

LOS ALAMOS NATIONAL LABORATORY

# Ten-Year Site Plan FY 2014



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Operated by: Los Alamos National Security, LLC

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## 1.0 EXECUTIVE SUMMARY

Los Alamos National Laboratory (the Laboratory) is the nation's premier national security science laboratory. Its mission is to develop and apply science and technology to ensure the safety, security, and reliability of the United States (U.S.) nuclear stockpile; reduce the threat of weapons of mass destruction, proliferation, and terrorism; and solve national problems in defense, energy, and the environment.

The fiscal year (FY) 2014 Ten-Year Site Plan (TYSP) is consistent with previous TYSPs and incorporates updated information in accordance with National Nuclear Security Administration (NNSA) guidance. The TYSP is a vital planning component to meet the NNSA commitment to ensure that the U.S. has a safe, secure, and reliable nuclear deterrent. The Laboratory also uses the TYSP as an integrated planning tool to guide development of an efficient and responsive infrastructure that effectively supports the Laboratory's missions and workforce. Emphasizing the Laboratory's core capabilities, this TYSP reflects the Laboratory's role as a prominent contributor to NNSA missions through its programs and campaigns.

The Laboratory is aligned with Nuclear Security Enterprise (NSE) modernization activities outlined in the NNSA Strategic Plan (May 2011), which include (1) ensuring that laboratory plutonium space effectively supports pit manufacturing and enterprise-wide special nuclear material (SNM) consolidation; (2) constructing the Chemistry and Metallurgy Research Replacement Nuclear Facility (CMRR-NF); (3) establishing shared user facilities to more cost effectively manage high-value, experimental, computational, and production capabilities; and (4) modernizing enduring facilities while reducing the excess facility footprint.

Long-range facility and infrastructure development planning is critical to ensure sustainment and modernization. Outyear reinvestment is essential for sustaining existing facilities and will be reevaluated on an annual basis. At the same time, major modernization projects will require new line-item funding. This document is, in essence, an overview of the plans for the Laboratory to modernize, streamline, consolidate, and sustain its infrastructure to meet its national security mission.

This TYSP covers two time horizons: (1) a 10-year tactical horizon extending to 5 years past the next Future Years Nuclear Security Program (FYNSP) Plan and (2) a strategic horizon that extends 15 years beyond the tactical horizon.

### PRIOR YEAR ACCOMPLISHMENTS

Significant infrastructure milestones for the Laboratory include the

### TAKE AWAY MESSAGE

Los Alamos National Laboratory will continue to face a significant challenge over the next 25 years in balancing near-term needs while transforming the infrastructure to ensure long-term viability. The Laboratory must maintain a robust infrastructure to fulfill diverse, complex, and evolving missions in a period of flat or decreasing budgets. The large number of existing facilities will continue to age, while safety, security, sustainability, and compliance requirements will likely increase. The Laboratory must also continue to act as an environmental steward, reduce environmental risk, and improve sustainability.

This plan identifies strategies that will enable the Laboratory to provide a flexible, responsive infrastructure within available resources. At the end of the 25-year period, the Laboratory will have completed the following:

- constructed new facilities and reinvested in enduring facilities to support critical capabilities,
- completed projects to improve energy efficiency and long-term sustainability of resources,
- modernized the utility infrastructure to support future programmatic needs,
- completed legacy cleanup and implemented Long-Term Environmental Stewardship (LTS) measures, and
- reduced overall footprint and consolidated nuclear infrastructure.

Even in the face of new and significant pressures, the Laboratory will continue to take substantial steps to streamline operations, modernize the infrastructure, and fulfill its vision of being the premier national security science laboratory.

- Transuranic (TRU) Waste Facility [due to Technical Area (TA)-54 Area G closure]: Phase A (infrastructure and site improvement) has completed construction, and Phase B is in final design.
- TA-55 Reinvestment Project (TRP) II: Phase A and Phase B are in construction, and Phase C is in final design.
- Electrical Infrastructure Upgrades TA-3 Substation Project: Attained critical decision (CD)-1.
- Sanitary Effluent Reclamation Facility (SERF) Expansion Project: Completed project.

The Laboratory has also greatly increased the effectiveness and efficiency of its environmental stewardship activities—from cleaning up legacy waste and minimizing waste generated during current operations to increasing recycling rates and reducing energy consumption and water use. The Laboratory worked to meet the Consent Order and other regulatory commitments and worked with all regulatory entities to prioritize deliverables; shipped record quantities of TRU waste to the Waste Isolation Pilot Plant (WIPP) for the fourth consecutive year; and effectively planned for future energy use. These plans included the installation of electric meters; infrastructure support for the construction, development, and commissioning of a new 1-megawatt (MW) photovoltaic array on a former landfill to supply Los Alamos County with renewable power; and a strategy to recycle rather than discharge millions of gallons of industrial wastewater.

### **CURRENT STATE OF SITE**

Currently, the Pajarito Corridor development entails major infrastructure planning efforts for the Laboratory. The CMRR-NF's substantial final design was completed in preparation for a 5-year deferral of the project; preparation for radiological operations at the Radiological Laboratory Utility and Office Building (RLUOB) are ongoing; the TRU Waste Facility Phase A site infrastructure subproject has completed construction, and the Phase B facilities subproject is currently in final design; the replacement Radioactive Liquid Waste (RLW) Treatment Facility (RLWTF) low-level waste capability is in final design; the TRP II, Phase C final design is completing, and construction is underway for Phases A and B; the Nuclear Materials Safeguards and Security Upgrade Project (NMSSUP), Phase II construction is nearing completion; and seismic improvements are being completed at Plutonium Facility (PF)-4. Two tanks in 50-0250 are being converted for daily influent storage in support of near-term groundwater discharge reduction and future capability requirements.

In addition to the Pajarito Corridor development, further revitalization is being planned for the core of TA-3. Preconceptual planning is also underway for a TA-53 signature science facility, Matter-Radiation Interactions in Extremes (MaRIE), as well as facilities at TA-3 and TA-16 needed to support the increasing core capability workload.

In coordination with the Site Sustainability Plan, all major facility construction and refurbishment projects will be designed to meet either Leadership in Energy and Environmental Design (LEED) Gold or Guiding Principles [Department of Energy (DOE) O 436.1] for sustainability and improved energy efficiency. An Energy Savings Performance Contract was completed that reduces the Laboratory's electrical energy usage by more than 3% annually for targeted facilities. Planning is also underway

to refurbish and expand some aging institutional infrastructure, particularly the Laboratory's 115-kV and 13.8-kV electrical power systems, to meet the anticipated electrical power demand for exascale supercomputing.

The Laboratory continues to prioritize the protection of ground and surface water and to focus efforts on accelerating the shipment of aboveground TRU waste as a part of the 3706 Campaign, an effort to disposition 3706 m<sup>3</sup> of aboveground TRU waste by the end of 2015. The Laboratory is meeting all scheduled Consent Order milestones established with the New Mexico Environment Department (NMED) for addressing legacy contamination at the site.

### **CHANGES FROM PREVIOUS YEAR**

The Facilities and Infrastructure Recapitalization Program (FIRP) ends in FY 2013, with all projects completed in FY 2012. This program reduced legacy-deferred maintenance (DM) by \$257M and eliminated 501k gross square feet (gsf) of obsolete and unused structures. The Roof Asset Management Program (RAMP) repaired or replaced ~1.2 M ft<sup>2</sup> of building roofs with better-insulated, more-energy-efficient "cool roofs," saving approximately \$2.9M in operating costs over the life of the roof. To recapitalize our infrastructure, the proposed Capability Based Infrastructure (CBI) program investment strategy will provide targeted, strategic investments for life extension and modernization of enduring facilities supporting defense programs. In addition to continued management reform, the proposed Security Envelope Enhancement project will provide improved protection against vehicle threats for locations containing SNM, classified matter, personnel, and property.

### **FUTURE PLANS**

Mission-need requirements within the next decade are an Energetic Materials Characterization Facility, Weapons Manufacturing Support Facility, Nuclear Counter-Proliferation/Terrorism (NCP/T) Facility, and a Contained Firing Facility. Reinvestment and renewal of radiological chemistry, chemistry, bioscience, physical science, and astrophysics laboratories; the TA-3 Cogeneration Steam System Reconfigure; and an enhanced TA-3 chilled water system are being considered in the next decade. Upon anticipated completion of the CMRR-NF, or alternative plutonium strategies to accommodate the deferral, demolition of the Chemistry and Metallurgy Research (CMR) building is planned to commence. The viability of any of these projects will depend on the Laboratory's evolving missions, NNSA support, and outyear funding.

### **INFRASTRUCTURE RISK TO MISSION**

*Future Capabilities and Capacity Gaps:* Over the next decade, specific elements and workload of the ongoing

Weapons Program will be shaped by agreements and policies, such as the new Strategic Arms Reduction Treaty (START) and the Nuclear Posture Review (NPR). The trends toward a smaller, operationally deployed stockpile will continue. As the stockpile becomes smaller, the premium on confidence in the weapons will grow, placing increasing demands on the science, technology, and engineering (ST&E) supporting the stockpile.

The Laboratory will continue to ensure the safety, security, and effectiveness of U.S. nuclear deterrent and provide expertise in nuclear weapons ST&E that supports international stability and national security, consistent with the Laboratory's national security missions. However, the physical infrastructure supporting both direct-funded facilities and underlying ST&E capabilities requires recapitalization to provide continuing support for the nation's defense and global security. It is critical that the Laboratory receives adequate funding, on an annual basis, to support day-to-day facility operations and maintenance and continue construction activities to modernize and replace aging structures. Without a vital infrastructure, the Laboratory's ability to perform experimentation, modeling, simulation, design, engineering, and production will be placed at risk, possibly creating gaps in our ability to certify the U.S. stockpile and our ability to support other important national security priorities.

Some of the infrastructure first developed for the nuclear weapons programs is filling a gap and is now being applied to counterterrorism (CT), counterproliferation (CP), and work-for-others missions. For instance, some computing and laboratory space has been made available in buildings that were vacated by the weapons programs, whereas other facilities are meeting both weapons and CT/CP needs. These Laboratory capabilities will continue to align with the changing nuclear weapons programs in a synergistic manner to ensure that the nation's investment in the Laboratory's Weapons Program core capabilities remains vibrant and is usefully applied to broad national security missions. At the same time, demand from sponsors for additional program work within the CT and CP core capability continues to surface the need for additional facility space.

**Maintenance:** Current and outyear operations and sustainment budget targets in Enterprise Infrastructure (EI) and outyear budgets are not adequate to support the level of preventive and corrective maintenance required to avoid the growth of DM. Institutional focus on the reliability of facility safety systems will also leave shortfalls in maintenance funding. Short-term solutions to these maintenance funding gaps include continued investments through an internal program titled New Requirements &

Major Maintenance (NRMM) Projects, which will focus funding on reducing DM on mission-critical (MC)/mission-dependent (MD) facilities and improving efficiency through consolidation and footprint reduction initiatives (which will redistribute funds to facilities with high-priority maintenance needs).

**Environmental Issues:** Under the Framework Agreement jointly developed by the DOE/NNSA and NMED, the Laboratory will continue to address the highest environmental risk by focusing on TRU waste within TA-54. The Laboratory will continue to work closely with NMED to ensure that investigations and corrective actions meet all compliance requirements and are carried out in a cost-effective and efficient manner that provides full protection of human health and the environment. The Laboratory also works with other regulatory entities to ensure that their compliance requirements are met. Additionally, the Laboratory has developed a Long-Term Environmental Stewardship & Sustainability Strategy (LTSS) that defines strategies and tactics for addressing past legacy issues, controlling present emissions, and creating a sustainable future. Long-range infrastructure planning efforts directly address environmental and sustainability issues in coordination with the Site Sustainability Plan, the Enduring Waste Management Plan, and the LTSS. Environmental and sustainability criteria are key components of the Laboratory's infrastructure management strategy.



**Above:** In 2012, the Laboratory shipped record quantities of TRU waste to WIPP for the fourth consecutive year.

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## 2.0 SITE OVERVIEW AND SNAPSHOT

**Location:** Los Alamos, New Mexico

**Type:** Multi-Program Laboratory

**Web site:** <http://www.lanl.gov>

**Contract Operator:** Los Alamos National Security, LLC

**Responsible Field Office:** Los Alamos Field Office

**Site Manager:** Geoffrey Beausoleil (Acting)

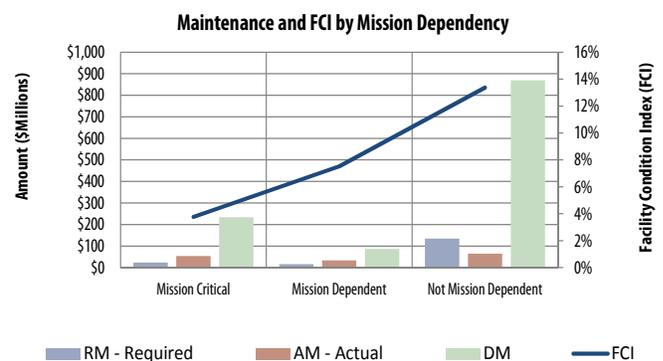
Los Alamos National Laboratory was established in 1943 as a secret, centralized site to coordinate scientific research of the Manhattan Project, an Allied effort to develop the world's first atomic weapon. Located ~25 miles northwest of Santa Fe, New Mexico, the remote location was ideal because it provided controlled access, steep canyons for testing high explosives (HE), and some existing infrastructure (Figure 3). Following the end of World War II, the Laboratory expanded operations while continuing to provide significant contributions to the nation's science and defense programs. A unique array of facilities and infrastructure was built during the Cold War to accommodate weapons scientific research and development. Many of those unique facilities are now obsolete and need to be refurbished or replaced to sustain the Laboratory's current core capabilities, which include (1) design, certification, testing, experiments, surveillance, and ST&E base; (2) plutonium; (3) tritium; (4) HE; (5) nonnuclear; (6) SNM accountability, storage, protection, handling, and disposition; (7) enabling infrastructure; (8) CT & CP; and (9) support for other mission/program capability. A real property snapshot of the facilities supporting these core capabilities is shown in Figure 1.

The Laboratory is one of the largest institutions in northern New Mexico, with an annual budget of approximately \$2.1 billion in FY 2013. The majority of funding comes from the NNSA Weapons Program (53%), which is supplemented by funds from nonproliferation (11%), security (7%), other DOE programs (17%), and non-NNSA programs (12%) (FY 2012 funding details are captured in Figure 2). With a total workforce of approximately 10,000 people (as of April 30, 2013), the Laboratory has affiliated personnel that comprise professional (30.4%), technical (27%), flexible workforce (11.8%), post-docs and students (11.7%), managers (8.5%), craft employees (7.6%), support (2.5%), and executive staff (0.5%). Management of the Laboratory is the responsibility of Los Alamos National Security, LLC (LANS), which comprises four top U.S. organizations—the University of California, Bechtel, Babcock & Wilcox Technical Services, and URS Energy & Construction.

1. Per FY 2012 FIMS snapshot
2. DOE owned real property (buildings, trailers, other structures)
3. DOE owned real property and leased facilities
4. DOE owned and leased, operational gsf

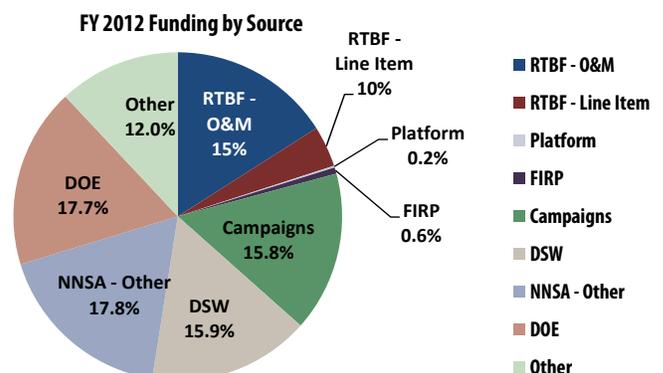
**Figure 1: Real Property (End of FY 2012 FIMS Reporting)**

- 28,116 Acres (Leased / Owned)<sup>1</sup>
- 1,063 Buildings/Trailers:
  - 7,925,911 gsf Active & Operational<sup>2</sup>
  - 303,748 gsf Non-Operational<sup>2</sup>
  - 471,622 gsf Leased
- Replacement Plant Value:<sup>3</sup> \$14,058,722,390
- Deferred Maintenance:<sup>2</sup> \$1,190,514,100
- Facility Condition Index:<sup>2</sup> 8.6%
  - Mission Critical 3.8%
  - Mission Dependent 7.5%
  - Non-Mission Dependent 13.4%
- Asset Utilization Index (Overall):<sup>4</sup> 99.0%



**Figure 2: FY 2012 Funding by Source**

- FY 2012 Total Site Operating Cost: \$2,337M
- FY 2012 Total NNSA Funding: \$1,542M
- FY 2012 Total DOE (non-NNSA) Funding: \$378M
- FY 2012 Total Other Funding: \$255M



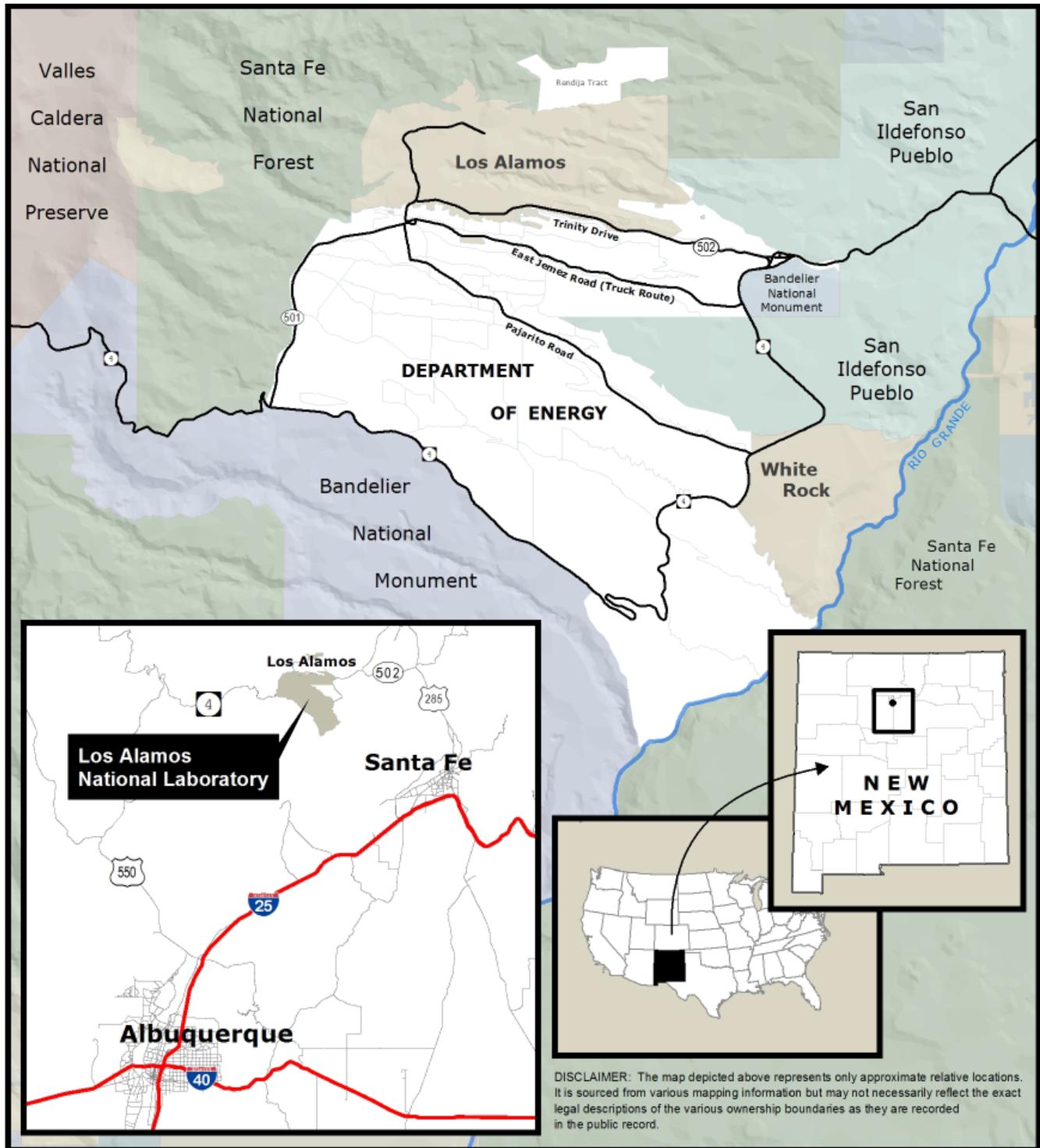


Figure 3: Location Map of Los Alamos National Laboratory

## 3.0 ASSUMPTIONS

### PROGRAMMATIC

Primary drivers for the FY 2014 TYSP include the 2008 Complex Transformation Record of Decision (ROD), 2010 NPR, the new START treaty, FY 2012 Stockpile Stewardship and Management Plan, FY 2011–41 Corporate Physical Infrastructure Business Plan (CPIBP), 2011 Amended ROD for the Nuclear Facility portion of the CMRR Project, and the December 2012 Construction Working Group–Integrated Construction Alignment Plan. Based on key directives from these documents, it is assumed that the Laboratory will continue to support warhead surveillance and stockpile assessment science and technology to ensure certification in the absence of underground nuclear testing. The Laboratory will also continue to meet the immediate needs of the stockpile, including production and Life Extension Program (LEP) commitments and milestones. Meanwhile, the Laboratory will continue to strengthen its ST&E base by developing and sustaining high-quality scientific staff and maintaining the ability to design nuclear warheads, including development and engineering expertise and capabilities.

In support of these programmatic missions and as part of the Department's strategy for creating a smaller, safer, more secure, and effective physical infrastructure, the following assumptions are made about key Laboratory infrastructure projects:

- CMRR-NF is currently planned to be completed no sooner than 2025, with beneficial occupancy anticipated ~2 years later. These dates are consistent with NNSA's FY 2013 President's Budget Request that deferred the CMRR-NF construction by at least 5 years.
- Radiological operations in the RLUOB laboratories will commence in FY 2014.
- Reinvestments will be made in the PF-4 infrastructure (TA-55 TRP II), and replacement facilities are expected for waste processing capabilities (RLWTF and the TRU Waste Facility).

### BUDGET

Funding profiles in this TYSP are consistent with the FY 2012 FYNSP and the President's Fiscal Year 2014 Budget Request. This TYSP assumes resolution and adoption of the FY 2014 budget request; initiation of the CBI program and the Federal Disposition Program; continued funding for the cleanup of process-contaminated structures and for Consent Order activities, as well as accelerated shipment of TRU waste; and institutional funding for footprint reduction, reinvestment, new construction, and replacement of non-weapons program facilities.

Although EI will fund the minimal operations of most facilities, FYNSP targets are well below current operating

budgets and are significantly below the levels required in FY 2015–19.

### PLANNING

*Maintenance:* An Annual Maintenance Work Plan will be prepared for each facility or area to identify activities and resources needed to accomplish Laboratory maintenance. Each annual maintenance work plan supports the annual update to the TYSP. Disposition funding will continue to eliminate obsolete/nonsustainable facilities, allowing for the avoidance of associated DM while directing maintenance funding toward enduring facilities. Condition assessments will continue to provide a better understanding of facility condition and consequently will equip the Laboratory with better information to prioritize maintenance spending.

*Disposition:* Investment from several programs is anticipated to continue the footprint reduction progress made over the last decade. The three principal funding sources currently anticipated include Environmental Management (EM) to address process-contaminated facilities at TA-54, Laboratory Institutional funding to address small structures (especially trailers/transportables), and NNSA funding to address a significant number of buildings currently shut down/excessed, as well as those anticipated to be shut down over the coming years. Although the FIRP projects (which removed almost 501k gsf since 2002) ended in FY 2012, initiation of NNSA's new Footprint Disposition Program (FDP) is proposed for FY 2014.

*Land Transfer:* The Atomic Energy Community Act of 1955 [as amended (P. L. 105-119 Amendment Conveyance to Los Alamos, NM, MISC2)], National Defense Authorization Act, and the Amended ROD for DOE/EIS-0293 (Conveyance and Transfer EIS) issued January 23, 2012, has identified lands no longer necessary to retain and will make them available for transfer. Approximately 2461 acres has been transferred to the County of Los Alamos, the Los Alamos Public Schools, and the Department of the Interior (DOI)–Bureau of Indian Affairs (BIA) in trust on behalf of the Pueblo of San Ildefonso since FY 2002. Additional lands are scheduled to transfer before FY 2023.

*Sustainability:* The Laboratory will continue to integrate DOE Order 436.1 Site Sustainability requirements into infrastructure planning, maintenance, and program and project execution. The LTSS plan addresses legacy waste issues, the control of current emissions, and the development of a sustainable future infrastructure.

*Capability Based Infrastructure:* The Laboratory provided a prioritized project list consistent with the requirements of the CBI data call and will continue to evaluate potential projects and support the planning and execution of the CBI program as it matures.

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## 4.0 CHANGES FROM PRIOR YEAR TYSP

### MANAGING THE STOCKPILE

- Facility corrective maintenance, maintenance, and utility projects have been added to this mission area under the CBI program.

### PREVENTING PROLIFERATION

- A general plant project to upgrade a facility in support of the International Atomic Energy Agency (IAEA) activities is underway.

### EMERGENCY RESPONSE

- No change in plans from the prior year.

### CONTINUING MANAGEMENT REFORM

- A tactical training facility and an indoor firing range attained occupancy in FY 2012. Investments in protection systems and facilities, including upgrades to security posts and sustainment of enduring facilities, are anticipated.

### RECAPITALIZING INFRASTRUCTURE

- The proposed CBI program investment strategy provides targeted, strategic investments for the life extension and modernization of enduring requirements supporting the defense program (DP).
- Primary and secondary road upgrade projects are planned for the next 10 years.
- The FIRP program ends in FY 2013. Legacy DM was reduced by \$257M while eliminating 501k gsf of obsolete and unused structures.
- Public Law 105-119 (November 1997) requires the conveyance or transfer of land not required for the Laboratory's national security missions to external parties for preservation or economic diversification. To date, ~2461 acres has been transferred to the County of Los Alamos, Los Alamos Public Schools, and DOI-BIA in trust on behalf of the Pueblo of San Ildefonso. Initially enacted for 10 years, the public law has been extended until 2023 to ensure transfer of all eligible parcels. Under this law, ~3 acres of land was transferred to Los Alamos Public Schools and about 13 acres was transferred to the County of Los Alamos in FY 2013.
- Continued investments in the restoration and preservation of historic facilities, considered for inclusion in the limited public access Manhattan Project National Historical Park, will protect the historic facilities. Federal legislation for this Park is currently underway with DOI, DOE, and National Park Service (NPS) support.

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## 5.0 FUTURE VISION AND CORE CAPABILITIES

### DESIGN, CERTIFICATION, TESTING, EXPERIMENTS, SURVEILLANCE, AND ST&E BASE

The Laboratory performs basic scientific research, design, system engineering, development testing, reliability assessments, and the certification of nuclear weapons. In 1995, the President concluded that the continued vitality of all three nuclear weapons laboratories was essential to the nation's ability to fulfill the requirements of stockpile stewardship in the absence of underground nuclear testing. The Laboratory maintains responsibility for the nuclear design and engineering of its nuclear physics packages and uses exceptional ST&E capabilities to preserve the U.S. nuclear deterrent and support the W76-1 and B61-12 LEPs.

#### TACTICAL PLANNING HORIZON (FY 2014–23)

*Dual-Axis Radiographic Hydrodynamic Test Facility Operations:* DARHT (15-0312) is used to perform integrated, nonnuclear experiments designed to measure the many complex and dynamic aspects of implosion systems, shock physics, and high-velocity impacts. In early 2008, the Laboratory received authorization from NNSA to begin operating Axis 2, and DARHT fired its first-ever double-viewpoint hydrodynamic test of a nuclear weapon component mockup in late 2009. Strategic plans include increasing the number of annual shots and finding additional applications beyond the weapon's LEP. DARHT is expected to provide an enduring, contained hydro-testing capability for the NSE.

*Nicholas C. Metropolis Center for Modeling and Simulation:* This facility (03-2327) houses Cielo, the next-generation petascale-capability-class platform for the Advanced Simulation and Computing (ASC) Campaign, and has more than 10 times the computing power of the supercomputer it replaced. Cielo was approved for classified operations in March 2011 and enables scientists to increase their understanding of complex physics, as well as improve confidence in the predictive capability for stockpile stewardship. Cielo runs the largest and most demanding workloads involving modeling and simulation, primarily for milestone

calculations. After Cielo, the next platform, Trinity, will introduce key elements of technologies deemed necessary as the stepping-stone toward exascale computing. Exascale computing, which is the ASC Roadmap, will be a thousand-fold increase in computing capabilities over the current petascale platforms. Installation of Trinity will begin in 2015, and acceptance will occur in 2016. Many upgrade projects are required at the Metropolis Center and in the electrical distribution utilities to provide adequate electrical capacity to support future computing missions.

*Los Alamos Neutron Science Center Facilities:* The LANSCE facilities consist of a high-intensity 800-million-electron-volt (MeV) linear accelerator (53-0003), a proton storage ring (53-0008), neutron target systems at the Weapons Neutron Research facility (53-0369) and the Manuel Lujan Jr. Neutron Scattering Center ("Lujan Center") (53-0622), and associated beam lines and detector systems. LANSCE celebrated its 40th anniversary in 2012 and continues to contribute to the Laboratory's stockpile stewardship mission through the exploration, development, and application of particle accelerator-based science and technology to provide new tools to help ensure the safety and reliability of the nation's nuclear weapons stockpile. Weapons research at LANSCE provides answers to fundamental questions that arise in the stewardship of an aging nuclear stockpile. Researchers use neutron and proton beams as penetrating probes to study weapon components and materials. LANSCE helps to maintain a set of core technical competencies that are critical to the Laboratory's mission, including advanced materials science, particle-beam technology, and nuclear science.

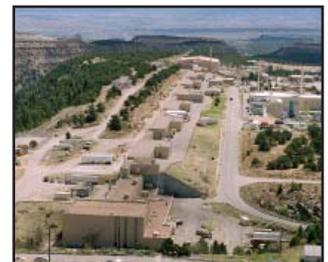
LANSCE's reliability has been under increasing stress over the past few years. Major components have become obsolete, have demonstrated failure, and are operating years beyond expected service lives. Replacement part fabrication could cause a 1-year shutdown. The Linear



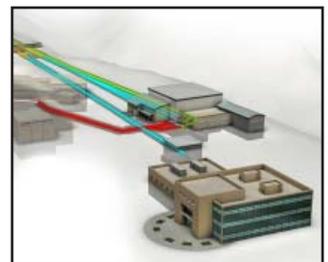
Dual Axis Radiographic Hydrodynamic Test Facility



Nicholas C. Metropolis Center for Modeling and Simulation Facility



Los Alamos Neutron Science Center (LANSCE)



Proposed Matter-Radiation Interactions in Extremes (MaRIE) Facility



Materials Science Laboratory (MSL)

Accelerator Risk Mitigation (LINAC RM) projects are an independent compilation of beamline and infrastructure maintenance projects that will focus on renovating and modernizing the existing linear accelerator and related systems. The projects are designed to sustain reliable facility operations past 2020 for defense research and applications, with a priority on dependable beam delivery. Funding for a portion of the LINAC RM projects was initiated in late FY 2010, and work was initiated in FY 2011. Additional operating phases are planned through FY 2017.

The proposed science magnet and signature facility, MaRIE, will provide a vital increase in Laboratory capabilities for materials research at LANSCE. MaRIE will integrate a state-of-the-art materials synthesis and characterization capability, a dynamic extremes environment, and a materials irradiation environment with diagnostic tools. The mission need to be fulfilled by MaRIE 1.0 is to close key gaps in our ability to understand the condition of the nuclear stockpile and to extend the life of nuclear materials by observing and ultimately controlling how mesoscale material properties affect weapon performance. In December 2012, NNSA Deputy Administrator Cook directed the Laboratory to move to CD-0 for MaRIE 1.0. In response to this guidance, Los Alamos National Laboratory and Lawrence Livermore National Laboratory (LLNL) are writing a joint letter on science and certification and are developing an implementation plan for achieving CD-0.

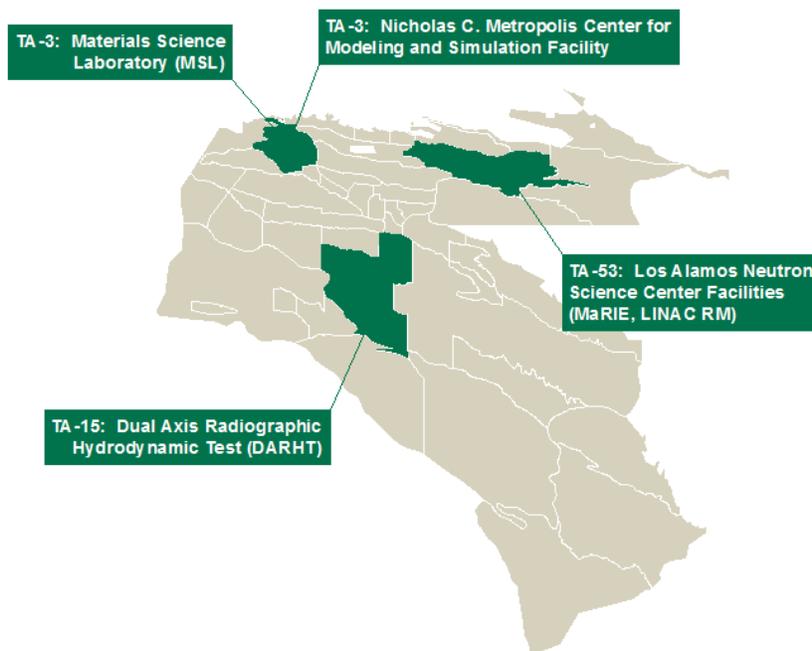
*Materials Science Laboratory:* The MSL (03-1698) supports four types of experimentation: materials processing, mechanical behavior in extreme environments, advanced materials development, and materials characterization.

The MSL is in excellent condition, and only minor life-extension-related projects are currently planned. A project to construct new laboratories in an unfinished part of the second floor is near completion. These laboratories will support the chemical synthesis, characterization, and preparation of new materials.

*Other ST&E Base Facilities:* An array of materials science and engineering facilities and capabilities supports hydrodynamic testing at DARHT, stockpile life extension, and other stockpile stewardship needs. Chemistry and geosciences capabilities support weapons, nonproliferation, and other national security missions with capabilities for measurement, analysis, and forensics. Actinide science capabilities at the Laboratory remain an important resource enabling NNSA mission delivery. A range of experimental and theoretical capabilities provides critical contributions to the quantification of margins and uncertainties (QMU) and to the science-based prediction of complex systems for nuclear weapon stewardship and threat reduction. Many of the facilities supporting the base ST&E capabilities are aging and deteriorating, and planning is ongoing to identify required reinvestments or new construction.

**STRATEGIC PLANNING HORIZON**  
(FY 2024–38)

No major imminent changes are expected for mission, program areas, and workload currently assigned to the Laboratory, although the program will progress to address evolving national security and other challenges. Planning is ongoing for the 25-year timeframe to determine what facility reinvestments or new construction will be required to meet mission needs for those facilities in the near term.



## PLUTONIUM

The future stockpile is projected to be smaller, leading to changes in the associated production requirements that are currently under evaluation. The Laboratory is responsible for key nuclear components within the majority of active weapons systems. Most notably, TA-55 provides the only fully functioning plutonium facility used for research and development (R&D) and the only pit manufacturing capability within the NSE. The Laboratory was named a consolidated Center of Excellence for plutonium research, development, and manufacturing activities. The Laboratory's mission is to lead science, engineering, and technology development across a broad range of plutonium-centric programs, with a continuing responsibility to manage and understand the material in all applications.

The Laboratory, through existing capabilities and planned nuclear facility consolidation and modernization activities, has established a stable weapons infrastructure to meet near-term manufacturing needs, but additional capacity for expanded pit production is currently at risk because of the CMRR-NF project deferral.

### TACTICAL PLANNING HORIZON (FY 2014–23)

TA-55: Activities in support of pit manufacturing, surveillance, and certification performed at TA-55 include plutonium casting, fabrication, machining, and metallurgy laboratories work; plutonium recovery; metal preparation; and destructive analysis and nondestructive analysis laboratories work. An SNM storage vault is also located at TA-55. PF-4 (55-0004) and many of the MD facilities and infrastructure (F&I) at TA-55 will require significant investment to ensure that programmatic requirements can be met.

The following projects in the TA-55 area will enable continued operation to meet programmatic requirements:

- *TA-55 Reinvestment Projects:* TRP will revitalize aging, mechanical, safety, facility controls, and other selected systems.

- *Nuclear Materials Safeguards and Security Upgrades Project Phase II:* NMSSUP will upgrade and replace the existing physical security system at TA-55 to address the new protection strategy requirements and deteriorating physical security infrastructure.
- *Radioactive Liquid Waste Treatment Facility Upgrade:* The RLWTF project will construct a facility to improve the RLW treatment capabilities at TA-50. The facility will provide increased reliability and process capability to meet projected regulatory requirements for discharge.
- *Transuranic Waste Facility:* This project will provide a replacement facility to stage, characterize, and certify newly generated TRU waste. The Consent Order currently requires that the Laboratory's existing TRU waste processing capability located at TA-54 be closed and remediated by 2015.

*Chemistry and Metallurgy Research Facility:* The existing CMR building (03-0029) at TA-3 serves as the primary facility for a broad spectrum of actinide, metallurgical, and materials properties testing systems of radiological components for Security Category (CAT)-III material levels. The CMR building houses significant nuclear materials capabilities in support of programs at TA-55, including the NSE's premier analytical chemistry capability, metallography, and R&D for science-based stockpile stewardship and surveillance programs.

The CMR facility has been operating on a "run-to-2019" philosophy in anticipation of the CMRR project's completion. The CMR facility will be required to operate at some minimal level to sustain capabilities needed for ongoing missions. Until CMRR-NF is certified as operational, significant investments in the maintenance of the CMR facility's infrastructure are required to keep the CMR facility functioning. The CMRR will provide new facilities at TA-55 to house existing CMR building capabilities and consolidate Security CAT-I/II laboratory work in a single area to minimize the



Nuclear Materials Safeguards and Security Upgrades Project (NMSSUP) Phase II



Radioactive Liquid Waste Treatment Facility (RLWTF) Upgrades



Transuranic Waste (TRU) Facility



Chemistry and Metallurgy Research (CMR) Facility

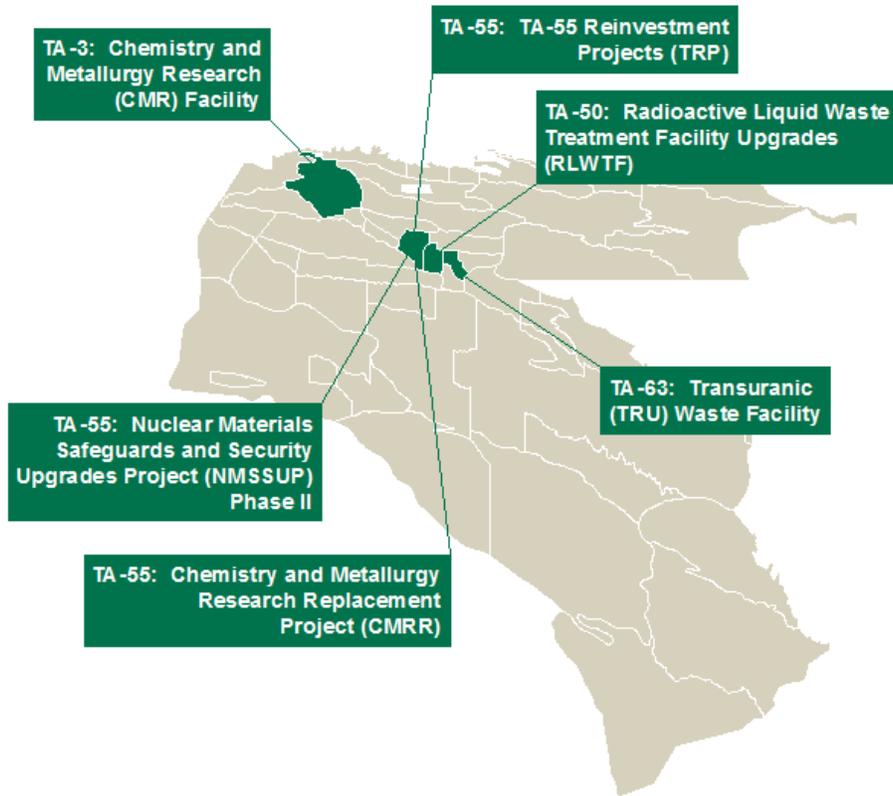


Radiological Laboratory Utility Office Building (RLUOB)

transfer of SNM within the NSE. The CMRR project consists of RLUOB and a security CAT-I/II, Hazard CAT-II nuclear laboratory building (CMRR-NF). Construction of RLUOB was completed in 2011, and radiological operations are planned to commence in FY 2014. Although substantial final design for the CMRR-NF was completed in FY 2012, the FY 2013 President’s Budget Request did not include any funding for the project and deferred, by at least 5 years, construction of the facility. Without CMRR-NF, the Laboratory’s pit manufacturing capability will be limited. Currently, many options are being explored to determine the path forward for this project, including potential programmatic impacts and gaps and possible mitigating actions. Future TYSPs will include any revised project plan for maintaining the Laboratory’s plutonium capability.

**STRATEGIC PLANNING HORIZON  
(FY 2024–38)**

No significant changes are expected in the future for the plutonium mission, programs, and workload currently assigned to the Laboratory. TA-55 is expected to be the NSE’s only fully functioning plutonium facility used for R&D and pit manufacturing during the next 25 years. During this period, planning will be initiated on any still-to-be-identified additional PF-4 upgrades/life-extension projects. Also during this time period, it is anticipated that the CMRR-NF will have been completed and that the CMR building will have been decommissioned and excessed.



**TRITIUM**

Tritium R&D work at the Laboratory is high-pressure gas operations in support of enduring nuclear weapons stockpile activities. Tritium work involves a wide variety of pressures, temperatures, materials, equipment, and processes, which makes each operation unique. It is anticipated that the Laboratory will continue current tritium R&D work in support of the stockpile for the foreseeable future.

aged R&D units, and plutonium/tritium interaction tests. A rewrite of the WETF Documented Safety Analysis was completed in FY 2012, and comment resolution is currently in process; inventory reduction activities are continuing, and many small infrastructure projects are currently planned to support sustainable, predictable tritium operations.



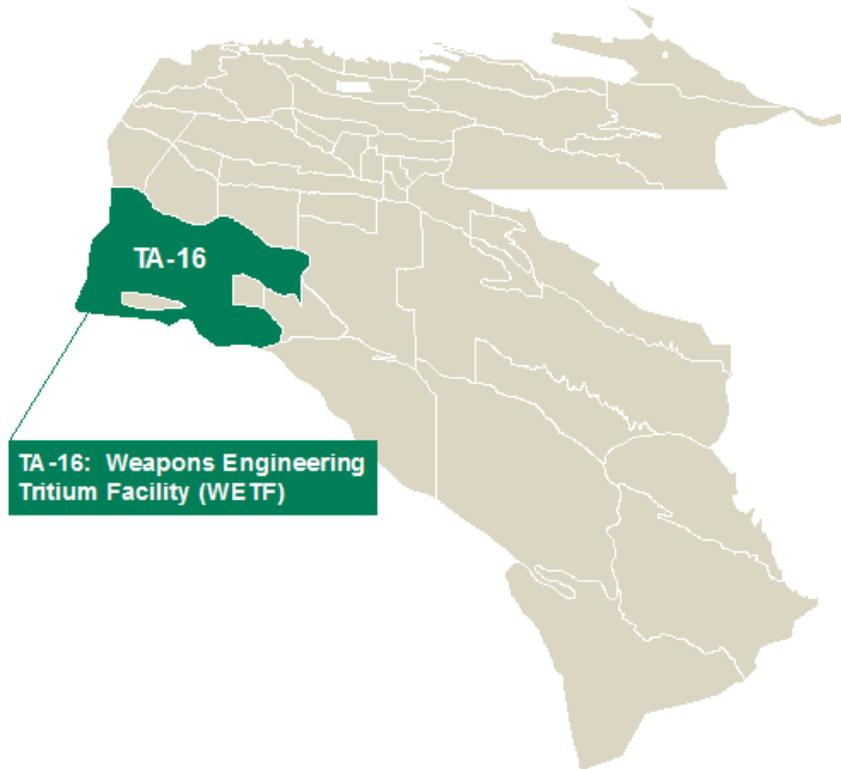
**Weapons Engineering Tritium Facility (WETF)**

**TACTICAL PLANNING HORIZON**  
(FY 2014–23)

*Weapons Engineering Tritium Facility:* WETF (16-0205) supports many unique tritium capabilities not performed anywhere else within the NSE, including R&D on tritium reservoirs, sample mining, reloading of

**STRATEGIC PLANNING HORIZON**  
(FY 2024–38)

No significant changes are expected in the future for the tritium mission, programs, and workload currently assigned to the Laboratory. Planning may be initiated on possible upgrades/life-extension projects to support mission requirements.



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**HIGH EXPLOSIVES**

The Laboratory’s HE capability, which ensures the stability and dependability of HE in nuclear weapons, is essential to maintaining the safety and reliability of the nuclear weapons stockpile. HE R&D supports the improved predictive capability for performance, safety, and aging. This capability is increasingly becoming interwoven into the Laboratory’s Global Security missions through the shared use of some existing facilities and the transfer of a few weapons program facilities that are no longer needed.

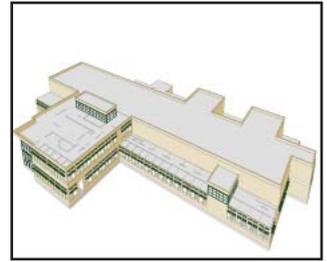
**TACTICAL PLANNING HORIZON**  
(FY 2014–23)

*High Explosives Production, Assembly, and Science Facilities Operations:* These facilities provide the diverse experimental capabilities needed to synthesize, formulate, shape, and machine small-scale HE components, as well as provide the characterization of fundamental materials properties and behavior and of small-scale sensitivity and the performance of new, current, and aged HE formulations. A proposed project is building the Energetic Materials Characterization Facility, which will house energetic material operations and provide capabilities critical to the surveillance, surety, and safety

of energetic materials. The project will also replace aging and obsolete facilities at TA-9. Another proposed project, the Dynamic Equation of State Facility, will relocate and consolidate gun capabilities from TA-15 and TA-39 to TA-40.

*High Explosives Radiography:* The TA-8 radiography (08-0023) capability characterizes HE components. The facility supports the detonator fabrication program, hydrodynamic testing at DARHT, and subcritical testing at the Nevada National Security Site. The facility is over 55 years old, is in failing condition, and is planned to be consolidated and refurbished to create a safer work environment. A project to refurbish (08-0022) the Nondestructive Testing Facility was completed in FY 2013.

*High Explosives Firing Sites:* The HE firing sites are used primarily for experimental studies for stockpile data, issues of importance for global security, and R&D. Research focuses on dynamic properties of various materials, subassemblies, and integrated experiments under conditions produced by HE. Tests are conducted in the open air or contained. A modernization and consolidation plan has been developed to reduce the number of open-air firing sites



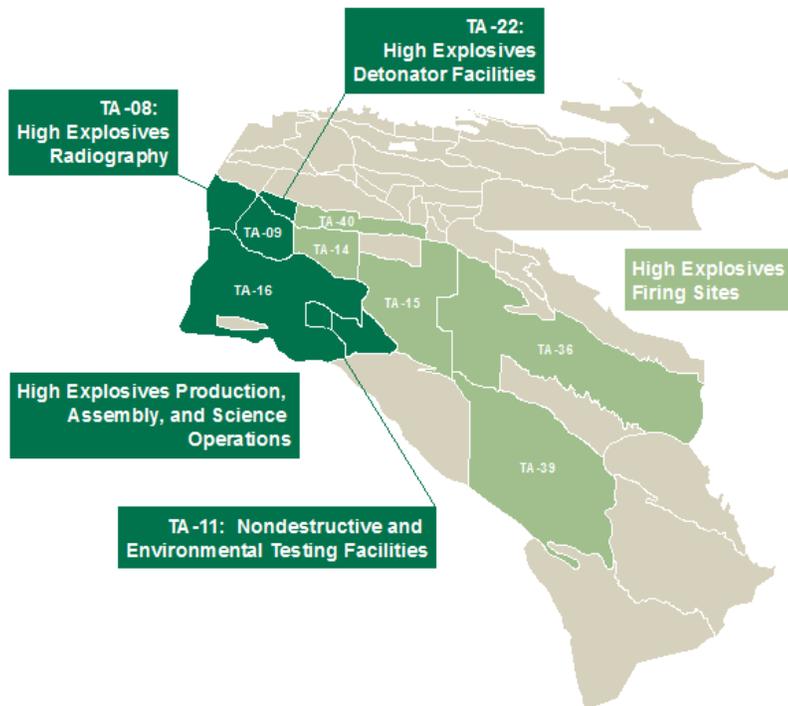
Proposed Energetic Materials Characterization Facility



High Explosive Radiography Facility



High Explosives Firing Sites



while increasing the number of contained firing sites, thus reducing the footprint and improving safety and performance.

*Nondestructive and Environmental Testing Facilities Operations:* These facilities provide the capability for component and subsystem environmental testing, including vibration, shock, temperature evaluation, and radiography in both destructive and nondestructive modes. The environmental testing capability, in support of LEP missions, is currently planned to remain at TA-11. A project to refurbish the area is beginning in FY 2013, with anticipated completion in FY 2017.

*High Explosives Detonator Facilities (R&D and Production):* The HE detonator facilities provide the capability to design, develop, manufacture, and test detonator systems. The

facilities also currently provide the capability to produce detonators/initiators for all warheads in the stockpile. The detonator facilities are in good condition, and no related projects are currently planned.

#### STRATEGIC PLANNING HORIZON (FY 2024–38)

No significant changes are expected in the future for the HE missions, programs, and workload currently assigned to the Laboratory. Planning is ongoing for the 25-year timeframe to determine what facility reinvestments or new construction will be required to meet mission needs. Other likely projects may include reinvestment to update aging building infrastructure, replace equipment, and upgrade facility systems to ensure the continued support of programmatic missions.

**NON-NUCLEAR**

The Laboratory’s non-nuclear component production and testing capability comprises a variety of activities, including some that are unique within the NSE.

**TACTICAL PLANNING HORIZON  
(FY 2014–23)**

*Beryllium Technology Facility:* The BTF (03-0141) provides the only technical and classified capability within DOE for non-nuclear beryllium component fabrication and beryllium R&D. Operations at the BTF include alloy development, foundry operations, inspections, nondestructive testing, joining, machining, metallography, mechanical testing, and powder operations. The BTF completed the replacement of its facility management system to ensure that all building systems continue proper operations.

*Machine Shops:* The two machine shops in TA-3 (03-0039 and 03-0102) provide special or unique parts in support of weapons programs, including parts used for testing or replacement within the stockpile. Capabilities include the fabrication of specialty components, fabrication using unique materials, and dimensional inspection of fabricated components. The shops are almost 60 years old, and a replacement facility, the Weapons Manufacturing Support Facility, is currently planned to house consolidated high-precision machining operations.

*Sigma:* This facility (03-0066) supports a large, multidisciplinary technology base in materials fabrication science. This facility is used mainly for materials synthesis and the processing, characterization, fabrication, joining, and coating of metallic and ceramic items. Capabilities provided by the Sigma facility will be required to support increased manufacturing. In the long term, the Sigma facility is a candidate for replacement because of its age and condition. However, for the near term, it provides an important capability for radiological activities that are consistent with the facility and ongoing weapons program activities. Options for future replacement or redevelopment to house Sigma’s weapons work continue to be considered.

**STRATEGIC PLANNING HORIZON  
(FY 2024–38)**

No significant changes are expected in the future for the non-nuclear component production/testing missions, programs, and workload currently assigned to the Laboratory. Within the 25-year timeframe, planning will be initiated to determine what facility reinvestments or new construction will be required to meet mission needs for facilities without projects planned in the near term.



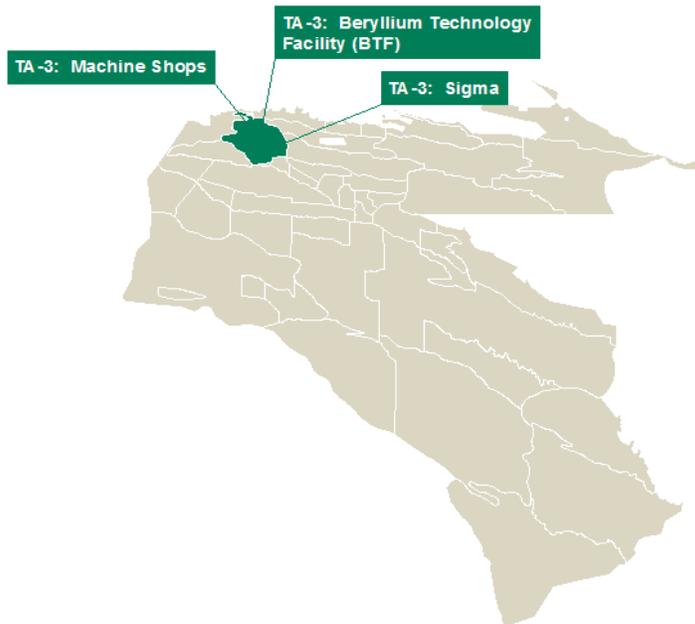
Beryllium Technology Facility (BTF)



Machine Shops



Sigma Facility



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**SPECIAL NUCLEAR MATERIAL ACCOUNTABILITY, STORAGE, PROTECTION, HANDLING, AND DISPOSITION**

The Laboratory has been identified by NNSA as the nation’s consolidated Center of Excellence for plutonium research, development, and manufacturing activities. One key element to performing this mission is the ability to store CAT-I quantities of SNM. This requirement had been met for the last 30 years, primarily by the CMR facility and PF-4 at TA-55. In 2001, the CMR facility was de-inventoried and reduced to a CAT-III facility, leaving PF-4 as the only facility authorized to store and process significant amounts of SNM.

**TACTICAL PLANNING HORIZON (FY 2014–23)**

*PF-4:* As programmatic activities associated with pit manufacturing, surveillance, Pu-238 heat sources, and nonproliferation programs are being consolidated to the PF-4 facility, the capacity to meet the needs for storage and processing of SNM is being challenged. The main storage vault is currently over 95% full. Focused efforts aimed at processing and discarding materials no longer required for programmatic work, in conjunction with vault and laboratory reconfigura-

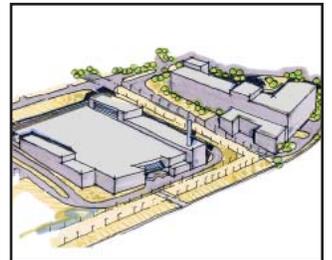
tions, will help mitigate the escalating space problem for the next decade. The Accelerated Vault Workoff project is increasing efforts to process, package, and ship excess material out of the PF-4 vault. Some material currently held on the floor is being migrated to the vault for safety and security reasons, and this migration has the potential to occupy some of the liberated vault space. In conjunction with the containerization of materials on the processing floor and seismic modifications to the facility structure, vault storage supports reductions in the facility material at risk.

**STRATEGIC PLANNING HORIZON (FY 2024–38)**

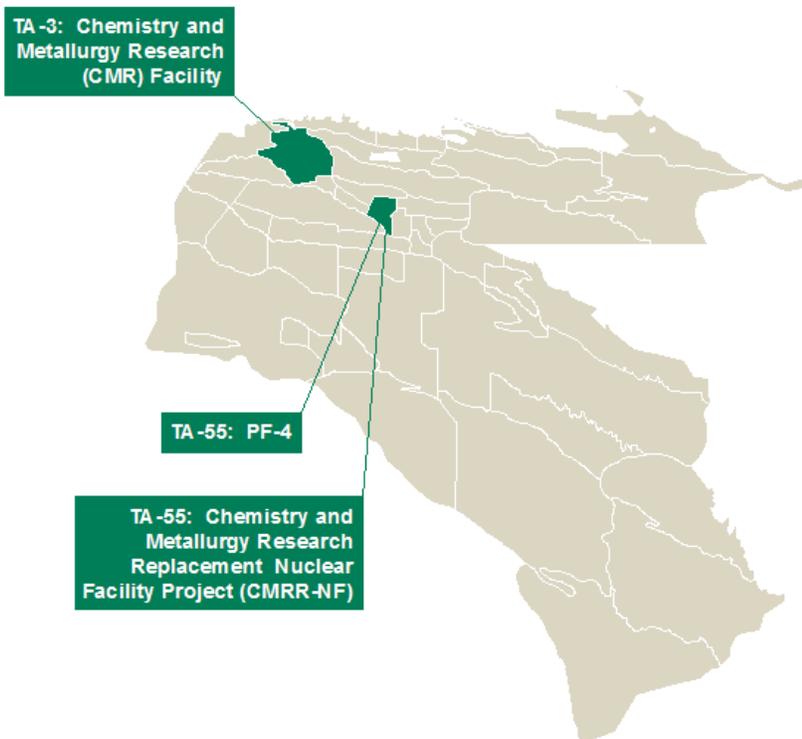
It will be necessary to expand the capacity available for the storage and processing of CAT-I quantities of SNM beyond 2023, or programmatic work will be impacted. It is anticipated that CMRR-NF will be coming on line in this timeframe and will provide the required expansion, including additional vault space and laboratory space for work that is currently performed in the CMR facility.



Plutonium Facility (PF-4)



Chemistry and Metallurgy Research Replacement Nuclear Facility Project (CMRR-NF)



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## ENABLING INFRASTRUCTURE

In FY 2010, the Laboratory Director initiated an institutional program to reinvest in the Laboratory's aging F&I. The strategy of this program remains to identify the F&I most essential to Laboratory missions, determine capability gaps (existing and future), and structure a consolidated plan of targeted investment to address the existing gaps and mitigate predicted future gaps in capability. This multi-year program includes prioritized investments in refurbishment and repurposing of existing facilities, consolidation of like workscope into common facilities and centralization of related scope functions, removal of poor facilities from active status, replacement of end-of-life-cycle facilities, performance of new construction as appropriate, disposition of excess facilities, and modernization of utilities. Although funding for this institutional reinvestment plan is adjusted annually based on resource availability, the prioritized list of F&I needs continues to ensure that the investment of available dollars will go to areas with the highest infrastructure need. For FY 2013, the Director has determined that approximately \$24M will be reinvested through this program.

The Laboratory's Site Sustainability Plan establishes goals in alignment with the DOE's Strategic Sustainability Performance Plan (SSPP) to reduce energy intensity, greenhouse gas (GHG) emissions, water consumption, and waste. These goals are integrated directly with the Laboratory's LTSS and are executed in collaboration with the Laboratory's International Organization for Standardization (ISO) 14001 Environmental Management System. The Site Sustainability Program was funded by the Director and is investing in the operation of SERF to achieve its water reductions. The Laboratory also is investing in many projects, including the recently completed Energy Savings Performance Contract (ESPC) and SERF expansion; High-Performance Sustainable Building (HPSB) implementation; lighting retrofits; heating, ventilation, and air conditioning (HVAC) recommissioning; building night setback scheduling; and the associated footprint reduction efforts to contribute toward the energy and water

goals and achieve GHG reduction. The Federal Energy Management Program (FEMP) guidance allows some buildings to be excluded from the energy intensity reduction calculation, which is established by the Energy Independence and Security Act of 2007. Some of these excluded facilities may require increased power because of the missions they serve. The Laboratory will purchase Renewable Energy Credits (RECs) and continue to pursue and implement lower carbon electricity resources and energy reduction projects to reduce GHG emissions.

### TACTICAL PLANNING HORIZON (FY 2014–23)

Highlights from this institutional program include removing excess temporary buildings, upgrading aging utility systems, improving roads and parking lots, recapitalizing on major plants and equipment, and completing other targeted facility life extension projects in high-capability facilities [such as the Sigma (03-0066) and Radiochemistry Laboratory (48-0001) buildings]. The Radiochemistry Laboratory houses the Hot Cell Facility for the processing of medical isotopes produced at the TA-53 Isotope Production Facility (see *Science Programs*, p. 31).

*Refurbishment:* Projects completing in FY 2013 include the TA-59-0001 Laboratory Utilization and the MSL Laboratory Infill. Refurbishment of F&I in the 10-year timeframe includes water tanks and the Omega Bridge and the SM-40 reconstruction of laboratory N161. Life extensions are scheduled to take place in many enduring facilities, including the fire stations, institutional computing facilities, and science laboratories.

*Replacement/New Construction:* Planned replacement facilities within the next 25 years should include radiochemistry, chemistry, bioscience, physics laboratories, and proposed replacements for the Receiving & Distribution Center (03-0030) and the Crafts/Shops facility (03-0038). Examples of new construction projects that are being considered or planned include



Otowi Building Life Extension Project



D&D of Temporary Structures



Additional 115kV Transmission Line



Sanitary Effluent Reclamation Facility



Replacement of the TA-3 Steam Plant

light chemistry and biological laboratories, as well as open and secure office buildings. The expansion of the TA-48 bioassay laboratory (48-0045) with an additional cleanroom facility (48-0262) is an example of new construction that will address capability needs.

*Disposition:* The planned elimination of obsolete facilities is a key element in the accomplishment of several complementary infrastructure, sustainability, and business goals, including DM reduction, energy intensity reduction, GHG reduction, workspace environment improvement, targeted maintenance investment in enduring facilities, and reduced risk associated with aged structures. The institutional footprint reduction program is currently targeting \$5M annually for excess and the disposition of temporary facilities. Although this budget is insufficient for the disposition of large permanent facilities, it allows for the excess of permanent structures in the near term. The Laboratory is continuing to seek other funding sources for disposition of currently excessed permanent facilities.

*Historical Properties:* Associated with World War II and the Cold War, 35 historic buildings and structures at the Laboratory are candidates for long-term retention and will be managed in compliance with the National Historic Preservation Act. The 17 properties supported the wartime Manhattan Project and may become part of the proposed Manhattan Project National Historical Park. If the proposed Park legislation becomes law, the Laboratory will prepare a plan for scheduled public access to key historical buildings located within limited access areas. Prescheduled escorted bus tours, perimeter security fence modifications that create private vehicle peninsulas, Americans-with-Disabilities-Act-compliant access, and comfort stations are a few of the infrastructure issues that will need to be addressed.

*Modernization of Utilities:* Within the next 10 years, utility investments primarily will be balanced among assets needed to meet the Laboratory's expanded supercomputing mission, improve energy efficiency, increase the mix of renewable energy generation, and refurbish aging infrastructure. Some of the investment to provide additional electrical power for the supercomputing mission is expected to be funded by the ASC Campaign.

Major efforts by system are as follows.

**Natural Gas**—Upgrades and replacements in the system are planned in accordance with the Department of Transportation's (DOT's) Distribution Integrity Management Plan (DIMP), beginning with TA-3, TA-16, and TA-55 to TA-46. A high-pressure gas line extension made to the existing combustion turbine is under consideration to enable "black start" capability for the generating unit and to reduce the net cost of generation.

**Water**—Reduction of potable water consumption to meet sustainability goals is expected to be satisfied by the SERF plant expansion. Continuation of reliability is dependent on the completion of major water tank refurbishment projects and the initiation of replacements of critical 60-year-old water mains, beginning at TA-3.

**Electric**—Reconductoring the Norton transmission line will increase the Laboratory's import capability to 135 megavolt ampere (MVA). The Public Service Company of New Mexico (PNM) Resources, Inc., will also need to reductor the Reeves transmission line or construct a third 115-kilovolt (kV) line to Los Alamos to raise the import capability above 200 MVA.

The Laboratory Electrical Infrastructure Upgrades line item project will replace the TA-3 substation and expand electrical distribution systems to provide the capacity and reliability to serve mission loads at TA-3 and the Metropolis Center. Transmission and distribution upgrade projects are planned to bring reliable service to and around the site. Other electric utility projects include upgrading the controls for the Static Var Compensator and the Combustion Gas Turbine Generator and replacing the 15-kV switchgear at TA-55. Additional photovoltaic power generation at the former TA-61 landfill is being considered but will likely be solicited by Los Alamos County through a power purchase agreement rather than by NNSA direct investment.

**Wastewater**—The SERF plant expansion is expected to satisfy the increased cooling demand of increasing computing loads by using recycled sanitary plant effluent, thereby reducing potable water consumption and ensuring compliance with the National Pollutant Discharge Elimination System (NPDES) permit. To ensure high levels of reliability, a site-wide refurbishment of deteriorating lift stations, manholes, and piping will be initiated, along with upgrades to satellite septic systems and the Sanitary Waste Water System (SWWS).

**Steam, Cogeneration Plant, and Combustion Gas Turbine Generator (CGTG)**—Replacing the obsolete controls and providing a high-pressure natural gas source to the CGTG are priority items. Long-term reliability of the TA-3 heating system and the ability to achieve sustainability targets are dependent on the replacement of the TA-3 Steam Plant. This facility is over 60 years old and has increasingly large-scale maintenance projects, failing steam turbines, and a failing electrical generation system. Initial phases of the cogeneration plant and heating system replacement are planned to enable retirement of the existing steam plant by 2025. This replacement includes the addition of a heat-recovery steam generator to the existing gas turbine and replacing the TA-3 campus steam system with a longer life-cycle, more cost-effective hot-water system.

**Roads**—Primary and secondary road upgrades are planned in the next 10 years. The Los Alamos Canyon Bridge Refurbishment project is planned to start within 5 years.

**STRATEGIC PLANNING HORIZON**  
(FY 2024–38)

**Natural Gas Water and Wastewater**—Continuation of the Laboratory-wide replacements for water, gas, and wastewater buried piping and other major equipment will occur in the 11- to 25-year timeframe. Upgrades or replacements of systems for line items, such as MaRIE, will be evaluated.

**Electric**—Electric utility planning will continue to define the projects to build distribution substation ties, upgrade substations (including transformers), and provide infrastructure to support future growth, mainly in the Supercomputing, LANSCE, and TA-55 mission areas.

**Wastewater**—The SERF plant and delivery system will be evaluated to ensure that it has the capacity and reliability for cooling needs of the Metropolis Center as computing capacity increases into the 2020s.

**Steam, Cogeneration Plant, and CGTG**—Replacements in the cogeneration plant and heating system will continue into the strategic window. Evaluation and implementation of a central chilled-water utility serving the computer centers and the National Security Sciences Building (NSSB) are also under consideration.

**Roads**—The Los Alamos Canyon Bridge will continue to receive life-extension refurbishments in the 11- to 25-year timeframe. In the strategic timeframe, widening East Jemez Road (truck route) for safety purposes is planned. New roads, parking lots, and pedestrian safety routes will be completed in conjunction with new facility projects.

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## COUNTERTERRORISM & COUNTERPROLIFERATION

As part of the Laboratory's national security programs, this core capability is designed to provide end-to-end mission support to the NNSA's Office of Defense Nuclear Nonproliferation (NA-20), Office of Emergency Operations (NA-40), and Office of CT and CP (NA-80). The mission is to prevent the proliferation of nuclear weapons, strengthen global nuclear security, ensure response capabilities, and support arms control and disarmament treaty verification.

Activities within this core capability include

- nonproliferation,
- nuclear forensics,
- nuclear CT,
- emergency response,
- intelligence analysis, and
- treaty verification.

DOE and NNSA national security programs, occupying facilities across the Laboratory, are designed to

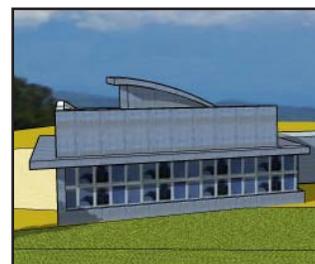
- detect, secure, and dispose of dangerous nuclear and radiological material, as well as develop technology and expertise to reduce the nuclear threat;
- provide technology development and support policy and decision making in the areas of space science, space-based nuclear detonation detection, and national security space missions;
- meet national needs to dispose of excess weapons-grade plutonium and repurpose plutonium stockpiles for peaceful and non-weapons purposes;
- develop and integrate CT and CP solutions relevant to end users working in tactical operations;
- provide personnel, equipment, training, facilities, and communication to respond to worldwide nuclear and radiological events; and
- support DOE Office of Intelligence (IN) through direct intelligence analysis, intelligence-related research and development, and intelligence operations support.

### TACTICAL PLANNING HORIZON (FY 2014–23)

Within this decade, the CT/CP mission could grow to the point where consolidation and co-location of functions into new facilities would become necessary. The proposed Nuclear Counter-Proliferation/Terrorism facility, uniquely devoted to understanding and defeating nuclear proliferation and terrorism (one of the top priorities within the U.S. nuclear agenda), will consolidate functions and provide modernized infrastructure for this capability.

*Counter and Nonproliferation:* This Laboratory's core capability plays a vital role in achieving the nation's nuclear counter and nonproliferation agenda by applying technical acumen, access to nuclear materials, international field experience, and knowledge of weapons systems. In accelerating the efforts to implement President Obama's initiative to secure all vulnerable nuclear materials worldwide in 4 years, the nuclear nonproliferation core capability anticipates that additional computing space, radiological laboratory space, and development and training areas will be needed. Within this tactical timeframe, projects being investigated to sustain this core capability include expanding the low-enriched uranium processing at the Sigma facility and molybdenum-99 isotope production at LANSCE. In FY 2012, the Laboratory began efforts to renovate an existing facility (66-0001) to meet the needs of the IAEA training facility.

*Space Systems:* This program provides science-based space solutions, engages the national debate on space issues with sound technical input, and diversifies the space-systems product line to enable a broader national security impact. Within the next few years, the Laboratory is evaluating options to provide a TA-3 location for the Space Systems Data and Operations Center. This growing program currently occupies space in the Physics building, which is targeted for replacement. Additionally, a small, modular communications/operations facility will be needed at Fenton Hill, consoli-



Proposed Space Systems Data and Operations Center



Cold War Era Physics Building (TA-03-0040)



Aging/Obsolete Facility at Fenton Hill



Cold War Era Radiological Laboratory Building at TA-35



Proposed Space Systems Instrumentation Building

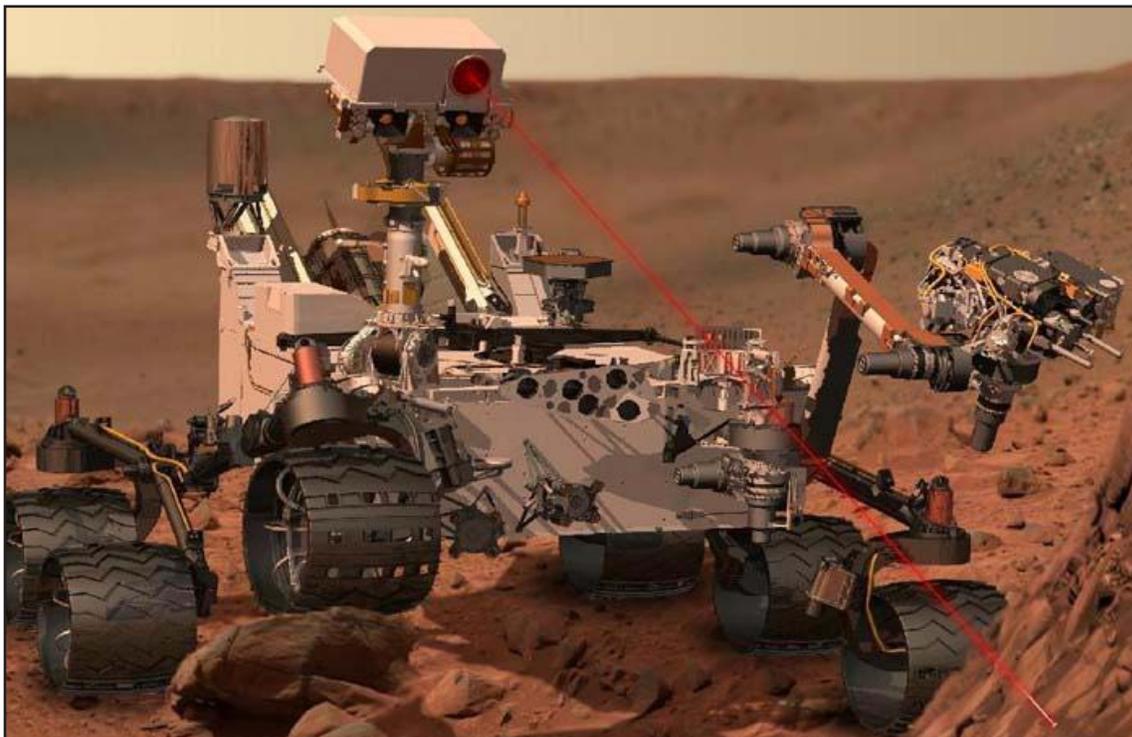
dating functions from obsolete structures for life-safety purposes.

*Non-Weapons Plutonium Activities:* This effort focuses on the use of the consolidated Center of Excellence for plutonium research, development, and manufacturing for non-weapons activities. Near-term efforts are focused on two areas: (1) providing the process and manufacturing development expertise to prototype the NSE's weapons-grade plutonium disposition needs, including the manufacture of mixed oxide fuel; and (2) continuing to produce heat sources for national missions, including the space program. These efforts, in addition to supporting national nonproliferation activities, also serve as a key means to diversify the activities performed at TA-55 and provide additional funding sources to maintain critical capabilities. Facility adjustments and operation modifications may require consideration to meet potential expanded or accelerated manufacturing requirements.

*Emergency Response (NA-40):* The scope of this program is to provide personnel, equipment, training, facilities, and communication to respond to worldwide nuclear and radiological events at all times. New or repurposed space is needed for planning, training, practice, and response. Conference rooms, sensitive compartmented information facility (SCIF) space, and flexible training areas will be provided in the proposed NCP/T facility.

#### STRATEGIC PLANNING HORIZON (FY 2024–38)

Early in the next decade, a new nonproliferation radiological laboratory, training, and office building capable of handling CAT-III/IV SNM will be needed to replace obsolete Cold-War-era radiological laboratory buildings at TA-35. During this time period, a Space-Systems Instrumentation Line Item building will be necessary to replace many of the activities currently conducted in the Physics building. This facility will increase the capacity for R&D, design, fabrication, calibration, and testing of space instrumentation.



**Above:** Artist's rendering of the Curiosity rover containing the Laboratory's ChemCam, an instrument developed in collaboration with the Jet Propulsion Laboratory and the Institute de Recherche en Astrophysique et Planetologie, France. ChemCam is comprised of two instruments: (1) a remote micro-imager high-resolution pictures and (2) laser-induced breakdown spectroscopy (LIBS) equipment for chemically analyzing rocks and soil.

## SUPPORT OF OTHER MISSION / PROGRAM CAPABILITY (WORK FOR OTHERS)

The Laboratory's Global Security programs work with private entities and other government agencies, such as the Department of State (DoS), Department of Defense (DoD), Department of Homeland Security (DHS), the U. S. Intelligence Community, and foreign partners. The Laboratory contributes to these non-NNSA entities on multiple fronts, including the development of science and technologies that support CT and CP, nuclear threat response, warfighter programs, energy security efforts, emerging threats, and one-of-a-kind analysis to ensure a safe and secure nation. These efforts contribute directly to national strategies and international initiatives to help ensure global stability.

Activities within this core capability include

- warfighter support,
- intelligence support,
- energy system development and analysis,
- complex system modeling and analysis,
- cyber security,
- technology exploitation,
- climate and natural system modeling and analysis, and
- health threats.

These activities are dispersed throughout the Laboratory, many in buildings that are up to 60 years old. The reinvestment in and replacement of these facilities will create a modern and efficient workplace. Programs within this core capability are designed to

- understand, detect, and respond to emerging national security threats, including threat analysis, detection, and technologies to respond to nuclear, radiological, biological, and chemical threats and to explosives weapons of mass effect (WME);
- research, develop, and apply unique technologies supporting the warfighter and DoD missions; and
- service national needs to understand and improve infrastructure resilience,

stability, security, and reliability to prevent calamity and avoid crises while ensuring global economic, political, and social stability.

### TACTICAL PLANNING HORIZON (FY 2014–23)

Over the next decade, several new projects may become necessary should the work-for-others programs expand significantly.

*Warfighter Support:* This program provides high-leverage, game-changing technology to the American warfighter. This quickly expanding program needs additional and modern laboratory, office, and SCIF space, which could be provided in the proposed NCP/T facility.

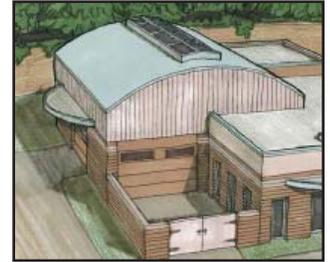
*Homeland Security:* This program contains respected experts and research and development capabilities on WME threats; contributes to global architectures for identifying, detecting, and defeating WME threats; and provides vital technologies and options for responding to and mitigating WME events. This quickly expanding program needs additional laboratory, office, and shop space and secure computing and SCIF space proposed for the NCP/T facility.

*Special Support for DoD:* This program is one of the DoD's special operations community's preferred providers for rapid response CT applications in the areas of tagging, tracking, and locating; reconnaissance and surveillance; command, control, and communication; and energetic materials and is a significant contributor to the NNSA-laboratory nuclear CP team. As another growth area, immediate reinvestment is needed in some buildings housing existing SCIF space, as well as the addition of high-performance computing (HPC) facilities. Firing site activities require additional facility space to support a mix of energetic materials activities. Also, large-scale energetic materials testing is being considered at DARHT and other existing firing sites.

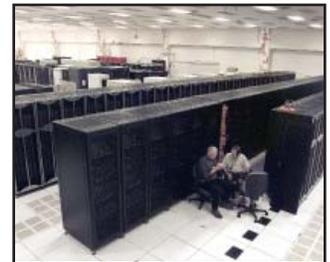
*Intelligence Analysis, Integration, and Exploitation DOE-IN:* This program area solves critical and challenging technical intelligence



Proposed Nuclear Counter-Proliferation and Counter-Terrorism Facility (NCP/T)



Proposed Additional Compartmented Information Facility (SCIF) Space



Increased HPC demands



Aging/Obsolete Laboratory at TA-35-0002



Proposed Stand-off Active Interrogation Field Site and Proton Interrogation Facility at LANSCCE

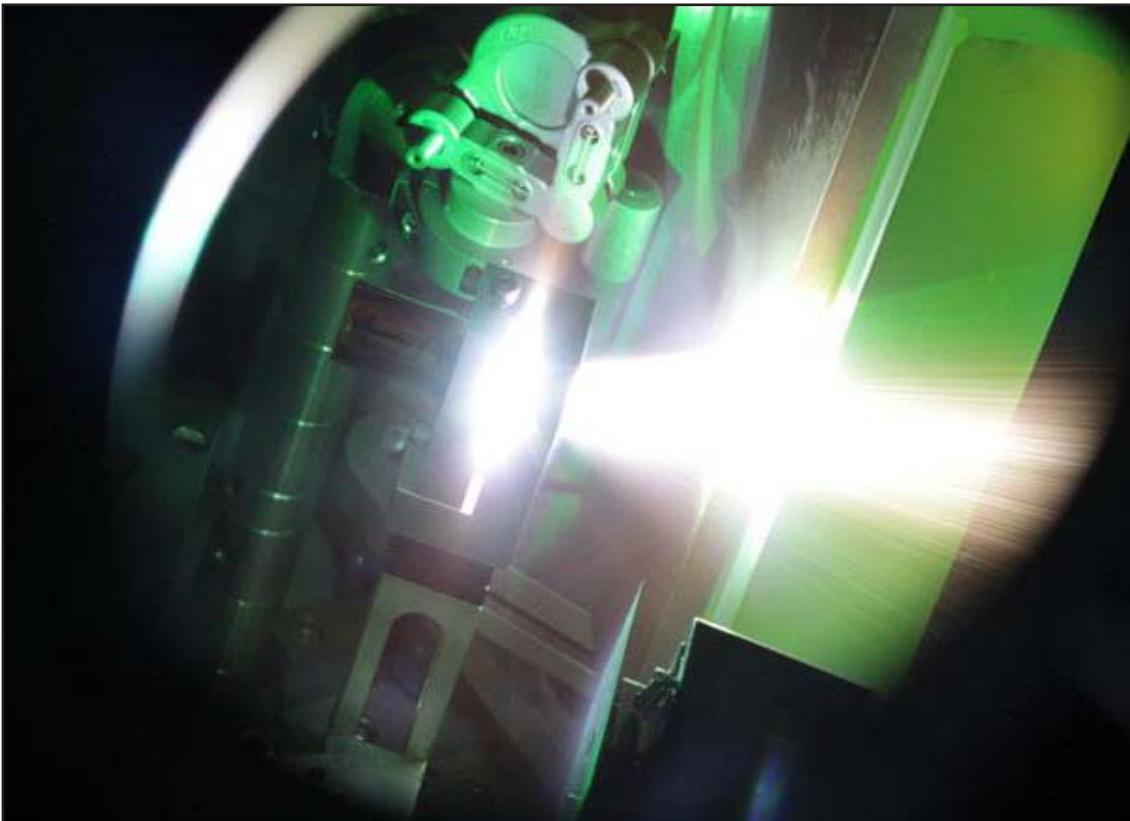
and cyber problems. Reinvestment in existing facilities and construction of new SCIF office and laboratory space will promote and accommodate the need for expanded HPC capability in a secure cyber environment. Ancillary cooling and power upgrades will be required to support new HPC systems. The NCP/T facility would include this capability. Remote R&D areas will need small maintenance and operation facilities.

*Energy and Resilient Infrastructures:* This effort focuses on mitigating the impacts of energy demand growth, sustainable nuclear energy, and materials and concepts for clean energy. Potential partnering opportunities in these areas exist with the DoD, DOI, and the US intelligence community, as well as with industry partners such as Chevron and Exxon. These capabilities occupy space in several TA-16 facilities first developed for the nuclear weapons programs during the Cold War. The near-term plan

for accommodating future expansion for this product line is to use existing facilities and capabilities throughout several organizations and areas at the Laboratory (i.e., increase space usage). This approach may need to be augmented with additional HPC and TA-3 facility space to meet the work-for-others energy security program demands. To demonstrate the Laboratory's strength and capabilities for this program, additional laboratory space, SCIF space, and/or office space may also be needed.

#### STRATEGIC PLANNING HORIZON (FY 2024–38)

The following decade will still require replacement of end-of-life-cycle facilities supporting this capability, including a Standoff Active Interrogation Field Site and Proton Interrogation Facility at LANSCE and additional laboratories.



**Above:** An intense burst of laser energy slams into an extremely thin foil target to produce neutrons at Los Alamos National Laboratory's TRIDENT laser facility during a recent experiment, which proved that laser-driven neutrons can be used to detect and interdict smuggled nuclear materials. (Photo credit: Los Alamos National Laboratory).

## OTHER CAPABILITIES (SCIENCE AND ENVIRONMENTAL PROGRAMS)

### SCIENCE PROGRAMS

The Laboratory operates many science and engineering facilities vital to national security, as well as to science missions. For example, LANSCE supports NNSA as an MC facility. LANSCE is also the Laboratory's top experimental science facility priority and supports the Office of Science (SC) as a national user facility for materials research, as well as for medical isotope production, and the Office of Nuclear Energy (NE) with nuclear-energy-related research. Additionally, the Laboratory manages components of the National-Science-Foundation-sponsored National High Magnetic Field Laboratory (NHMFL) (35-0124), the SC-sponsored Center for Integrated Nanotechnologies (CINT) (03-1420), and the Stable Isotope Resource (35-0085). LANSCE, NHMFL, and CINT are major national scientific user facilities, supporting over 1000 visits annually from qualified members of the national and international science and engineering community.

#### *Los Alamos Neutron Science Center*

**Non-NNSA Missions:** LANSCE will remain an important facility for non-NNSA missions in addition to its important NNSA role, with funding for accelerator operations supported through enterprise infrastructure. The facility also supports two notable technical facilities—the Lujan Center for Neutron Scattering and the Isotope Production Facility (53-0984) formerly supported by NE and now under SC. The Isotope Production Facility is integrated into the DOE Isotope Program and serves the nation by providing materials, expertise, and data that meet the most important existing, emerging, and future needs for accelerator-produced radioisotopes used for medical therapy and diagnostics, national security, and nuclear physics applications. Isotopes produced at the Laboratory are used for cardiac imaging for roughly 25,000 patients a month, and the domestic need for these critical isotopes continues to increase. Additional research into the production of novel isotopes for radioisotope therapy is ongoing, and infrastructure upgrades

to support this effort may be required.

The Laboratory anticipates the additional evolution of SC and NE activities at LANSCE with the completion of LINAC RM, including new and enhanced instrumentation within the Center to complement future operation of the Spallation Neutron Source at Oak Ridge National Laboratory.

#### *Matter-Radiation Interactions in Extremes:*

As discussed relative to NNSA mission needs under the Design, Certification, Testing, Experiments, Surveillance, and ST&E Base Core Capability, the Laboratory is pursuing the signature facility concept MaRIE for achieving and maintaining leadership in materials-centric national security science. MaRIE's focus is on achieving solutions for transformational materials performance, with an emphasis on matter-radiation interactions in extremes. Those solutions, enabled by MaRIE, will provide unique capabilities to address many national and global security challenges. MaRIE will be an international user facility and add to the suite of national user facilities provided through the Lujan Center, NHMFL, and CINT.

To support the Laboratory vision as the premier national security science laboratory, modernization of aging facilities and consolidation of the Laboratory footprint to a sustainable size and configuration are required. The Laboratory's long-range plan includes projects that will provide new modern state-of-the-art facilities to support critical NNSA and mission-related scientific efforts for the next 25 to 50 years. The Laboratory needs to replace aging infrastructure with modern, safe, and secure infrastructure that supports the recruitment and retention of premier scientists, consolidates and reduces the Laboratory's facility footprint, and reduces the operating and maintenance costs.

In addition, the Laboratory's Biological Sciences Laboratory (BSL) facility (03-1076) will provide foundational capability for biosecurity R&D, extending the scope of laboratory work to pathogens of significant national security concern. All required documents for startup have been submitted,



National High Magnetic Field Laboratory (NHMFL)



Center for Integrated Nanotechnologies (CINT)



Lujan Center for Neutron Scattering



Packaged waste ready for transport



TA-54 Closure and Disposition of Legacy Transuranic Waste

and the BSL is awaiting the ROD. Facility startup is anticipated in FY 2014.

### ENVIRONMENTAL PROGRAMS

The DOE Office of EM funds the EM Program at the Laboratory, and the NNSA Los Alamos Field Office provides direction to the Laboratory's EM Program for characterizing and remediating contaminants in the environment, decontaminating and decommissioning facilities, and managing and disposing of hazardous, mixed, low-level, and TRU waste. On March 1, 2005, DOE, the University of California, and NMED signed a Compliance Order on Consent (the Consent Order) that established requirements and schedules for the investigation and cleanup of contaminated legacy sites. On June 1, 2006, LANS assumed the responsibility as the management and operating (M&O) contractor. All required post-remedy monitoring and maintenance activities are planned to be transitioned from the EM Program to the site landlord, NNSA, through the LTS Program.

### CONSENT ORDER AND OTHER ENVIRONMENTAL MANAGEMENT PROJECTS

*Soil and Water Remediation:* These efforts include all investigation, remediation, regulatory and public interfacing, and associated work related to solid waste management units, material disposal areas (MDAs), areas of concern (AOCs), and the affected ground and surface waters at the Laboratory. The scope is for investigation and cleanup (if needed) of the approximately 800 solid waste management units and areas of concern remaining from the original 2129 sites spread over the Laboratory. These sites include canyon bottoms, septic tanks and lines, chemical storage areas, wastewater outfalls, landfills, incinerators, firing ranges,

surface spills, and electric transformer storage areas. Project activities are conducted in accordance with the Consent Order, as well as applicable environmental laws, regulations, and end-state objectives.

*Disposition of Legacy TRU Waste:* Some sites being remediated under the Consent Order also contain stored (aboveground and belowground) legacy radioactive wastes. This waste is packaged, inspected, and loaded for shipping at TA-54. Approximately 5000 m<sup>3</sup> of aboveground and 2400 m<sup>3</sup> of belowground waste must be dispositioned and sent to WIPP before disposal sites are closed at TA-54. Closure of TA-54 will involve the demolition of nearly 280,000 ft<sup>2</sup> of facilities and remediation of disposal areas per the Consent Order. The remedy currently recommended by the Laboratory is installation of an evapotranspiration cover over the disposal areas and soil vapor extraction (SVE).

### POST CONSENT ORDER ACTIVITIES

When corrective actions for solid waste management units (SWMUs) and AOCs are completed under the Consent Order, requirements for long-term controls at these sites will be transferred to the Laboratory's Hazardous Waste Facility Permit. Once the Laboratory's cleanup actions are at a level appropriate for land use designations, supportive of mission needs, and compliant with all applicable laws and regulations, the LTS efforts will begin. These efforts, aligned with the Laboratory's LTSS, are tied to DOE's LTS guidance and will include in its scope continuity of data and information management, environmental sampling, and maintenance of engineered barriers/remedies. Additionally, facilities for newly generated waste will replace those decommissioned at TA-54.

## 6.0 REAL PROPERTY ASSET MANAGEMENT

### SITE FOOTPRINT

#### CURRENT

The Laboratory footprint at the beginning of FY 2013 was ~8.7 million gsf, with a total of 1063 facilities. The total includes 809 (7918k gsf) permanent facilities, 204 (312k gsf) trailers and transportables, and 50 (471k gsf) leased facilities. The Laboratory footprint has trended downward in recent years through ongoing disposition efforts funded by several programs. However, from FY 2012 to FY 2013, the total square footage has actually grown with the occupancy of RLUOB at TA-55. As with RLUOB, the construction of new facilities has addressed new and ongoing program requirements. These efforts have helped address facility age and sustainability concerns as they relate to programmatic risk. However, ~37% of the remaining permanent structures are more than 50 years old and 84% of the remaining trailers/transportable are over 20 years old, emphasizing the need for a continued balance between new construction and disposition investment to achieve an appropriately sized, energy-efficient, sustainable footprint consistent with mission requirements.

FY 2012 represented the eleventh year of the congressional one-for-one footprint reduction mandate. During this time period, the Laboratory eliminated over 1.4 million gsf, while adding ~0.7 million gsf through new construction (including RLUOB). The delta was “banked” in accordance with DOE/NNSA requirements. This level of success provides the basis for continued removal over the next 10 years of additional shut-down/excessed structures no longer required for mission work.

#### FUTURE

Ongoing work in FY 2013 is anticipated to remove over 45k gsf. During the FY 2014–23 timeframe, the Laboratory anticipates the removal of over 250k gsf with currently identified funding sources, primarily EM and Institutional funding. The multiyear FDP proposed for initial NNSA funding, beginning in FY 2014, is not currently anticipated to fund disposition at Los Alamos National Laboratory in the first year. However, FDP is anticipated to be the key funding source for addressing disposition at the Laboratory for a significant number of currently shut-down/excessed facilities, as well as other structures anticipated for shutdown in the coming years. The Laboratory is working with NNSA and other sites in developing an executable program. Approximately 500k gsf is proposed for FDP-funded disposition during this timeframe.

An implication equally important to square footage removal is the minimization of activities and the planned removal of most structures at six TAs: TA-18, TA-21, TA-41, TA-43,

TA-46, and TA-54. The elimination of most existing trailers and transportable buildings across the institution is also a goal during this timeframe. Eliminating obsolete facilities over the next 10 years will continue to be a basic business strategy that accomplishes more than reducing operating and surveillance and maintenance (S&M) costs. It also

- minimizes risk associated with deteriorating facilities;
- contributes to all site and national goals associated with reductions in water and energy use and GHG and carbon footprint reduction, as well as the avoidance of DM;
- addresses waste disposal as soon as possible, thereby avoiding the continued escalation costs associated with removal; and
- creates available land for future programmatic activities.

For an enduring site such as Los Alamos National Laboratory, the removal of obsolete structures as soon as possible following completion of the shut-down/excessing processes is the best approach for reducing cost, minimizing risk, and maximizing program opportunities. Over time, all enduring sites will have structures that reach the end of their viable lifetimes and need to be removed. A national program (such as the proposed FDP) created to address the elimination of obsolete structures quickly, before a significant backlog is realized, would provide a practical and efficient infrastructure means to address this issue.

The outyears will provide continued challenges for the replacement and removal of major structures that will have been in service for 70 years or more. The highest-profile project will be the removal of the CMR facility. This nuclear facility was constructed in 1953 and consists of ~570k gsf within the most populated TA of the Laboratory. Currently, deferral of the CMRR-NF project will delay removal of the existing CMR. Many other major nonnuclear research facilities will be in a similar situation, requiring investment for life extension, replacement, and eventual removal. These facilities, constructed in the early 1950s, include the Crafts/Shops facility (115k gsf, constructed in 1952) and the Tech Shop (154k gsf, constructed in 1954). Institutional multi-program facilities, such as the Physics building (187k gsf, constructed in 1953) and the Receiving & Distribution Center (115k gsf, constructed in 1952) present numerous challenges that are driving replacement strategies as early as possible within the 25-year timeframe. In total, these five structures amount to more than 1.1M gsf.

#### “FREEZE THE FOOTPRINT”

On March 14, 2013, the Office of Management and Budget (OMB) issued direction titled “Implementation of OMB Memorandum M-12-12 Section 3 Freeze the Footprint.” It

stated that “...Executive Branch departments and agencies shall not increase the total square footage of their domestic office and warehouse inventory compared to the FY 2012 baseline.” The Laboratory baseline has since been confirmed at 2,583,191 gsf for office and warehouse space. For the years FY 2013–15, no new facilities of this type are anticipated. The Freeze the Footprint requirement is consistent with the infrastructure business strategies at the Laboratory, as described above. The anticipated removal of these types of structures over the next 3 years will contribute to this new mandate, as well as to the previously established Congressional One-for-One mandate.

**LEASE ARRANGEMENTS**

The current level of leased space is viewed as being a practical, flexible, and cost-effective approach for accommodating in the range of 1500 staff consistent with mission requirements at the Laboratory (excluding subcontract personnel who are not part of the Laboratory workforce). In the absence of major mission shifts affecting the overall workforce, no major changes are anticipated with the aggregate quantity of leased space. However, the Laboratory is currently considering lease space options for securing flexible swing space for researchers during refurbishment projects that affect their laboratory space. Because it is recognized that each lease has specific attributes, cost, and term, the associated effectiveness in meeting functional requirements is continually verified for contract conformance, followed by the opportunity to conclude or renegotiate the lease when appropriate. Currently, no budgeted plans exist to shift the current workforce from leased space to owned facilities on the Laboratory site (Figure 4). All contractor leases are managed

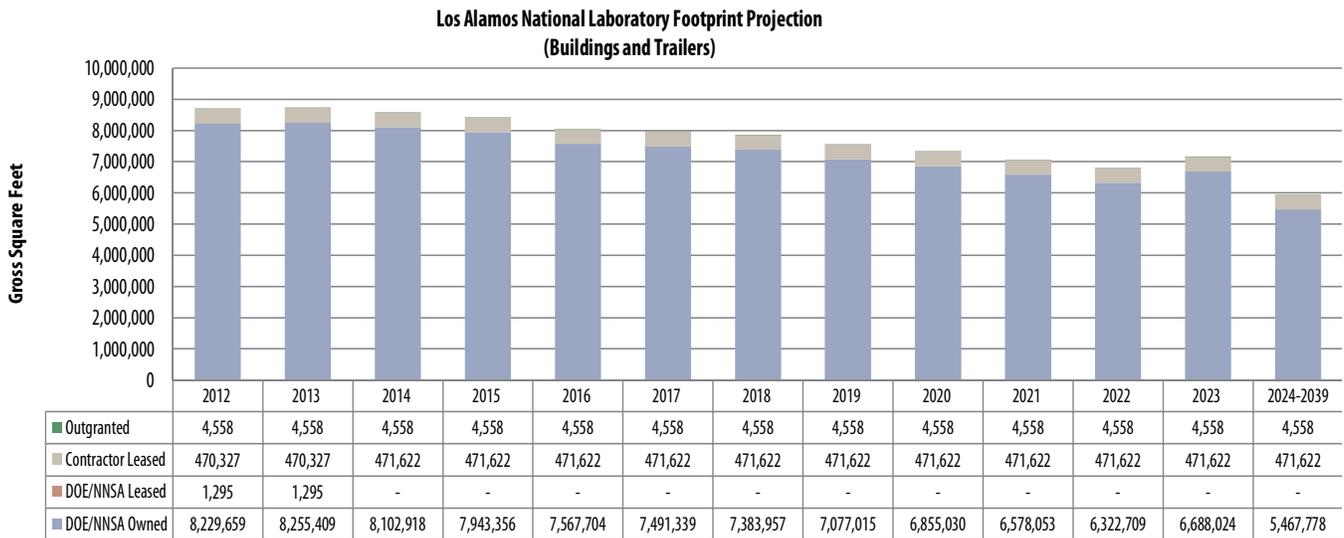
by the Laboratory and are included in the Facilities Information Management System (FIMS) database.

Approximately 100 acres and one facility are leased by others from DOE at the site. These leases support research facilities and community needs, such as the Los Alamos County Eco Station (LACES) (a solid waste transfer and recycle facility, formerly a landfill), communication towers, and construction support. The recent FY 2012 long-term lease of 54 acres at the LACES to the County of Los Alamos permits the construction and operation of a 2-MW solar photovoltaic field. This use provides a demonstration of new technologies.

**FACILITY CONDITION**

The current condition of MC facilities is “Good,” with a facility condition index (FCI) of 3.8% (Figure 5). The condition of the MC facilities has remained fairly constant over the past 8 years (Figure 6). MC FCI is predicted to gradually increase through the tactical planning horizon of this TYSP because of the sunset of FIRP and lack of sufficient funds for a sustainable maintenance program. Planned DM buy-down activities, coupled with the construction of RLUOB, are predicted to keep the FCI for MC facilities rating at Good.

The current aggregate FCI for MD facilities is 7.5% and is predicted to be 7.7% in FY 2013. This relatively flat trend will continue through the tactical and strategic planning horizons. The FCI decreased in MD facilities between FY 2011 and FY 2012 because of the reclassification of several facilities from MD to non-mission dependent (NMD) and the condition assessment inspections and archiving. The FCI for MD facilities is predicted to increase during the



**Figure 4:** Los Alamos National Laboratory Footprint Projection (Buildings and Trailers)

Replacement Plant Value (RPV) <sup>5</sup>		\$14,059	Million			
Total Deferred Maintenance (DM) <sup>6</sup>		\$1,191	Million			
Site Wide Facility Condition Index (FCI) <sup>7</sup>		8.6%				
		Facility Condition Index (FCI) <sup>6*</sup>	Asset Condition Index (ACI) <sup>6**</sup>	Asset Utilization Index (AUI) <sup>7</sup>	# of Assets <sup>5</sup>	Gross Square Feet (GSF) Buildings & Trailers (000s) <sup>5</sup>
Mission Dependency	Mission Critical	3.8%	96.2%	98.9%	32	2,266
	Mission Dependent	7.5%	92.5%	99.6%	303	1,445
	Not Mission Dependent	13.4%	86.6%	98.5%	728	4,990
Facility Use	Office	7.7%	92.3%	98.4%	276	2,343
	Laboratory	5.8%	94.2%	97.1%	196	3,350
	Warehouse	8.4%	91.6%	99.7%	249	663
	Medical	0.0%	100.0%	100.0%	1	21
	All other Categories	12.1%	87.9%	99.2%	341	2,325

**Figure 5:** Los Alamos National Laboratory Real Property Asset Management per End of FY 2012 FIMS Reporting

\* FCI = DM/RPV

\*\* ACI = 1-FCI

strategic horizon. Future consolidation, reinvestment, and new construction will prevent further significant increases in the MD FCI.

The condition of NMD facilities is “Fair,” with an FCI of 13.4. This trend is expected to remain relatively flat throughout the tactical and strategic planning horizons. Continued reinvestment in targeted facilities will improve the condition as long as funds are available. Consolidation planning and footprint reduction will continue to improve DM in NMD facilities. Planned footprint reduction, mission consolidation efforts, and programs such as CBI will provide for the allocation of funding for recapitalization of real property assets but will need to be accelerated to outpace aging and degradation of the facilities.

The Laboratory continues to place emphasis on its condition assessment survey program, with 1.47M gsf of Laboratory space to be inspected this fiscal year.

### DEFERRED MAINTENANCE REDUCTION

Flat EI budgets have resulted in lower amounts of available funding for real property maintenance in MC and MD facilities. Current and outyear budgets may not be adequate to support the level of preventive and corrective maintenance required to avoid the growth of DM. Institutional focus on the reliability of facility safety systems, such as pressure safety, electrical power systems, and fire protection, will

also leave shortfalls in maintenance funding. The cessation of FIRP will also contribute to DM growth. However, the Laboratory is hopeful that the CBI initiative will mature into a viable, supported program.

The DM reduction goals require that the Laboratory make increased investments in real property maintenance over the next several years. Funding will likely not be available for increases in maintenance, but the Laboratory will continue efforts to fund investments, through NRMM projects, with a goal of decreasing DM on MC facilities. NRMM projects will be funded based on their ability to achieve longer-term cost savings and increased operational efficiencies, to result in either consolidation of operations or decommissioning/decontamination of existing facilities, or to support unique, specific enhancements or upgrades to a facility that would not be ordinarily funded but that are reasonably expected to enhance programmatic efficiency or reduce risk.

Other strategies to reduce maintenance funding gaps include avoiding maintenance needs through footprint reduction and streamlining maintenance activities to increase productivity. With the required maintenance of shut-down facilities reduced to a surveillance level, remaining maintenance funds can be applied to facilities with high-priority maintenance needs, thus preventing the growth of new DM. The Laboratory has also been pursuing efforts to increase the overall efficiency and cost effectiveness of maintenance by streamlining certain types of low-hazard, routine activities. Through a graded approach to maintenance planning, many low-complexity, non-emergency maintenance and service activities have

5. DOE owned real property and leased facilities

6. DOE owned real property (buildings, trailers, other structures)

7. Operational DOE owned and leased gsf

Planned Real Property Expenditure by Mission Dependency



Figure 6: Los Alamos National Laboratory Planned Real Property Expenditure by Mission Dependency <sup>8</sup>.

been preapproved for expedited execution and do not require detailed planning and scheduling.

Any reduction in funding (e.g., new budget authority, delays in construction project activities, or shortfalls in cost recovery funding) puts the availability of Laboratory facilities at risk. The Laboratory ensures the safety, security, and compliance of its facilities as a number-one priority; however, funding reductions may lead to decisions that put facility availability and the completion of associated mission activities at risk.

**SPACE UTILIZATION AND CONSOLIDATION**

Improving space utilization is a part of the strategic goal to be accomplished through footprint reduction. The process for utilization improvements is integrated into the consolidation process for footprint reduction. Institutional space standards were updated in 2010 based on benchmarking performed by the International Facility Managers Association for governmental and educational office space use. Continued application of the new space standards, coupled with consolidation and footprint reduction efforts, will enable the Laboratory to continue to improve usage rates into the future.

**SUSTAINABILITY/ENERGY**

The Laboratory prepared the FY 2013 Site Sustainability Plan to describe progress toward the goals established in DOE’s SSPP. Per the requirements of DOE Order 436.1 Departmental Sustainability, the Laboratory uses its ISO 14001:2004-certified Environmental Management System (EMS) to establish objectives to improve compliance, reduce environmental impacts, increase operational capacity, and

meet long-term sustainability goals. The goals of the 2013 Site Sustainability Plan are fully integrated into the Laboratory’s institutional environmental objectives under the EMS and its LTSS.

The challenges presented by the sustainability goals established in DOE Order 436.1 require innovative solutions that draw on the many organizations, resources, and talents at the Laboratory. The FY 2013 Plan reflects FY 2012 accomplishments and outlines FY 2013 actions that enable the Laboratory to continue progress toward DOE’s sustainability reporting requirements and goals.

The Laboratory is working to institute cultural change to implement all DOE sustainability goals. Outreach efforts drive cultural change; this type of communication could reduce energy and water usage by as much as 5%. This change requires the use of a sustainability lens in all corporate management decisions: planning, executing, evaluating, and improving operations to maximize sustainability and support sound business practices. Realizing energy and water reductions through communications requires new focus and funding.

To meet the sustainability goals, the Laboratory will pursue a combination of additional investment in renewable energy, green construction practices, and operational improvements for energy efficiency. The Laboratory has developed a Return on Investment (ROI) funding strategy to work toward achieving the SSPP goals. This strategy includes investing in recommissioning, facility improvements, the building of automation systems, publicity and outreach, lighting retrofits, and the implementation of energy and water conservation measures. Currently, \$3.35M is dedicated to energy and water reduction efforts. The Laboratory’s Site Sustainability Program will contribute

8. DOE owned and operated assets

to NNSA's Sustainability goal achievement by allocating an additional \$3.5M–5M each year until the end of FY 2015, which is projected to reduce energy intensity by 3% per year.

## SECURITY INFRASTRUCTURE

### NEAR TERM (FY 2014-23)

In the near term, the Laboratory's Security and Safeguards (S&S) Program will continue to consolidate security assets and replace and improve aging infrastructure to effectively support the Laboratory's missions. The primary focus will be on the consolidation of SNM at TA-55. The construction and activation of the CMRR-NF was expected to complete the Laboratory's consolidation of nuclear facilities into one security CAT-I SNM area located within the Pajarito Corridor. However, the project start date has been delayed 5 years, making continued operations (security CAT III) at the existing CMR facility a necessity until the CMRR-NF is built. The secondary focus will be the protection of classified matter, property, and personnel outside of the Pajarito corridor.

The following major initiatives, either underway or in the planning phases, are necessary to achieve NNSA's strategic goals and objectives over the next decade. These initiatives are either funded or were submitted to NNSA in the FY 2014–19 FYNBP budget request. The most significant projects are listed below, and the comprehensive items are listed on the NA-00/NA-70 Non-Recurring Projects and Procurements List. Prioritization within this TYSP submission is consistent with the prioritization within the current Non-Recurring Projects and Procurements List as was submitted to NA-00/NA-70.

*Nuclear Materials Safeguards and Security Upgrades Project Phase II (funded):* Facility security improvements resulting from NMSSUP Phase II should be completed during late FY 2013/early FY 2014. These physical and access control infrastructure improvements will enhance the site security posture and, coupled with NNSA threat guidance changes, will result in more cost-effective Pro-Force resources. Additionally, NNSA is considering project scope expansion to enhance security further and provide benefits to the weapons program operations by increasing portal throughput and providing automated systems for material surveillance (Post-116 upgrades project).

*Protective Force Training Facilities (funded—on hold):* The outdoor firing-range upgrades were scheduled to begin construction during FY 2013 but were put on hold because of a funding shortfall that resulted from the congressionally mandated budget sequestration. The outdoor range upgrade is the fourth and final planned Pro-Force training facility (simulation center, tactical training facility,

indoor range, and outdoor range upgrades) and, once completed, will result in a complete suite of state-of-the-art training facilities sufficient for a robust Pro-Force training environment.

*Security Envelope Enhancement Project (funding request FY 2014–17):* This project addresses the creation of a hardened site envelope, which would provide enhanced protection against vehicle threats. The project would allow for rerouting public vehicle traffic around the northern perimeter of the Laboratory by either splitting West Jemez Road or creating a bypass road (depending on the results of the alternatives analysis study, which is currently underway). This separation and rerouting of public traffic, in conjunction with improvements to the Pajarito vehicle access portal and secondary roadways, would allow a new security envelope to restrict vehicle access to badge holders only and eliminate public access onto a majority of the Laboratory's site. The new perimeter would encompass both the Pajarito corridor and the TA-3 central area, which is the Laboratory's most densely populated work area.

*Legacy Field Panel Replacements (funding request FY 2014–17):* Four separate projects would support the replacement of legacy field panels with modern Argus field equipment, which will upgrade the site's field panels to a current Argus configuration. The legacy field panels are obsolete and require excessive maintenance. These panels do not support the increased processing speeds of new Argus equipment and require special software gateways to communicate with Argus. No spare parts are available, except those obtained by cannibalizing existing units. All of these factors cause inherent problems for system effectiveness and reliability. The estimate is based on a previous analysis and plan developed for this replacement, which includes craft labor and materials for project completion.

*Permanent Vehicle Inspection Station (Post-10) (funding request FY 2018):* This station would replace the current station with a facility to include vehicle cover. The current facility consists of a trailer and a portable post, which were initially intended to be temporary structures but have been made permanent.

*Pro-Force Consolidated Facility (TA-16) (funding request FY 2019):* This facility would be constructed to centralize Pro-Force activities and allow for more versatility and efficiency in providing on-shift training. The replacement facility would improve the facilitation of on-shift and off-shift training, reducing time associated with officer rotation and transition. The indoor range and the tactical training facility are currently located at TA-16.

*Replacement Badge Office (funding request FY 2019):* Replace the current Laboratory badge office with a facility

outside of the East Jemez Road Vehicle Access Portal (VAP) containment area.

*Security Office Building (funding request FY 2020–22):* This project addresses the construction of a secure office building of ~13,000 ft<sup>2</sup>, with accommodations for 50–60 staff members at TA-3. The new building would replace seven outdated transportable buildings adjacent to Building 03-0440 and house the staff that currently occupies the existing transportable offices. The proposed site requires no major utility or site work and will use existing adjacent parking. The new facility will enhance work efficiencies, provide appropriate work areas, and be constructed to current DOE standards for energy use and sustainability.

*Post-116 Upgrades (funding request FY 2019–20):* This project will renovate Post-116 to provide more efficient operation, replace outdated systems, and install a new Argus capability. The primary scope includes (1) renovation of Post-118 to accommodate PF-4 access while P116 is being renovated; (2) renovation of Post-116 to include replacement of most existing systems, installation of x-ray systems, SNM monitors, Positive Personnel Identification and Verification booths, Argus compatibility, and explosives detectors; (3) cosmetic repairs to the internal guard booth, life safety upgrades, and other minor improvements; (4) development of security infrastructure to include the installation of Argus field panels (AFPs), redundant signal wire, secondary alarm station at TA-55/PF-142, and the installation of Argus compatible readers at the TA-55 muster area; and (5) development of redundant power from TA-55/PF-142 to Post-116. This upgrade will make Post-116 equipment fully compatible with all of the upgrades currently occurring as a part of the NMSSUP II project.

*PF-4 Compartmentation (funding request FY 2018–20):* This project will provide Argus-based compartmented security to the PF-4 laboratory area. The initial plan creates 20 security compartments based on material balance areas in PF-4. The work scope includes (1) development of an AFP complex in rooms 181 and 181a at PF-3: the 13 AFP complexes will be installed with redundant power, additional cooling, and communication to both the secondary alarm system (SAS) and central alarm system (CAS) (a project assumption is that infrastructure to the SAS and CAS will be available through a separate project); (2) installation of all physical conduit and wiring infrastructure inside PF-4; (3) replacement of approximately 69 doors with fire rated doors, including egress/security hardware and various mechanical modifications to maintain proper air/pressure balance; (4) installation of remote access panels (RAPs) on both sides of each impacted door; and (5) development of new software to support the PF-4 compartment concept.

*Electromagnetic Pulse (EMP) (funding request FY 2019–20):* This project will address the fabrication of protective filters to shield sensitive equipment from electromagnetic pulse attacks from malicious, industrial, or natural causes. The EMP project will provide protection to vital security equipment from short- and medium-length electromagnetic pulses. The scope of this effort will include the design, development, testing, parts procurement, and fabrication of 130 passive filters. After several units have been successfully tested, they will be placed in service and monitored for several months. After the filters successfully pass this phase of acceptance, the filters will be installed in key electronic equipment at the CASs and SASs. Optional work includes remote monitoring of the filters for attacks and installation of 94 filters in the Perimeter Intrusion Detection Alarm System bed detection system. A class-three estimate is being prepared. This scope is currently estimated at \$5M as an expense-funded project with a current study to cost the work as a capital equipment project.

*Homeland Security Presidential Directive (HSPD)-12 Compliance (Argus) (funding request FY 2018–20):* This project addresses 200 Argus stations based on a preliminary plan, including estimates of craft labor and materials. This plan and estimate are based on the mandated 3-year completion deadline. The estimate is based on NA-70 guidance that the Argus equipment (RAPs, AFPs, etc.) is to be provided by the LLNL Argus depot at no cost to the Laboratory.

*HSPD-12 Compliance (Apollo) (funding request FY 2018–20):* This project addresses labor, equipment, and material costs to convert approximately 1200 Apollo access points. The estimate is based on a preliminary plan and analysis, including gross estimates of craft labor and materials. This plan is based on the mandated 3-year completion deadline. Argus stations are not included.

#### LONG TERM (FY 2024-38)

If it is assumed that priority security and safeguards projects are funded in the near term, the Laboratory's security program will be positioned to more efficiently and effectively protect the security CAT-I assets on the Pajarito corridor, which are critical facilities within the core TA-3 area, as well as protect the Laboratory population. Enhancements should allow for the protection of CAT-I material with minimal Pro-Force manpower and minimal recurring physical and system maintenance costs over the long term. Furthermore, proposed reductions to security area footprints and system upgrades necessary for compliance with Argus and HSPD-12 requirements should enable efficient and effective protection of classified matter with minimal physical and system maintenance costs in the long term.

## ACRONYMS

AFP	Argus Field Panel	FCI	Facility Condition Index
AOC	Area of Concern	FDP	Facility Disposition Program
ASC	Advanced Simulation & Computing Campaign	FEMP	Federal Energy Management Plan
BIA	Bureau of Indian Affairs	FIMS	Facilities Information Management System
BSL	Biological Science Laboratory	FIRP	Facilities and Infrastructure Recapitalization Program
BTF	Beryllium Technology Facility	FIT	Facility and Infrastructure Transformation
CAS	Central Alarm System	FY	Fiscal Year
CAT	Category	FYNISP	Future Years Nuclear Security Program
CBI	Capability-Based Infrastructure	GHG	Greenhouse Gas
CD	Critical Decision	GSF	Gross Square Feet
CGTG	Combustion Gas Turbine Generator	HE	High Explosives
CINT	Center for Integrated Nanotechnologies	HPC	High-Performance Computing
CMR	Chemistry and Metallurgy Research	HPSB	High Performance Sustainable Building
CMRR	Chemistry and Metallurgy Research Replacement (Project)	HSPD	Homeland Security Presidential Directive
CMRR-NF	Chemistry and Metallurgy Research Replacement Nuclear Facility (Project)	HVAC	Heating, Ventilation, and Air Conditioning
CP	Counterproliferation	IAEA	International Atomic Energy Agency
CPIBP	Corporate Physical Infrastructure Business Plan	IN	Office of Intelligence
CT	Counterterrorism	ISO	International Organization for Standardization
DARHT	Dual-Axis Radiographic Hydrodynamic Test (Facility)	kV	Kilovolt
DHS	Department of Homeland Security	LACES	Los Alamos County Eco Station
DIMP	Distribution Integrity Management Plan	LANS	Los Alamos National Security, LLC
DM	Deferred Maintenance	LANSCE	Los Alamos Neutron Science Center
DoD	Department of Defense	LEED	Leadership in Energy and Environmental Design
DOE	Department of Energy	LEP	Life Extension Program
DOI	Department of the Interior	LINAC RM	Linear Accelerator Risk Mitigation
DOS	Department of State	LLNL	Lawrence Livermore National Laboratory
DOT	Department of Transportation	LTS	Long-Term Environmental Stewardship Program
DP	Defense Program	LTSS	Long-Term Environmental Stewardship and Sustainability Strategy
EI	Enterprise Infrastructure	M&O	Management and Operating (contractor)
EM	Environmental Management	MaRIE	Matter-Radiation Interactions In Extremes
EMP	Electromagnetic Pulse	MC	Mission Critical
EMS	Environmental Management System	MD	Mission Dependent
ESPC	Energy Savings Performance Contract	MDA	Material Disposal Area
F&I	Facilities and Infrastructure		

MeV	Million Electron Volt	REC	Renewable Energy Credit
MSL	Materials Science Laboratory	RLUOB	Radiological Laboratory Utility and Office Building
MW	Megawatt		
MVA	Megavolt Ampere	RLWTF	Radioactive Liquid Waste Treatment Facility
NCP/T	Nuclear Counter-Proliferation/Terrorism (Facility)	ROD	Record of Decision
NE	Office of Nuclear Energy	ROI	Return of Investment
NHMFL	National High Magnetic Field Laboratory	S&M	surveillance and maintenance
		S&S	Safeguards and Security
NMD	Non-Mission Dependent	SAS	Secondary Alarm System
NMED	New Mexico Environment Department	SC	Office of Science
NMSSUP	Nuclear Materials Safeguards and Security Upgrades Project	SCIF	Sensitive Compartmented Information Facility
NNSA	National Nuclear Security Administration	SERF	Sanitary Effluent Reclamation Facility
		SNM	Special Nuclear Material
NPDES	National Pollutant Discharge Elimination System	SSPP	Strategic Sustainability Performance Plan
NPR	Nuclear Posture Review	ST&E	Science, Technology, and Engineering
NPS	National Park Service	START	Strategic Arms Reduction Treaty
NRMM	New Requirements & Major Maintenance	SVE	Soil Vapor Extraction
NSE	National Security Enterprise	SWMU	Solid Waste Management Unit
NSSB	National Security Sciences Building	SWWS	Sanitary Waste Water System
OMB	Office of Management and Budget	TA	Technical Area
PF	Plutonium Facility	TRP	TA-55 Reinvestment Project
PNM	Public Service Company of New Mexico	TRU	Transuranic
		TYSP	Ten-Year Site Plan
QMU	Quantification of Margins and Uncertainties	U.S.	United States
		VAP	Vehicle Access Portal
R&D	Research and Development	WETF	Weapons Engineering Tritium Facility
RAMP	Roof Asset Management Program	WIPP	Waste Isolation Pilot Plant
RAP	Remote Access Panel	WME	Weapons of Mass Effect

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