

Draft
Site-Wide Environmental Impact
Statement for Continued Operation of
Los Alamos National Laboratory

January 2025



U.S. Department of Energy
National Nuclear Security Administration
Los Alamos National Laboratory

Summary

SUMMARY

COVER SHEET

RESPONSIBLE FEDERAL AGENCY: U.S. Department of Energy (DOE)/National Nuclear Security Administration (NNSA)

TITLE: Draft Site-Wide Environmental Impact Statement for Continued Operation of the Los Alamos National Laboratory (LANL SWEIS) (DOE/EIS-0552)

LOCATION: Los Alamos, New Mexico

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Abstract: Los Alamos National Laboratory (Laboratory or LANL) supports several NNSA missions, including enhancing U.S. national security through the military application of nuclear energy; maintaining and enhancing the safety, reliability, and effectiveness of the U.S. nuclear weapons; promoting international nuclear safety and nonproliferation; reducing global danger from weapons of mass destruction; and supporting U.S. leadership in science and technology. The continued operation of the Laboratory includes the DOE Office of Environmental Management (DOE-EM) legacy cleanup efforts at the LANL.

This SWEIS analyzes the potential environmental impacts of the reasonable alternatives for continuing LANL operations for approximately the next 15 years and has been prepared in accordance with Section 102(2)(C) of NEPA (42 U.S.C. §§ 4321–4336(e), as amended), regulations promulgated by the Council on Environmental Quality (40 Code of Federal Regulations [CFR] Parts 1500–1508, effective May 20, 2022), DOE’s NEPA implementing procedures (10 CFR Part 1021), and NNSA Policy 451.1. The regulations (40 CFR 1502.7) state “... proposals of unusual scope or complexity, shall be 300 pages or fewer ...” A page is 500 words and does not include explanatory maps, diagrams, graphs, tables, and other means of graphically displaying quantitative or geospatial information (40 CFR 1508.1(v)). **Per the definition of a page, this Draft SWEIS is approximately 285 pages.**

This LANL SWEIS analyzes three alternatives: (1) No-Action, (2) Modernized Operations, and (3) Expanded Operations. Under the No-Action Alternative, NNSA would continue current facility operations throughout LANL in support of assigned missions. The No-Action Alternative activities have previously completed NEPA reviews and include construction of new facilities; modernization, upgrade, and utility projects; and decontamination, decommissioning, and demolition (DD&D) of excess and aging facilities. The No-Action Alternative includes the continued legacy cleanup and environmental remediation. The alternative includes 87 new projects, totaling almost 1.5 million

square feet. Under the No-Action Alternative, NNSA would implement 11 projects involving facility upgrades, utilities, and infrastructure, affecting about 216 acres of the LANL site, and about 1.6 million square feet of excess or aging facilities would undergo DD&D. It also includes changes in operations, examples of which include increased plutonium pit production and the remediation of a hexavalent chromium plume in Mortandad Canyon.

The Modernized Operations Alternative includes the scope of the No-Action Alternative plus additional modernization activities, including (1) construction of replacement facilities; (2) upgrades to existing facilities, utilities, and infrastructure; and (3) DD&D projects. Under Modernized Operations, NNSA would replace facilities that are approaching their end of life, upgrade facilities to extend their lifetimes, and improve work environments to enable NNSA to meet operational requirements. The alternative also includes proposed projects to reduce greenhouse gases and other emissions. The Modernized Operations Alternative includes 139 new projects, totaling over 3.4 million square feet. Under the Modernized Operations Alternative, NNSA would implement 27 projects involving facility upgrades, utilities, and infrastructure, affecting about 925 acres (more than 40 million square feet) of the LANL site. Of this 925 acres, up to 795 acres are proposed for installation of up to 159 megawatts of solar photovoltaic arrays across the site. Over 1.2 million square feet of excess or aging facilities would undergo DD&D.

The Expanded Operations Alternative includes the actions proposed under the Modernized Operations Alternative plus actions that would expand operations and missions to respond to future national security challenges and meet increasing requirements. This alternative includes construction and operation of new facilities that would expand capabilities at LANL beyond those that currently exist. The Expanded Operations Alternative includes 18 new projects, totaling about 947,000 square feet. NNSA would implement four projects involving utilities and infrastructure affecting about 46 acres of the LANL site. The Expanded Operations Alternative also includes changes in operations, examples of which include revised wildland fire risk reduction treatments and management of feral cattle.

Decisions about future operations at the Laboratory will be provided in an NNSA Record of Decision published in the *Federal Register*, which will be issued no sooner than 30 days after the U.S. Environmental Protection Agency publishes its Notice of Availability (NOA) in the *Federal Register* of the Final LANL SWEIS.

Public Comments: DOE issued a Notice of Intent in the *Federal Register* (87 FR 51083) on August 19, 2022, announcing a 45-day SWEIS scoping period to receive input on the preparation of this Draft SWEIS. In response to comments, NNSA extended that comment period until October 18, 2022. Comments received during that scoping period were considered in the preparation of this Draft SWEIS. Comments on this Draft SWEIS will be accepted following publication of the U.S. Environmental Protection Agency's NOA in the *Federal Register* for a period of 60 days and will be considered in the preparation of the Final SWEIS. Any comments received after the comment period will be considered to the extent practicable. During the public comment period for this Draft SWEIS, NNSA will hold in-person and online public hearings. The dates and times of those public hearings will be announced on the DOE NEPA web page and the NNSA NEPA Reading Room (<https://www.energy.gov/nepa>, <https://www.energy.gov/nnsa/nnsa-nepa-reading-room>), as well as in local newspapers, and in *Federal Register Notices of Availability*.

CONTENTS

SUMMARY	S-1
S.1 Introduction and Purpose and Need for Agency Action	S-1
S.1.1 Introduction.....	S-1
S.1.2 Background.....	S-1
S.1.3 Purpose and Need for Agency Action	S-4
S.1.4 Scope and Alternatives in this Site-Wide Environmental Impact Statement	S-6
S.1.5 Public Involvement	S-6
S.2 Proposed Action and Alternatives.....	S-7
S.2.1 Introduction and Development of the SWEIS Alternatives	S-7
S.2.2 No-Action Alternative	S-8
S.2.3 Modernized Operations Alternative.....	S-10
S.2.4 Expanded Operations Alternative	S-11
S.2.5 Analytical Parameters for the Alternatives.....	S-12
S.2.6 Alternatives Considered but Eliminated from Detailed Study	S-13
S.2.7 Preferred Alternative.....	S-13
S.3 Environmental Consequences	S-13
S.3.1 Introduction.....	S-13
S.3.2 Comparison of Environmental Consequences of the Alternatives	S-14
S.4 References	S-31

LIST OF FIGURES

Figure S.1-1 Location of the Los Alamos National Laboratory Site.....	S-3
Figure S.1-2 Identification and Location of Technical Areas and Planning Areas Comprising the Los Alamos National Laboratory	S-4
Figure S.2-1 Level of Operations for the LANL Alternatives	S-8

LIST OF TABLES

Table S.2-1 Summary of Construction and DD&D – No-Action Alternative.....	S-10
Table S.2-2 Summary of Construction and DD&D – Modernized Operations Alternative..	S-11
Table S.2-3 Summary of Construction and DD&D – Expanded Operations Alternative.....	S-12
Table S.3-1 General Regions of Influence for the Environmental Resources.....	S-14
Table S.3-2 Comparison of Environmental Consequences	S-15
Table S.3-3 Summary of Consequences Related to Infrastructure.....	S-27
Table S.3-4 Summary of Accident Risks Applicable to All Alternatives	S-28
Table S.3-5 Summary of Impacts from Potential Site-Wide Events	S-29

ACRONYMS AND ABBREVIATIONS

BLM	U.S. Bureau of Land Management
BSL	biosafety level
C&D	construction and demolition
Ci	curie
CFR	Code of Federal Regulations
CGTG	combustion gas turbine generator
CMP	Campus Master Plan
CMR	Chemistry and Metallurgy Research
CT EIS	<i>Environmental Impact Statement for the Conveyance and Transfer of Certain Land Tracts Administered by the U.S. Department of Energy and Located at the Los Alamos National Laboratory, Los Alamos and Santa Fe Counties, New Mexico</i>
DARHT	Dual Axis Radiographic Hydrodynamic Test
DD&D	decontamination, decommissioning, and demolition
DMMSC	Dynamic Mesoscale Materials Science Capability
DoD	U.S. Department of Defense
DOE	U.S. Department of Energy
DOE-EM	DOE Office of Environmental Management
EA	environmental assessment
EIS	environmental impact statement
EPA	U.S. Environmental Protection Agency
EPCU	Electric Power Capacity Upgrade
FFRDC	Federally Funded Research and Development Center
FSI	Future Supercomputing Infrastructure
FTWC	Flanged Tritium Waste Container
GHG	greenhouse gas
GMAP	gaseous mixed activation products
HC	Hazard Category
HE	high-explosives
HPC	high-performance computing
kW-hr	kilowatt-hour
LANL	Los Alamos National Laboratory
LANSCE	Los Alamos Neutron Science Center
LCF	latent cancer fatality
LLW	low-level radioactive waste
M&O	Management and Operating
MDA	material disposal area
MEI	maximally exposed individual
MFP	mixed fission products
MGY	million gallons per year
MLLW	mixed low-level radioactive waste
MOX	mixed-oxide
MT	metric ton
MW	megawatt
NAA	No-Action Alternative

NEEWC	National Energetic and Engineering Weapons Complex
NEPA	National Environmental Policy Act
NMED	New Mexico Environment Department
NNSA	National Nuclear Security Administration
NNSS	Nevada Nuclear Security Site
NOA	Notice of Availability
NPDES	National Pollutant Discharge Elimination System
NPR	Nuclear Posture Review
NSE	Nuclear Security Enterprise
OB/OD	open burning/open detonation
PV	photovoltaic
P/VAP	particulate/vapor activation product
R&D	research and development
RLWTF	Radioactive Liquid Waste Treatment Facility
ROD	Record of Decision
SDC	Seismic Design Category
SERF	Sanitary Effluent Reclamation Facility
SFNF	Santa Fe National Forest
SNM	special nuclear material
SWEIS	site-wide environmental impact statement
TA	technical area
TRU	transuranic (waste)
TWF	TRU Waste Facility
UAS	unmanned aircraft system
U.S.C.	United States Code
USFWS	U.S. Fish and Wildlife Service
VRM	visual resource management
WETF	Weapons Engineering Tritium Facility
WIPP	Waste Isolation Pilot Plant
WTF	water treatment facility

SUMMARY

S.1 Introduction and Purpose and Need for Agency Action

This summary concisely presents information from the *Site-Wide Environmental Impact Statement for Continued Operation of Los Alamos National Laboratory* (DOE/EIS-0552) (LANL SWEIS or SWEIS). The information includes the purpose and need for agency action (Section S.1.3), a description of the alternatives considered (Section S.2), the environmental resource areas evaluated (Section S.3.1), and a comparison of the potential consequences by resource area for each alternative (Section S.3.2).

S.1.1 Introduction

The Los Alamos National Laboratory (Laboratory or LANL) is a Federally Funded Research and Development Center (FFRDC) sponsored by the National Nuclear Security Administration (NNSA). FFRDC sites are owned by the Federal Government but operated by contractors and provide federal agencies with research and development (R&D) capabilities that could not otherwise be met effectively by the Federal Government or the private sector alone. The continued operation of the Laboratory is critical to NNSA's primary missions of maintaining the U.S. nuclear stockpile, nonproliferation, and counterterrorism and counterproliferation.

NNSA has prepared this SWEIS in accordance with the *National Environmental Policy Act of 1969* (42 U.S.C. §§ 4321–43435(e) NEPA), to analyze the potential environmental impacts of the continued operation of the Laboratory. NNSA prepared the previous SWEIS for LANL in 2008 (NNSA 2008).

NNSA seeks comment on this Draft SWEIS from the public, tribal and local governments, other federal agencies, and interested stakeholders. This input will allow NNSA to make appropriate adjustments prior to publishing a Final SWEIS. Following completion of a Final SWEIS, NNSA will issue a Record of Decision (ROD), which will state NNSA's decision and identify alternatives considered in reaching its decision, specifying the alternative or alternatives considered environmentally preferable. NNSA may discuss preferences among alternatives based on relevant factors including economic and technical considerations and NNSA's statutory missions. In the ROD, NNSA will state whether it has adopted all practicable means to avoid or minimize environmental harm from the alternative selected, and if not, why not. NNSA will adopt and summarize, where applicable, a monitoring and enforcement program for any enforceable mitigation requirements or commitments. This monitoring and enforcement program likely would include a revision to the existing Mitigation Action Plan (DOE 2020).

S.1.2 Background

The U.S. Government has owned the LANL site since 1943, and over time the Laboratory has been operated by three different Management and Operating (M&O) contractors. Triad National Security, LLC (Triad) has been the M&O contractor for the Laboratory since November 1, 2018. Whereas at the time of the 2008 LANL SWEIS, the Laboratory employed about 13,500 people and had an annual budget of about \$2 billion, the Laboratory now employs more than 15,000 people (federal staff, contractors, subcontractors) and has an annual budget of over \$4 billion.

In addition to its work supporting NNSA missions, the Laboratory conducts other important work for DOE and in partnership with other federal and non-federal entities, including significant work in support of DOE's Office of Science. The Laboratory is host to national user facilities such as

the Los Alamos Neutron Science Center (LANSCE), including one of the nation's most powerful linear accelerators, and the National High Magnetic Field Laboratory. (See Chapter 2 of the SWEIS for a summary of the Laboratory's missions.)

In 2015, DOE's Office of Environmental Management (DOE-EM) was assigned the mission to safely, efficiently, and with full transparency complete the cleanup of legacy contamination and waste resulting from nuclear weapons development and government-sponsored nuclear research at LANL. These environmental remediation activities were analyzed in Appendix I of the *Final Site-Wide Environmental Impact Statement for Continued Operation of Los Alamos National Laboratory, Los Alamos, New Mexico* (2008 LANL SWEIS) (NNSA 2008). The DOE-EM mission at LANL continues today.

The LANL site is located in northern New Mexico, largely within incorporated Los Alamos County and, in part, Santa Fe County, and adjacent to a segment of Sandoval County (Figure S.1-1). Although the Laboratory has locations in Santa Fe, the main Laboratory campus is located approximately 40 road-miles from the city of Santa Fe.

LANL occupies about 40 square miles (26,058 acres) of land on the eastern flank of the Jemez Mountains along the area known as the Pajarito Plateau (LANL 2024). LANL operations are conducted within numerous facilities located in 50 designated technical areas (TAs), which include other noncontiguous properties situated near LANL.

Figure S.1-2 includes color coding to reflect the different planning areas identified in this SWEIS. The planning areas are defined and described in Section S.2.1.

Most of the LANL site area is undeveloped grassland, shrubland, woodland, and forest that serve to provide a buffer for security and safety, and space for future development and expansion. As of the end of 2022, LANL's facilities comprised 8.2 million square feet of laboratory, production, administrative, storage, service, and miscellaneous space; the total space available for operational use changes frequently as structures are demolished or built at LANL (LANL 2024).

This LANL SWEIS describes facilities and activities on a mission basis and organizes the description of the alternatives consistent with the planning areas identified in the Laboratory's *Campus Master Plan* (CMP) (LANL 2021, 2022). The CMP and associated planning processes provide the framework for facility and infrastructure development to make sure that the Laboratory can meet future national security challenges. The planning areas are utilized in this SWEIS to facilitate analysis of environmental impacts across the Laboratory. More details about the CMP, planning areas, and future development at LANL are provided in Section S.2.1.

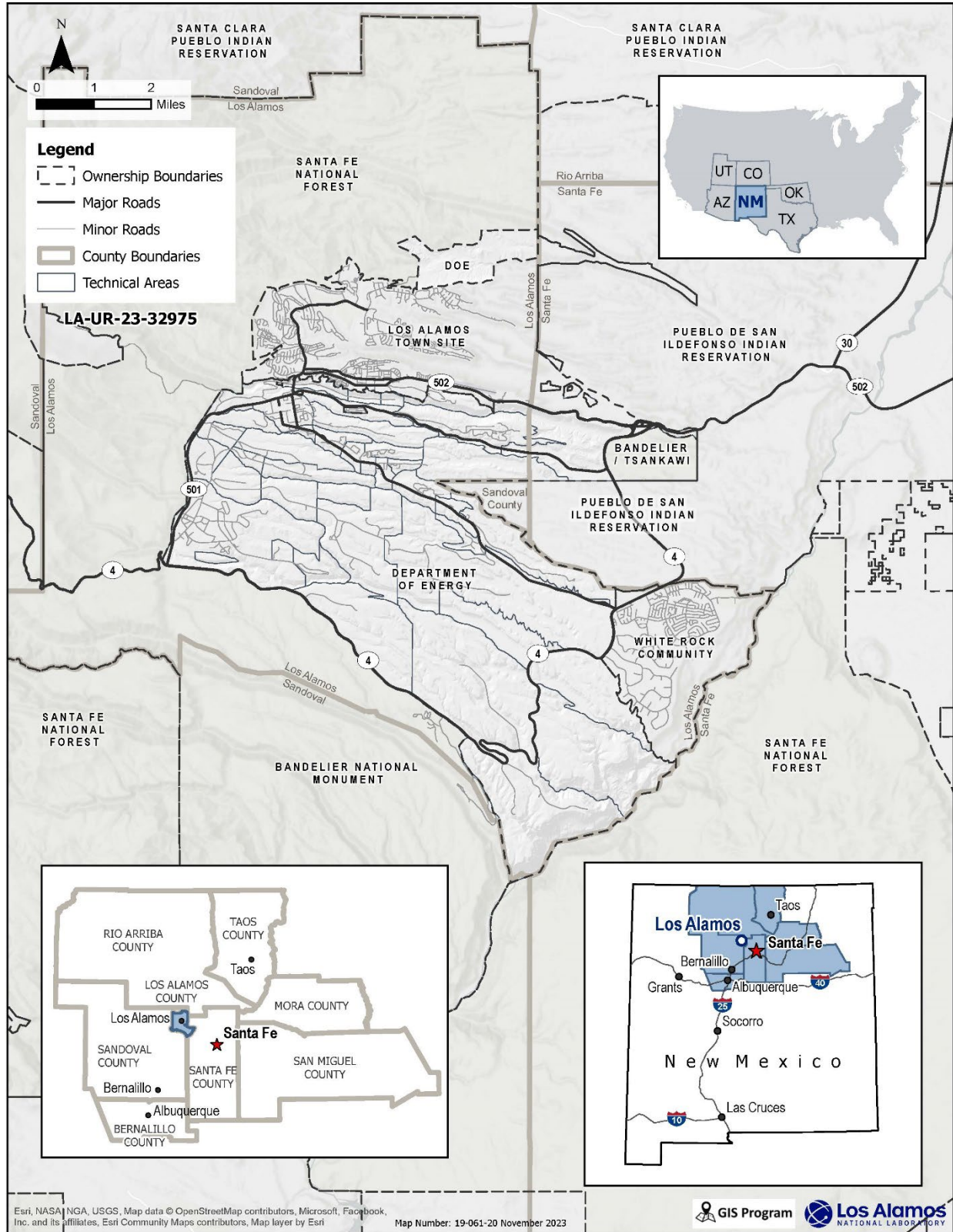


Figure S.1-1 Location of the Los Alamos National Laboratory Site

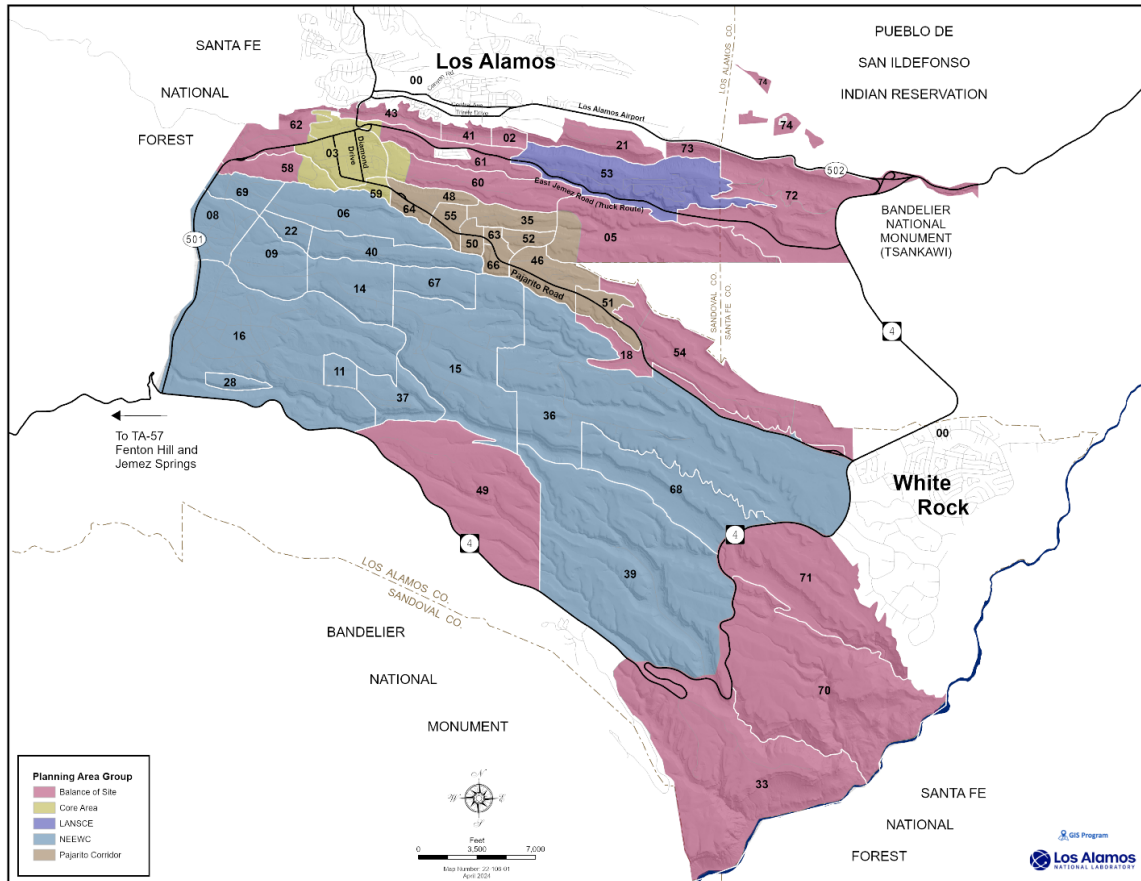


Figure S.1-2 Identification and Location of Technical Areas and Planning Areas Comprising the Los Alamos National Laboratory

The Laboratory has almost 900 individual facilities, including nuclear and radiological facilities. Nuclear and radiological facilities are identified by a hazard category (HC), which relates to the potential consequences of an accident event (10 Code of Federal Regulations [CFR] Part 830). At the Laboratory, there are no HC-1 nuclear facilities, which are the type of nuclear facilities with the potential for significant offsite consequences. Rather, the nuclear facilities at LANL are either HC-2 or HC-3 (LANL 2018). Hazard categories are defined in the Glossary (Chapter 9 of the SWEIS). Facilities that handle less than HC-3 threshold quantities of radioactive materials but require identification of “radiological areas” under 10 CFR Part 835 are designated as radiological facilities. All facilities are evaluated in this SWEIS. The Laboratory also includes accelerator facilities, which are operated in accordance with DOE Order 420.2D, “Safety of Accelerators.”

S.1.3 Purpose and Need for Agency Action

NNSA proposes to continue managing the Laboratory and its resources in a manner that meets evolving national security missions and that responds to the concerns of affected and interested individuals and agencies. This SWEIS analyzes the environmental impacts of three alternatives for the continued operation of LANL.

The purpose of the continued operation of the Laboratory has not changed since issuance of the 2008 LANL SWEIS and continues to be to provide support for DOE/NNSA’s core missions as

directed by Congress and the President. NNSA's need to continue operating the Laboratory is focused on its obligation to ensure a safe and reliable nuclear stockpile and fulfillment of agency missions. For the foreseeable future, NNSA, on behalf of the U.S. Government, will need to continue its nuclear weapons R&D, surveillance, computational analysis, components manufacturing, and nonnuclear aboveground experimentation. Currently, many of these activities are conducted solely at the Laboratory. A curtailment or cessation of these activities would run counter to national security policy as established by Congress and the President.

The Laboratory plays vital roles in NNSA missions, including enhancing U.S. national security through the military application of nuclear energy; maintaining and enhancing the safety, reliability, and effectiveness of the U.S. nuclear weapons stockpile, including the ability to design, produce, and test, in order to meet national security requirements; promoting international nuclear safety and nonproliferation; reducing global danger from weapons of mass destruction; and supporting U.S. leadership in science and technology.

The continued operation of the Laboratory includes DOE's execution of legacy cleanup efforts at the LANL site. The current *Compliance Order on Consent between the State of New Mexico Environment Department (NMED) and the DOE* (Consent Order) is the principal regulatory driver for legacy waste cleanup at LANL.¹

S.1.3.1 Other LANL Program Considerations and Needs

The NNSA is charged with supporting U.S. leadership in science and technology. Funded by a broad contingent of the scientific community—including NNSA, the DOE Office of Science, academic and industry partners, and Laboratory Directed Research and Development investments—basic science ensures that the Laboratory's research capabilities remain at the cutting edge and that LANL scientists and engineers are prepared to solve critical challenges. As discussed in Chapter 2 of the SWEIS, the Laboratory works in many areas, such as counterterrorism, energy security and long-term energy needs, advancing bioscience and biosecurity, and breakthroughs in fundamental sciences and applied technology. Additionally, the Laboratory supports other government organizations, the advancement of science, and industry through the transfer of technology. These missions require infrastructure investments.

As shown on Figure 1.3-1 in Chapter 1 of the SWEIS, approximately 30 percent of LANL facilities are more than 60 years old, and approximately 56 percent are more than 50 years old. About 40 percent of the Laboratory's assets (buildings and trailers) are considered to be in poor or very poor condition (LANL 2022). Older buildings are less efficient and require more maintenance, including utility replacements and other large-scale refurbishments that are weighed against replacement with newer, more efficient, and better-designed buildings. Although the Laboratory maintains these facilities and conducts operations safely with appropriate environmental and safety controls, there is a need to both maintain and reinvest in a modern infrastructure for the future.

¹ The *Compliance Order on Consent between the State of New Mexico Environment Department (NMED) and the DOE* (Consent Order) defines a process to establish annual milestones to achieve desired remediation end states. Information on the current Consent Order and Settlement Agreement can be found at: <https://www.env.nm.gov/wp-content/uploads/sites/12/2016/05/LANL-Consent-Order-June-2016.pdf> and at <https://www.env.nm.gov/hazardous-waste/wp-content/uploads/sites/10/2024/09/NzcxOWIxNWEzOWE1OTZiMjcxNTcwNTY1YV8xNjc5MzE.pdf>

S.1.4 Scope and Alternatives in this Site-Wide Environmental Impact Statement

This SWEIS analyzes three alternatives: (1) No-Action Alternative, (2) Modernized Operations Alternative, and (3) Expanded Operations Alternative. A general overview of these alternatives is presented below, and Section S.2 provides a listing of the projects, activities, and operational changes associated with each alternative.

The No-Action Alternative would continue current operations throughout the Laboratory that support current missions and includes ongoing operations and, for currently assigned mission scope: (1) construction of minor replacement facilities; (2) upgrades to existing facilities and utility/infrastructure projects; (3) environmental remediation, (4) decontamination, decommissioning, and demolition (DD&D) activities; and (5) management and disposition of wastes (e.g., radioactive and hazardous waste) currently existing or newly generated from previously analyzed programs/activities.

The programmatic context for the Modernized Operations Alternative is the strengthened support of existing programs and activities by modernizing facilities, as necessary. This alternative includes the scope of the No-Action Alternative, plus additional modernization activities and DD&D. Under this alternative, NNSA would replace facilities that are approaching their end of life, upgrade facilities to extend their lifetimes or improve their performance, and improve work environments to enable the Laboratory to improve efficiencies while still meeting operational requirements. Although this alternative involves additional new construction, proposals would not expand capabilities and operations at the Laboratory beyond those that currently exist.

The Expanded Operations Alternative includes the actions proposed in the Modernized Operations Alternative, plus actions that would enable expanded operations and missions to respond to future national security challenges and meet increasing requirements. This alternative would expand capabilities at the Laboratory beyond those that currently exist.

S.1.5 Public Involvement

The NEPA process includes two opportunities during which DOE/NNSA specifically requests public involvement: the scoping process and the public comment period for the Draft SWEIS. On August 19, 2022, NNSA published a Notice of Intent to prepare the LANL SWEIS (87 FR 51083) and announced a 45-day SWEIS scoping period that was extended until October 18, 2022.

NNSA held online public scoping meetings on September 13 and 14, 2022, to discuss the SWEIS and to receive comments on the potential scope. In addition to the online scoping meetings, NNSA provided other methods (i.e., email or postal mail) for submitting comments on the SWEIS scope. A summary of the scoping comments, including an indication of how NNSA considered the comments, along with a more detailed discussion of the public scoping process, is provided in Appendix B of the SWEIS.

This Draft SWEIS is subject to public review and a comment period, which will not be less than 45 days, and begins with the U.S. Environmental Protection Agency's (EPA's) publication of the Notice of Availability (NOA) for this Draft SWEIS in the *Federal Register*. During the public comment period, NNSA will hold at least one public hearing (and may hold more than one public hearing), which will be announced at least 15 days in advance on the NNSA NEPA Reading Room website (<https://www.energy.gov/nnsa/nnsa-nepa-reading-room>), in local New Mexico newspapers, in a notice sent via the GovDelivery mailing list, in letters and meetings with local tribes and pueblos, and via a *Federal Register* NOA. NNSA will consider all comments received

during that public comment period in preparing the Final SWEIS and will append or otherwise publish all substantive comments received on the Draft SWEIS, or summaries thereof if the number of comments is exceptionally voluminous. After an NOA for the Final SWEIS is published in the *Federal Register*, there is a 30-day waiting period before NNSA may issue a ROD.

S.2 Proposed Action and Alternatives

S.2.1 Introduction and Development of the SWEIS Alternatives

This section briefly describes the three alternatives that NNSA is evaluating for continued operation of LANL. To evaluate the potential environmental impacts, NNSA developed construction and operational parameters for each alternative (e.g., land disturbed, waste generated) (*see* Section S.2.5). As identified in Section S.1.2, the CMP provides a basis for the alternatives considered in this SWEIS

Campus Master Plan. In September 2021, LANL published the 2021 CMP (LANL 2021), which was the Laboratory's first comprehensive site plan in more than 20 years. In addition to providing the framework for facility and infrastructure development, the CMP established an integrated, site-wide process for ongoing collaborative planning efforts.

The CMP divides LANL into the following five planning areas, as discussed in Chapter 3; Section 3.1 in the SWEIS:

- The Core Area
- The Pajarito Corridor Area
- The NEEWC Area
- The LANSCE Area
- Balance of Site Area

SWEIS Alternatives Overview. As described in Section S.1.4, the alternatives build on each other, starting with the No-Action Alternative, which reflects the use of existing facilities to continue current operations plus the construction and operation of new facilities, implementation of facility upgrades and utility/infrastructure projects, and DD&D of excess and aging facilities. The two action alternatives include the actions described for the No-Action Alternative, as well as additional actions which are listed in Sections S.2.3 and S.2.4.

Figure S.2-1 provides a high-level illustration of the comparative level of operations for the three alternatives. The analysis in this LANL SWEIS considers ongoing activities and proposed activities that could occur over approximately the next 15 years (2024–2038).

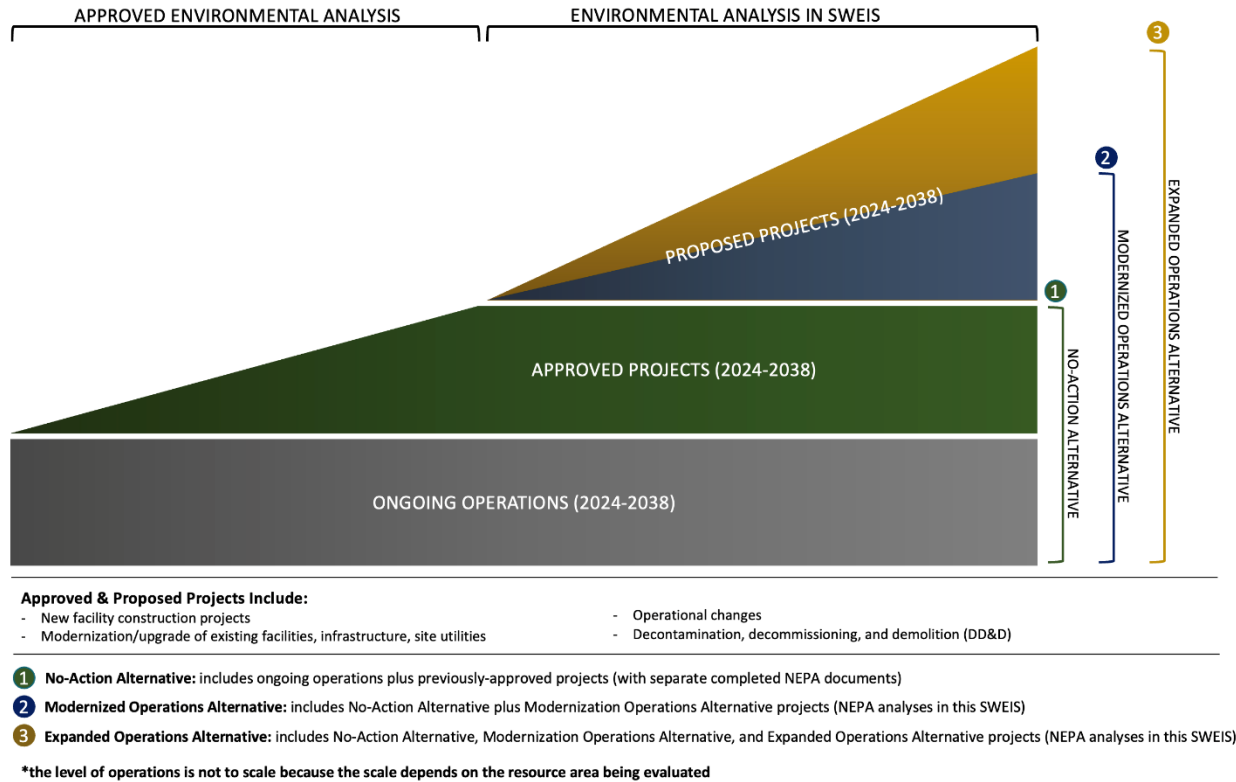


Figure S.2-1 Level of Operations for the LANL Alternatives

S.2.2 No-Action Alternative

The No-Action Alternative reflects continuation of current, ongoing operations and implementation of approved projects (those with current, or in-process, NEPA coverage). One example of an approved action based on an earlier NEPA document is NNSA’s 2020 decision to implement elements of the Expanded Operations Alternative from the 2008 LANL SWEIS as needed to produce a minimum of 30 war reserve plutonium pits per year for the national pit production mission and to implement surge efforts to produce up to the analyzed limit to meet the previous and current NPRs (DoD 2018, 2022) and national policy (85 FR 54544, September 2, 2020).

The approved projects to be implemented under the No-Action Alternative include: (1) construction of new facilities; (2) upgrade of existing facilities and infrastructure projects (including utility and transportation projects); and (3) DD&D of excess and aging facilities for which NEPA analysis/documentation already exists or would be completed before publication of a ROD on the Proposed Action presented in this SWEIS. Therefore, as shown on Figure S.2-1, the No-Action Alternative includes a level of operation for LANL greater than ongoing operations. Under the No-Action Alternative, operations would continue at a steady-state into the future, but at a level lower than would be needed to fully support the growing NNSA mission requirements.

S.2.2.1 No-Action Alternative – New Facilities and Upgrade/Infrastructure Projects

Twenty-three new facilities, representing a development footprint of almost 1.5 million square feet (33.8 acres), would be constructed under the No-Action Alternative. Several of these projects represent multiple proposals for similar facilities in different locations. For instance, one “project” includes constructing 22 storage warehouses. This SWEIS combines similar projects to present a

more efficient analysis of potential impacts. In addition the Laboratory would upgrade existing facilities, potentially installing a 10-megawatt (MW) solar PV array and a proposed electric power transmission line, and implement institutional construction laydown areas and site-wide transportation and parking projects. These utility/infrastructure projects have a projected total footprint of about 216 acres, 84 of which will be temporary construction areas (on and off site) that will be restored after construction. The full list of projects included in the No-Action Alternative is presented in Chapter 3, Section 3.2 of the SWEIS.

In addition, DOE would continue actively remediating contaminated areas at LANL under the No-Action Alternative and in accordance with the 2016 Consent Order. The potential impacts of the baseline planning for remediation are included in Chapter 5 of the SWEIS as an element of the No-Action Alternative.

S.2.2.2 No-Action Alternative – Operational Changes

The No-Action Alternative includes changes in current baseline operations that may or may not be associated with construction or upgrade of facilities, utilities, or infrastructure. These are described in more detail in Chapter 3, Section 3.2.4 of the SWEIS. Some examples include:

- **Increased plutonium pit production** to produce a minimum of 30 war reserve plutonium pits per year and to implement surge efforts to produce up to the analyzed limit.
- **Venting of Flanged Tritium Waste Containers (FTWCs)** – The Laboratory and NNSA have been integrating with the EPA and NMED to obtain approval to move forward with the plan to vent the FTWCs currently located in TA-54. The Laboratory maintains a public website to provide updated information about the plan (<https://environment.lanl.gov/resources/ftwc/>)
- **Chromium Interim Measures and Final Remedy** – DOE will implement the proposed action in DOE (2024) and use adaptive site management to select and implement options to remediate the hexavalent chromium contamination in Mortandad and Sandia canyons.
- **Continuation of Land Conveyance and Transfer** of approximately 1,280 acres, which remain to be conveyed from the 1999 Final Environmental Impact Statement for the Conveyance and Transfer of Certain Land Tracts Administered by the U.S. Department of Energy and Located at the Los Alamos National Laboratory (CT EIS; DOE 1999) (LANL 2023).

S.2.2.3 Notable Attributes Associated with the No-Action Alternative

As shown on Table S.2-1, a slight net decrease in facility square footage at LANL is expected under the No-Action Alternative, as projected construction associated with new facilities is slightly smaller than the projected facility DD&D actions. Most new facility construction will occur in the Pajarito Corridor Planning Area. Of the new facilities that are planned for construction, approximately 74 percent (1,081,000 square feet) is associated with warehouses, office buildings, parking structures, and a training and development center. Many of the new facilities are replacements for existing facilities, and operations associated with those replacement facilities would not change substantively compared to existing operations. However, implementation of the increased pit production mission will introduce notable operational changes compared to existing operations. For example, there will be changes in employment, radiological doses to workers and the public, radiological waste quantities, and transportation of nuclear materials/wastes. There will also be an increase in wastes associated with DD&D activities. These DD&D wastes include

construction and demolition debris, radioactive wastes (low-level radioactive waste [LLW], mixed LLW [MLLW], and TRU waste), and hazardous wastes (including asbestos-contaminated wastes).

Table S.2-1 Summary of Construction and DD&D – No-Action Alternative

CMP Planning Area	Construction Footprint (ft ²)	Upgrade/Utility/Infrastructure Footprint (acres)	DD&D Footprint (ft ²)
Core Area	221,000	11.8	1,176,000
Pajarito Corridor	954,400	44	316,000
NEEWC	197,000	62.7	103,000
LANSCE	42,000	1.1	16,000
Balance of Site	57,000	96.8 ^c	19,000
TOTALS	1,471,400 (33.8 acres)	216 acres	1,630,000 (37.4 acres)

DD&D = decontamination, decommissioning, and demolition; LANL = Los Alamos National Laboratory; LANSCE = Los Alamos Neutron Science Center; NEEWC = National Energetic and Engineering Weapons Complex

S.2.3 Modernized Operations Alternative

The Modernized Operations Alternative includes the scope of the No-Action Alternative, as described in Section S.2.2, plus additional modernization activities. The alternative also includes proposed projects to reduce greenhouse gases and other emissions (e.g., a Net-Zero Project, increased implementation of electric vehicle charging stations, and development of up to 795 acres of solar energy facilities). The proposed DD&D of additional facilities under the Modernized Operations Alternative would eliminate excess facilities and reduce costs and risk. The schedule for implementation of the individual projects would be dependent on several factors including, among other things, funding priorities and availability of the proposed land area (e.g., completion of planned DD&D of excess facilities). The full list of projects proposed under the Modernized Operations Alternative is presented in Chapter 3, Section 3.3 of the SWEIS. There are no additional proposed changes in operations identified for this alternative.

S.2.3.1 Notable Attributes Associated with the Modernized Operations Alternative

As shown on Table S.2-2, there would be a net increase in facility square footage at LANL under the Modernized Operations Alternative, as construction actions would exceed DD&D actions. The net effect would be an increase in facilities of over 2.2 million square feet at LANL in addition to that identified for the No-Action Alternative. Most new facility construction would occur in the Core Area and Pajarito Corridor planning areas. Of the new facilities that would be constructed, about 78 percent (over 2.6 million square feet) would be associated with storage warehouses, office buildings, light laboratory/office facilities, and parking structures. In addition to the construction footprint in Table S.2-2 for new facilities, there are proposed utility and infrastructure projects, which include solar PV arrays (a footprint of up to 795 acres), a remote parking area in TA-72 (25 acres), institutional laydown areas (38 acres), Los Alamos Canyon Bridge replacement (11.5 acres), and other site-wide roads and parking (54 acres).

Table S.2-2 Summary of Construction and DD&D – Modernized Operations Alternative

CMP Planning Area	Construction Footprint (ft²)	Upgrade/Utility/ Infrastructure Footprint (acres)	DD&D Footprint (ft²)
Core Area	1,448,500	24.6	544,400
Pajarito Corridor	847,600	82.8	329,900
NEEWC	518,800	463	122,400
LANSCE	184,600	8.5	79,100
Balance of Site	431,000	349	140,000
TOTALS	3,430,500 (79 acres)	up to 928 acres	1,216,000 (27.9 acres)

DD&D = decontamination, decommissioning, and demolition; LANSCE = Los Alamos Neutron Science Center; NEEWC = National Energetic and Engineering Weapons Complex

Because most of the new facilities are replacements for existing facilities, operations associated with the Modernized Operations Alternative would be similar to existing operations at LANL. In most cases, there would not be notable changes in infrastructure requirements, effluents, or hazards at LANL. Depending on the degree of implementation of some renewable energy projects, there could be an overall decrease in the electricity use and air emissions associated with the Modernized Operations Alternative. There would be an increase in wastes associated with DD&D activities. These DD&D wastes would include construction debris, radioactive wastes (LLW and MLLW), and hazardous waste (including asbestos-contaminated wastes). These changes are reflected in the analytical parameters used in the SWEIS (*see* Section S.2.5).

S.2.4 Expanded Operations Alternative

The Expanded Operations Alternative includes the actions proposed under the Modernized Operations Alternative, as described above, plus actions that would expand operations and missions to respond to future national security challenges and meet increasing requirements. This alternative includes construction and operation of new facilities that would expand capabilities at LANL beyond those that currently exist. For example, under the Expanded Operations Alternative NNSA is proposing to construct and operate an additional supercomputing complex that would enable NNSA to expand the capabilities of that program. NNSA also proposes to construct and operate a new x-ray-free electron laser facility in TA-53 to supplement the capabilities of LANSCE. Construction and operational parameters associated with the Expanded Operations Alternative are discussed in Section S.2.5. The full list of projects proposed under the Expanded Operations Alternative is presented in Chapter 3, Section 3.4 of the SWEIS.

S.2.4.1 Expanded Operations Alternative – Operational Changes

The Expanded Operations Alternative includes changes in operations (above those proposed in the No-Action Alternative) that may or may not be associated with construction of facilities, utilities, or infrastructure. These are described in more detail in Chapter 3 of the SWEIS and examples include:

- **Wildland fire risk reduction treatments** to revise fire mitigation treatment standards to minimize wildfire risk on LANL property and promote forest health and resilience.
- **Feral/invasive cattle management** to include live trapping, relocation, and/or lethal control.

S.2.4.2 Notable Attributes Associated with the Expanded Operations Alternative

As shown on Table S.2-3, there would be an increase in facility square footage at LANL under the Expanded Operations Alternative, as there are only construction actions and no DD&D actions. There would be an increase in facilities of about 927,000 square feet above that identified in Table S.2-2 for the Modernized Operations Alternative.

Table S.2-3 Summary of Construction and DD&D – Expanded Operations Alternative

CMP Planning Area	Construction Footprint (ft ²)	Utility and Infrastructure Footprint (ft ²)
Core Area	10,000	590,000
Pajarito Corridor	287,700	7,100
NEEWC	306,800	36,000
LANSCE	197,100	482,000
Balance of Site	125,000	871,000
TOTAL	926,600	1,986,000

DD&D = decontamination, decommissioning, and demolition; LANSCE = Los Alamos Neutron Science Center; NEEWC = National Energetic and Engineering Weapons Complex

Although most operations associated with the Expanded Operations Alternative would be similar to existing operations at LANL, there would be notable increases annual electricity and water requirements. Several proposed facilities would involve nuclear material operations that could increase radiological air emissions, radiological waste quantities, worker and public radiological doses, and hazards at LANL.

S.2.5 Analytical Parameters for the Alternatives

A primary challenge in preparing a site-wide analysis is to address the impacts of the individual projects/actions while also addressing the totality of impacts. To accomplish those dual goals, NNSA defined and accumulated data for each of the projects/actions proposed for each of the alternatives. For each project/action, NNSA consulted with subject matter experts from the Laboratory to quantify key parameters (e.g., land disturbed, waste generated). The accumulated parameters for construction and operations (which include contributions from all proposed projects) are presented in Appendix A of the SWEIS for each of the alternatives (Tables A.3.5-1 and A.3.5-2, respectively). As an example, the accumulated land disturbance ranges from 250 acres for the No-Action Alternative to 1,142 acres for the Expanded Operations Alternative.

This same process was used to develop parameters such as workforce, water use, and waste generation. In some instances, the accumulated parameters are largely driven by the contribution of one or two projects/actions. For example, the increased water and electricity usage at LANL in the future would be primarily associated with cooling water usage for the expanded supercomputing facility and operation of the x-ray free electron laser facility at TA-53. Similarly, for the No-Action Alternative, operational increases would largely result from implementation of the increased pit production mission. As these examples illustrate, in developing the key parameters for the SWEIS analysis, NNSA can account for projects/actions both individually and in totality, and the analysis in this SWEIS addresses each of these aspects.

S.2.6 Alternatives Considered but Eliminated from Detailed Study

NNSA considered public input and comments received during the scoping process in determining the range of alternatives in this Draft LANL SWEIS. NNSA only considered reasonable alternatives that would meet the purpose and need described in Section S.1.3. The following alternatives were considered in developing the Draft SWEIS but were eliminated from detailed analysis because they did not allow LANL to fulfill the NNSA mission requirements. The specific reasons for elimination are provided in Chapter 3, Section 3.6 of the SWEIS.

- Complete closure of LANL
- Transfer of current missions/operations from LANL to other sites
- Conversion of LANL to an academic laboratory and/or an environmental research laboratory
- Relocation of all nuclear materials and nuclear research to another site Reduced operations at LANL
- Shift funding from weapons work to environmental cleanup

S.2.7 Preferred Alternative

Council on Environmental Quality NEPA regulations require that an agency identify its preferred alternative, if one or more exists, in a Draft EIS and identify such an alternative in the Final EIS (40 CFR 1502.14 (d)). The preferred alternative is the alternative that NNSA believes would fulfill its statutory missions and responsibilities, considering economic, environmental, technical, and other factors. NNSA has identified the Expanded Operations Alternative as the preferred alternative for the continuing operations of LANL.

S.3 Environmental Consequences

S.3.1 Introduction

NNSA evaluated the potential direct and indirect environmental impacts of the No-Action Alternative, the Modernized Operations Alternative, and the Expanded Operations Alternative based on the descriptions of those alternatives in Chapter 3 of the SWEIS and compared the potential impacts with the affected environment as described in Chapter 4 of the SWEIS. The potential impacts are presented using the methodologies described in Appendix C of the SWEIS.

The SWEIS evaluates the environmental impacts of the alternatives within defined regions of influence (ROIs). The ROIs are specific to the type of effect evaluated and encompass geographic areas within which any significant impact would be expected to occur. For example, human health risks to the general public from exposure to airborne contaminant emissions are assessed for an area within a 50-mile radius of the center of the LANL site. Table S.3-1 provides brief descriptions of the ROIs for the resource areas analyzed in the SWEIS.

Table S.3-1 General Regions of Influence for the Environmental Resources

Environmental Resource	Region of Influence
Land and visual resources	LANL site and nearby offsite areas
Geology and soils	LANL site and nearby offsite areas
Water resources	LANL site and adjacent surface water and groundwater under the LANL site, nearby offsite areas, and extending northward into southern Colorado
Climate, air quality, and noise	LANL site, nearby offsite areas within local air quality control regions
Noise	LANL site, nearby offsite areas, and access routes to and from the site
Ecological resources	LANL site and nearby offsite areas
Human health and safety	LANL site and nearby offsite areas within 50 miles
Cultural and paleontological resources	LANL site and nearby offsite areas
Socioeconomics	The five-county region where the majority of LANL employees reside
Infrastructure	LANL site and nearby offsite areas
Waste management	LANL site and nearby offsite areas, plus offsite waste disposal areas
Transportation	Transportation corridors between LANL and other sites where wastes/materials are transported
Environmental justice	Minority and low-income populations within 50 miles of the LANL site
Environmental restoration	LANL site and nearby offsite areas

S.3.2 Comparison of Environmental Consequences of the Alternatives

A summary comparison of the environmental consequences for the continued operation of LANL is provided in Table S.3-2. Table S.3-3 provides additional details regarding potential impacts to infrastructure. The tables compare the potential impacts to environmental resources associated with the continued operation of LANL under the No-Action Alternative and the two action alternatives. The information in Table S.3-2 includes data for both construction and operations. Detailed analyses supporting the summary comparisons are provided in Chapter 5 of the SWEIS. Table S.3-4 summarizes potential accident risks associated with LANL's nuclear facilities. Table S.3-5 provides potential impacts of site-wide seismic events and a site-wide wildfire event.

Table S.3-2 Comparison of Environmental Consequences

No-Action Alternative	Modernized Operations Alternative	Expanded Operations Alternative
<i>Land Use and Visual Resources (see Section 5.2 of the SWEIS)</i>		
<p>Total permanent land development for all five planning areas would be 129 acres (34 acres of facilities, 132 acres of infrastructure, and 37 acres recovered through DD&D). Site-wide development footprint would be 3,415 acres (4% more than the baseline).</p> <p>No change to the current or future land use designation. Activities represent a continuation of existing land uses and would be compatible with existing and approved future land uses at and surrounding the site.</p>	<p>Total permanent land development for all five planning areas would be 979 acres (79 acres of facilities, 928 acres of infrastructure, and 28 acres recovered through DD&D). Site-wide development footprint would be 4,393 acres; an increase of 29% over the NAA.</p> <p>No change to the current or future land use designation. Activities represent a continuation of existing land uses and would be compatible with existing and approved future land uses at and surrounding the site.</p>	<p>Total permanent land disturbance for all five planning areas would be 1,046 acres (100 acres of facilities, 974 acres of infrastructure, and 28 acres recovered through DD&D). Site-wide development footprint would be 4,460 acres, an increase of 31% over the NAA.</p> <p>No change to the current or future land use designation. Activities represent a continuation of existing land uses and would be compatible with existing and approved future land uses at and surrounding the site.</p>
<p>Construction activities would result in temporary changes to the visual appearance due to the presence of cranes, construction equipment, demolition, facilities in various stages of construction/DD&D, and possibly increased dust.</p> <p>All planning areas would retain their existing VRM classes. The EPCU project would construct transmission lines and structures across the Rio Grande.</p>	<p>Construction activities would result in additional temporary changes to the visual appearance due to the presence of cranes, construction equipment, demolition, facilities in various stages of construction/DD&D, and possibly increased dust.</p> <p>All planning areas except Balance of Site would retain their existing VRM classes. Potential solar PV arrays in locations near the site boundary would cause a degradation in the VRM class for Balance of Site. The replacement bridge would cause short-term adverse visual impacts from construction and staging areas. Long-term, no adverse visual impacts are anticipated.</p>	<p>Construction activities would result in additional temporary changes to the visual appearance due to the presence of cranes, construction equipment, demolition, facilities in various stages of construction/DD&D, and possibly increased dust.</p> <p>All planning areas except Balance of Site would retain their existing VRM classes. The proposed 20-acre pumped hydropower demonstration near the site boundary would be visible from Bandelier National Monument and cause a degradation in the VRM class for Balance of Site.</p>

No-Action Alternative	Modernized Operations Alternative	Expanded Operations Alternative
<i>Geology and Soils (see Section 5.3 of the SWEIS)</i>		
<p>Disturbance of about 62 acres of previously undisturbed soil would occur; no prime farmland exists on LANL; all offsite development would be in previously disturbed areas. Ongoing remediation efforts would continue to improve soil conditions at LANL. Faulting and seismic events could result in potential hazards to existing and planned facilities at the LANL site. Any new facility would be designed and constructed to meet seismic design criteria commensurate with the risk category requirements. Potential impacts from geologic hazards (i.e., seismic events) are discussed under “accidents.”</p>	<p>Disturbance of about 731 acres of previously undisturbed soil (above the NAA) would occur; no prime farmland exists on LANL. Ongoing remediation efforts would continue to improve soil conditions at LANL.</p> <p>There would be extensive grading of soils for site preparation and installation of the solar arrays (641 acres are currently undisturbed), which could result in wind and water erosion of native soils if graded areas remain uncovered for long periods of time.</p> <p>Faulting and seismic conditions are the same as under the NAA.</p>	<p>Disturbance of about 806 acres of previously undisturbed soil (above the NAA) would occur; no prime farmland exists on LANL. Ongoing remediation efforts would continue to improve soil conditions at LANL.</p> <p>The Laboratory would apply wildland fire risk reduction treatments to certain high-risk areas, which would have the potential to destabilize soils and increase erosion and runoff.</p> <p>The risks associated with extensive grading (from Modernized Operations) also apply to Expanded Operations.</p> <p>Faulting and seismic conditions are the same as under the NAA.</p>
<i>Water Resources (see Section 5.4 of the SWEIS)</i>		
<p>Surface Water:</p> <p>Approximately 62 acres of impervious surfaces would be newly introduced from new facilities and infrastructure projects.</p> <p>New facilities would increase impervious surfaces, which could increase stormwater runoff. LANL meets stormwater compliance monitoring requirements and implementation of a stormwater pollution prevention plan would minimize any pollution that might leave the site by stormwater.</p>	<p>Surface Water:</p> <p>Approximately 90 acres of impervious surface would be newly introduced from the new facilities and infrastructure projects.</p> <p>Stormwater permitting would be the same as under the No-Action Alternative. There would be no construction and operations projects that would affect the floodplains at LANL.</p> <p>There may be a newly permitted outfall in TA-3, however, discharges would be within current permit limits.</p>	<p>Surface Water:</p> <p>Approximately 121 acres of impervious surface would be newly introduced from the new facilities and infrastructure projects.</p> <p>Stormwater permitting would be the same as under the No-Action Alternative.</p> <p>Water lines supporting the FSI/HPC WTF would cross streams and floodplains during construction, which would be subject to the <i>Clean Water Act</i> Section 404/401 requirements. Floodplain assessment would be required per Executive Order 11988, “Floodplain Management,” prior to any construction. This project would also</p>

No-Action Alternative	Modernized Operations Alternative	Expanded Operations Alternative
<p>There would be no construction and operations projects that would affect the floodplains at LANL.</p> <p>Groundwater:</p> <p>Any discharge from septic tanks to groundwater would be monitored, managed, and subject to the requirements of applicable permits.</p> <p>Groundwater quality in the Sandia and Mortandad canyons would continue to improve as an effective groundwater treatment plan associated with the Final Remedy for remediation of the hexavalent chromium plume would be implemented.</p>	<p>Groundwater</p> <p>No changes from the NAA.</p>	<p>implement a new NPDES-permitted outfall into Two-Mile Canyon.</p> <p>Groundwater:</p> <p>No changes from the NAA.</p>
<i>Air Quality and Noise (see Section 5.5 and Appendix H of the SWEIS)</i>		
<p>Fugitive dust would be generated during clearing, grading, and other earth-moving operations. Construction emissions would exceed the <i>de minimis</i> thresholds for PM₁₀. The Laboratory would use measures to reduce below the threshold.</p> <p>No radiological emissions would be expected during construction activities; radiological emissions during operations include 2,753 Ci/year, made up of:</p> <ul style="list-style-type: none"> • 1,850 Ci of tritium • 800 Ci GMAP • 100 Ci MFP • 3 P/VAP • 8.9×10⁻⁶ americium • 8.9×10⁻⁴ plutonium • 1.5×10⁻¹ uranium 	<p>Fugitive dust would be generated during clearing, grading, and other earth-moving operations. Construction emissions would exceed the <i>de minimis</i> thresholds for PM₁₀. The Laboratory would use measures to reduce below the threshold.</p> <p>No radiological emissions would be expected during construction activities; radiological emissions during operations would include 150 Ci/year GMAP (in addition to NAA); potential health effects of radiological emissions are presented below under “human health.”</p> <p>There is the potential for short-term radiological air emissions for DD&D of 29 radiologically contaminated facilities; however, the activities would be performed in accordance with an NNSA-approved DD&D</p>	<p>Fugitive dust would be generated during clearing, grading, and other earth-moving operations. Construction emissions would exceed the <i>de minimis</i> thresholds for PM₁₀. The Laboratory would use measures to reduce below the threshold.</p> <p>No radiological emissions would be expected during construction activities; radiological emissions during operations would include about 650 Ci/year in addition to the Modernized Operations Alternative made up of:</p> <ul style="list-style-type: none"> • 650 Ci GMAP • 7.5×10⁻⁶ americium • 6.9×10⁻⁵ plutonium • 1.4×10⁻² uranium

No-Action Alternative	Modernized Operations Alternative	Expanded Operations Alternative
<p>Venting of FTWCs (a one-time event) could release as much as 30,000 curies of tritium. Potential health effects of radiological releases are presented below under “human health.”</p> <p>There is a potential for short-term radiological air emissions during DD&D of 13 radiologically contaminated facilities, however, the activities would be performed in accordance with an NNSA-approved DD&D plan to protect the environment, workers, and the public.</p> <p>An increase of GHG emissions of roughly 10,500 metric tons of carbon dioxide equivalent (CO₂e) annually during construction would be a negligible (~3 percent) increase from 2022 site-wide emissions.</p> <p>The 2024 present value of the social cost of GHG would be about \$1,930,000,000 in 2020 dollars at a 1.5-percent discount rate, an annualized value of \$145,000,000 site-wide with roughly \$3,000,000 expected from construction and operations of new facilities and transport of waste and materials over the 15-year period. Present value social benefits from operating solar PV arrays were estimated at \$6,120,000.</p>	<p>plan to protect the environment, workers, and the public.</p> <p>An increase of roughly 17,000 metric tons of CO₂e annually during the peak of construction would be a minor adverse (~5 percent) increase from the NAA.</p> <p>The annualized value of these GHG emissions would be roughly \$6,600,000 from construction and operation of new facilities over the 15-year period. Annualized social benefits from implementation of half of the proposed solar PV arrays (~89 MW) was estimated at \$37,000,000.</p>	<p>Potential health effects of radiological emissions are presented below under “human health.”</p> <p>There would be no additional DD&D activities from those presented under the No-Action and Modernized Operations alternatives.</p> <p>An increase by roughly 18,100 metric tons annually during the peak of construction would be a minor adverse (~5 percent) increase from the NAA.</p> <p>The annualized value of GHG emissions would be \$7,400,000 from construction and operations of new facilities over the 15-year period. Social benefits would be similar to the Modernized Operations Alternative.</p>
<p>Although construction, remediation, and DD&D activities would cause temporary noise impacts, almost all activities would be confined to the LANL property boundary and more than 800 feet from residential areas or businesses.</p>	<p>The Los Alamos Canyon Bridge Replacement and DD&D of the Health Research Laboratory would be within 400 feet of private residences, within 800 feet of two churches, and more than 1,000 feet from Los Alamos High School. Noise would be noticeable but would abate after construction.</p>	<p>In addition to the other alternatives, the pumped hydropower demonstration at TA-39 and TA-49 would be within 800 feet from the LANL site boundary. The project would be north of the Bandelier National Monument, about 1.5 miles to the northwest of the Juniper Family Campground.</p>

No-Action Alternative	Modernized Operations Alternative	Expanded Operations Alternative
<p>Impacts from a 10% increase in the workforce would result in a negligible increase in traffic noise.</p>	<p>Construction of solar PV arrays at Site B would be near the site boundary and could temporarily impact residences in the White Rock community.</p> <p>Impacts from a 15% increase in the workforce during construction would result in a negligible increase in traffic noise.</p>	<p>Impacts from a 21% increase in the workforce during construction would result in a negligible increase in traffic noise.</p>
<i>Ecological Resources (see Section 5.6 of the SWEIS)</i>		
<p>Nine projects could occur in undeveloped sites in habitat for the Mexican spotted owl, a federally listed threatened species. The projects would require review under the LANL Habitat Management Plan and individual Section 7 consultation with the USFWS.</p> <p>Construction would have no appreciable impact on native vegetation, plant species of concern, or wetlands. Operations would be consistent with current activities and would have no appreciable impact on ecological resources.</p>	<p>Fifteen projects would potentially occur in undeveloped habitat for the Mexican spotted owl. The projects would require review under the LANL HMP and individual Section 7 consultation with the USFWS.</p> <p>The proposed Los Alamos Canyon Bridge replacement would cross both core and buffer habitat for the Jemez Mountains salamander, a federally listed endangered species. The project would require review under the LANL HMP as well as USFWS consultation.</p>	<p>In addition to the projects under the Modernized Operations Alternative, eight projects, would potentially occur in undeveloped habitat for the Mexican spotted owl. The projects would require review under the LANL HMP and individual Section 7 consultation with the USFWS.</p> <p>The proposed FSI/HPC would require new power lines and the supporting WTF would require new water lines. Any powerlines would be constructed in accordance with industry guidelines for protecting raptors. The water lines would traverse core and buffer habitat for the Jemez Mountains salamander and require review under the LANL HMP as well as USFWS consultation.</p> <p>Expansion of the OB/OD would decrease pollutants and risks to birds and other animals and plants in the region.</p> <p>Thinning or clearing of forest land to reduce the risk of wildfire could potentially affect the Mexican spotted owl and Jemez Mountains salamander. The Laboratory would continue following the HMP and protected species</p>

No-Action Alternative	Modernized Operations Alternative	Expanded Operations Alternative
		<p>guidelines, giving greater allowance for removal of damaged or diseased high-risk trees within the species' habitats.</p> <p>Management actions to reduce invasive feral cattle would reduce existing impacts, such as trampling and overgrazing of riparian vegetation, degradation of water quality from cattle defecations, and increased soil erosion from degradation of vegetation cover.</p>
Human Health (see Section 5.7 and Appendix D of the SWEIS)		
<p>Nonradiological impacts:</p> <ul style="list-style-type: none"> • Lost days due to injury/illness per year: 483 • Number of occupational fatalities per year: 1.3 <p>Radiological Impacts:</p> <p><u>Public:</u></p> <ul style="list-style-type: none"> • Collective dose to 50-mile population: 6.11 person-rem • Population risk: 3.7×10^{-3} LCF • Offsite MEI dose: 3.07 millirem • MEI risk: 1.8×10^{-6} LCF <p><u>Workers:</u></p> <ul style="list-style-type: none"> • Number of radiation workers: 4,450 • Average annual dose to individual radiation worker: 115 millirem • Average annual radiation worker risk: 7×10^{-5} LCF • Collective annual dose to radiation workers: 512 person-rem • Total annual radiation worker risk: 0.31 LCF 	<p>Nonradiological impacts (including NAA):</p> <ul style="list-style-type: none"> • Lost days due to injury/illness per year: 499 • Number of occupational fatalities per year: 1.3 <p>Radiological Impacts (including NAA):</p> <p><u>Public:</u></p> <ul style="list-style-type: none"> • Collective dose to 50-mile population: 6.18 person-rem • Population risk: 3.7×10^{-3} LCF • Offsite MEI dose: 3.18 millirem • MEI risk: 1.9×10^{-6} LCF <p><u>Workers:</u></p> <ul style="list-style-type: none"> • Number of radiation workers: 4,530 • Average annual dose to individual radiation worker: 115 millirem • Average annual radiation worker risk: 7×10^{-5} LCF • Collective annual dose to radiation workers: 521 person-rem • Total annual radiation worker risk: 0.31 LCF 	<p>Nonradiological impacts (including NAA):</p> <ul style="list-style-type: none"> • Lost days due to injury/illness per year: 527 • Number of occupational fatalities per year: 1.4 <p>Radiological Impacts (including NAA):</p> <p><u>Public:</u></p> <ul style="list-style-type: none"> • Collective dose to 50-mile population: 6.73 person-rem • Population risk: 4.0×10^{-3} LCF • Offsite MEI dose: 3.66 millirem • MEI risk: 2.2×10^{-6} LCF <p><u>Workers:</u></p> <ul style="list-style-type: none"> • Number of radiation workers: 4,912 • Average annual dose to individual radiation worker: 130 millirem • Average annual radiation worker risk: 7.8×10^{-5} LCF • Collective annual dose to radiation workers: 639 person-rem • Total annual radiation worker risk: 0.38 LCF

No-Action Alternative	Modernized Operations Alternative	Expanded Operations Alternative
<p>A one-time event of venting FTWCs could result in a dose to the MEI of up to 8 millirem, however, the total annual dose to the MEI from all sources would be controlled to be less than 10 millirem for any 12-month period.</p>		
<i>Cultural and Paleontological Resources (see Section 5.8 of the SWEIS)</i>		
<p>Potential impacts to cultural resources would be avoided or reduced by locating projects in areas previously disturbed and with modern developments already present; rerouting construction to avoid resources; marking or fencing cultural resources that are at risk; and monitoring construction activities to ensure erosion is controlled and inadvertent impacts do not happen.</p> <p>The LANL site has undergone a comprehensive review to identify significant historic buildings, structures, and objects, in accordance with its Cultural Resources Management Plan. The Manhattan Project National Historical Park properties would see beneficial impacts from relocating operations that work with explosives away from those properties.</p> <p>Consultation for the Chromium Final Remedy EA is ongoing. Cultural resources in the area of potential effect are within the Pueblo de San Ildefonso Reservation, and the Pueblo cultural resources concerns for the hexavalent chromium plume area have yet to be identified.</p>	<p>Eleven known cultural resources could be physically impacted; four are considered significant and would require mitigation prior to construction.</p> <p>It is anticipated that four new facilities in the Pajarito Corridor Planning Area as well as the increased worker activity in the area could result in impacts to the settings of traditional cultural properties and associated practices. In addition, two of the nine potential solar PV array areas and the TA-72 parking area and bus transfer station are likely to impact the settings of traditional cultural properties. Additional tribal consultations would be required for these projects.</p> <p>Fire Station 5 in TA-16 has been declared eligible for the National Register as a historic building. Its upgrade and adaptive reuse would be implemented in accordance with LANL's CRMP.</p>	<p>Twenty-two known cultural resources could be physically impacted (in addition to those identified in the Modernized Operations Alternative); 15 are considered significant and would require mitigation prior to construction. Twelve of the known resources would be impacted by the 20-acre pumped hydropower facility in TA-39 and TA-49. Impacts would include those identified for the Modernized Operations Alternative.</p> <p>Proposals without specific locations (e.g., burial of site utility lines, forest thinning and wildland fire risk reduction treatments, and feral/invasive cattle management) would be managed in accordance with the CRMP and Section 106 Programmatic Agreement, as necessary.</p>

No-Action Alternative	Modernized Operations Alternative	Expanded Operations Alternative
<i>Socioeconomics (see Section 5.9 of the SWEIS)</i>		
<p>The following socioeconomic impacts are in addition to the baseline described in Section 4.9.</p> <ul style="list-style-type: none"> • Additional direct employment: 1,530 • Additional indirect employment: 700 • Additional direct earnings: \$163.6M • Anticipated value added from LANL: \$246.8M <p>There would be an average of 650 DD&D/construction workers per year, peaking at 1,300 workers in any given year, through 2029; DD&D would continue through 2038.</p> <p>Due to the low potential for impacts on the region of influence population, steady-state operations would not be expected to affect community services and schools.</p>	<p>The following socioeconomic impacts are in addition to the No-Action Alternative.</p> <ul style="list-style-type: none"> • Additional direct employment: 780 • Additional indirect employment: 284 • Additional direct earnings: \$69.8M • Anticipated value added from LANL: \$102.9M <p>There would be an average of 530 DD&D/construction workers per year, peaking at 1,060 workers in any given year. Construction and DD&D would continue in parallel with operations until 2038.</p> <p>Due to the low potential for impacts on the ROI population, steady-state operations would not be expected to affect community services and schools.</p>	<p>The following socioeconomic impacts are in addition to the No-Action Alternative.</p> <ul style="list-style-type: none"> • Additional direct employment: 915 • Additional indirect employment: 495 • Additional direct earnings: \$112M • Anticipated value added from LANL: \$171.7M <p>There would be an average of 710 DD&D/construction workers per year, peaking at 1,420 workers in any given year. Construction and DD&D would continue in parallel with operations until 2038. There would be no additional DD&D than that proposed under the Modernized Operations Alternative.</p> <p>Due to the low potential for impacts on the ROI population, steady-state operations would not be expected to affect community services and schools.</p>
<i>Infrastructure (see Section 5.10 of the SWEIS)</i>		
Existing infrastructure would be adequate to meet all requirements (<i>see</i> Table S.3-3).	Existing infrastructure would be adequate to meet all requirements after implementation of EPCU project under the NAA (<i>see</i> Table S.3-3).	Existing infrastructure would be adequate to meet all requirements after implementation of EPCU project under the NAA (<i>see</i> Table S.3-3).

No-Action Alternative	Modernized Operations Alternative	Expanded Operations Alternative
Waste Management (see Section 5.11 of the SWEIS)		
<p>Construction, environmental remediation, DD&D, and operations would generate the following projected annual quantities of waste:</p> <ul style="list-style-type: none"> • LLW (m³/yr): 9,754 • MLLW (m³/yr): 280 • TRU/ waste (m³/yr): 652 • Hazardous (MT/yr): 2,989 • NMSW (MT/yr): 838 • Nonhazardous (MT/yr): 6,995 	<p>Operations (including construction and DD&D) would generate the following projected annual quantities of waste including that generated under the NAA:</p> <ul style="list-style-type: none"> • LLW (m³/yr): 10,680 • MLLW (m³/yr): 296 • TRU/ waste (m³/yr): 655 • Hazardous (MT/yr): 3,157 • NMSW (MT/yr): 1,636 • Nonhazardous (MT/yr): 11,385 	<p>Operations (including construction and DD&D) would generate the following projected annual quantities of waste including that generated under the NAA:</p> <ul style="list-style-type: none"> • LLW (m³/yr): 12,051 • LLW (m³/yr): 323 • TRU/ waste (m³/yr): 670 • Hazardous (MT/yr): 3,312 • NMSW (MT/yr): 4,514 • Nonhazardous (MT/yr): 11,485
Transportation and Traffic (see Section 5.12 and Appendix F of the SWEIS)		
<p>Traffic and Parking:</p> <p>Construction/DD&D activities would utilize the existing transportation infrastructure in the region and could potentially cause periodic light-to-moderate adverse impacts to local traffic flows from construction-worker commuting and the intermittent presence of additional construction vehicles.</p> <p>A gradual increase (i.e., less than or equal to 2.1 percent per year in the first 4 years) in the LANL workforce under the No-Action Alternative would not be expected to significantly, adversely impact operation of the primary and secondary road networks at LANL.</p> <p>The proposed parking structure in TA-48 and the offsite parking and shuttle service would help accommodate increased levels of onsite traffic and parking. The Laboratory would deploy 26 acres of new or reconfigured roads</p>	<p>Traffic and parking:</p> <p>The impacts to traffic and local transportation would not be notably different than under the NAA.</p> <p>Construction of five parking structures, a 25-acre remote parking and bus transfer station, 41 acres of new or reconfigured roads, and 11 acres of parking associated with the new facilities. The Los Alamos Canyon Bridge replacement should improve traffic flow, although during construction, traffic congestion would be expected in the area.</p> <p>Radiological Transport:</p> <ul style="list-style-type: none"> • Dose to transport crews: 1,171 person-rem per year • LCF Risk to transport crews: 0.70 LCF • Incident-free dose to general public: 159 person-rem • LCF Risk to Public: 0.096 LCF 	<p>Traffic and parking:</p> <p>The impacts to traffic and local transportation would not be notably different than under the NAA.</p> <p>Construction of 20 acres of new or reconfigured roads and 6 acres of parking associated with new facilities, beyond that described for the Modernized Operations Alternative.</p> <p>Radiological Transport:</p> <ul style="list-style-type: none"> • Dose to transport crews: 1,200 person-rem per year • LCF Risk to transport crews: 0.72 LCF • Incident-free dose to general public: 172 person-rem • LCF Risk to Public: 0.10 LCF • Accident Risk to Public: 5.6×10^{-4} LCF

No-Action Alternative	Modernized Operations Alternative	Expanded Operations Alternative
<p>and 18 additional acres of parking, both of which would improve onsite vehicular flows and address parking space shortages.</p> <p>Radiological Transport:</p> <p>During operations, DD&D, and environmental remediation, LANL would regularly transport radiological waste, SNM, and other nuclear materials to and from the LANL site. The estimated impacts of these shipments would be:</p> <ul style="list-style-type: none"> • Dose to transport crews: 1,153 person-rem per year • LCF Risk to transport crews: 0.69 LCF • Incident-free dose to general public: 154 person-rem • LCF Risk to Public: 0.092 LCF • Accident Risk to Public: 5.6×10^{-4} LCF • Number of Traffic Fatalities from Accidents: 0.038 <p>An estimated annual total of 210 SNM/high-activity material shipments (including pits to and from Pantex) would be made between 2024 and 2038 to and from LANL.</p> <p>About 886 LLW/MLLW offsite shipments (assumed for analytical purposes to go to NNSS) and 166 TRU waste shipments to WIPP would occur annually.</p> <p>Annual offsite shipments of hazardous waste would increase by approximately 4% over baseline conditions.</p>	<ul style="list-style-type: none"> • Accident Risk to Public: 5.6×10^{-4} LCF • Number of Traffic Fatalities from Accidents: 0.041 <p>Approximately 975 LLW/MLLW offsite shipments to NNSS and 167 TRU waste shipments to WIPP would occur annually, an increase of 10% and 0.6%, respectively, over the NAA.</p> <p>Annual offsite shipments of hazardous waste would increase by about 5% over that projected for the NAA.</p>	<ul style="list-style-type: none"> • Number of Traffic Fatalities from Accidents: 0.045 <p>An estimated total of 219 SNM/high-activity material shipments would be made annually between 2024 and 2038 to and from LANL, an increase of nine annual shipments, or 4%, over the NAA.</p> <p>Approximately 1,107 offsite shipments of LLW/MLLW (assumed for analytical purposes to go to NNSS) and 172 TRU waste shipments to WIPP would occur annually, an increase of 25% and 3.6%, respectively, over the NAA.</p> <p>Annual offsite shipments of hazardous waste would increase by about 10% over that projected for the NAA.</p>

No-Action Alternative	Modernized Operations Alternative	Expanded Operations Alternative
<i>Environmental Justice (see Section 5.13 of the SWEIS)</i>		
<p>NNSA evaluated the potential impacts from construction, environmental remediation, DD&D, and operational activities at LANL in all resource areas and identified no disproportionate and adverse impacts to communities with environmental justice concerns.</p> <p>Potential conveyance and transfer of 570 acres in Rendija Canyon could be developed into residential housing. Based on the CT EIS, restricting public use of roads and trails in Rendija Canyon would hinder public access to National Forest lands, which serve as traditional firewood gathering and collection areas for other forest products by local Hispanic and Native American populations. Restricted access to this area could have a disproportionate adverse impact on minority populations.</p>	<p>NNSA evaluated the potential impacts from construction, environmental remediation, DD&D, and operational activities at LANL in all resource areas and identified no disproportionate and adverse impacts to communities with environmental justice concerns.</p>	<p>NNSA evaluated the potential impacts from construction, environmental remediation, DD&D, and operational activities at LANL in all resource areas and identified no disproportionate and adverse impacts to communities with environmental justice concerns.</p>

No-Action Alternative	Modernized Operations Alternative	Expanded Operations Alternative
<i>Accidents and Intentional Destructive Acts (see Section 5.14 and Appendix D of the SWEIS)</i>		
<p>The range of potential accident risks from operating facilities under the NAA are presented in Table S.3-4.</p> <p>Impacts of potential site-wide events (seismic, wildfire) assumed to affect multiple facilities are presented in Table S.3-5.</p> <p>Potential impacts from intentional destructive acts may be similar to or could exceed the range of potential accident impacts presented in the SWEIS. Analysis of these potential impacts are presented in Appendix M (classified).</p>	<p>The range of accidents presented for the NAA would also be representative of operations under the Modernized Operations Alternative, which are presented in Table S.3-4.</p> <p>The impacts of potential site-wide events would be the same as under the NAA. Potential impacts from intentional destructive acts may be similar to or could exceed the range of potential accident impacts presented in this SWEIS. Analysis of these potential impacts are presented in Appendix M (classified).</p>	<p>The range of accidents presented for the NAA would also be representative of operations under the Expanded Operations Alternative, which are presented in Table S.3-4.</p> <p>Because of the addition of proposed TRU waste staging areas, impacts of potential site-wide events would increase. These impacts are presented in Table S.3-5.</p> <p>Potential impacts from intentional destructive acts may be similar to or could exceed the range of potential accident impacts presented in this SWEIS. Analysis of these potential impacts are presented in Appendix M (classified).</p>

Ci = curies; CO_{2e} = carbon dioxide equivalent; DD&D = decontamination, decommissioning, and demolition; EA = environmental assessment; EPCU = electric power capacity upgrade; FSI = Future Supercomputing Infrastructure; FTWC = flanged tritium waste container; GHG = greenhouse gas; GMAP = gaseous mixed activation products; HMP = habitat management plan; HPC = high-performance computing; LANL = Los Alamos National Laboratory; LCF = latent cancer fatality; LLW = low-level radioactive waste; m³ = cubic meters; MEI = maximally exposed individual; MFP = mixed fission products; MLLW = mixed low-level radioactive waste; MT = metric tons; MW = megawatt; NAA = No-Action Alternative; NMSW = New Mexico Special Waste; NNSS = Nevada National Security Site; NPDES = National Pollution Discharge Elimination System; OB/OD = open burning/open detonation; PM = particulate matter; PV = photovoltaic; P/VAP = particulate/vapor activation product; ROI = region of influence; SNM = special nuclear material; TRU = transuranic; USFWS = U.S. Fish and Wildlife Service; VRM = visual resource management; WIPP = Waste Isolation Pilot Plant; WTF = water treatment facility

Table S.3-3 Summary of Consequences Related to Infrastructure

Resource Parameter	Existing Capacity	Baseline Average (2017-2022)	No-Action Demand	Modernized Operations	Expanded Operations
Domestic water (MGY)	542	266	290	300	495
Sanitary wastewater (gal/d)	602,800	312,600	371,400	387,650	409,275
Electricity – power consumption (MkW-hr/yr)	651 ^a	451 average	621 average; 730 peak ^b	658 average; 774 peak ^b	810 average; 1,174 peak ^b
Electricity – average annual peak demand (MW)	116.0 ^a	70.0 average	86.7 average; 111.4 peak ^b	92 average; 132 peak ^b	110 average; 171 peak ^b
Natural gas (dec/d)	22,110	4,755	4,155	3,913	3,913
Petroleum fuel (gal/yr)	N/A	525,130	426,000	440,000	483,000

DD&D = decontamination, decommissioning, and demolition; dec/d = decatherms per day; EPCU = electric power capacity upgrade; gal/d = gallons per day; gal/yr = gallons per year; MGY = million gallons per year; MkW-hr/yr = million kilowatt-hours per year; MW = megawatt; N/A = not applicable

a Electrical consumption and import capacity are expected to increase from 651 to 1,100 million kW-hr per year and from 116 MW to 200 MW, respectively, upon completion of the EPCU project under the No-Action Alternative.

b Monthly peak.

Table S.3-4 Summary of Accident Risks Applicable to All Alternatives

Accident Scenario	Conservative Meteorology		Average Meteorology	
	MEI (LCF)	Offsite Population (LCF)	MEI (LCF)	Offsite Population (LCF)
DBA-1: TA-55, PF-4: Plutonium Facility glovebox fire	1.15×10 ⁻⁶	1.13×10 ⁻⁴	1.64×10 ⁻⁷	2.01×10 ⁻⁵
DBA-2: TA-55, PF-4: Plutonium Facility fire involving heat source plutonium	2.48×10 ⁻⁸	1.21×10 ⁻⁶	1.74×10 ⁻⁹	2.12×10 ⁻⁷
DBA-3: TA-54, Area G: Vehicle impact while transporting TRU waste containers with ensuing fuel pool fire	1.01×10 ⁻⁷	2.25×10 ⁻⁶	2.06×10 ⁻⁸	4.12×10 ⁻⁷
DBA-4: TA-54, Area G: Refueling vehicle impacts TRU Storage Array with ensuing fuel pool fire	8.28×10 ⁻⁷	1.08×10 ⁻⁵	9.12×10 ⁻⁸	1.95×10 ⁻⁶
DBA-5: TA-54, Area G: Large combustible fire in TRU Storage Array	1.02×10 ⁻⁷	3.37×10 ⁻⁶	2.65×10 ⁻⁸	6.00×10 ⁻⁷
DBA-6: TA-54, Area G: FTWC explosion causing sympathetic explosion of the other FTWCs resulting in a pressurized release of tritium.	1.32×10 ⁻⁸	2.70×10 ⁻⁶	3.77×10 ⁻⁹	2.72×10 ⁻⁷
DBA-7: TA-3, CMR: Explosion in CMR Wing 9	4.98×10 ⁻⁷	1.63×10 ⁻⁴	1.51×10 ⁻⁷	3.00×10 ⁻⁵
DBA-8: TA-54, RANT: Vehicle impacts waste containers inside RANT with ensuing pool fire	2.90×10 ⁻⁷	1.41×10 ⁻⁵	8.22×10 ⁻⁸	2.95×10 ⁻⁶
DBA-9: TA-16, WETF: Process Room fire	6.63×10 ⁻⁷	2.82×10 ⁻⁴	3.55×10 ⁻⁷	3.09×10 ⁻⁵
DBA-10: TA-63, TWF: Vehicle impact in Shipping/Receiving Area with ensuing pool fire	1.11×10 ⁻⁸	2.76×10 ⁻⁶	1.64×10 ⁻⁹	4.76×10 ⁻⁷
DBA-11: TA-50, WCRRF: High impact seismic event and fire inside building	5.52×10 ⁻⁷	1.12×10 ⁻⁴	8.46×10 ⁻⁸	1.92×10 ⁻⁵
DBA-12: TA-50, TLW: External fire spreads into the TLW Treatment Facility	3.48×10 ⁻⁸	4.62×10 ⁻⁶	4.79×10 ⁻⁹	8.21×10 ⁻⁷
DBA-13: TA-53, LANSCE: Explosion due to deflagration from natural gas leak	7.80×10 ⁻⁸	2.79×10 ⁻⁶	1.81×10 ⁻⁸	5.42×10 ⁻⁷

CMR = Chemistry and Metallurgy Research Facility; ER = Experimental Room in Lujan Center; FTWC = flanged tritium waste container; LANSCE = Los Alamos Neutron Science Center; LCF = latent cancer fatality; MEI = maximally exposed individual; RANT = Radioassay and Nondestructive Testing Facility; TA = technical area; TLW = TRU Liquid Waste Treatment Facility; TRU = transuranic; TWF = Transuranic Waste Facility; WCRRF = Waste Characterization, Reduction, and Repackaging Facility; WETF = Weapons Engineering Tritium Facility

Table S.3-5 Summary of Impacts from Potential Site-Wide Events

Site-wide Event	Average Meteorology	
	MEI (LCF)	Offsite Population (LCF)
<i>No-Action Alternative</i>		
Annual Risk Totals for SDC-2 Seismic/Fire involved Facilities	3.36×10^{-7}	1.38×10^{-5}
Annual Risk Totals for SDC-3 Seismic/Fire involved Facilities – Entire Site (SDC-2 plus SDC-3)	5.30×10^{-7}	3.35×10^{-5}
Annual Risk Totals for Site-wide Wildfire Event	2.66×10^{-6}	2.85×10^{-4}
<i>Modernized Operations Alternative</i>		
Annual Risk Totals for SDC-2 Seismic/Fire involved Facilities	3.36×10^{-7}	1.38×10^{-5}
Annual Risk Totals for SDC-3 Seismic/Fire involved Facilities – Entire Site (SDC-2 plus SDC-3)	5.30×10^{-7}	3.35×10^{-5}
Annual Risk Totals for Site-wide Wildfire Event	2.66×10^{-6}	2.85×10^{-4}
<i>Expanded Operations Alternative</i>		
Annual Risk Totals for SDC-2 Seismic/Fire involved Facilities – Expanded Operations Alternative	4.47×10^{-7}	2.51×10^{-5}
Annual Risk Totals for SDC-3 Seismic/Fire involving SDC-3 Seismic/Fire Involving Entire Site (SDC-2 plus SDC-3 Seismic/Fire Events)	8.55×10^{-7}	4.89×10^{-5}
Annual Risk Totals for Site-wide Wildfire Event	3.53×10^{-6}	3.75×10^{-4}

MEI = maximally exposed individual; LCF = latent cancer fatality; SDC = Seismic Design Category

S.4 References

- 10 CFR Part 830. “Nuclear Safety Management.” Energy. U.S. Department of Energy. *Code of Federal Regulations*. Available online: <https://www.ecfr.gov/current/title-10/part-830>
- 10 CFR Part 1021. “National Environmental Policy Act Implementing Procedures.” Energy. U.S. Department of Energy. *Code of Federal Regulations*. Available online: <https://www.ecfr.gov/cgi-bin/text-idx?SID=7badeb153b53b77d8297172e1d76d083&mc=true&node=pt10.4.1021&rgn=div5>
- 40 CFR Parts 1500–1508. Subchapter A, “National Environmental Policy Act Implementing Regulations.” Protection of Environment. Council on Environmental Quality. *Code of Federal Regulations*. Available online: <https://www.ecfr.gov/current/title-40/chapter-V/subchapter-A>
- 85 FR 54544. “Amended Record of Decision for the Site-Wide Environmental Impact Statement for the Continued Operation of Los Alamos National Laboratory, Los Alamos, NM.” *Federal Register*. National Nuclear Security Administration, Department of Energy. September 2, 2020. Available online: <https://www.govinfo.gov/content/pkg/FR-2020-09-02/pdf/2020-19349.pdf>
- 87 FR 51083. “Notice of Intent To Prepare a Site-Wide Environmental Impact Statement for Continued Operation of the Los Alamos National Laboratory.” *Federal Register*. National Nuclear Security Administration, Department of Energy. August 19, 2022. Available online: <https://www.govinfo.gov/content/pkg/FR-2022-08-19/pdf/2022-17901.pdf>
- 42 U.S.C. §§ 4321–4336(e). “National Environmental Policy Act.” *United States Code*. Available online: <https://uscode.house.gov/view.xhtml?path=/prelim@title42/chapter55&edition=prelim>
- DoD (U.S. Department of Defense) 2018. *Nuclear Posture Review*. Office of the Secretary of Defense. February. Available online: <https://media.defense.gov/2018/Feb/02/2001872886/-1/-1/2018-NUCLEAR-POSTURE-REVIEW-FINAL-REPORT.PDF>
- DoD (U.S. Department of Defense) 2022. *Nuclear Posture Review*. Office of the Secretary of Defense. October. Available online: <https://media.defense.gov/2022/Oct/27/2003103845/-1/-1/2022-NATIONAL-DEFENSE-STRATEGY-NPR-MDR.PDF>
- DOE (U.S. Department of Energy) 1999. *Final Environmental Impact Statement for the Conveyance and Transfer of Certain Land Tracts Administered by the U.S. Department of Energy and Located at Los Alamos National Laboratory, Los Alamos and Santa Fe Counties, New Mexico*. DOE/EIS-0293. October. Available online: <https://www.energy.gov/nepa/articles/doeeis-0293-final-environmental-impact-statement-october-1999>

- DOE (U.S. Department of Energy) 2020. *Mitigation Action Plan for Los Alamos National Laboratory Operations*. LA-UR-20-27101. September. Available at: <https://www.energy.gov/sites/default/files/2020/12/f81/september-2020-revision-mitigation-action-plan-eis-0380-lanl-sweis.pdf>
- DOE (U.S. Department of Energy) 2024. *Final Chromium Interim Measure and Final Remedy Environmental Assessment, Los Alamos National Laboratory, Los Alamos, New Mexico*. DOE/EA-2216. July. Available at: <https://www.energy.gov/nepa/doeea-2216-chromium-interim-measure-and-final-remedy-los-alamos-new-mexico>.
- LANL (Los Alamos National Laboratory) 2018a. *List of Los Alamos National Laboratory Nuclear Facilities*. LIST-SBD-503-R1.1. December.
- LANL (Los Alamos National Laboratory) 2021. *2021 Campus Master Plan*. LA-CP-21-20800. September. OFFICIAL USE ONLY. Publicly available version (LA-UR-22-21424 January 2022) available online: <https://permalink.lanl.gov/object/tr?what=info:lanl-repo/epr/ESHID-603721>
- LANL (Los Alamos National Laboratory) 2022. *Campus Master Plan*. LA-CP-22-20721. September. OFFICIAL USE ONLY.
- LANL (Los Alamos National Laboratory) 2023. *SWEIS Yearbook 2021 Comparison of 2021 Data with Projections of the 2008 Site-Wide Environmental Impact Statement for Continued Operation of Los Alamos National Laboratory*. LA-UR-22-32473. Rev. 2. February 22. Available online: <https://permalink.lanl.gov/object/tr?what=info:lanl-repo/lareport/LA-UR-22-32473>
- LANL (Los Alamos National Laboratory) 2024. *SWEIS Yearbook 2022: Comparison of 2022 Data with Projections of the 2008 Site-Wide Environmental Impact Statement for Continued Operation of Los Alamos National Laboratory*. LA-UR-24-22037. Rev. 1. May. Available online: <https://permalink.lanl.gov/object/tr?what=info:lanl-repo/lareport/LA-UR-24-22037>
- NNSA (National Nuclear Security Administration) 2008. *Final Site-Wide Environmental Impact Statement for Continued Operation of Los Alamos National Laboratory, Los Alamos, New Mexico*. DOE/EIS-0380. May. Available online: <https://www.energy.gov/nepa/downloads/eis-0380-final-site-wide-environmental-impact-statement>