Laboratory Storage |
| TA-9 | 49 | Magazine |
| TA-9 | 50 | Receiving and Shipping. |
| TA-9 | 52 | Magazine |
| TA-9 | 53 | Magazine Office |
| TA-9 | 54 | Magazine |
| TA-9 | 55 | Magazine |
| TA-9 | 272 and 273 | Transportables |
| TA-9 | 265 | Boiler Building Office Transportables |
| TA-9 | 48 | Machining Building |
| TA-9 | 28 | Shop Building |
| TA-14 | 6 | Storage Building |
| TA-14 | 22 | Magazine |
| TA-14 | 23 | Control Building |
| TA-14 | 24 | Magazine |
| TA-15 | 30 | Guard Station |
| TA-15 | 40 | Laboratory and Office Building |
| TA-15 | 46 | Exercise Facility (Former Guard Station) |
| TA-15 | 140 | Storage Building |
| TA-15 | 183 | Laboratory and Office Building |
| TA-15 | 447 | Trailer |
| TA-15 | 448 | Trailer |
| TA-15 | 456 | Transportable |
| TA-15 | 476 | Trailer |
| TA-22 | 52 | Machine Shop |
| TA-22 | 66, 67,68,69 | Storage Buildings |
| TA-36 | 5 | Preparation Building |
| TA-36 | 3, 6, or 8 | Firing Site |
| TA-39 | 2 | Laboratory and Office Building |
| TA-39 | 6 | Firing Chamber |
| TA-39 | 67 | Support Building for Chamber 6 |
| TA-39 | 103 | Transportable |
| TA-39 | 107 | Transportable |
| TA-39 | 138 | Support Building for Chamber 6 |
| TA-40 | 1 | Laboratory and Office Building |
| TA-40 | 2 | Magazine |
| TA-40 | 3 | Preparation Building |
| TA-40 | 4 | Firing Point |
| TA-40 | 8 | Contained Firing Vessel |
| TA-40 | 9 | Firing Point to be vacated |
| TA-40 | 12 | Crystal Laboratory |
| TA-40 | 13 | Magazine |
| TA-40 | 14 | Preparation Building |
| TA-40 | 15 | Firing Point |

**Table 1.** continued

| TA | Building | Current Use |
|---|---|---|
| TA-40 | 23 | Machine Shop |
| TA-40 | 36 | Magazine |
| TA-40 | 37 | Magazine |
| TA-40 | 38 | Magazine |
| TA-40 | 39 | Magazine |
| TA-40 | 40 | Inert Preparation Building |
| TA-40 | 41 | Laboratory Building |
| TA-40 | 45 | Solvent Shed |
| TA-40 | 90 | Transportable |
| TA-69 | 1 | Guard Station #431 |
| TA-69 | 2 | Doublewide Trailer outside fence building |
| TA-69 | 5 | Trailer |
| TA-69 | 26 | Guard Station |

All phases of the Proposed Action, including construction, operation, and demolition, would be conducted in accordance with LANL's requirements for waste management (LANL 1998a). These requirements specify that waste shall be reduced as much as technically and economically feasible. Waste minimization practices (such as material substitution, source reduction, hazard segregation, recycling, and reuse) would be incorporated into all waste-generating activities. Waste disposal would occur only after waste minimization options have been implemented or when other options are not safe or are not technically or economically feasible. Wastes would be recycled or salvaged in accordance with LANL's property management process. In the case of construction, a Waste Minimization Plan would be prepared and followed.

Demolition activities could involve structures that are eligible for listing on the National Register of Historic Places. None of the structures involved in the Proposed Action have been identified as being desirable for retention based solely on its historic significance. Appropriate compliance with the *National Historic Preservation Act* would be undertaken, and, if a treatment plan was necessary, this would be negotiated with the State Historic Preservation Officer (SHPO). All construction and demolition actions would then proceed based on the implementation of that treatment plan.

Information that is common to all the construction activities included in the Proposed Action is presented in the following section (2.1.1). Subsections of Section 2.1.1 include discussion of the construction of each of the buildings and structures. Operations are discussed in Section 2.1.2, and the demolition actions included as part of the Proposed Action are summarized in Section 2.1.3. The projected schedule for completion of the Proposed Action is described in Section 2.1.4.

### 2.1.1 Construction

The Proposed Action would involve new construction within the Two-Mile Mesa Complex. This complex is located in a developed area containing about 40 structures and occupied by about 200 workers. The proposed new construction sites would be located within the Two-Mile Mesa Complex area shown in Figure 3. Some mature trees may need to be removed from areas near the periphery of the complex. No construction would be conducted within a floodplain or a wetland. New construction areas would be sited to avoid impacts to prehistoric and Homestead Era cultural resources and to sensitive habitat areas. Should previously unknown cultural resources be discovered during construction, work would cease in that area until LANL's

cultural resources specialists could review the evidence, identify procedures for working in the vicinity of the cultural resources, and initiate any necessary consultations with Federal, state, and tribal entities.

New building construction, asphalt removal, utility corridor excavation, or post-construction landscaping could disturb some potential release sites (PRSs)[4]. When possible, PRSs would be avoided. If disturbance of PRSs were necessary, soils from PRSs would be returned to the excavated area after disturbance when feasible or would be characterized and disposed of appropriately. Should a previously unknown or suspect disposal site be disclosed during subsurface construction work, work would cease until LANL's ER Project staff could review the site and would identify procedures for working within that site area.

With the exception of buildings used for larger quantities of HE (the CHEM building, one of the contained firing structures, and associated magazine/explosive experiment preparation structures) (discussed in Sections 2.1.1.3 and 2.1.1.6 below), construction of new buildings would be performed using common construction industry methods since the operational uses of these structures do not have potential hazards that would entail unique structural requirements. The CHEM building and other buildings with larger quantities of HE would be designed and constructed in accordance with U.S. Army guidelines (DOA 1990) meet DOE's and LANL's HE loading requirements. All new buildings would be constructed in accordance with seismic criteria in current building codes. No buildings would be constructed over known faults or within 50 feet (ft) (15 meters [m]) of known seismic faults active since the beginning of the Holocene (approximately 100,000 years ago).

Each of the new buildings and structures would be designed according to general design criteria for a new facility (LANL 1999a). Buildings would be designed with a minimum lifetime expectancy of 30 years of operation. Unless otherwise stated in the facility descriptions below, buildings would typically consist of a concrete slab foundation with a one- to two-story superstructure. The total height of the buildings above ground level would be less than 32 ft (9.6 m). Various kinds of spaces would be included in these buildings, such as photocopying rooms, file servers, mail alcoves, building reception areas, locker rooms, visiting staff rooms, equipment receiving areas, shipping and storage spaces, main and satellite telecommunication rooms, mechanical rooms, electrical rooms, large and small conference rooms, break rooms, janitorial storage rooms, restrooms, fire protection areas, elevator lobbies, equipment rooms, stairwell areas, security control points, vaults, and hallway spaces.

Building exteriors (such as surface finish, roof lines, and windows) would be designed to be architecturally compatible with one another and with other recent buildings in the Two-Mile Mesa Complex. Typically roof drains would collect snowmelt and rain water from these buildings and would channel the runoff to appropriate release points, such as landscaped areas.

[4] PRS—The Environmental Restoration (ER) Project Glossary (ER 2000-0095) refers to PRSs as potentially contaminated sites at LANL that are identified as either solid waste management units (SWMUs) or areas of concern (AOCs). AOCs are areas at LANL that might warrant further investigation for releases based on past facility waste-management activities. A SWMU is any discernible unit at which solid wastes have been placed at any time, irrespective of whether the unit was intended for the management of solid or hazardous waste. Such units include any area at a facility at which solid wastes have been routinely and systematically released. This includes regulated units (i.e., landfills, surface impoundments, waste piles, and land treatment units) but does not include passive leakage or one-time spills from production areas and units in which wastes have not been managed (e.g., product-storage areas).

Storm water runoff systems would be designed to minimize soil erosion. Each of the newly constructed buildings would be designed with safety and security features appropriate to the work to be performed in that building. These features could include air handling and filtration systems, standby emergency generators, alarms, security equipment, monitoring equipment, emergency lighting, and similar kinds of equipment and systems.

Consistent with DOE Order 413.3 (DOE 2000a), *Program and Project Management for the Acquisition of Capital Assets*, the buildings would be constructed, remodeled, or refurbished according to sustainable design concepts. The design would include features that would allow the structures to operate with improved electric and water use efficiency and would incorporate recycled and reclaimed materials into their construction to the extent possible. For example, construction might incorporate elements made of reclaimed and recycled materials, use low-flow lavatory fixtures to minimize potable water use, and employ natural lighting and energy-efficient lighting fixtures and equipment to reduce electric consumption. The finished landscaping would be designed in compliance with DOE Order N 450.4 (DOE 2001), *Assignment of Responsibilities for Executive Order 13148, Greening the Government Through Leadership In Environmental Management*. This order establishes new goals and requirements that affirm DOE's approach to improving environmental performance through the use of environmentally and economically beneficial landscaping practices. U.S. Environmental Protection Agency (EPA) guidance (60 FR 40837) identifies a framework for these landscape practices on managed Federal lands and Federally funded projects. One of the guiding principles focuses on the use of regionally native plants in site design and implementation where cost-effective and to the maximum extent practicable; a native plant species is defined as one that occurs naturally in a particular region, ecosystem, or habitat without direct or indirect human actions.

As noted in Section 2.1, all activities at LANL are required to minimize waste generation. Operational and administrative activities (such as recycling office waste) that would enhance overall LANL waste minimization efforts and efforts to reduce the use of potable water and energy sources would be employed. Every effort would be made to recycle and re-use construction (and demolition) materials. LANL has existing recycling contracts for the following materials: metal, paper, cardboard, concrete, asphalt, wire, smoke detectors, exit signs, and light bulbs. To the maximum extent possible, construction (and demolition) contractors would be required to segregate these materials for recycling. Waste Minimization Plans would be developed and followed for each construction project.

The new buildings would be heated by natural gas-fired boilers. New refrigeration units would comply with applicable air quality regulations. Combustion sources such as electrical generators, boilers, water heaters, and furnaces would be registered in compliance with Title 20 of the New Mexico Administrative Code (NMAC) (20 NMAC 2.72). Average water and power use and waste generation amounts in the new buildings would be similar to other modern office and shop buildings.

Onsite utilities (gas, water, sewer, electric, communications, computer networks) would be reconfigured and upgraded for efficient distribution to the existing and new buildings. Utility corridors would be established and utilities relocated to provide a consolidated, efficient utility network that can be serviced without major disruption to the complex. In addition, consolidation of utilities would reduce future site ground disturbance. Connections and upgrades to the existing underground utilities would be necessary. Electrical power distribution may need to be upgraded to the Two-Mile Mesa Complex to serve the proposed new buildings in the complex;

however, no additional electrical power transmission lines are anticipated. Other utilities within the Two-Mile Mesa Complex may also need to be upgraded to serve the consolidated complex, although no major changes in utility mains outside the Two-Mile Mesa Complex are anticipated. These corridors and related utility installation would require excavation of approximately 16,000 linear ft (4,800 m) of trenches.

Clearing or excavation activities during site construction have the potential to generate dust. Dust suppression would be conducted as necessary using best available control measures (BACMs) (such as water spraying or use of soil tackifiers[5]) to minimize the generation of dust during construction activities. The application of specific BACMs would be determined on a case-by-case basis.

Work at the site would require the use of heavy equipment such as cranes, forklifts, backhoes, cement trucks, and other similar construction equipment. The work would also require the use of a variety of hand tools and equipment. Noise at the site would be audible primarily to the involved workers and to workers housed in the Two-Mile Mesa Complex area. Involved site workers would be required to wear appropriate personal protective equipment (PPE), including hearing protection. During the construction phase, space in the immediate vicinity would be available for equipment storage and material staging. To the extent possible, the security fences at the Two-Mile Mesa Complex would be realigned so that construction could take place outside the security area. After construction, the security fences would be relocated so that most, but not all, of the new buildings would be inside the security fence. Temporary parking areas, staging areas, laydown yards, and construction access roads may be established during the construction phases. These areas would be reclaimed or used for permanent parking under the Proposed Action.

Construction work would be planned and managed to ensure that standard worker safety goals are met and that work would be performed in accordance with good management practices, regulations promulgated by the Occupational Safety and Health Administration, and various DOE orders involving worker and site safety practices. A Notice of Intent to Discharge would be filed under the National Pollutant Discharge Elimination System (NPDES) *General Permit for Stormwater Discharges Associated with Large Construction Activities*. Engineering best management practices (BMPs) would be implemented for each construction site as part of a construction Storm Water Pollution Prevention Plan required by the NPDES General Permit. These BMPs may include but not be limited to, the use of hay bales, plywood, or synthetic sedimentation fences with appropriate supports installed to contain excavated soil and surface water discharge during construction of each building and structure. After each building and structure was constructed, loose soil and debris that was not part of the landscaping design would be removed from the area.

Foot and vehicular traffic would be affected for short periods during delivery of construction materials and by the addition of construction workers in the area. Approximately 80 construction workers would be onsite during the peak construction period, adding approximately 35 vehicles to local roadways during the construction period. These construction workers would park their personal vehicles either in existing parking lots or in other designated parking areas.

[5] Tackifiers are chemical dust suppressants often added to water that act to disperse the chemicals, then evaporate after application. The chemicals that are left behind bind the soil particles together into larger particles that are less easily blown in the air.

In addition, about three NNSA and 20 UC workers may perform site inspections and monitor construction and demolition activities during peak activity periods.

Vehicles (such as dump trucks) and heavy machinery (such as bulldozers, drill rigs, dump trucks, cranes, and cement mixer trucks) would be used onsite during the construction phase. These vehicles would operate primarily during the daylight hours and would be left onsite over night. Temporary construction lighting would be directed toward the work area.

Construction materials would be procured primarily from New Mexico suppliers. Construction workers would be drawn primarily from communities across New Mexico.

Site preparation and construction activities would produce a type of material called "construction and demolition" waste, which is a nonhazardous subcategory of "solid" waste as defined in New Mexico State regulations[6]. Solid waste refers to the regulatory definition of waste in Federal regulation (40 CFR 261) and not to its physical state; solid wastes may be solid, liquid, or gaseous. Typically, construction and demolition waste consists of such items as packaging and strapping material, unused pieces of gypsum board, glass, copper wire, broken or bent nails and screws, and empty material containers. Some of these materials, such as glass and copper wire, are recyclable; they would be sent to offsite recycle facilities. Soil and reclaimed asphalt material and crushed concrete rubble would be staged at an existing site on Two-Mile Mesa for potential construction use at the Two-Mile Mesa Complex or at other existing LANL storage yards until these materials could be reused at LANL or at other offsite locations. Non-reclaimable and non-recyclable construction and demolition waste would be disposed of in the Los Alamos County Landfill or at its replacement facility for solid waste disposal.

If wastes from construction activities (or demolition activities) are mixed with hazardous constituents as defined in 20 NMAC 9.1, their disposal is not regulated as construction and demolition waste but as hazardous waste. Hazardous waste as defined in Federal regulations (40 CFR 261) may be either "characteristic" (for example, toxic, flammable, or corrosive) or "listed." Listed wastes are derived from specific processes listed in 40 CFR 261. Proposed construction is not expected to generate any *Resource Conservation and Recovery Act* (RCRA) characteristic or listed hazardous wastes.

Routine maintenance actions would be performed during the operational life of the various buildings and structures. At the end of each facility's useful life, final demolition would be performed as needed. Separate NEPA compliance reviews would be performed at that time.

In addition to construction of buildings, the Proposed Action would include changing traffic patterns around the Two-Mile Mesa Complex as well as landscaping the entire complex. Employee recreation areas within the Two-Mile Mesa Complex may be incorporated into the landscaping plan.

Traffic circulation in the immediate Two-Mile Mesa Complex would be modified as part of the construction activities in the Two-Mile Mesa Complex. Most personal vehicles of site workers would be restricted to the perimeter of the Two-Mile Mesa Complex. The interior portion of the site would be preserved for pedestrian walkways and landscaping. Some parking spaces would remain within the interior of the Two-Mile Mesa Complex; these would be reserved for handicap parking and other authorized vehicles. Parking areas would be added to accommodate about 400

[6] Waste types are defined in more detail in the footnotes in Section 3.2.

to 600 additional vehicles. Most of the roads that would be utilized around the perimeter of the Two-Mile Mesa Complex already exist but there would be some new road construction.

Artificial lighting would be modified or added to provide adequate lighting for pedestrian walkways inside the Two-Mile Mesa Complex. Additional lighting may be added to existing perimeter parking areas and newly constructed parking areas. This artificial lighting would be directed downward toward the parking and walking areas and away from wooded locations and canyons. Outdoor lighting for the newly constructed buildings and structures would conform to the requirements of the *New Mexico Night Sky Protection Act* (NMSA 74-12).

Some of the existing concrete pads, asphalt covered areas, and power poles would be removed as part of the Proposed Action. The newly developed portions of the Two-Mile Mesa Complex would be landscaped or reseeded with native grasses and allowed to return to a more natural state. Low-pressure sprinklers and a drip irrigation system may be required to establish and maintain landscaping if native grasses are not used.

The following subsections describe construction of each component of the Proposed Action in detail.

#### *2.1.1.1 New Shock and Detonation Physics (SDP) Office Building*

The new SDP Building would have one or two stories with approximately 20,000 $ft^2$ (1,800 $m^2$) of available floor space that would accommodate approximately 65 LANL workers. The building would provide offices, conference rooms, carpenter and staff shops, communications, and laboratory space. Functionally, this building would provide working space for the employees who are currently housed at TA-9, TA-39, TA-40, and other technical areas. Operations would consist of normal office work, laboratory work with electronics and lasers, fabrication of wood and metal explosive experiment stands, diagnostics, and prototype machining typical of existing DX operations.

The SDP Building would be constructed in the general location shown on the conceptual design (see Figure 3). No known PRSs are present within the proposed structure footprint at the construction site.

Approximately 806 cubic yards ($yd^3$) (613 cubic meters [$m^3$]) of solid waste would be generated during construction of the SDP Building. This waste would be disposed of at the Los Alamos County Landfill or its replacement landfill or may be stockpiled as clean fill material for future projects.

#### *2.1.1.2 New Collaborative Energetics Research Laboratory (CERL) Building*

The new CERL Building would have one or two stories with approximately 15,000 $ft^2$ (1,350 $m^2$) of available floor space that would accommodate 40 to 50 LANL and non-LANL workers. The building would provide offices, conference rooms, and laboratory space. Functionally, this building would provide security-reconfigurable working space for DX employees and collaborators who are housed both inside and outside the current LANL security perimeter.

The CERL Building would be constructed in the general location shown in the conceptual diagram (see Figure 3). No known PRSs are present within the proposed structure footprint at that construction site.

Approximately 806 $yd^3$ (613 $m^3$) of solid waste would be generated during construction of the CERL Building. This waste would be disposed of at the Los Alamos County Landfill or its replacement landfill or may be stockpiled as clean fill material for future projects.

#### *2.1.1.3 New Characterization of Highly Energetic Materials[7] (CHEM) Laboratory*

The new CHEM Laboratory would have one or two stories with approximately 50,000 to 85,000 $ft^2$ (4,500 to 7,650 $m^2$) of available floor space that would accommodate 100 to 200 LANL workers. The building would provide offices, conference rooms, analytical and organic chemistry laboratories, small-scale formulation and synthesis of energetic materials, an HE crystal laboratory, communications, laboratories, and safety and performance testing. Functionally, this new building would provide office and working space for the DX employees who conduct energetic materials research currently housed at TA-9 Buildings 21, 32, 33, and 34 (Photo 6), and TA-40 Building 12. Much like the DX chemistry facility at TA-9 Building 21, the building would be divided into an area where use of energetic materials is allowed and an area where use of energetic materials is not permitted. The building would be designed according to HE loading criteria described in the DOE Explosive Safety Manual (DOE 1996) and the DOE Order for Facility Safety (DOE Order 420.1).

**Photo 6.** Typical energetic materials research building (TA-9 Building 34).

[7] Highly Energetic Material – Any chemical compound or mechanical mixture that, when subject to heat, impact, friction, shock, or other suitable initiation stimulus, undergoes a very rapid chemical change with the evolution of large volumes of gas, light, or heat. Examples include high explosives, pyrotechnics, and thermites.

The proposed CHEM Building would be constructed in the general location shown in the conceptual design (see Figure 3). No known PRSs are present within the identified structure footprint at that construction site.

Approximately 2,465 $yd^3$ (1,873 $m^3$) of solid waste would be generated during construction of the CHEM Building. This waste would be disposed of at the Los Alamos County Landfill or other replacement landfill or may be stockpiled as clean fill material for future projects.

#### *2.1.1.4 New Engineering Diagnostics Facility (EDF)*

The new EDF would provide office and laboratory space for 40 to 60 LANL employees. The building would have one or two stories and would provide approximately 20,000 $ft^2$ (1,800 $m^2$) of available floor space. The building would provide office space, conference rooms, staff shop, communications, and laboratory space. Activities would be typical of office work, electronics, computers, communications, lasers, and electronic fabrication.

The EDF would probably be constructed in the location shown in the conceptual drawing (see Figure 3). No known PRSs are present within the proposed structure footprint at that construction site.

Approximately 806 $yd^3$ (613 $m^3$) of solid waste would be generated during construction of the EDF. This waste would be disposed of at the Los Alamos County Landfill or its replacement landfill or may be stockpiled as clean fill material for future projects.

#### *2.1.1.5 New High Bay Laboratory*

The new High Bay Laboratory would provide office space for approximately six LANL employees, a small conference area, staff shop, and large, open, high bay experimental laboratory space with a total of approximately 10,000 $ft^2$ (900 $m^2$) of available space. The High Bay Laboratory could be configured with crane and loading dock service and reinforced floor to support many "bulky" experimental research and development activities that demand open laboratory space. The activities that would be consolidated in this building include shock tubes, pre-experiment setup evaluations, large rotating masses, laser-based diagnostics, x-ray laboratories, and work with gram quantities of explosives in "boom boxes," which are small, portable containment vessels.

The High Bay Laboratory would probably be constructed in the location shown in the conceptual drawing (see Figure 3). No known PRSs are present within the proposed structure footprint at that construction site.

Approximately 616 $yd^3$ (468 $m^3$) of solid waste would be generated during construction of the laboratory building. This waste would be disposed of at the Los Alamos County Landfill or other replacement landfill or may be stockpiled as clean fill material for future projects.

#### *2.1.1.6 New Contained Firing Capability Buildings*

The new Contained Firing Capability buildings would be structures that would house portable vessels to contain the effects of detonating 22 pounds (lb) (10 kilograms [kg]) of TNT-equivalent HE or that would be separate concrete "bombproofs" in which HE tests may be performed. As many as five 22-lb (10-kg) TNT-equivalent rated containment vessels, including the vessel currently located at TA-40 Building 8, may be located at the Two-Mile Mesa Complex. Each vessel would be housed in a one-story building of approximately 3,000 $ft^2$ (270 $m^2$). A

"bombproof," which is an earth-covered concrete or metal chamber capable of containing 110 lb (50 kg) of TNT-equivalent HE, may be substituted for one of the containment vessel buildings. The bombproof would be approximately the same size as the other contained firing buildings. It would be separated from the other buildings by 100 ft (30 m) and would be oriented with doors facing away from nearby structures. Four magazine, diagnostic, and explosive experiments preparation support buildings totaling approximately 2,000 $ft^2$ (180 $m^2$) would also be provided. No offices would be located in this facility. Approximately six workers would conduct experiments in each of these buildings.

The new Contained Firing Capability buildings would be constructed in the general location shown in the conceptual drawing (see Figure 3). A PRS is present in this area; however, the buildings would be located such that the PRS would be avoided.

Approximately 806 $yd^3$ (613 $m^3$) of solid waste would be generated during construction of the new Contained Firing Capability structures. This waste would be disposed of at the Los Alamos County Landfill or its replacement landfill or may be stockpiled as clean fill material for future projects.

#### *2.1.1.7 New Gas Gun Facility Building(s)*

The new Gas Gun Facility would consolidate the gas gun operations currently located at TA-39 and TA-40. This new facility would include two to four single story buildings totaling approximately 12,000 $ft^2$ (1,080 $m^2$) to house the gas guns. Operations would be the same as those currently conducted at TA-40 Building 9, TA-39 Building 69, and TA-39 Building 89, which include operating gas guns to study inert and explosive target materials under various conditions.

The new Gas Gun Facility would be located near the new Contained Firing Capability buildings as shown in the conceptual drawing (see Figure 3). No offices would be located in this facility. Approximately six workers would conduct experiments in these buildings.

The new Gas Gun Facility would be constructed in the general location shown in the conceptual drawing (see Figure 3). A PRS is present in this area; however, the buildings would be located such that the PRS would be avoided.

Approximately 806 $yd^3$ (613 $m^3$) of solid waste would be generated during construction of the Gas Gun Facility building. This waste would be disposed of at the Los Alamos County Landfill or other replacement landfill or may be stockpiled as clean fill for future projects.

#### *2.1.1.8 New Detonator Qualification Facility (DQF)*

The new DQF would consolidate detonator testing operations currently located at TA-40 Building 5 and TA-40 Building 15. The new facility would consist of a one- to two-story building totaling approximately 4,000 $ft^2$ (360 $m^2$) to house detonator testing operations. Approximately four workers would conduct operations in this building. Operations would be the same as those currently conducted, which include testing detonators with small quantities of explosives (approximately 6.7 ounces [200 grams]) in containment enclosures. The DQF would generally be located near the new Contained Vessel Firing Capability Buildings as shown on the conceptual drawing (see Figure 3).

The new DQF would be constructed in the general location shown in the conceptual drawing (see Figure 3). A PRS is present in this area; however, the buildings would be located such that the PRS would be avoided.

Approximately 616 $yd^3$ (468 $m^3$) of solid waste would be generated during construction of the DQF. This waste would be disposed of at the Los Alamos County Landfill or its replacement landfill or may be stockpiled as clean fill material for future projects.

#### *2.1.1.9 New Additional Combination Office and Laboratory Buildings*

If staffing levels increase as projected, additional combined office and laboratory buildings would be constructed at the Two-Mile Mesa Complex. The new buildings would consist of one to three buildings, each one to two stories high, totaling approximately 20,000 $ft^2$ (1,800 $m^2$). Operations would involve typical office work and some laboratory activities, such as electronics assembly. These new buildings would be located in the general area of the SDP and CERL Buildings as shown in Figure 3. Approximately 80 workers would eventually be housed in each of these buildings.

The new buildings would be constructed in the general location shown in the conceptual drawing (see Figure 3). A PRS is present in this area; however, the buildings would be located such that the PRS would be avoided.

Approximately 806 $yd^3$ (613 $m^3$) of solid waste would be generated during construction of each office/laboratory building. This waste would be disposed of at the Los Alamos County Landfill or its replacement landfill or may be stockpiled as clean fill material for future projects.

#### *2.1.1.10 New Lecture Hall*

A new 350-seat lecture hall would be constructed at the Two-Mile Mesa Complex. The new lecture hall would consist of a one-story building, totaling approximately 9,000 $ft^2$ (810 $m^2$). The building would be used for conducting large meetings and colloquiums in support of programmatic work. The building would include an entry vestibule, restrooms, equipment, storage, and utility rooms in addition to the 350-seat lecture hall. This building would be located near the SDP and CERL Buildings as shown in Figure 3.

The new lecture hall would be constructed in the general location shown in the conceptual drawing (see Figure 3). A PRS is present in this area; however, the buildings would be located such that the PRS would be avoided.

Approximately 616 $yd^3$ (468 $m^3$) of solid waste would be generated during construction of the lecture hall. This waste would be disposed of at the Los Alamos County Landfill or its replacement landfill or may be stockpiled as clean fill material for future projects.

#### *2.1.1.11 New Machine Shop*

The new Machine Shop would replace the existing DX machine shop at TA-22 Building 52. The new facility would consist of a one- to two-story building totaling approximately 7,000 $ft^2$ (630 $m^2$) to house machining operations. Operations would be the same as those currently conducted at TA-22 Building 52, which includes machining metals and various plastics as well as welding operations. The new Machine Shop would be located near the existing machine shop as shown in Figure 3. Approximately 15 workers would be housed in this facility.

The new Machine Shop would be constructed in the general location shown in the conceptual drawing (see Figure 3). A PRS is present in this area; however, the buildings would be located such that the PRS would be avoided.

Approximately 616 $yd^3$ (468 $m^3$) of solid waste would be generated during construction of the new Machine Shop. This waste would be disposed of at the Los Alamos County Landfill or its replacement landfill or may be stockpiled as clean fill material for future projects.

#### *2.1.1.12 New Classified HE Storage Building*

The new Classified HE Storage Building would consolidate HE storage operations currently located at TA-16, TA-9, and TA-22. The new facility would consist of a one-story building totaling approximately 3,000 $ft^2$ (270 $m^2$) to store classified HE materials. Operations would be the same as those currently conducted. The new HE Storage Building would probably be located in the general area shown in the conceptual drawing (see Figure 3).

The new Classified HE Storage Building would be constructed in the general location shown in the conceptual drawing (see Figure 3). A PRS is present in this area; however, the buildings would be located such that the PRS would be avoided.

Approximately 616 $yd^3$ (468 $m^3$) of solid waste would be generated during construction of the storage building. This waste would be disposed of at the Los Alamos County Landfill or its replacement landfill or may be stockpiled as clean fill material for future projects.

#### *2.1.1.13 New Access Road and Access-Control Improvements*

A new access-control station, the Anchor Ranch Station, would be created to replace the existing access-control station at TA-69. Two options for modifying the existing access are under consideration: The preferred option would be to close the existing access-control station at TA-69 and construct a new access road and access-control station farther south within TA-16. This option would relieve congestion on SR 501 where vehicles queue to pass through the existing access-control station and would increase the sight distance along SR 501 at the intersection of SR 501 and the new access road. The new access road would begin at the northeast corner of TA-16 approximately where the TA-8 boundary intersects the TA-16 boundary. The new access road would extend east from SR 501 approximately 1,600 ft (480 m) and intersect the existing Anchor Ranch Road and the road connecting TA-8 and TA-22. About 1,600 ft (480 m) of roadway at the west end of the existing R-Site Road would be realigned and upgraded to intersect the new access road. Turning lanes would be added to SR 501 at the approaches to the new access road. The access-control station would be constructed some distance east of SR 501 to reduce traffic congestion at the intersection of SR 501.

The second option would be to relocate the existing access-control station at TA-69 farther east near the Two-Mile Mesa Complex and to construct a new access road about 2,400 ft (720 m) in length in the approximate location shown on Figure 4. This option would reduce traffic congestion at the intersection of Two-Mile Mesa Road and SR 501 but would not increase sight distance along SR 501 at the approaches to the turn-off to Two-Mile Mesa Road.

With either option, short access roads would be constructed within the Two-Mile Mesa Complex. The access roads would connect the new access-control station to existing roads, parking areas, and buildings. The new access roads would be designed to facilitate traffic movement within the complex and to and from other DX technical areas. Both options would

also include installing or relocating signs, fences, and safety elements, such as guardrails. Both options would also entail removal of the existing access-control station and closure or removal of portions of existing roadways. The proposed access road and access-control station construction would not affect cultural resources, sensitive habitat, or PRSs at any of the siting location.

### 2.1.2 Operations

DX operations that would be consolidated in the Two-Mile Mesa Complex as part of the Proposed Action are currently conducted in various DX facilities (see Table 1). The SWEIS (DOE 1999a) analyzed these operations as part of the total LANL operations. Therefore, these operations will not be analyzed again in this document, although any operational effects due to co-locating activities close to one another are included in the analyses of effects (Chapter 3). Since the SWEIS was finalized, all of the other operations involved in the Proposed Action have been operating at, or below, the levels projected in the SWEIS for the Expanded Alternative, which DOE selected in its 1999 Record of Decision (ROD) (LANL 2002a). Operations would be expected to continue at or below the Expanded Alternative levels analyzed in the SWEIS (DOE 1999a) after the consolidation of operations in the Two-Mile Mesa Complex.

In addition to relocating some existing equipment as part of the Proposed Action, new operational equipment may be purchased and installed. New, more efficient equipment would be expected to provide additional safety and environmental controls and to reduce energy and resource use.

Under the Proposed Action, some operations that use radioactive materials (DU) would be consolidated in the Two-Mile Mesa Complex. No other special nuclear materials would be involved in the relocated operations. Relocation of these operations would not require EPA pre-approval under (40 CFR 61). Subpart H (the National Emission Standard for Hazardous Air Pollutants [NESHAP] for Radiation [Rad NESHAP]). Stack and exhaust monitoring would be conducted as needed at the new locations.

Some components that would be used in various buildings may contain solid beryllium, as is the current practice. None of these operations would involve dispersable beryllium or would result in dispersal of beryllium.

Environmental controls to protect workers and the environment would be established to control emissions and exposures as effectively as, or more effectively than, the controls in the existing facilities where these operations are currently conducted. The quantity of waste generated would be reduced as much as technically and economically feasible by using material substitution, good housekeeping, hazard segregation, recycling, and reuse.

### 2.1.3 Demolition

Temporary buildings, such as transportables, would be removed from the DX technical areas previously identified and made available for other uses elsewhere at LANL or would be disposed of through the existing LANL excess property program. After DX operations are removed from permanent buildings, the buildings would be made available for other uses, starting in about fiscal year (FY) 05. If no further uses were identified (and none are anticipated), the buildings would be scheduled for demolition. Demolition would probably not occur immediately as these are not high-hazard buildings that would require immediate demolition. The schedule for demolition of buildings and structures would be dependent upon a number of factors, including

completion of any required regulatory compliance actions. Schedules would also be dependent upon funding and staffing requirements.

All vacated buildings would be regularly inspected for potential hazards to workers, the public, or the environment. If hazards were identified, appropriate maintenance or repair work would be conducted in accordance with LANL procedures. Inspections, and maintenance as necessary, would continue until building demolition was conducted.

The proposed demolition would involve several major work elements. Before any demolition, surfaces and fixtures would be tested or sampled to determine if contamination is present and in what quantities. Based on the sampling results, the buildings to be demolished would then be divided into contaminated and uncontaminated zones. Physical barriers would be established between work areas to protect workers and manage wastes and emissions. Workers would remove contaminated materials before demolition of uncontaminated areas begins. Asbestos is present in most of the buildings being considered for demolition or renovation. The asbestos would be removed according to established industry and regulatory procedures. Asbestos wastes generated during renovation and demolition activities are regulated under the NESHAP for Asbestos (40 CFR 61) and would be managed in accordance with all applicable regulations. Air emissions generated during asbestos removal activities would be controlled by use of containment tents (such as plastic drapes) and of high-efficiency particulate air (HEPA) filtered particulate collection devices, as necessary. Similar methods of containment would be used for removal and demolition of materials and structures that are contaminated with radioactive or hazardous materials. As wastes are removed, they would be packaged and managed according to established LANL procedures.

After contaminated materials are removed, general demolition of the remaining materials and structural elements would begin. Demolition of uncontaminated and decontaminated structures would be performed using standard industry demolition processes. After roof and walls are removed, concrete foundations and paved areas would be removed. A variety of equipment and techniques may be used in the demolition process. Typical equipment used in demolition include front-end loaders, bulldozers, wrecking balls, and pneumatic hammers, as well as various hand tools for removing such items as windows and copper wiring. Materials removed in the demolition process would be segregated to the extent feasible to facilitate recycling and waste management. Dust suppression would be conducted as necessary using BACMs, such as spraying with water or chemical dust suppressants. The application of specific BACMs would be determined on a case-by-case basis. After demolition is completed and waste and recycled materials are removed from the site, the area would be recontoured and revegetated or landscaped as appropriate.

Before starting demolition activities, a site-specific health and safety plan would be prepared and approved. Appropriate personal protection measures, such as the use of PPE (gloves, hard hats, steel-toed boots, eye shields, and ear plugs or covers), monitoring of hazards and worker exposures, and engineered controls would be a routine part of the demolition activities required to protect worker health and safety. In addition, LANL staff can provide site-specific hazard training as needed. Waste Minimization and Pollution Prevention Plans would be prepared under the Proposed Action to address waste issues for the demolition of the vacated buildings. As already discussed, building demolition materials would be recycled and reused to the extent practicable. All waste requirements for demolition-generated wastes would be met.

All wastes generated would be disposed of properly according to waste type. About 21,001 $yd^3$ (15,961 $m^3$) of uncontaminated building debris would be generated. In addition, about 191 $yd^3$ (145 $m^3$) of hazardous waste may be produced; and about 610 $yd^3$ (464 $m^3$) of asbestos would be generated. Wastes would be managed through the LANL waste management program. Solid waste would be disposed of at the Los Alamos County Landfill or sent offsite; hazardous waste would be shipped offsite to commercial facilities for treatment and disposal; low-level radioactive waste[8] (LLW), if any, would be disposed of within Area G, TA-54, at LANL or is sent offsite by to appropriate permitted facilities. Asbestos waste would be shipped offsite for disposal at a specifically permitted disposal facility. Refrigeration units to be replaced would be subject to the proper requirements (40 CFR 82) for evacuation and disposal of ozone-depleting substances (refrigerants).

After buildings were demolished, the concrete slabs and other building debris would either be crushed onsite or moved to LANL's Two-Mile Mesa or other existing LANL clean fill material storage sites. The crushed concrete would be used for fill and other activities at LANL or offsite. Clean fill dirt would be placed on the sites of the demolished buildings, and the entire area would be landscaped.

### 2.1.4 Schedule

Table 2 outlines the projected schedule for the Proposed Action. The final schedule would depend on the availability of funding.

**Table 2.** Projected Chronology of Proposed Action Construction and Operations

| Start Date | Completion Date | Activity | Subsequent Actions |
|---|---|---|---|
| FY 03 | FY 05 | Design and construct new entrance gate and access roads | Close Anchor Ranch Road and TA-69 entrance gate |
| FY 03 | FY 05 | Design and construct SDP Building | Relocate some personnel and operations from TA-9, TA-39, and TA-40 |
| FY 05 | FY 06 | 1) Design and construct CERL Building<br>2) Design and construct EDF | Relocate some personnel and operations from TA-15, TA-39, TA-46, TA-53, and TA-69 |
| FY 05 | FY 09 | Design and construct CHEM Building | Relocate personnel and operations from TA-9, TA-14, and TA-40 |
| FY 05 | FY 06 | Design and construct first contained firing facility | Close TA-39 Firing Point 6 operations |
| FY 06 | FY 07 | Design and construct second contained firing facility | Close TA-40 Firing Site Building 15 |
| FY 07 | FY 08 | Design and construct third contained firing facility | Close some storage buildings at Two-Mile Mesa Complex |
| FY 08 | FY 09 | Design and construct fourth contained firing facility | Close one of the TA-36 firing sites |
| FY 07 | FY 08 | Design and construct High Bay Laboratory | Relocate personnel and operations from TA-36 and TA-39 |
| FY 08 | FY 10 | Design and construct gas gun facilities | Relocate gas gun operations from TA-39 and TA-40 |
| FY 03–FY 13 | FY 03–FY 13 | Design and construct<br>• Three office/laboratory buildings<br>• DQF<br>• Lecture hall<br>• Classified HE Storage Building<br>• Machine Shop | Relocate personnel and operations from TA-15, TA-46, TA-39, and various other technical areas |

[8] LLW is radioactive waste that is not high-level waste, spent nuclear fuel, transuranic waste, byproduct material (as defined in Section 11e(2) of the *Atomic Energy Act* [AEA] of 1954, as amended), or naturally occurring radioactive material (DOE Order 435.1).

**Table 2.** continued

| | | | |
|---|---|---|---|
| FY 03–FY 10 | FY 03–FY 13 | Replace and upgrade utilities and infrastructure<br>Landscape | |
| FY 05–FY 10 | FY 05–FY 13 | Determine that vacated buildings have no further use; demolish or salvage buildings with no determined use | |

## 2.2 No Action Alternative

The No Action Alternative provides a description of projected conditions that would occur if NNSA did not implement the Proposed Action. This alternative must be considered even if NNSA is under a court order or legislative command to act (10 CFR 1021). Under the No Action Alternative NNSA would not construct new buildings for the functions described in the Proposed Action—nor would NNSA demolish the buildings that currently contain those functions. Outdoor firing tests would continue to be performed. Environmental advantages of contained firing tests would not be realized. Poor-quality office and laboratory space would continue to be used and the effectiveness of current staff and the ability to recruit and retain qualified employees would remain problematic. DX operations would continue to be conducted in dispersed facilities; there would be no reduction in the cost of facility maintenance. Access to DX facilities would continue to be provided by the existing access roads and access-control stations; no traffic improvements would occur along SR 501. No disturbance of DX sites would occur. There would be no construction or demolition debris requiring disposal. Utility usage would remain essentially the same. Expenses for repairs and replacement of aging HVAC systems and other building components would increase. As building systems and other components fail and cannot be replaced or repaired, areas of the buildings would be closed. Areas of buildings or entire structures that are deemed unsuitable for continuous human occupancy would be abandoned in place. All buildings, including vacated buildings, would be regularly inspected. Any building exhibiting hazards to workers, the public, or the environment would be subject to appropriate repair or remediation in accordance with LANL maintenance procedures.

## 2.3 Alternatives Considered but Dismissed

### 2.3.1 Use of Other Existing Space

UC staff at the LANL Space Management Office have determined that no comparable space is available at this time that could house the DX functions with the necessary security, safety, and other requirements. Office spaces for small numbers of personnel are available at scattered locations both within LANL and within Los Alamos town site; however, this fragmented approach to housing DX personnel would further negatively affect productivity and may increase operating costs. The ability to provide adequate security could likely not be met through this method of space procurement. This alternative was considered to be unreasonable as it would not meet NNSA's need to act and was not analyzed further in this EA.

### 2.3.2 Renovation of Existing Buildings and Structures without Construction of New Buildings or Demolition of Outmoded Buildings and Structures

Correcting all identified problems, inefficiencies, and inadequacies of the existing DX facilities would not meet NNSA's purpose and need for action. Modifications to existing facilities are expensive, inefficient, and would fall short of meeting operations and security requirements. The

existing spaces are too small or much too large and some of the existing equipment is outmoded and is no longer suitable for the DX mission. Renovating buildings does not change the size or cost of maintenance or resolve the issues of DX personnel: 1) housed in transportables that are vulnerable to fire and 2) dispersed in remote locations that make communication and cooperative work difficult. The ability of engineers to reconfigure the buildings to meet current needs within their existing footprints would also be difficult and costly. New HVAC, plumbing, electrical, and other building systems would have to be installed to replace the existing systems that are failing. Performing renovations of this nature and magnitude while the buildings are occupied would result in work slowdowns or require temporary relocation of some workers.

The overall effort required to retrofit the existing buildings to meet all current building design and safety codes, needs and requirements of operations, and security needs would be prohibitively difficult and expensive. The costs and time expenditures would be much greater than the cost and time required to plan and build new structures to house the programmatic, management, and support functions needed by UC.

In any event, there are not enough permanent buildings within the engineering complex that could be remodeled to consolidate the operations from the entire DX Division. Therefore, these operations could not be co-located and NNSA's purpose and need would not be met. This alternative was considered to be unreasonable and was not analyzed further in this EA.

## 2.4 Related Actions

### 2.4.1 Final Site-Wide Environmental Impact Statement for the Continued Operation of the Los Alamos National Laboratory

The Final LANL SWEIS (DOE 1999a), dated January 1999, was issued in February of that year. A ROD was issued in September 1999, and a Mitigation Action Plan was issued in October 1999. As already noted in this EA, the SWEIS included the information that more than half of LANL facilities are aging and in poor, fair, or failing conditions. An analysis of the effects of replacing these facilities was not included in the SWEIS (DOE 1999a).

The SWEIS included an analysis of effects of the existing DX operations at levels that were very slightly greater than are currently being forecast to be needed in the foreseeable future. The analysis of effects is therefore bounding of the operations, as they would be conducted if the Proposed Action's construction were to occur and operations were consolidated from around LANL into the consolidated Two-Mile Mesa Complex. This EA tiers from the SWEIS and a re-analysis of the operations will not be provided in this EA. Any points of difference from the effects attributable to consolidation of activities will, however, be included in the Chapter 3 analysis of effects within this EA.

### 2.4.2 Demolition of Vacated Buildings

The demolition of vacated buildings and removal of trailers and transportables are ongoing at LANL. Demolition activities are individually evaluated for NEPA compliance purposes. Various buildings and structures at LANL, other than those involved in the Proposed Action, have been categorically excluded from the need to prepare either an EA or an EIS. Others, such as the replacement of the existing Administration Building (TA-3 Building 43), have been the subject of EAs and EISs. Future demolition of vacated buildings may occur if NNSA decides to replace various aging buildings. These actions would be subject to separate NEPA compliance reviews.