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Los Alamos National Laboratory Electrical Power Capacity Upgrade Project

Draft Environmental Assessment



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EXECUTIVE SUMMARY

The United States (U.S.) Department of Energy (DOE) National Nuclear Security Administration (NNSA) is proposing to upgrade the electrical power supply system for Los Alamos National Laboratory (LANL). LANL requires a reliable and redundant electrical power supply to support mission programs and other activities conducted at LANL facilities. Electrical power supply forecasts project that existing transmission lines that serve LANL and Los Alamos County will reach capacity before 2027, and DOE/NNSA will not have the electrical power supply to meet mission requirements.

DOE/NNSA is seeking a special use permit (SUP) from the U.S. Department of Agriculture Forest Service (Forest Service) and a right-of-way (ROW) grant on the U.S. Department of the Interior Bureau of Land Management (BLM) for the construction and continued operation of a 115-kilovolt (kV) electrical line across National Forest System land and BLM-administered lands. DOE/NNSA has prepared this Environmental Assessment (EA) in coordination with the Forest Service Santa Fe National Forest (SFNF) as a cooperating agency and the BLM as a participating agency to

- analyze the potential environmental impacts associated with constructing and operating an additional 115 kV electrical transmission line from the Public Service Company of New Mexico–owned Norton Substation to LANL,
- upgrade the existing LANL electrical infrastructure to accommodate that additional transmission line and associated electrical upgrades across the LANL campus, and
- propose an amendment to the Santa Fe National Forest Land Management Plan (USDA 2022) that would allow for the designation of a utility corridor specific to this proposed transmission line on SFNF National Forest System land.

This EA analyzes one action alternative that would allow DOE/NNSA to have a reliable and redundant electrical power supply to meet existing mission requirements. The Proposed Action would allow for a three-phase, overhead, 115 kV electric power transmission line approximately 14 miles long. This transmission line would originate at the Norton Substation and cross approximately 2.5 miles on BLM-administered land, then cross approximately 8.6 miles on National Forest System land and ultimately span White Rock Canyon onto DOE/NNSA-managed lands at LANL for approximately 3 miles. Once the transmission line reaches LANL, the project would expand to include a host of additional electrical transmission, distribution, and system upgrades and electrical construction activities across the campus.

The transmission line would be located within a 100-foot-wide utility ROW. In addition, optical ground wire installation along the route would be incorporated into the overhead transmission lines, along with an optical fiber splice box mounted to a pole structure at an accessible location for future connection by others between the Norton Substation and the Rio Grande crossing. Current Forest Service and BLM guidance was assessed, and the proposed alternative was selected in coordination with the SFNF and BLM to avoid and minimize impacts to biological resources, cultural resources, and aesthetic landscape and to maximize use of existing roadways and utility ROWs. Tribal coordination has been ongoing and will continue to occur throughout the project.

The potential direct, indirect, and cumulative effects of the Proposed Action and a No Action Alternative were analyzed in accordance with the Council on Environmental Quality (CEQ) regulations at 40 CFR Parts 1500–1508 National Environmental Policy Act (NEPA) and implementing procedures at 10 CFR

Executive Summary

Part 1021.¹ The primary resource area impact from the Proposed Action would be the introduction of a new visual element into the landscape; however, because the proposed transmission line will be sited near or within existing roadways and utility ROWs, visual impacts would be minimized.

This EA is available for a 30-day review-and-comment period. Beginning on the date in the public notification, all comments provided within the comment period will be considered by the involved agencies during the preparation of the Final EA. The Final EA will include a summary of the comments received on the EA as well the responses to the comments.

¹ U.S. Department of Energy. (2004). Recommendations for the Preparation of Environmental Assessments and Environmental Impact Statements, 2nd Edition.

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1 Purpose and Need

1.1 Background

The Proposed Action occurs within the United States (U.S.) Department of Agriculture Santa Fe National Forest (SFNF) and U.S. Department of Energy (DOE) National Nuclear Security Administration (NNSA) lands, as well as a small portion of U.S. Department of the Interior (USDOl) Bureau of Land Management (BLM) lands. Los Alamos National Laboratory (LANL) is one of several national laboratories that DOE/NNSA supports and implements their mission. The NNSA, a semi-autonomous agency within the DOE, has two primary responsibilities: maintain and enhance the safety, security, and effectiveness of the U.S. nuclear weapons stockpile; and prevent nuclear weapons proliferation, thus reducing the threat of nuclear and radiological terrorism around the world.

LANL is a DOE/NNSA national laboratory whose primary mission is to solve national security challenges through scientific excellence, which spans nuclear security, intelligence, defense, emergency response, nonproliferation, counterterrorism, energy security, emerging threats, and environmental management. For LANL to maintain this array of scientific capabilities and expertise, DOE/NNSA requires a reliable and redundant electrical power supply.

DOE/NNSA is seeking a special use permit (SUP) from the SFNF and a right-of-way (ROW) grant from the BLM to construct and operate a 115-kilovolt (kV) electrical transmission line from the Public Service Company of New Mexico (PNM)–owned Norton Substation to LANL and to upgrade the existing electrical infrastructure on the LANL campus to accommodate the additional transmission line proposed to be constructed across BLM- and SFNF-administered lands. To obtain a special use permit on SFNF lands, DOE/NNSA is required to comply with the regulations of Title 36 Code of Federal Regulations (CFR) Part 251, Subpart B, and 36 CFR 251.54(f)(2) specific to electric power transmission lines with a capacity of 66 kV or higher for a SUP on U.S. Forest Service (Forest Service) lands. DOE/NNSA is also required to comply with 43 CFR Part 2800 regulations for a ROW grant on BLM-administered lands.

In accordance with the Council on Environmental Quality (CEQ) regulations at 40 CFR Parts 1500–1508 National Environmental Policy Act (NEPA) and implementing procedures at 10 CFR Part 1021, DOE/NNSA has prepared this environmental assessment (EA) to analyze the potential environmental impacts associated with implementation of the project within DOE/NNSA-administered lands, the issuance of a SUP on Forest Service–administered lands, and a ROW grant on BLM-administered lands. The Proposed Action is hereinafter referred to as the Electrical Power Capacity Upgrade (EPCU) project. Based on the analysis of environmental impacts in this EA, DOE/NNSA could

- determine that the potential environmental impacts of the Proposed Action would be significant to the human and natural environment, in which case NNSA would prepare an environmental impact statement; or
- determine that a Finding of No Significant Impact is appropriate, in which case NNSA could proceed with the Proposed Action with no additional NEPA documentation.

Figure 1-1 shows a map of the proposed project location. A full description of the project can be found in Chapter 2, Section 2.3. Contingent upon the NEPA process, implementation of the EPCU project scope could begin as early as summer 2024.

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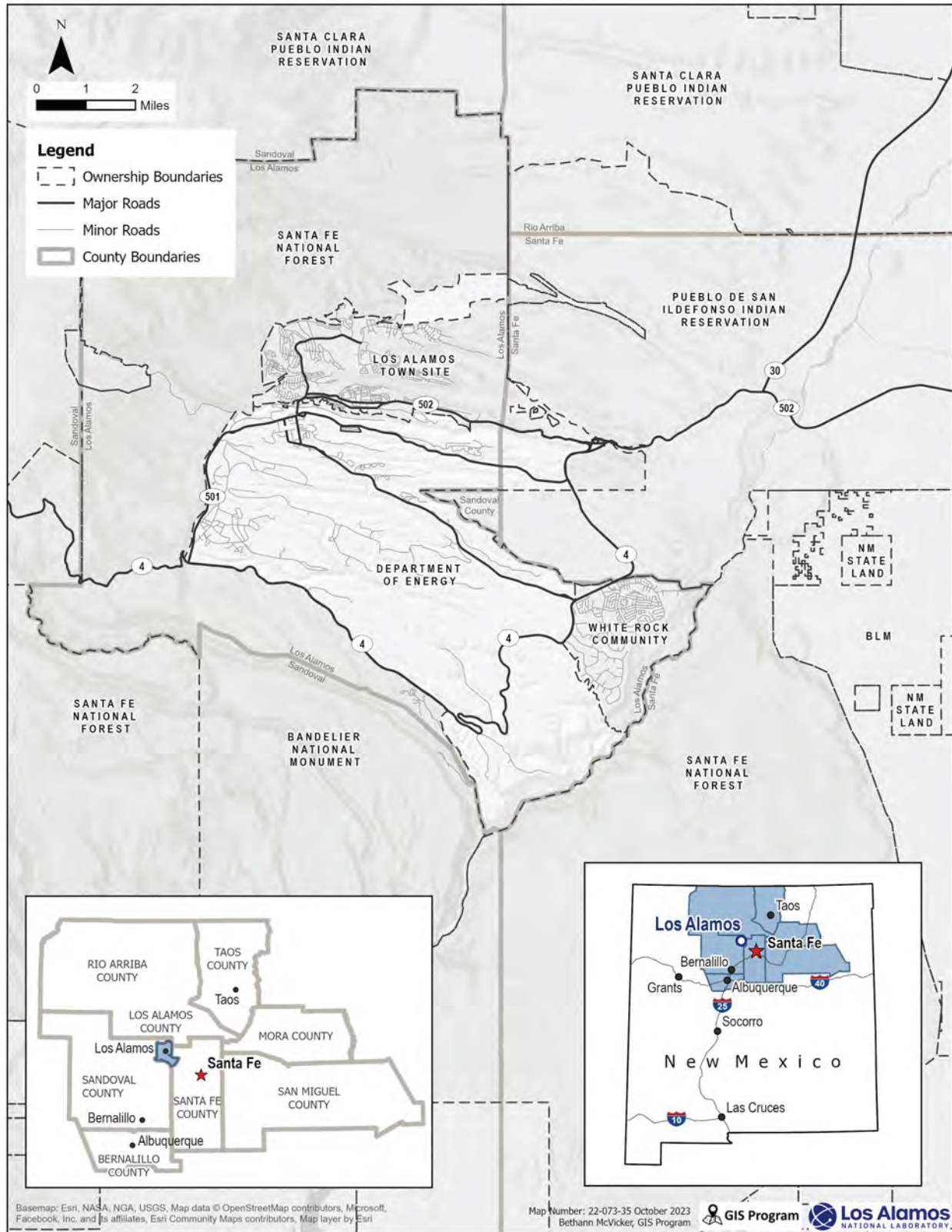


Figure 1-1. Project area location map.

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1.1.1 *Los Alamos National Laboratory*

LANL is one of several DOE/NNSA national laboratories that supports and implements their mission to maintain and enhance the safety, security, and effectiveness of the U.S. nuclear weapons stockpile and prevent nuclear weapons proliferation. LANL, located primarily in Los Alamos County, New Mexico, occupies approximately 40 square miles of land under the administrative control of DOE/NNSA. LANL is located in northern New Mexico, approximately 60 miles northeast of Albuquerque and 25 miles northwest of Santa Fe.

Ownership and distribution of utility services are shared between DOE/NNSA and Los Alamos County. DOE/NNSA administers and distributes most utility services to LANL facilities. Los Alamos County provides utility services to the Los Alamos townsite, to White Rock, and in some cases, to nearby Bandelier National Monument. Utility services include electrical power, natural gas, steam, water, sanitary wastewater, and refuse disposal.

Maintaining the necessary utilities and infrastructure is essential to sustain DOE/NNSA responsibilities and LANL mission requirements. LANL has been assigned major program responsibilities within their mission directive over the next 10 years (LANL 2017). Key facilities and associated programmatic operations supported by LANL's existing electrical infrastructure require adequate and reliable electrical power to fulfill their missions. Based on numerous studies conducted by and on behalf of DOE/NNSA and Los Alamos County, LANL's electrical power demand is projected to exceed current import capacity from the PNM system by 2027 (Global 2017).

1.1.2 *Santa Fe National Forest*

A segment of the Proposed Action would cross an area of the SFNF known as the Caja del Rio. The National Forest Management Act requires the Forest Service to develop land management plans to guide management activities at a forest-wide scale. Forest Service land and resource management plans guide the direction of specific projects or activities on the ground. The Santa Fe National Forest Land Management Plan (hereinafter "Forest Plan") was published in 2022 (USDA 2022).

The Forest Plan provides for multiple use and sustained yield of goods and services from the SFNF in a way that maximizes long-term net public benefits in an environmentally sound manner. The plan establishes goals and objectives to guide management activities to achieve its purpose. If a proposed project or activity is not consistent with the applicable plan components, the responsible official may amend the plan so that the project or activity will be consistent with the plan as amended. (36 CFR 219.15(c)(3))

1.1.3 *Bureau of Land Management*

A small segment of the Proposed Action would be located on public land managed by the BLM-Taos Field Office (TFO). The Taos Resource Management Plan (RMP), published in 2012 (USDOI 2012), includes the area considered in the Proposed Action. The Taos RMP provides broad-scale direction for the management of public lands and resources administered by the TFO. The RMP presents desired outcomes—expressed in terms of goals and objectives for resource conditions and uses—and establishes the allowable uses, management actions, and special designations that would enable the BLM to achieve the desired outcomes.

The Proposed Action is entirely within the ROW corridor designated under the Taos RMP for the purpose of co-locating land-use authorizations to the extent possible to avoid impacts to resources. According to BLM Manual 2803, the "BLM shall encourage prospective applicants to locate their ROW proposals in

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designated corridors,” and common use of corridors “shall be required whenever feasible.” The Taos RMP designated a 0.25-mile utility corridor along the Old Buckman Road (USDOJ 2012).

1.2 Purpose and Need for the Proposed Action

DOE/NNSA requires a reliable and redundant electrical power transmission supply to support mission requirements conducted at LANL facilities essential to maintaining LANL’s mission. An electrical power shortfall in the carrying capacity of the two existing transmission lines that service LANL and Los Alamos County is projected before 2027. A reliable, practicable, and feasible electrical power supply is required by DOE/NNSA to ensure continuous operations at LANL.

Currently, electrical power is imported to LANL from the PNM bulk electric system. LANL is supplied with electrical power through the Los Alamos Power Pool (LAPP)—as established under a long-standing Energy Coordination Agreement between DOE/NNSA and Los Alamos County—to import electrical power from the PNM bulk electric system (DOE 1998). An existing Network Integration Transmission Services Agreement between Los Alamos County and PNM and their Open Access Transmission Tariff allow LANL to access market power from outside the PNM control area, including access to low-cost renewable power generation.

LANL owns and operates a 115 kV transmission system served by two import lines from upstream PNM substations in Santa Fe (the Norton Line) and Bernalillo (the Reeves Line; Figure 1-2). The LANL system comprises six internal 115 kV transmission lines that connect the four substations and one switching station to enable power flow across the system. This system includes the Los Alamos Service Area, which serves the customer demands for both LANL and Los Alamos County. The substations step the voltage down to 13.8 kV, which is then distributed to customer loads. One onsite 24-megawatt (MW) combustion gas turbine generator is connected to the 13.8 kV distribution system.

Los Alamos County is a customer that is supplied by both the 115 kV transmission line (White Rock) and 13.8 kV transmission line (Los Alamos) substations; Los Alamos County also provides power scheduling and merchant desk services on behalf of LANL as part of LAPP. The 115 kV Los Alamos service area system is normally operated in a ring-type loop configuration, capable of sectionalizing to remain in full service with loss of any single line. As distribution provider and transmission owner, LANL is a North American Electric Reliability Corporation–registered entity.

Currently, one source of electric power generation exists onsite at LANL: a combustion gas turbine generator. This generator was replaced in 2021. It is limited to approximately 20 to 27 MW, which is shared through the Electric Coordination Agreement (DOE 1998). Future plans for additional energy generation also include a solar photovoltaic (PV) system. A plan to operate a 10 MW, ground-mounted PV on approximately 55 acres within the DOE/NNSA-managed lands is being developed by Los Alamos County.

Dependence on only two transmission lines to supply LANL and Los Alamos County is inconsistent with utility industry best practices for fully redundant power line service to large, critical load areas (NAP 2017). Multiple power lines are necessary to provide a contingency supply capability in case of power line failure due to an instance of uncontrollable natural forces or a scheduled shutdown for maintenance. Other major electricity users in the northern New Mexico area (i.e., Santa Fe, Española, and Farmington) are served by multiple power lines (three or more).

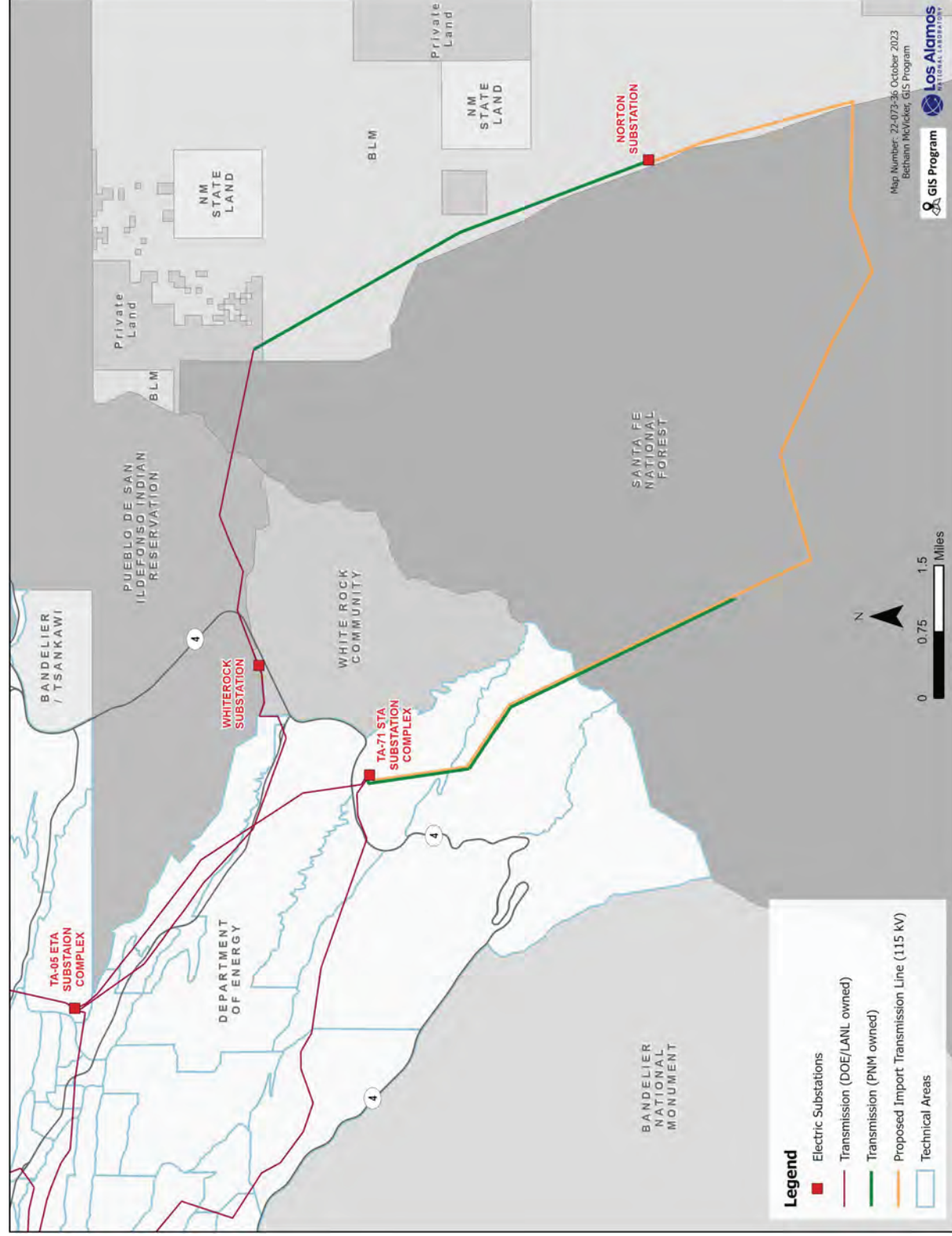


Figure 1-2. Two existing import 115 kV electric transmission lines.

In 2019, LAPP consumed approximately 90 MW (LANL 2020). If operations are left unconstrained, it is projected that LAPP peak demand would exceed 173 MW as early as 2027 (Global 2017). The projected peak demand would exceed the operating limit on the Norton Line. Los Alamos County and LANL have recognized the risk associated with reliance on only two transmission lines (DOE 1998). Operating at or above the import capacity limit is a risk to DOE/NNSA and LANL’s mission and for Los Alamos County residents and businesses.

In addition to addressing the need for reliable and redundant power, the need also exists to increase fiber optic capacity, which is currently limited by a single fiber bundle (24-strand cable)—provided to both LANL and the Los Alamos townsite for data and voice communication needs. Providing an additional fiber optic source would increase reliability and prepare for future demand.

1.3 Interagency Coordination

In accordance with regulatory direction and in furtherance of cooperative management among federal agencies charged with oversight of environmental resources, federal, state, local, and tribal entities that have a likely interest in or jurisdiction over aspects of the Proposed Action were sent scoping notices or consulted before and throughout the NEPA process. (See Chapter 4 of this EA for a complete list of the agencies, organizations, and tribal governments that were consulted within this project.)

Two other federal government agencies have jurisdiction over land involved in the Proposed Action and have participated in the pre-decisional EA preparation process as Cooperating and Participating Agencies (according to the definition under the CEQ’s Regulations for Implementing the Procedural Provisions of the NEPA, 40 CFR Parts 1500–1508, Subsection 1501.6). See Table 1-1. The proposed transmission line would cross public land that is under administrative control of both the SFNF and BLM-TFO. Designated utility ROWs exist for some sections of public land being considered under the Proposed Action; as such, the NNSA has applied for a SUP with the SFNF and a ROW grant with the BLM for authorization to construct and operate the proposed transmission line.

Table 1-1. Agencies Involved in the Proposed Action

Agency	Role	Responsibility
U.S. Department of Agriculture (USDA) Forest Service, Santa Fe National Forest, Española Ranger District	Cooperating Agency	<ul style="list-style-type: none"> • Provide oversight and guidance for the following: <ul style="list-style-type: none"> – NEPA analysis and any additional scoping requirements – Project-specific information and relevant data for addressing potential effects to resources located on SFNF-managed lands – Drafting of Forest Plan amendment language and Forest Plan compliance • Manage Forest Service objection process and drafting of the SFNF Decision Notice • Manage the Forest Service scoping/public outreach and objection process • Forest Supervisor will serve as the Deciding Official for the NEPA document and Forest Service SUP • Manage communications between Forest Service and tribal governments for the project • Manage the Endangered Species Act (ESA; ESA 1973), Section 7, consultation for the project • Coordinate with DOE/NNSA for compliance under Section 106-National Historic Preservation Act (NHPA).

Agency	Role	Responsibility
U.S. Department of Energy (DOE) National Security Administration, Los Alamos Field Office	Project Proponent, Lead Agency	<ul style="list-style-type: none"> • Prepare NEPA documents, including <ul style="list-style-type: none"> – Draft and Final Environmental Assessments – Draft Forest Plan amendment language and Forest Plan compliance – Clearly specified and accompanying documents – Outreach materials – Notification of availability of the Final Environmental Assessment – Decision document for DOE • Develop and post online a NEPA determination for the project • Coordinate with the SFNF and BLM to set up and manage regularly occurring project status calls and meetings to address issues <ul style="list-style-type: none"> – Ensure adherence to the agreed upon schedule for deliverables and key milestones • Follow national guidelines and specific government-to-government tribal agreements (EO 13175) <ul style="list-style-type: none"> – Share relevant information provided during Tribal consultations as appropriate – Manage communications between NNSA and Tribal governments for the project • Coordinate with the SFNF to ensure that ESA Section 7 consultation is completed in compliance with NNSA guidelines • Manage Section 106 National Historic Preservation Act (54 U.S.C. 306108 et seq.) consultation for the project; ensure that consultation is completed in compliance with Forest Service and DOE guidelines
U.S. Department of the Interior Bureau of Land Management, Taos Field Office	Participating Agency	<ul style="list-style-type: none"> • BLM-TFO will provide guidance for the following: <ul style="list-style-type: none"> – NEPA requirements specific to BLM-managed lands and analysis – Project-specific information, required documentation, and relevant data for addressing potential effects to resources located on BLM-managed lands • Manage communications between BLM and tribal governments for the project

This EA has been prepared by DOE/NNSA for the Proposed Action; however, the SFNF and BLM have participated in the EA preparation process and intend to adopt the DOE/NNSA's EA; each agency will prepare its respective decision document.

1.4 Public and Tribal Involvement and Identification of Issues

The project analyzed in this document constitutes a federal action that has the potential to affect the quality of the physical, biological, and human environment on public lands administered by the federal government. Therefore, projects must be analyzed pursuant to NEPA, under which federal agencies must carefully consider environmental concerns in their decision-making processes and provide relevant information to the public for review and comment.

The DOE/NNSA has prepared this EA in compliance with NEPA and other relevant federal and state laws and regulations. This EA contains analyses consistent with NEPA regulations, CEQ regulations,

Forest Service policy, and BLM policy. It discloses potential direct, indirect, and cumulative environmental effects on the human and biological environment anticipated to result from implementation of the Proposed Action. Specific resource issues analyzed were identified through internal Forest Service scoping and external public scoping.

On April 15, 2021, NNSA sent notifications to nearby Tribal Nations announcing the NEPA EA scoping period and inviting Tribes to provide comments regarding potential environmental impacts related to the proposed EPCU project. NNSA provided presentations on the EPCU project to the Eight Northern Indian Pueblos Council (ENIPC) and at the NNSA and DOE-Environmental Management lead Accord Technical Exchange Meeting (ATEM), which includes environmental staff from the DOE Accord Pueblos (Pueblos of San Ildefonso, Santa Clara, Jemez, and Cochiti). Comments were received from the Pueblo de Cochiti, Pueblo de San Ildefonso, Pueblo of San Felipe, Pueblo of Tesuque, and Santa Clara Pueblo. See Chapter 4, Section 4.3, for additional information.

A public notice to prepare an EA for the EPCU project was published to the DOE/NNSA NEPA Reading Room website² on April 19, 2021, starting a 30-day scoping period. The public notice provided a summary of the Proposed Action, instructions for providing comments, announcement for a virtual public scoping meeting, and the closure date for the scoping period.

The virtual public scoping meeting was held on Thursday, May 6, 2021, using an online platform due to state-imposed COVID-19 restrictions. Following the presentation, attendees were permitted to offer comments virtually on the Proposed Action and the project.

During the 30-day scoping period, commenters were able to provide input in writing by mail, by electronic mail, and via a comment submittal form on a public website.³ The 30-day comment period closed on May 21, 2021. During the initial scoping period, DOE/NNSA received 670 comments on the project scope. Of the comments received, 642 were form letters that originated from an unknown source. Although not an inclusive list, general comments and concerns included the following:

- The desired preference for use of alternative energy and onsite energy generation, including PV arrays, wind energy, gas-fired power plants, and battery storage
- Questions regarding the need for a new transmission line and the alternative of upgrading the existing transmission line
- Concern for the potential adverse impacts to ecological resources, cultural resources, traditional cultural properties, and El Camino Real de Tierra Adentro (“Royal Road of the Interior”) National Historic Trail (El Camino Real NHT)
- Concern for the potential adverse impacts and damage to recommended wilderness areas and other public land designations regarding the 2022 Forest Plan
- Concern for the potential adverse impacts to recreational opportunities and aesthetic and visual resources within the Caja del Rio region
- Concerns that this project is linked directly with supporting only the current and future pit mission at LANL and that its connection is in violation of the NEPA process (including concerns of segmentation) and general opposition to the overall LANL mission
- Importance of consultation with tribal nations

² <https://www.energy.gov/nnsa/nnsa-nepa-reading-room>

³ <https://www.lanl.gov/environment/epcu/index.shtml>

Comments provided during the initial 30-day scoping period were considered during the project development and preparation of this EA.

From these letters, substantive comments were extracted and categorized by resource area. Resources and issues that are not analyzed in detail in this EA are included in Chapter 1, Section 1.4.1. Specific resources that require in-depth analysis are considered in Chapter 3 and summarized in Section 1.4.2.

1.4.1 Unaffected Resources

The following resource topics were evaluated and later eliminated from detailed analysis because potential direct or indirect impacts would be negligible. The rationale for dismissing these resources from detailed analysis is described in the following sections.

Socioeconomics

The transmission line would be constructed by a LANL subcontractor over a period of approximately 2 years. The total labor requirements are estimated to be less than 100 persons. Because of the relatively low number of workers and timeframe needed to construct the proposed transmission line, construction activities would have a negligible effect on the socioeconomic character of the surrounding communities. Maintenance and operation of the new transmission line and upgrades to the LANL electrical infrastructure would be performed by existing LANL utility staff or third-party contractor under LANL supervision. In total, it is not expected that the proposed project would affect, or potentially affect, elements of the human environment such as population, employment, income, cost of living, property values, housing, or public services.

Noise

Transmission line noise levels along the existing Norton and Reeves Lines are consistent with background noise levels. To protect the public health and welfare, the U.S. Environmental Protection Agency (EPA) recommends 55 decibels (dB) as an acceptable noise level for residential areas (i.e., roughly the equivalent to a running air conditioner at 100 feet; EPA 2016). The most common noise associated with transmission lines is heard as a crackling or hissing sound and varies because of both weather and voltage of the line. During relatively dry conditions, noise from the proposed transmission line would range from 40 to 50 dB in close proximity (within 100 feet) to the line; in wet conditions, a person in close proximity may experience short bursts of sound at a level from 50 to 60 dB (Aspen 2021).

Noise as an effect to other resources is addressed throughout each resource section independent of a specific noise analysis. Noise as an unaffected resource is described here in the sense of operation and permanent noise caused by the operation of the transmission line. During the construction phase of the project, equipment use would temporarily increase the background noise level within 100 feet by more than 10 to 30 dB near the construction site. To reduce potential impacts to sensitive species, construction activities would occur outside of bird breeding season. The proposed project is not anticipated to cause a significant permanent increase in noise levels.

Air Quality

The National Ambient Air Quality Standards (NAAQS), of the Clean Air Act of 1970, for nonradioactive air emissions are regulated by the State of New Mexico for the EPA. The counties associated with the Caja del Rio and LANL are not designated as nonattainment areas.⁴ Construction activities could

⁴ Nonattainment areas are regions within the country where measured concentrations of one or more criteria pollutants exceed the NAAQS or contribute significant amounts of pollutants to an area that measures air quality that exceeds the standard.

temporarily increase localized particulate and other criteria pollutants. These emissions would be temporary and would be mitigated through dust suppression, maintained equipment, and limited soil disturbance. The proposed project is not anticipated to significantly affect air quality.

Waste Management

No known solid waste management, treatment, or active disposal sites would be disturbed by any portion of the proposed transmission line. Wastes generated by the Proposed Action would be either recycled or would go to an appropriate municipal solid waste landfill in accordance with applicable regulations. Rock, soils, and vegetation disturbed during the construction process would be left on site and managed according to requirements.

Infrastructure and Utilities

Construction of a new transmission line would ensure that a reliable and redundant power is available to meet LANL mission requirements. Long-term impacts would include an increase in LANL's electrical capacity. Any negative impacts (i.e., planned power outages) to utility systems would be temporary and minimal and would last only during the construction and commissioning phases of the project.

Environmental Restoration

Environmental restoration sites that could be affected by the proposed project would be clearly delineated before construction may begin and avoided. The re-conductoring of the power line on DOE/NNSA-managed lands would not involve ground-disturbing activities that would disturb environmental restoration sites.

1.4.2 Resources and Issues Identified During Scoping and Analyzed in Detail

Resources and issues identified during scoping are analyzed in detail in this EA are included in Table 1-2. Detailed analysis of these resources and issues is included in Chapter 3.

Table 1-2. Resources and Issues Identified During Scoping

Resource Area	Issue
Geology and Soils	Implementation of the Proposed Action could cause increased erosion and impact the productivity of soils.
Water	Implementation of the Proposed Action has the potential to impact surface water resources. A decrease in vegetation could result in decreased infiltration rates and increased runoff volume and velocity, causing increased erosion, topsoil loss, and sedimentation.
Vegetation	Implementation of the Proposed Action would cause vegetation disturbance or removal.
Wildlife	Implementation of the Proposed Action could directly impact threatened and endangered (T&E) species and other special status species, as well as wildlife habitat.
Cultural Resources	Ground-disturbing activities associated with implementation of the Proposed Action have the potential to adversely affect archaeological resources.
Recreation and Trails	Implementation of the Proposed Action could disturb and limit access for recreational users.
Visual Resources	Implementation of the Proposed Action would introduce new visual elements to the landscape, including transmission line structures approximately 70 feet tall and line spanning over the Rio Grande and Mortandad Canyon.

Resource Area	Issue
Land Tenure and Use	Implementation of the Proposed Action would convert approximately 85 acres of previously undeveloped/semi-developed land in the Caja del Rio region to a designated utility ROW.
Inventoried Roadless Areas	Implementation of the Proposed Action could impact the relatively undisturbed Inventoried Roadless Areas that provide habitat for wildlife and have ecosystem functions to provide for clean water, soil, and air; opportunities for dispersed outdoor recreation; and locations for study and research.
Livestock Grazing	Implementation of the Proposed Action could alter the available acreage for livestock grazing and remove or alter existing livestock fencing.
Environmental Justice	Implementaiton of the Proposed Action could cause potentially disproportionate and adverse impacts to minority and low-income populations.
Climate, Greenhouse Gases (GHGs), and Social Cost of Carbon	Implementation of the Proposed Action could cause an increase in GHG emissions.
Public and Worker Health and Safety/Accidents	Implementation of the Proposed Action could involve typical construction-related accidents and injuries.
White Rock Canyon Recommended Wilderness Area	Implementenation of the Proposed Action could affect the wilderness characteristics within the White Rock Canyon Recommended Wilderness Area.
S/N Transmission Line Utility Corridor Management Area (SNTUC)	Implementation of the Proposed Action could alter the management of the landscape within a newly established utility corridor management area.

1.5 Decision to Be Made

Based on public scoping and considering the potential effects to the environment and the degree of those effects on the action under 40 CFR 1501.3, DOE/NNSA, the Forest Service and BLM determined that an EA would be necessary to review, analyze, and document the potential impacts to the human and biological environment anticipated for implementation and operation of the proposed project. This EA is an analysis of potential environmental impacts rather than a decision document and details the site-specific environmental analysis for the Proposed Action.

Based on the analysis documented within this EA, the responsible official will decide whether to allow implementation of the Proposed Action for each respective agency. The decision document will include a determination of the significance of the effects and assess the project's consistency with the Forest Plan. Should a Finding of No Significant Impact determination be reached, a decision by the responsible official would be documented in a Decision Notice for each respective agency. DOE intends to adopt the decision of the Forest Service. The forest supervisor will also decide whether to amend the 2022 Forest Plan concurrently with the decision on implementation of the Proposed Action.

In addition to determining whether to approve the implementation of the Proposed Action analyzed in this document, the responsible official may also specify conditions of approval to be implemented with the Selected Alternative. The responsible official may also require additional Project Design Criteria and/or best management practices (BMPs) not discussed within this document and monitoring of project design.

Following the 30-day comment period, comments received on the EA will be finalized considering all comments received during the comment period. A comment response document will be prepared and included as an appendix in the Final EA. Once the Final EA is published, a 45-day objection period will begin, consistent 36 CFR 218 (on the Proposed Action) and 36 CFR 219, Subparts A and B (for the

Forest Plan amendments) in accordance with Forest Service-specific regulations. During this time, the public will be able to file written objections on the EA and proposed Forest Plan amendments. For a commenter to be eligible to submit an objection, commenters must have submitted a specific written comment during a previous public comment period and include the name and postal address of the commenter, as well as the title of the Project.

2 Description of Alternatives

2.1 Introduction

The CEQ regulations for implementing NEPA require federal agencies to prepare an EA for a proposed action that is not likely to have significant effects or when the significance of the effects is unknown (40 CFR 1501.5). An environmental assessment shall briefly discuss the purpose and need for the proposed action, the alternatives as required by section 102(2)(E) of NEPA, and the environmental impacts of the proposed action and alternatives and include a listing of agencies and persons consulted (40 CFR 1501.5(c)(2)). For applications to the agency requiring an environmental assessment, the agency shall commence the environmental assessment as soon as practical after receiving the application (40 CFR 1501.5(d)).

2.2 No Action Alternative

The No Action Alternative describes existing conditions and serves as a baseline for comparing the potential environmental effects of the Proposed Action. It must be considered even if DOE is under court order or legislative command to act (10 CFR 1021.321). Under the No Action Alternative, a new transmission line that originates at the Norton Substation and ends at LANL would not be constructed. Installation of transmission line structures would not occur on BLM-, SFNF-, or DOE-administered land. Any potential environmental effects along the proposed transmission line route would not occur. BLM- and SFNF-administered lands would continue to be available for uninterrupted multipurpose use. DOE/NNSA land uses at LANL would also remain unchanged. The benefit of reliability in electrical power supply from a new transmission would not be created.

LANL and Los Alamos County would not have an additional reliable or redundant transmission line for their respective operations. More frequent and longer duration of outages would be expected due to extensive maintenance problems with existing lines and shortages in the regional power supply. Load shedding would occur until additional power could be returned to LANL for normal operations.

2.3 Proposed Action

The Proposed Action includes construction of a new transmission line and continued maintenance outside the LANL property boundary and both transmission and distribution improvements and continued maintenance within the LANL property boundary. NNSA will coordinate with BLM and SFNF to determine specific ground-disturbing locations in compliance with applicable laws, policies, and procedures.

The Proposed Action would allow for a three-phase, overhead, 115 kV electric power transmission line approximately 14 miles long, which would originate at the Norton Substation and cross approximately 2.5 miles on BLM-administered land, then cross approximately 8.6 miles on SFNF-administered land, and ultimately span White Rock Canyon onto DOE/NNSA-managed lands at LANL for approximately 3 miles (Figure 2-1). The entire transmission line would require a perpetual ROW of 50 feet from center line (100 feet total width). The entire project would have continued operation and maintenance activities within that ROW. Construction activities would have a temporary ROW of 200 feet.

The proposed transmission line siting requirements include identifying a route with the least impact to recreational resources (e.g., Dead Dog Trailhead, El Camino Real NHT), residential and user viewsheds, cultural and biological resources, and special land use designated areas (USDA 2022). The transmission

Description of Alternatives

line siting was supported by biological and cultural resources surveys; viewshed analyses; guidance and direction from SFNF, BLM, and PNM; and input from area Tribes (see Chapter 4, Section 4.2).

Construction of the Proposed Action would require the use of equipment such as

- backhoes, track hoes, front end loaders, tractors, skid steers, digger derrick with auger, blades, cranes, two-man lift buckets, flatbed delivery trucks, concrete trucks, dump trucks, small standard high clearance vehicles, and other heavy machinery;
- pneumatic hammers; and
- a helicopter to string overhead lines across the Rio Grande between SFNF and LANL; and across Mortandad Canyon on LANL property.

The new line would begin at the Norton Substation and continue south along the road within the existing Norton utility corridor. Once atop the plateau, the proposed transmission line would parallel Forest Service Road 24 until it reaches the existing Reeves Line. The proposed transmission line would then parallel the Reeves Line toward Los Alamos Canyon, cross the Rio Grande, and terminate at the LANL Southern Technical Area (STA) Southern Switching Station (Figure 2-2).

Optical ground wire (OPGW)⁵ installation along the route would be included into the proposed overhead transmission line designs as well as an optical fiber splice box mounted to a pole structure at an accessible location for future connection by others between the Norton Substation and the Rio Grande crossing. The exact pole location would be determined by LANL during detailed design, after structure locations are finalized. The inclusion of OPGW in the proposed transmission line does not increase ground disturbance. The OPGW is incorporated into the three-phase plus a static ground number of wires that make up the proposed transmission line and does not increase the number of wires on the poles.

A total of 14 staging areas are proposed for the project. Nine staging areas are proposed on LANL property, four staging areas are proposed on SFNF-administered lands, and one staging area is proposed on BLM-administered lands. Staging areas will be approximately 2 to 5 acres, depending on the material and size of equipment needed for the section of line being constructed. Every effort would be made to site all staging areas within previously disturbed areas. Removal of vegetation would be limited, and erosion control measures would be taken to limit sediment transport. All access roads and staging areas would be returned to “as found” or “improved” conditions based on defined mitigations (Appendix C). Existing roads (Figure 2-2) would be used for both construction and maintenance access. New roads created under the Proposed Action would be within a newly proposed management area proposed as part of this project and covered under the Special Use Permit. Existing access roads may be improved to provide safe access for construction equipment passage, pole placement, and line spanning.

⁵ OPGWs are two small ground wires that are attached and strung between the tops of transmission structures. Ground wires are used for lightning protection. When lightning strikes, the overhead ground wires take the charge instead of the conductors.

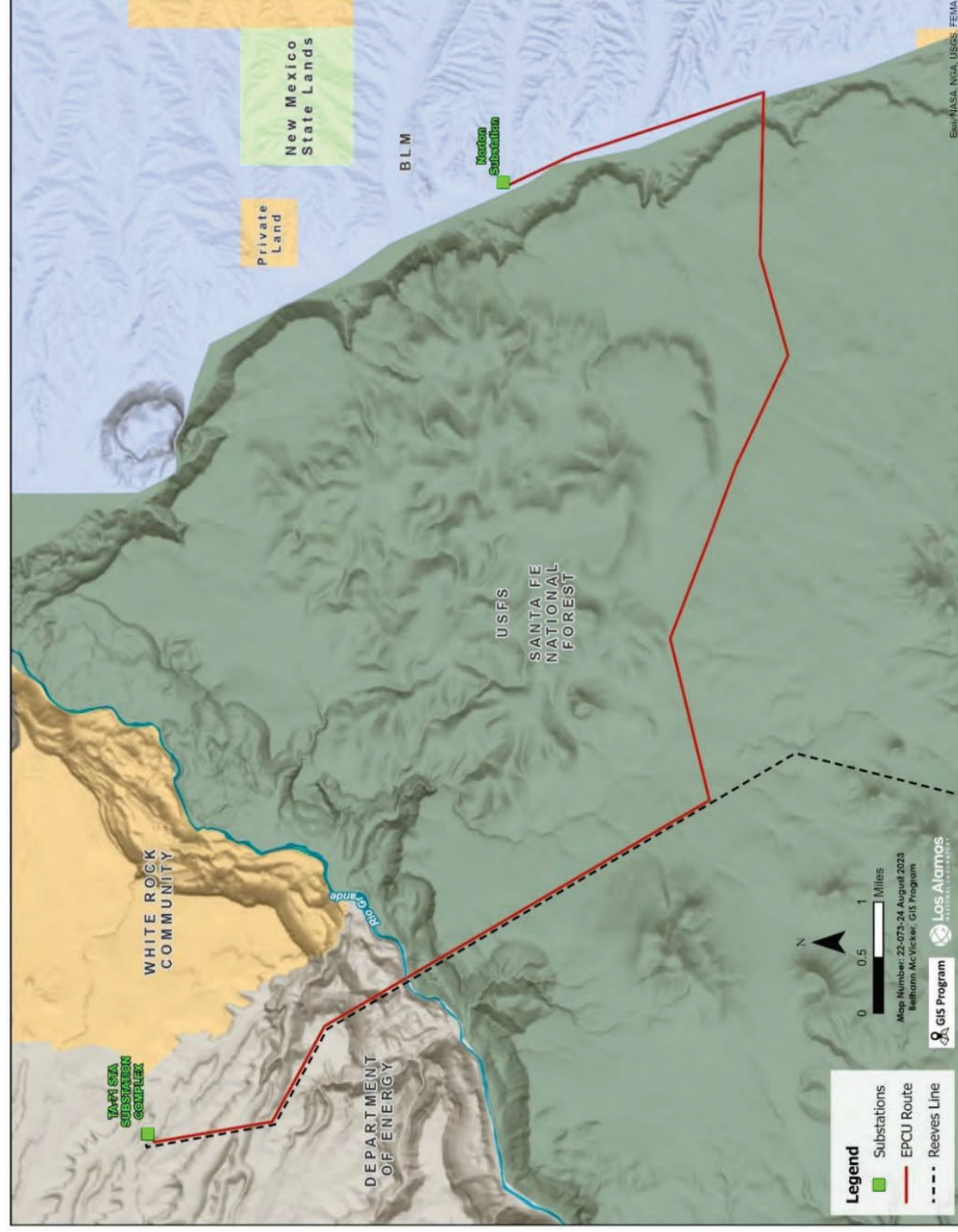


Figure 2-1. Proposed transmission line from Norton Substation to LANL Switching Station.

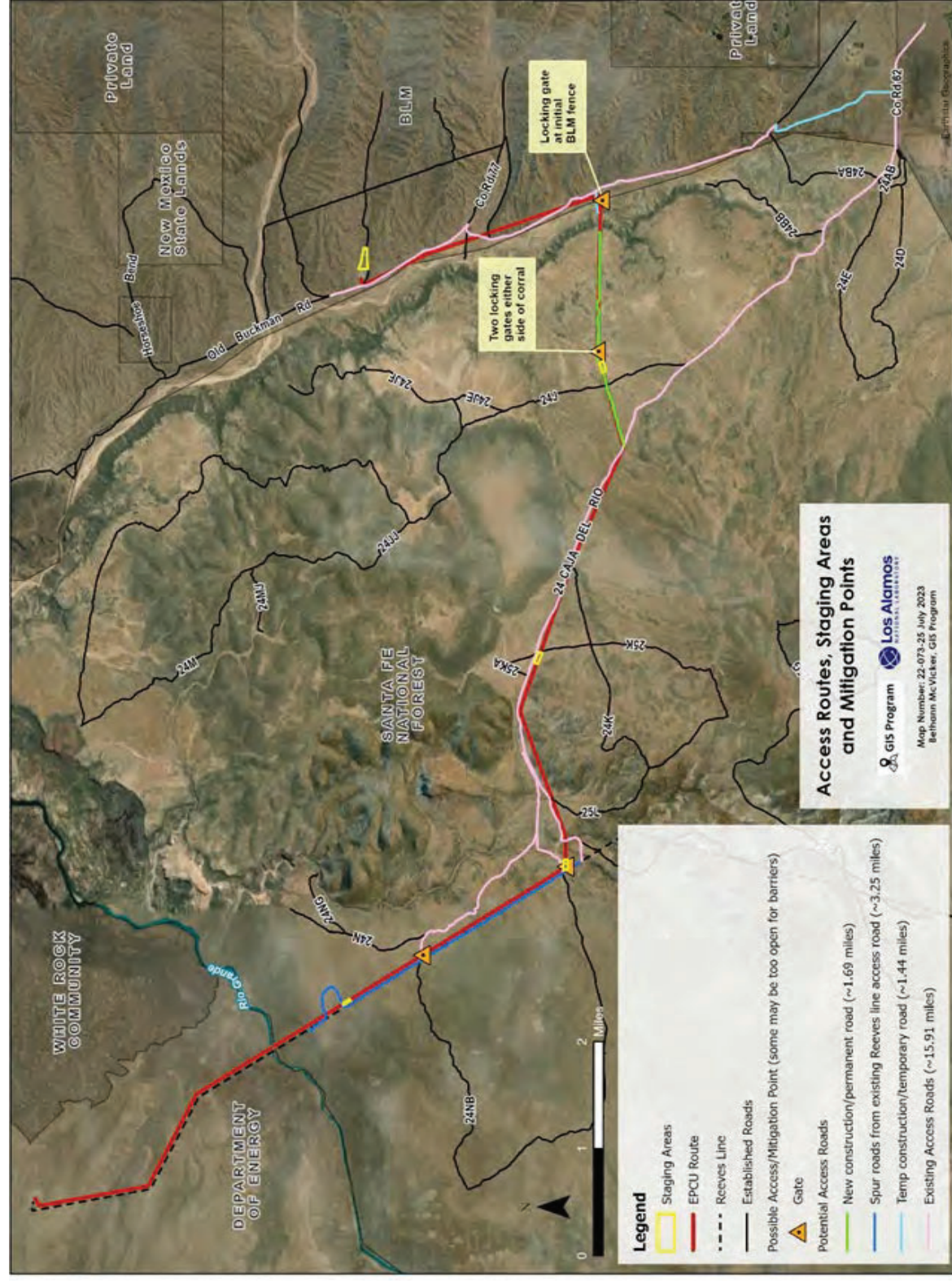


Figure 2-2. Proposed access routes, staging areas, and mitigation points for construction, continued maintenance, and operation of the transmission line on BLM- and Forest Service-administered lands.

Table 2-1 describes the potential areas of impacted soil disturbance (by development of roads and staging areas for construction) and how the Proposed Action would use existing roads, which would remain after the construction and be used along with existing ROWs for maintenance access. Figure 2-3 shows the proposed staging areas within LANL property, and Figure 2-4 illustrates proposed access routes.

Table 2-1. Proposed Road Use and Staging Areas by Land Ownership

Agency	Road Use (miles)			New Permanent Spur Roads	Number of Staging Areas (2–5 acres each)
	Existing Authorized	New Temporary	New Permanent Road Segment		
BLM	7.2	1.19	0	0	1
DOE	30.1	3.3	0	0	9
SFNF	15.3	0.25	1.69	0.55	4

The need exists to construct two new temporary road segments (Figure 2-2), for a total of approximately 1.44 miles on BLM- and Forest Service-administered lands. Temporary road segments would occur within BLM- and SFNF-administered lands. They would be in currently disturbed, unauthorized, two-track routes. These roads would be constructed to allow the construction of the utility line. Temporary roads would be decommissioned and returned to a pre-construction state within 1 year of the line construction in that area.

A new permanent road segment and additional spur roads would be needed for construction and continued monitoring and maintenance within SFNF-administered lands. The new, permanent road segment would be approximately 1.69 miles long, within an already-established, two-track road that accesses a corral. The new permanent road would have two gates installed on either side of the corral to control access. Additional access control measures (e.g., locking gates, berms) may be put into place to control unauthorized access to needed maintenance routes (Figure 2-2).

The portion of the line that would parallel the existing Reeves line would use the existing access route for construction and maintenance (Figure 2-2) and would require spur road access. Because the lines would be situated approximately 150 feet apart, spur roads would be needed between the access road and the new line. It is estimated that approximately 17 electrical poles would be placed within that area. Approximately 170 feet of spur road would be needed to access the new line from the existing road for each pole, equating to approximately 2,890 feet (0.55 miles) of new permanent access road along the 3.25-mile route of the existing access road for the Reeves line on National Forest System land. New and temporary roads would be built with earth-moving equipment, such as backhoes, graders, and tractors.

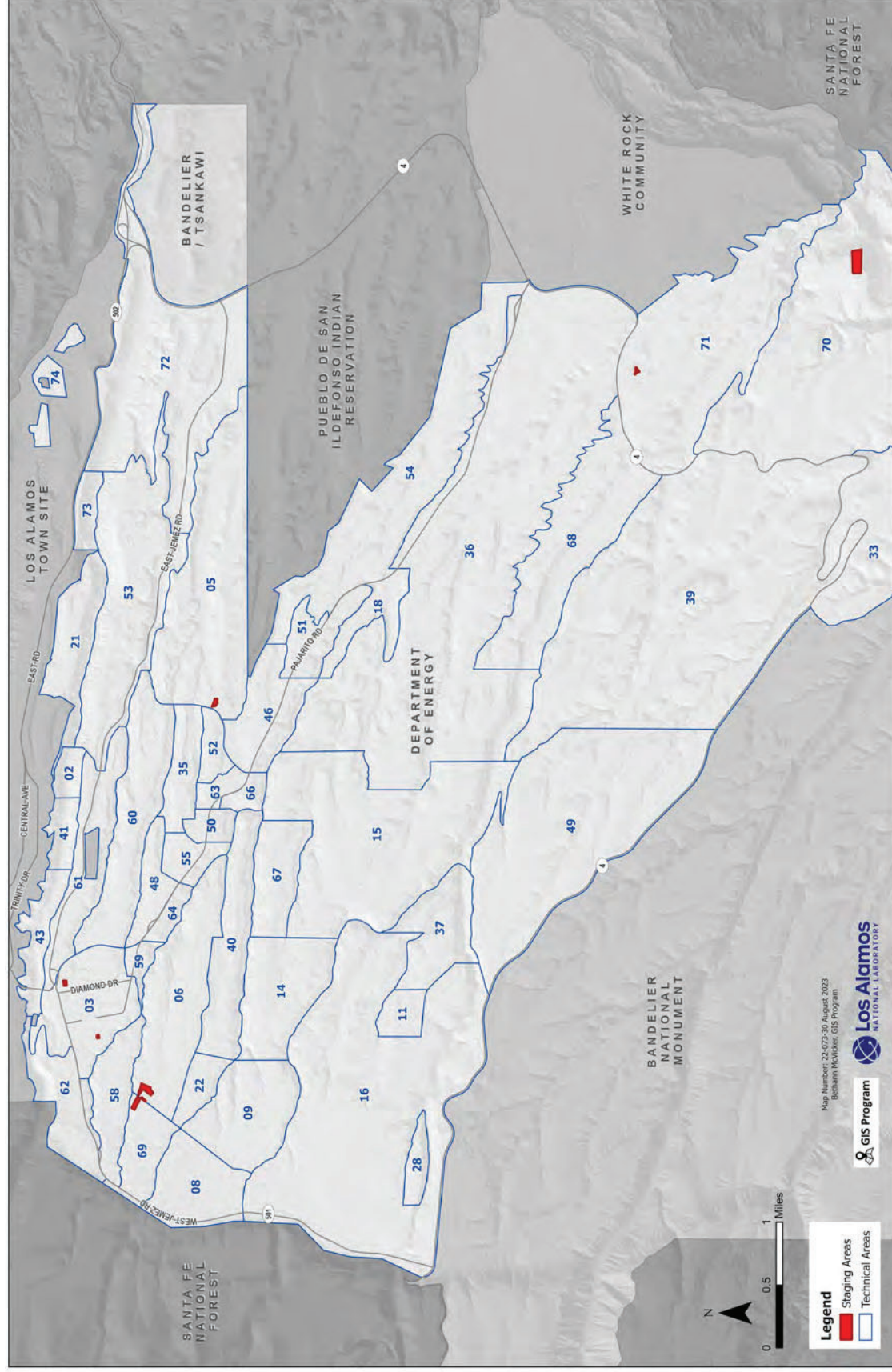


Figure 2-3. Proposed staging areas within LANL.

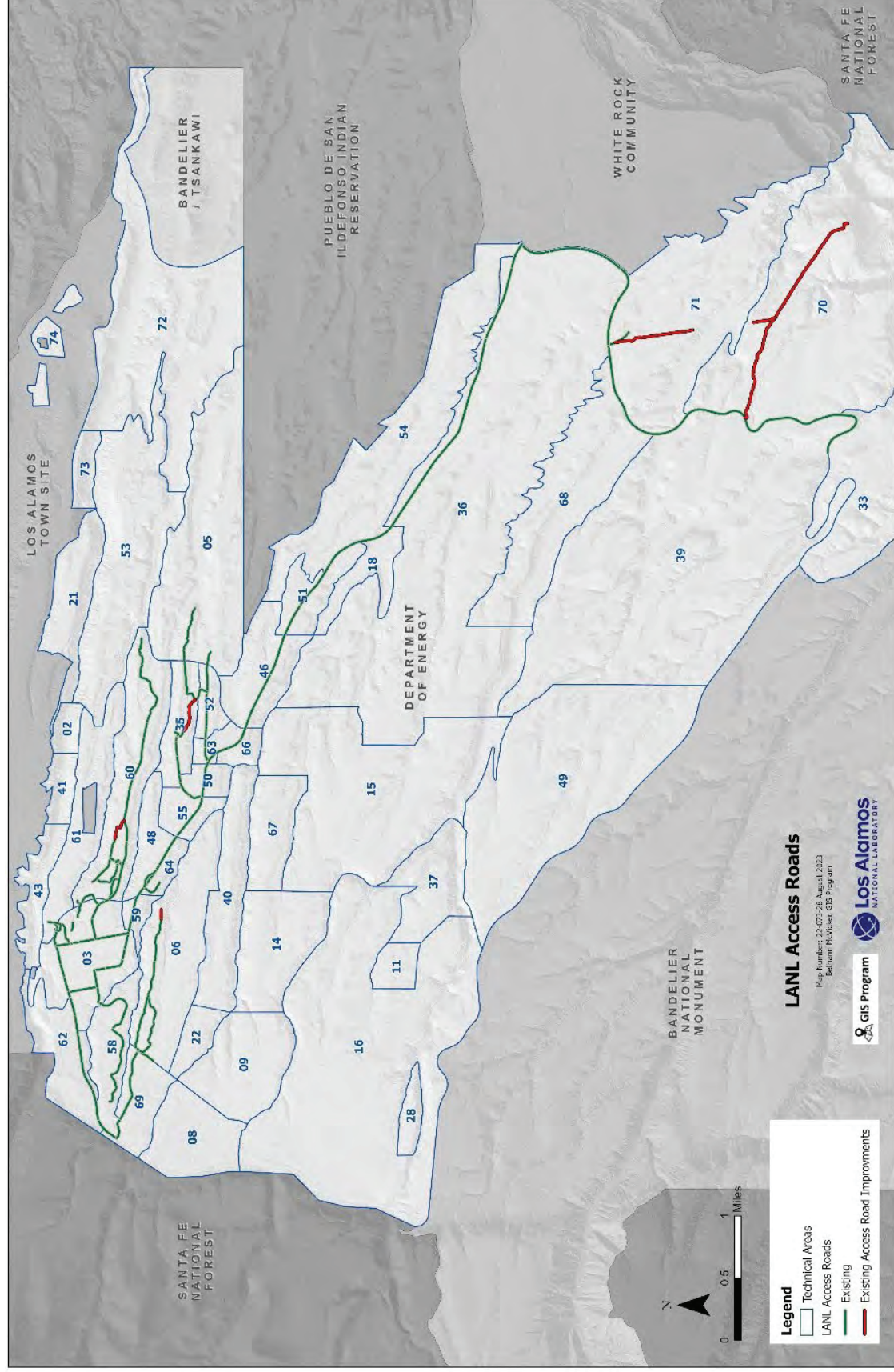


Figure 2-4. Proposed access routes within LANL property for construction, continued maintenance, and operation.

Description of Alternatives

Activities associated with upgrading existing LANL electrical infrastructure on DOE/NNSA lands (Figure 2-5) would include approximately 4 miles of overhead transmission line⁶ construction, approximately 8 miles of overhead distribution⁷ line construction, and 3 miles of underground distribution line as follows:

- Construct a new 115 kV transmission line between the Eastern Technical Area (ETA) Substation and the Technical Area 3 (TA-03) Substation (approximately 4 miles)
- Construct a new current-limiting reactor on the existing Norton Transmission Line at the ETA Substation
- Expand the ETA substation by approximately 58,510 square feet to accommodate the new current-limiting reactor and the new 115 kV transmission line termination, which would include excavation of the site to a depth of approximately 15 feet to allow for the ground grid below the final finished elevation
- Construct additional dedicated distribution lines (approximately 3 miles) to the Strategic Computing Complex, a secured facility that supports the calculation, modeling, simulation, and visualization of complex nuclear weapons data in support of the Stockpile Stewardship Program
- Construct a high-capacity, three-way distribution intertie circuit (approximately 5 miles)
- Upgrade existing substations and switching stations to receive additional power from the proposed transmission line, including voltage support devices as needed
- Use of a helicopter to string overhead lines across the Rio Grande and Mortandad Canyon

The construction of a new 115 kV transmission line between the TA-03 Substation and the ETA Substation (CN Line) is needed to improve overall electrical reliability and maintain voltage stability. The proposed route for the new CN Line would follow the existing utility ROW between the ETA Substation and the TA-03 Substation. The existing distribution line within the ROW would be replaced with steel monopole supports with the new CN Line, and the existing line would be configured in a double circuit configuration. The CN Line is represented in Figure 2-5 as OVERHEAD - TRANSMISSION.

The Strategic Computing Complex requires 80 megavolt-ampere (MVA) capacity to meet its full mission requirements; therefore, the Strategic Computing Complex needs additional distribution lines from the TA-03 Substation and Western Technical Area (WTA) Substation. The proposed additional line from the TA-03 Substation would use a new underground duct bank system. The additional lines from the WTA Substation would use a combination of existing and new duct bank. Soil cover at the existing duct banks would be replaced with new, high-thermal-conductivity, flowable-fill product. A new duct bank to accept the new distribution line would be constructed outside of the Strategic Computing Complex on Mercury Road.

The proposed addition of new 15 kV circuits between TA-03, ETA, and WTA would allow for greater capability and operational flexibility at these locations. The new circuits would follow existing utility ROWs to the extent possible. The proposed addition of new 15 kV circuits would also include the addition of new pad-mounted, stepped capacitor banks and isolation switches at each location.

⁶ Transmission lines carry high-voltage electricity for long distances and require 3-phase 3-wire. Transmission lines are thicker and require higher-length towers.

⁷ Distribution lines carry low-voltage electrical power shorter distances, typically from substations to the consumer end. Distribution lines require 3-phase 4-wire or single-phase wire, are thinner, and have small-length towers.

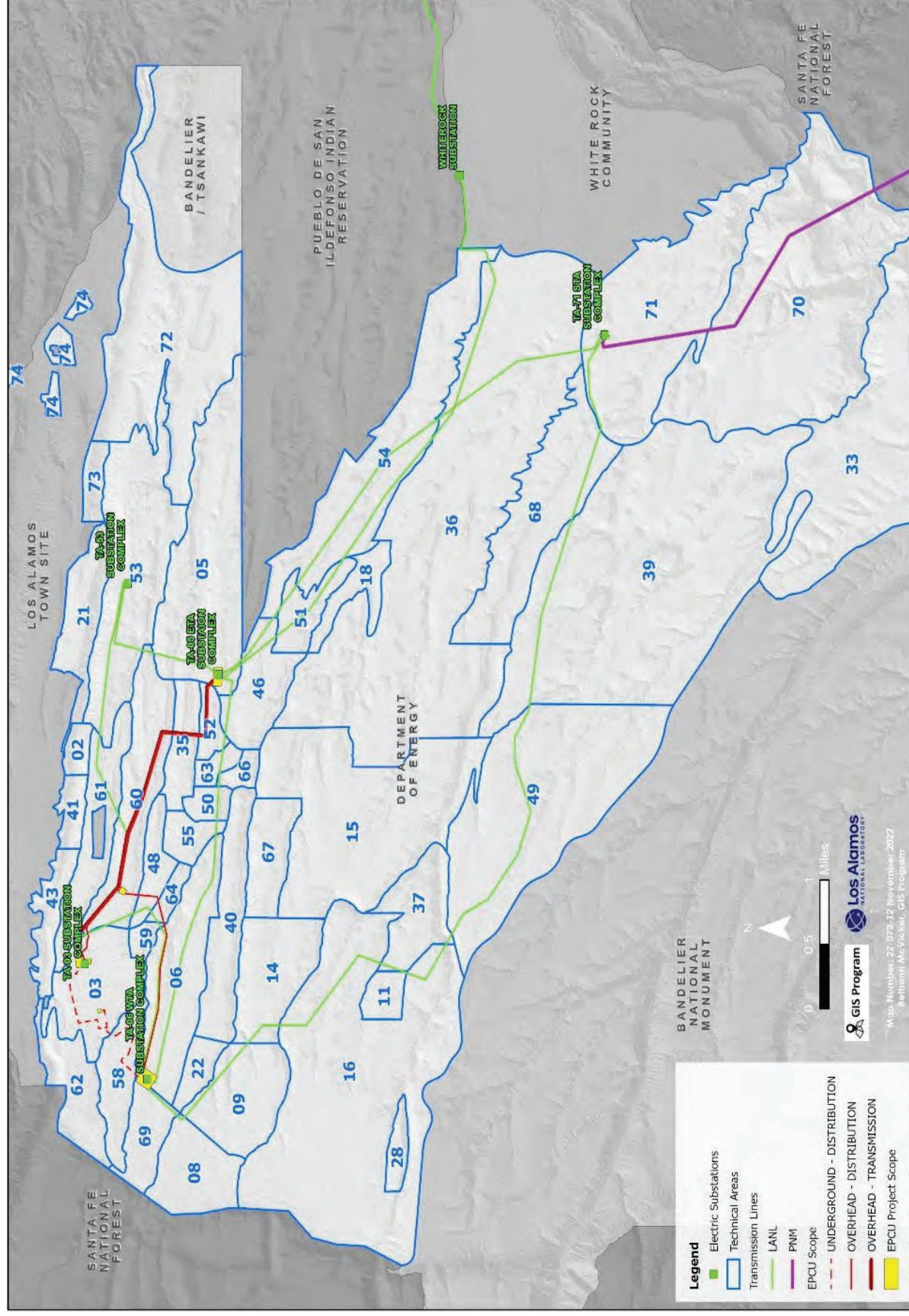


Figure 2-5. Scope of Proposed Action on DOE/NNSA property.

Description of Alternatives

The existing substations and switching stations would be upgraded to receive additional power from the proposed transmission lines and distribution circuits. These upgrades include extending the substation bus work to receive new transmission and distribution lines; adding a current limiting series reactor; adding new capacitors and disconnecting switches; adding a new power transformer; moving or creating ring bus bays; and installing new relays, metering, and protection and controls equipment.

Fiber optic network and associated infrastructure is currently located at the Technical Area 71 (TA-71) STA Switching Station that runs to the Technical Area 6 (TA-06) WTA Substation interface point. The proposed fiber optic line would tie into the existing infrastructure at TA-71. Full capability access would then be accessed from the TA-06 WTA Substation interface point. No new additional infrastructure would be needed to carry fiber optic from TA-71 further into LANL.

The proposed transmission line from the Norton Substation and across LANL is expected to consist of three 954,000 circular mils aluminum conductor, steel-reinforced cable (ACSR) conductors⁸ and an OPGW.⁹ Conductors are supported by different structures depending on the design requirements.

2.3.1 Types of Structures Needed

Two-Pole Structures

Conductors would be supported on wooden pole structures with cross bracing, cross arms, insulators, a grounding system, and guy-wires as needed (Appendix B, Figure B-1). Straight sections of the proposed transmission line would be built with two-pole structures (Appendix B, Figure B-2). Poles would not be required to have beacon lights or waist lighting because of the structures' height. Poles would be placed approximately 800 feet apart or at areas where a transmission line needs to progress (i.e., near the edge of an escarpment, over a hill or rise, or at a significant turn in the line).

Three-Pole Structures

At locations where the transmission line bends horizontally, a turning structure is required. Turning structures consists of three steel poles (Appendix B, Figure B-3). Turning structures require guy-wires on one side of the structure to prevent the transmission line from collapsing.

Four-Pole Structure

A four-pole structure is required to maintain structural stability. These structures are typically placed once every 1.5 to 2 miles, depending on the length of the conductor (Appendix B; Figure B-4). These structures have additional guy-wires to support the line tension in either direction.

Tangent Structures

The proposed transmission line would need to cross the Rio Grande at White Rock Canyon (Appendix B, Figure B-5). The anticipated crossing location is just over a mile wide and would require two types of pole structures on each side. Tangent structures would vertically support the weight of the conductor and would be placed nearest to the canyon's edge. Four-pole structures support the horizontal tension

⁸ The wires that carry the electrical current on a transmission line are called conductors. Conductors are made with aluminum outer layer and a steel core; they often have a coating to reduce reflectivity and brightness. Conductors are supported by cross arms with insulators, devices that prevent the electricity from jumping from the conductors to the tower and down to the ground. The insulators are made of impact-resistant porcelain or fiberglass and are nonreflective. The conductors would need to be fitted together where one reel of conductor ends and a new reel begins.

⁹ OPGWs are two small ground wires that are attached and strung between the tops of transmission structures. Ground wires are used for lightning protection. When lightning strikes, the overhead ground wires take the charge instead of the conductors.

Description of Alternatives

associated with the crossings and would be placed farther away from the canyon's edge. Concrete foundations are required to better resist the large tensile forces. Crossing structures are typically steel mono poles (Appendix B, Figure B-6). The proposed transmission line at the crossing would have conductors designed to withstand tension and wind shear; the line would also have overhead markers (Appendix B; Figure B-7)—safety instruments applied to power lines that identify transmission lines for aircraft—consistent with the crossing structures adjacent to the proposed crossing.

Double Transmission Circuit Structure

A double transmission circuit structure supports two different transmission and/or distribution lines (a total of six conductors) on one set of structures (Appendix B; Figure B-8). To limit impacts to sensitive wildlife habitat, a double transmission/distribution circuit structure would be used for a portion of the new 115 kV transmission line between the TA-03 Substation and the LANL ETA Substation within the DOE/NNSA-managed lands. The double transmission/distribution circuit proposed would include a new 115 kV circuit on top with a 13.8 kV distribution circuit directly below.

Transmission lines have been a contributing factor in initiating wildland fires. In some instances, high winds can blow nearby trees into transmission lines or cause conductors to touch, creating a spark. To minimize a transmission and/or distribution-line-initiated wildland fire, preventive measures are incorporated into the project design. These preventive measures include

- the use of robust insulators to isolate the electrical energy at pole structures;
- grounded pole structures to reduce the potential for lightning impacts;
- maximizing spacing between conductors to prevent touching in a cross wind, thus preventing an arc flash;
- routine pole inspections and repairs by qualified personnel;
- compliance with a Forest Service vegetation management plan performance of fuel-reduction activities within the utility ROW;
- BLM general project design features/guide stipulations for soils, vegetation, weeds, and special status plant species; and
- real-time, power-flow monitoring and fast-reacting relays/circuit breakers to interrupt power flow during a fault or lightning-strike event.

2.3.2 Construction Activities

This section describes what would occur during the construction phase of the project across all jurisdictional boundaries. A variety of activities are necessary to allow for construction to occur, such as road identification, preparation of staging areas, and final location siting for structures. A generalized construction schedule is provided in Table 2-2, followed by a description of general construction activities for both the SFNF and BLM utility ROWs and within the LANL-managed land. Upgrades to existing LANL electrical infrastructure would occur simultaneously within the construction of the proposed transmission line on the Caja del Rio Plateau.

Description of Alternatives

Table 2-2. Anticipated Project Construction Phases and Timeframes

Construction Phase	Description	Estimated ^a Timeframe
Transmission and Structure Siting and Final Design	Siting engineers, archaeologists, biologists, and land-use specialists use field work, aerial imagery, environmental data, public comments, and SFNF, BLM, and Tribal consultations to determine the final transmission structure placement while avoiding obstacles and minimizing impacts. Field work includes geotechnical investigations that require limited borings and/or trenching.	12 months
Preparing Utility Right-of-Way	Vegetation that could compromise safety is cleared and, if needed, access roads are improved or built. Staging areas are constructed.	2 months
Install Footings	Borings for transmission structures are dug using truck-mounted auger, excavator, or blasting. Treated wooden poles are placed in each new hole and backfilled. H-frame structures are installed.	4 months
Install Crossing and Turning Structures	Crossing structures and turning structures are constructed on site or off site, taken to designated locations, and installed with necessary equipment.	4 months
Stringing Conductor	Conductor is reeled between structures and pulled into proper tension and permanently attached.	4 months
Upgrades to Existing LANL Electrical Infrastructure	Existing switching stations and substations are upgraded to support additional electrical capacity. New distribution lines to Strategic Computing Complex are installed. Circuits are added between ETA, WTA, and TA-03.	24 months
Clean up and Energize	Equipment and debris are removed from construction site. Sites are restored according to construction specifications. The line is energized.	12 months

^a Estimates are based on similar construction activities. Not included are migratory bird non-distribution periods.

Transmission Structure Siting

Transmission structures would be securely attached to the ground directly or with footings. Two-pole structures would be anchored to the ground in a boring. Using a truck-mounted auger, holes would be drilled at the engineered specific hole diameter and depth. Poles would be placed into the boring and, as necessary, backfilled with auger cuttings or other type of specified backfill. Proposed transmission structures are positioned to

- provide adequate conductor clearances aboveground to safeguard the public, utility workers, and utility facilities;
- avoid obstacles;
- avoid and minimize impacts to aesthetic, cultural, and biological resources; and
- reduce overall project footprint.

Native soil would be banked up and tamped around the pole above the natural grade and sloped away to avoid surface-water infiltration. Guy-wires each have a steel auger element that is turned into the ground using BMPs to avoid or minimize impacts to resource areas (Appendix C).

Shaft footings are made of reinforced steel and concrete at the base of steel transmission structures. Footing depth depends on the site-specific soil or rock characteristics. During construction, an auger would be used to make appropriately sized vertical shafts for the footings. Soil and rock removed would be either spread out onto an approved location or removed from the project area. Once foundations are set and cured, transmission line structures would be erected via helicopter or large crane.

Description of Alternatives

Preparing Utility ROW

Typical construction includes disturbance from vehicles, construction equipment, crane pads, etc., and involves soils compaction and vegetation removal. Vegetation removal would occur within the 100-foot perpetual ROW. Selective vegetation removal could occur in areas where transmission structures are sited and where equipment needs to be located for staging purposes or where necessary to maintain safe clearances to energized conductors.

Temporary Roads

Temporary roads may be built to allow access to the transmission structures along the route. Any temporary road that is built would be located within the ROW. Project design efforts would avoid placement of structures within stream crossings, El Camino Real NHT, and any cultural resources. The entrance to temporary roads from established Forest Service roads would use controls in compliance with SFNF Forest Travel Management Plan requirements (USDA 2012).

New Permanent Roads

New permanent road segments would be built to allow access for construction and continued operation of the transmission line. New permanent roads are proposed within the SNTUC and within the transmission line ROW on National Forest System lands. Project design efforts would avoid placement of structures within stream crossings, El Camino Real NHT, and any cultural resources. The entrance to permanent roads from established Forest Service roads would use controls in compliance with SFNF Forest Travel Management Plan requirements (USDA 2012).

Existing Roads

Improvements to existing roads may occur to allow for safe construction equipment access. Roads would be graded, and rock would be placed where the soil is unstable. Vegetation removal could be necessary if roads need to be widened; however, upon completion of the project, areas would be reclaimed using agency-approved BMPs. Installation of culvert could be necessary to avoid road washout. Use of existing roads on Forest Service-managed lands would be in compliance with SFNF Travel Management Plan requirements (USDA 2012).

Staging Areas

Temporary staging areas would be sited along or near the transmission line for materials storage, construction vehicle parking, and transmission structures assembly. Staging areas could range between approximately 2 to 5 acres, depending on the amount of materials and size of vehicles and equipment needed for that portion of line construction. Any potential disturbance would be temporary, and DOE/NNSA would use mitigation measures (Appendix C) to rehabilitate disturbance. Staging areas would be located within the temporary, 200-foot-wide construction ROW on SFNF-administered lands (Figure 2-2 and Figure 2-3).

Vegetation Management

A vegetation management plan would be developed between DOE/NNSA and the Forest Service before project implementation, adhering to the requirements identified in 36 CFR 251. In addition, vegetation management within the DOE/NNSA-managed lands would adhere to existing LANL vegetation-management standards.

Description of Alternatives

Biological monitors would be onsite before and during construction activities to ensure that vegetation management occurs according to project specifications. All vegetation that would interfere with the energized conductor would be removed from the 100-foot-wide utility ROW at the time of construction, consistent with engineering standards. At the transmission structure sites, all vegetation and stumps would be removed. Vegetation removed would be hauled off-site to avoid fire hazards within the ROW. The removal areas, including root systems, are typically 50 feet by 50 feet.

Trees (stable or unstable) within or outside of the easement that are deemed to present a safety hazard would be removed consistent with engineering standards. A tree would be identified as a safety hazard if it could fall into, bend, or grow into the conductor or be close enough to the conductor as it swings to cause a flashover of current. Trees would also be removed if they would pose a safety hazard to construction workers or the public.

Within the Caja del Rio Plateau, piñon and juniper trees (safety hazard) would be removed within 50 feet of center line, consistent with engineering standards. Wildland fire mitigations are incorporated into the transmission line design, including robust insulators to reduce spark sources; grounded structures to reduce lightning-initiated wildland fire; conductor spacing to minimize sparking; specified line tension, height, and line sag to minimize touching lines during high-wind events; and regular pole and insulator inspections.

Stringing Conductor

After the conductor is mounted on the transmission line structures, the conductor would be pulled to the appropriate tension at designated sites (tensioning sites) along the easement. A flat area approximately 300 feet by 100 feet would be needed for a pulling area to accommodate a large flatbed trailer with the reels of conductor and a tensioning machine. Site disturbance could consist of grading and placement of crushed rock. Environmental review would be conducted for these areas when they are identified on all properties. Upon completion, these sites would be reclaimed to pre-disturbance conditions using agency approved BMPs as described in Appendix C.

Upgrades to Existing LANL Electrical Infrastructure

Construction activities may occur simultaneously between all land jurisdictions. Preparation for upgrades to existing LANL infrastructure may occur before, during, or after the construction of the transmission line across the Caja del Rio Plateau. This work may include underground duct bank and substation and switching station upgrades.

Underground Duct Bank

To minimize impacts, a combination of existing and new underground duct bank may be used for the additional distribution line from the TA-03 and WTA Substations to the Strategic Computing Complex. New underground duct bank would be constructed along Mercury Road within TA-03, further making use of existing development. Construction would require the use of excavation equipment to create an open trench to the desired depth. Once a portion of the trench is dug, conduit would be placed into the trench. The area around the conduit would be filled with a high-strength, thermally corrective concrete, and then the trench would be backfilled and the site reclaimed. Backfill materials may be clean excavated material, thermal sand, and/or a thermally corrective concrete mix.

Description of Alternatives

Substation and Switching Station Upgrades

Upgrades to substation and switching station components include installing a spare transformer, new switchgears,¹⁰ new distribution feeder circuits, new ring bus bays to receive new distribution and transmission lines; and updating relay, breaker, and protection and control equipment. Upgrades could include the installation of concrete transformer and switchgear pads, concrete footings, and other ground-disturbing activities to ensure that new and upgraded equipment are anchored to the ground. To minimize adverse impacts, excavation activities would focus on areas with existing disturbance.

The ETA substation footprint would be expanded by approximately 58,500 square feet to accommodate the new transmission line from the TA-03 Substation and installation of a new current-limiting reactor on the existing Norton line. Final design will validate the extent of required expansion that would occur to the north and west or to the south and west of the current substation footprint. The expansion would include the excavation to a depth of approximately 15 feet, the extension of the existing buried grounding grid, placement of gravel or other engineering fill, and extension of existing perimeter fence. In addition, a new bus bay would be installed to accept the new transmission line on the northwest side of the ETA.

In addition, the SFNF Forest Plan would need to be amended to allow the project to occur on SFNF-administered lands, as described in Chapter 2, Section 2.3.3.

2.3.3 Santa Fe National Forest Plan Amendments

As required by the National Forest Management Act, all projects and activities authorized by the SFNF must be consistent with the Santa Fe National Forest Land Management Plan (16 U.S.C. 1605(I) as described at 36 CFR 219.1). Consistency with the plan is accomplished by a project or activity being consistent with applicable plan components or, in cases where a project or activity is not consistent, the responsible official can amend the plan so that the project or activity will be consistent with the plan as amended. The Proposed Action would include programmatic amendments to the 2022 Santa Fe National Forest Land Management Plan that are necessary to achieve the purpose and need and assure consistency with the Forest Plan. The Forest Plan would be amended using the 2012 Planning Rule (36 CFR 219.13).

A programmatic plan amendment—focused on energy development and improvement needs—to the 2022 Santa Fe National Forest Land Management Plan, as amended, would be required for the SFNF to approve the proposed SUP.

- Specific language for the amendments is part of the Proposed Action. It includes the establishment of the S/N Transmission Line Utility Corridor Management Area (SNTUC). The SNTUC is proposed to run the entire length of the transmission line across SFNF-managed lands. It would be 100-foot wide, encompasses approximately 104 total acres and approximately 1.69 miles of new permanent roads. including four new Forest Plan components:
 - a. Desired Conditions
 - I. MA-SNTUC-DC-1: The S/N Transmission Line Utility Corridor Management Area is managed for utility infrastructure that provides reliable electrical power, ensuring continuity of Los Alamos National Laboratory operations.
 - b. Guidelines
 - I. MA-SNTUC-G-1: Construction of utility infrastructure for the Los Alamos National Laboratory Electrical Power Capacity Upgrade Project S/N transmission line (e.g., towers, poles) or associated above-ground facilities should blend in with the general

¹⁰ Switchgears are used to de-energize equipment to allow work to be done and to clear faults downstream.

Description of Alternatives

- landscape to help minimize scenery impacts (e.g., coloration of towers and poles, use of wood poles, non-glare tint on wires, aligning of infrastructure with topography).
- II. MA-SNTUC-G-2: Management activities should be consistent with the scenic integrity objective of “low”.
 - III. MA-SNTUC-G-3: The S/N Transmission Line Utility Corridor Management Area should be managed for semiprimitive motorized recreation opportunity spectrum (ROS); and
- Additional amendment language plan components include:
 - Caja del Rio Wildlife and Cultural Interpretive Management Area MA-CAJA-S-1: Maximize use of existing utility line corridors for additional utility line needs. New utility corridors and communication sites will not be allowed except for the Los Alamos National Laboratory Electrical Power Capacity Upgrade Project, S/N transmission line.
 - Inventoried Roadless Areas DA-IRA-G-2: Management activities should be consistent with the scenic integrity objective of high expect within the S/N Transmission Line Utility Corridor Management Area.
 - National Historic Trails DA-NHT-G-1: Management activities in NHT corridors should be consistent with or make progress toward achieving scenic integrity objectives of high or very high within the foreground of the trail (up to 0.5 mile either side) or within the identical trail viewshed—the landscape area visible from the trail based on topography except within the S/N Transmission Line Utility Corridor Management Area.

A full description of the proposed programmatic Forest Plan amendments and description of each plan component can be found in Appendix A. Figure 2-6 shows the Proposed Action in relation to the proposed SNTUC.

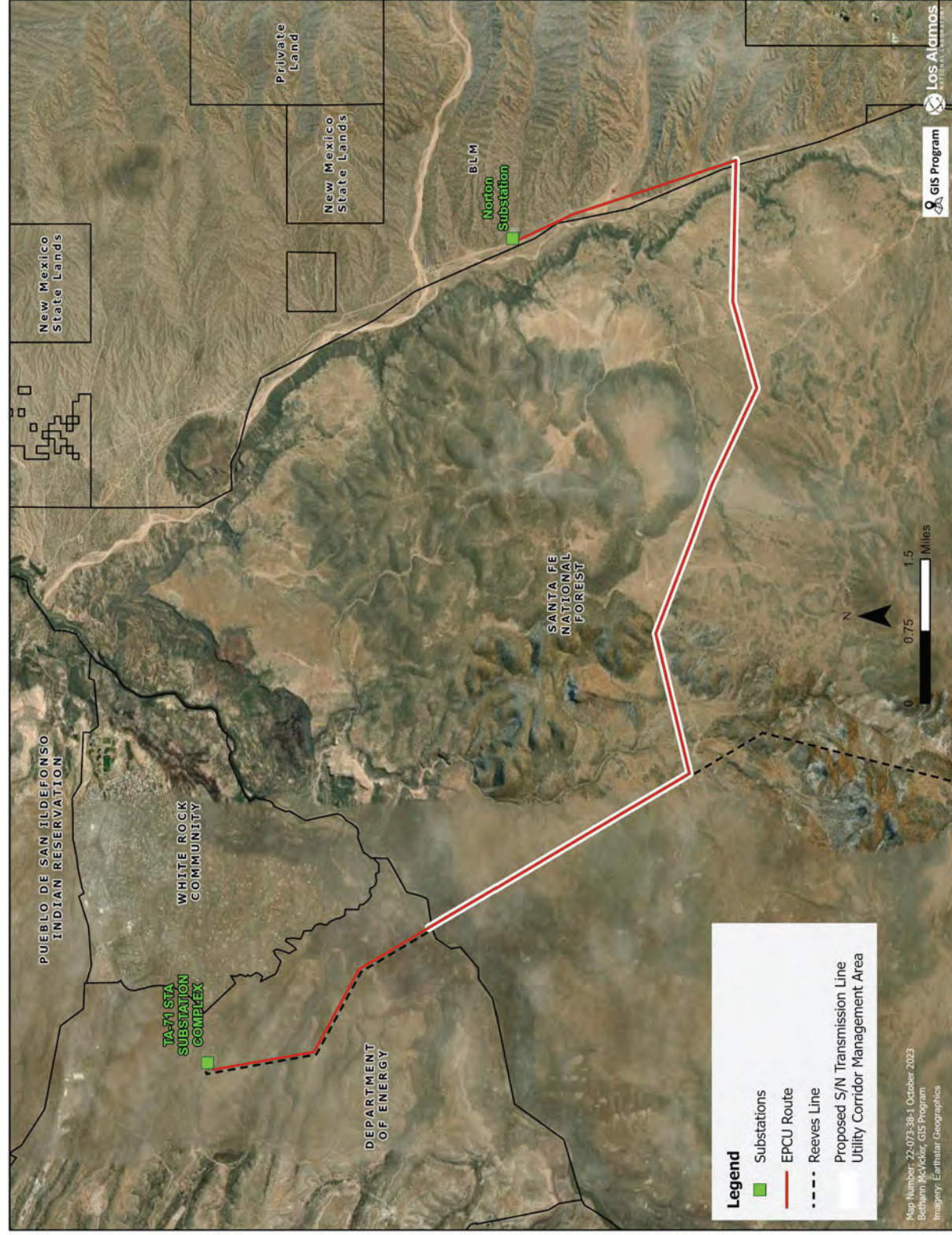


Figure 2-6. Proposed Action in relation to Santa Fe National Forest—proposed S/N Transmission Line Utility Corridor Management Area.

2.4 Alternatives Considered but Eliminated from Detailed Study

In 2019, DOE/NNSA evaluated the need to increase electrical transmission capacity and performance to meet electrical demands. They evaluated several alternatives to address the potential risk of exceeding the existing power capacity and provide redundant and reliable electrical power to LANL. The evaluation criteria for potential alternatives included the abilities to

- maximize power transmission and distribution quality, resiliency, and reliability to critical Laboratory areas;
- provide additional MVA capacity (up to 80 MVA) distribution feeder circuits and switchgear to the Strategic Computing Complex;
- minimize disruption to ongoing operations and programs during construction;
- provide additional substation distribution interties to increase operational flexibility;
- increase operational flexibility for future expansion, including onsite generation; and
- provide additional MVA capacity (200–266 MVA) 100 percent redundancy for all offsite and onsite transmission.

Alternatives were considered based on the evaluation criteria, and the following alternatives were eliminated from detailed study.

2.4.1 *Reconductoring Existing Transmission Lines*

The project evaluated reconductoring for four of six onsite transmission lines during conceptual design. More detailed power flow analysis indicated that one new transmission line is necessary but not the upgrade of four existing transmission lines.

The project further evaluated the reconductoring of the existing Norton and Reeves Lines to afford greater electric-current-carrying capacity that would reduce the potential risk associated with exceeding the existing operating limits. However, this alternative would expose LANL and Los Alamos townsite to a single point of power failure for up to 3 years during construction activities for reconductoring.

Mission objectives could be compromised should power failure occur throughout LANL, and social and economic impacts could occur should power failure occur throughout Los Alamos County. Reconductoring the two existing lines under this alternative would not address the purpose and need for reliable and redundant power and could be cost prohibitive.

2.4.2 *Expand Onsite Power Generation*

The construction and operation proposed in the EPCU project is for transmission of power, not generation of power. DOE/NNSA considered expansion of onsite power generation by different means. This alternative involved construction and operation of additional onsite power-generation facilities described as follows. All potential options (or combinations) for onsite power generation mechanisms considered under this alternative would not address the purpose and need for reliable and redundant power, would not use proven technologies for the scale of electrical power needed, and could lead to concerns with regulatory requirements.

Small Modular Nuclear Reactor Generation

The use of an onsite small modular reactor was eliminated due to regulatory requirements and the immaturity of the technology. Additionally, it would require a substantial amount of water for cooling. The reactor would not be readily available until after the projected energy shortfall.

Wind Generation

The use of renewable energy sources, such as wind, is not viable because of the low average wind speed. Los Alamos is not an ideal location due to the proximity to the Jemez Mountains and canyons that create turbulence. Intermittency of wind generation is not compatible with LANL's demand pattern without significant grid support.

Solar Photovoltaic Generation

Solar energy is not a viable option because it would require a significant land area (approximately 400 to 500 acres). The scale at which a facility would need to be built would not make up for the electrical power shortfall (LANL 2016; van de Ven et al. 2021). Intermittency of solar generation is not compatible with LANL's demand pattern without significant grid support. Future plans exist for energy generation via a PV system on approximately 55 acres within DOE/NNSA-managed lands; however, this system would not be of the extent and scale needed to meet the purpose and need for the project.

Combustion Gas Turbine Generation

LANL has an existing gas-fired combustion turbine generator with a capacity of 20 to 25 MW. The contingency for when this unit is offline is the supply of power from the transmission grid. The addition of 80 MW of gas turbine generation would push LANL into a major new source review for air quality permitting. The life cycle cost of this option is significantly higher than the preferred alternative. Further power generation with fossil fuel is not consistent with federal guidance for reduction of greenhouse gas emissions.

Add Onsite Power Storage

This alternative involves the construction and operation of a battery power storage facility (i.e., stationary battery storage). Stationary battery energy storage, mechanical energy storage, thermal energy storage, and chemical energy storage technologies are mature but have only a limited extended application and are undergoing advancement for commercial applications (DOE 2020). DOE has proposed a proof-of-concept project to install a new battery bank that would support an area of the Laboratory near the Dual Axis Radiographic Hydrodynamic Test Facility (DOE 2023). This option would serve as a small-scale pilot study for LANL, but this alternative is not viable because there is insufficient swing in site power demand to recharge storage batteries overnight. The addition of onsite power storage considered under this alternative would not address the purpose and need for reliable and redundant power.

2.4.3 New Transmission Line Alternatives

The project briefly considered underground transmission line construction and the possibility of a transmission interconnection at a location other than PNM's Norton Substation, as described in more detail in the following sections.

New Overhead Transmission Line

The project evaluated numerous potential siting and alignments for constructing a new transmission line from the Norton Substation to LANL (Figure 2-7). Input from tribal governments and members

eliminated all but one proposed route. To address the purpose and need for agency action (Chapter 2), potential routes that would

- be excessively longer than the Proposed Action,
- not improve the reliability or redundancy of electrical power to LANL,
- not allow for completion of the project before the required timeframe of 2027, or
- cause significant environmental impacts

were not considered to be viable alternatives and are not analyzed further in this document.

New Underground Transmission Line

Underground high-voltage electric transmission systems have been constructed and operated throughout the country and are typical in congested urban areas and in areas with high wildland fire potential. An underground high-voltage electric transmission system requires technological considerations that are more complex and costly than other types of underground electric distribution systems. Construction of an underground high-voltage electric transmission system requires a continuous zone of disturbance approximately 15 to 20 feet wide and 6 to 8 feet deep, creating a permanent zone in the form of surface disturbance and causing potential impacts to biological and cultural resources. If a line is damaged, the location of the damaged element is difficult to identify, and repairs are considered costly.

The colocation of a transmission line with other underground utilities (i.e., underground fiber-optic lines) was not considered because the space requirements are different. The project eliminated underground construction as a viable alternative because of the technical complexity associated with mechanical and voltage stresses on an underground high-voltage electric transmission system; construction difficulties associated with trenching, accessibility, and servicing required for installing, jointing, splicing, and maintaining installations; and potential environmental impacts.

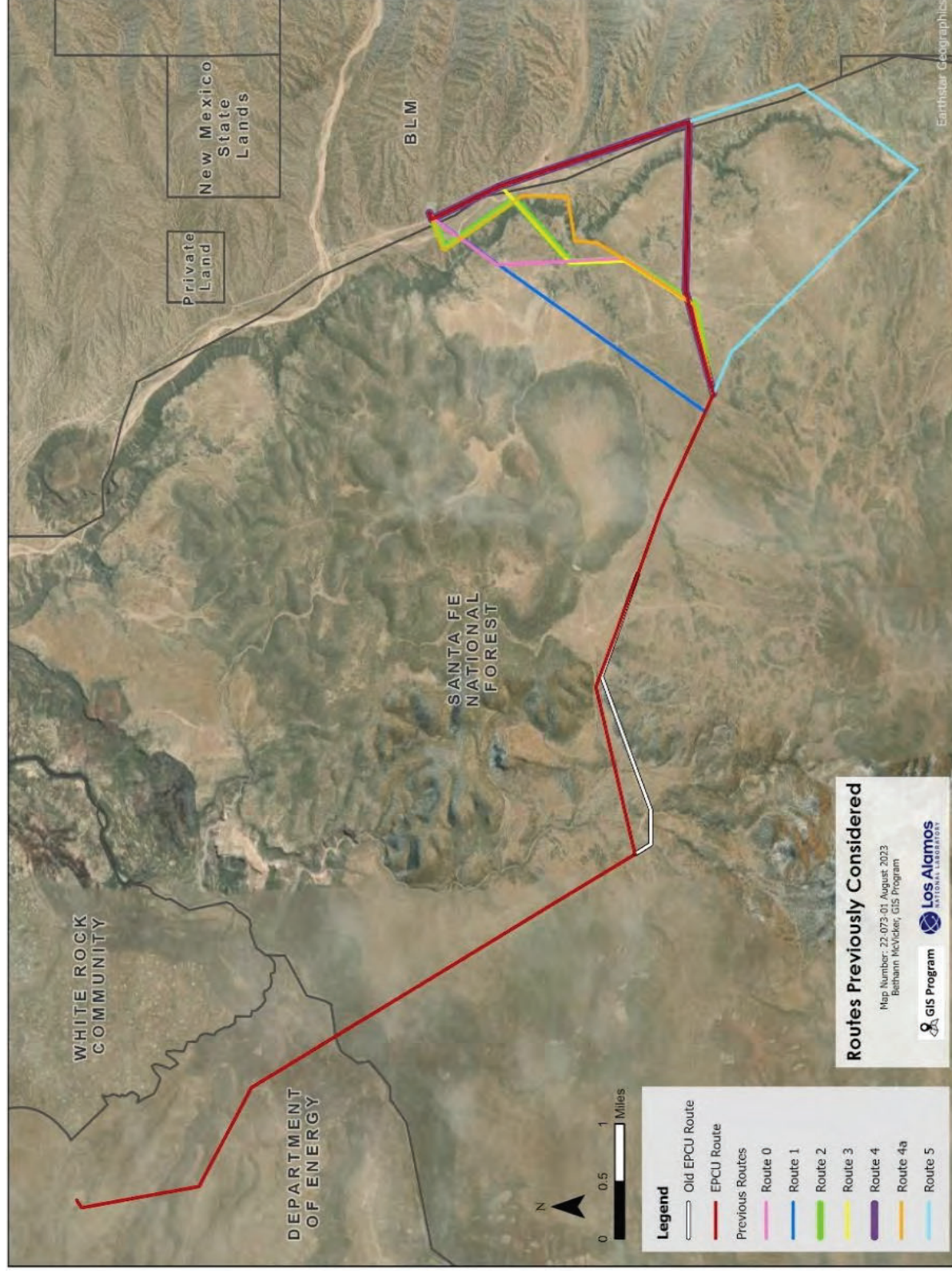


Figure 2-7. Overhead transmission line routing options previously considered.

3 Affected Environment and Environmental Consequences

CEQ regulations direct agencies to succinctly describe the environment that could be affected by the alternatives under consideration (40 CFR 1502.15). This chapter describes the existing environment for resources across human and biological environments that has the potential to be affected by implementing the Proposed Action. Each Affected Environment description is followed by an Environmental Consequences discussion that provides an analysis of the potential effects of implementing the Proposed Action. Direct effects are caused by the action and occur at the same time and place. Indirect effects are caused by the action and are later in time or farther removed in distance but are still reasonably foreseeable (i.e., likely to occur within the duration of the project). Cumulative effects are the result of the incremental direct and indirect effects of any action when added to other past, present, and reasonably foreseeable future actions and can result from individually minor but collectively significant actions that take place over a period of time.

This chapter is based on the issues identified in Chapter 1, Section 1.4. Based on an understanding of the proposal, familiarity of the project area, and analysis of the issues raised in scoping, the following resources are considered in detail in this analysis: Forest Plan amendments, Caja del Rio Wildlife and Cultural Interpretive Management Area (Caja MA), Inventoried Roadless Areas (IRAs), geology and soils, water resources, greenhouse gases, ecological resources, livestock grazing, environmental justice, cultural resources, land tenure and use, recreation, visual resources, public and worker health and safety/accidents, and White Rock Canyon Recommended Wilderness Area.

3.1 Forest Plan Amendments

As described in Section 1.1.2, a portion of the project area is administered by the SFNF, and management activities will need to be compliant with the 2022 Forest Plan. As discussed in Section 2.3.3, the Forest Plan describes management actions that include standards, guidelines, objectives, desired resource conditions, and the availability and suitability of lands for various activities in the Forest (USDA 2022). Analysis of the Forest Plan amendments as part of the Proposed Action (Section 2.3.3) will be analyzed in this section and apply only to Forest Service–administered lands within the project area. All proposed Forest Plan amendments would be in place for the life of the Forest Plan.

3.1.1 Affected Environment

Establishment of the S/N Transmission Line Utility Corridor Management Area

This Forest Plan amendment would establish a new management area known as the S/N Transmission Line Utility Corridor Management Area (SNTUC). This action would allow for the implementation of the project and would specify desired conditions and guidelines for the newly created management area. The SNTUC is proposed to be the length of the project area within Forest Service–administered lands, approximately 8.6 miles long, 100 feet wide from centerline, and encompass approximately 104 total acres.

The Scenic Integrity Objectives (SIO) for the SNTUC would be low. Current Forest Plan desired conditions for the project area are identified as medium and high. Establishment of the SNTUC identifies the SIO as low throughout the project area, which allows the scenic integrity to remain consistent where the project could intersect a different management area that has a higher SIO. A full description of SIOs can be found in Section 3.10.1.

The ROS for the SNTUC would be semiprimitive motorized. Current Forest Plan desired conditions for most of the project area have an identified ROS of semiprimitive motorized; however, in one section of the project area, the SNTUC intersects the Arroyo Montoso IRA for approximately 0.4 miles. The Arroyo Montoso IRA is located on the most northern portion of the project area, and the ROS within the IRA is semiprimitive nonmotorized. The establishment of the SNTUC identifies the ROS as semiprimitive motorized throughout the project area. A full description of ROS can be found in Section 3.9.

Caja del Rio Wildlife and Cultural Interpretive Management Area

This Forest Plan amendment would allow for the implementation of the project within this management area. The current Forest Plan standard for the Caja MA states, “Maximize the use of existing utility line corridors for additional utility line needs. New utility corridors and communication sites will not be allowed” (USDA 2022). The Forest Plan amendment is proposed solely for the implementation of the proposed project and no other utility project. The Proposed Action does not intend to combine the two corridors; rather, the Proposed Action parallels the existing Reeves line as closely as feasible for approximately 2.96 miles. The remainder of the area included in the Proposed Action (within the Caja MA) that does not parallel the existing Reeves Line is approximately 1.2 miles.

Inventoried Roadless Area

The Forest Plan Amendment specific to the IRA would change the SIO for the project from high to low only within the SNTUC and only within the IRA that overlaps the SNTUC. The Arroyo Montoso IRA is located on the most northern portion of the project area within Forest Service–administered lands. The portion of the proposed project that overlaps the IRA is approximately 0.44 miles. A complete analysis of the IRA can be found in Section 3.3.

National Historic Trails

The Forest Plan amendment specific to national historic trails is needed based on the proximity of the proposed project to El Camino Real NHT. Current Forest Plan guidelines for management activities within national historic trail corridors is to make progress toward achieving SIOs of high or very high within the foreground of the trail (up to 0.5 mile on either side) (USDA 2022). The portion of El Camino Real NHT within Forest Service–administered lands is approximately 7.78 miles. The proposed project will perpendicularly cross the El Camino Real NHT on the southeast corner of the project area. The Proposed Action will be within the 0.5-mile foreground area of the trail on the eastern portion of Forest Service–administered lands within the project area.

3.1.2 Environmental Consequences

No Action Alternative

Under the No Action Alternative, the proposed Forest Plan amendments would not occur. Permanent changes to the Forest Plan would not go into effect, and the proposed project would not be implemented; however, the purpose and need for the project would not be met.

Proposed Action

Establishment of the S/N Transmission Line Utility Corridor Management Area

Scenic Integrity Objective

Through the establishment of the SNTUC, the guideline for SIO would be low. The establishment of a SIO of low could affect recreation experiences for users who enjoy the area for its scenic value. The

introduction of a utility corridor in an area where no powerline currently exists could affect recreational experience and scenic enjoyment. Continued operation and maintenance of the SNTUC throughout the life of the Forest Plan would mean that occasional maintenance activities, service, and repairs could affect a recreational user's scenic quality experience while these operations are occurring. Periodic use of the new permanent roads and vehicle use within the ROW for operation and maintenance could also affect scenic value. Although the SNTUC is narrow, vegetation management to address wildfire hazard concerns could also affect scenic value to recreationists. Maintenance of vegetation within the SNTUC would occur throughout the life of the project. The establishment of the SNTUC is specific only to this project and would not allow the area to be used for additional utilities.

The establishment of the SIO as low within the SNTUC could also affect heritage resources within the project area, which could have significance associated with the viewshed. Implementation of the project and its continued operation and maintenance of the transmission line and ROW could affect the viewshed of heritage resources.

To minimize the effect to scenic value and heritage resources, the transmission line would be built in accordance with the new management guidelines that require the above-ground facilities to blend with the general landscape to minimize visual impacts (Appendix A and Appendix C). Transmission structures and access roads will not be sited within identified cultural resource boundaries. Consultation with culturally affiliated Tribal Nations will be completed to ensure that impacts to known cultural resources—including traditional cultural properties—are avoided. Federal agencies and Tribal monitors will monitor ground-disturbance activities during construction, which is expected to alleviate further impacts caused by the continued operation and maintenance of the line throughout the life of the Forest Plan.

The SFNF uses the Forest Service Scenery Management System to “determine the importance of scenery and identify scenic resources as they relate to people” (USDA 2022); therefore, the SIO within the SNTUC would not affect other resources analyzed within this EA.

Recreation Opportunity Spectrum

Through the establishment of the SNTUC, the guideline for ROS would be semiprimitive motorized (consistent with the desired ROS outside of the SNTUC throughout the project area except for the small area within the IRA), which would not impact resources outside of the IRA. Within the IRA, the implementation of the proposed plan amendment would allow for one consistent ROS setting within the SNTUC. This change would include approximately 0.4 miles within the SNTUC (approximately 100 feet wide). This permanent change to the ROS within the SNTUC that overlaps the IRA would allow for minimal motorized use authorized for and intended only for this project. Incidental unauthorized motorized use from the public could occur and could impact soils, vegetation, wildlife, heritage resources, nonmotorized recreation, and visual and scenic resources; however, this area is within rough topography and not easily accessible, and impacts to these resources are expected to be negligible.

Caja del Rio Wildlife and Cultural Interpretive Management Area

The Forest Plan amendment specific to the Caja MA would allow project implementation. The establishment of the SNTUC would limit activities associated with the Proposed Action only within the SNTUC for this project. Additional utility corridors would not be allowed. The SNTUC parallels the existing Reeves line for approximately 2.96 miles to maximize the use of existing corridors.

The SNTUC would use existing access road for the Reeves line, necessitating approximately 0.55 miles of spur roads to access poles along the S/N transmission line. Using existing access roads would limit the amount of new road construction needed. Building of new permanent spur roads and continued

maintenance throughout the life of the Forest Plan within the project area could impact recreational uses, scenic value, heritage resources, soils, wildlife, and vegetation. These resources could be impacted by establishing permanent roads in areas that are currently undisturbed, increasing dust and soil disturbance, removing vegetation and continuing to remove woody vegetation to reduce wildfire risk, and creating a new visual element on the landscape.

Initial vegetation removal and subsequent ROW maintenance (use of heavy machinery, chain saws, or other necessary tools) for the life of the Forest Plan could impact recreational access, visual and scenic resources, heritage resources, soils, water, and wildlife while removal efforts are occurring. Vegetation removal to maintain the ROW and reduce wildfire hazard could impact recreational use, scenic and visual resources, cultural resources, soils, and water.

To minimize the effect to scenic value and heritage resources, the transmission line would be built in accordance with the new management guidelines that require the above-ground facilities to blend with the general landscape to minimize visual impacts (Appendix A and Appendix C). Transmission structures and access roads will not be sited within identified cultural resource boundaries. Consultation with culturally affiliated Tribal Nations will be completed to ensure that impacts to known cultural resources—including traditional cultural properties—are avoided. Federal agencies and Tribal monitors will monitor ground-disturbance activities during construction.

Additional mitigation measures and BMPs, such as the use of biological monitoring staff, revegetating disturbed area, and installation of erosion-control devices, would be implemented to minimize the effects to soil, water, vegetation, and wildlife (Appendix C) as operation and maintenance needs continue throughout the life of the project.

Inventoried Roadless Area

The proposed Forest Plan amendment specific to the IRA would allow for the SIO to be changed for the SNTUC from high to low. This change would occur only for the portion of the SNTUC that overlaps the IRA (approximately 0.44 miles) and not for any other project. Recreational users would see an additional powerline that could impact scenic value to recreationalists. Continued operation and maintenance of the SNTUC throughout the life of the Forest Plan would mean that occasional maintenance activities, service, and repairs could affect a recreational user's visual and scenic experience as these operations occur.

The establishment of the SIO as low within the SNTUC could also affect heritage resources, which could have significance associated with the viewshed. Implementation of the project and its continued operation and maintenance of the transmission line and ROW could affect the viewshed of heritage resources.

To minimize the effect to these resources, additional proposed guidelines for the SNTUC call for above-ground facilities to blend in with the general landscape and the use of mitigation measures, such as non-glare tint on wires, use of wood poles, and alignment of infrastructure with topography to reduce the visual impacts (Appendix A and Appendix C). Transmission structures and access roads will not be sited within identified cultural resource boundaries. Consultation with culturally affiliated Tribal Nations will be completed to ensure that impacts to known cultural resources—including traditional cultural properties—are avoided. Federal agencies and Tribal monitors will monitor ground-disturbance activities during construction, which is expected to alleviate further impacts caused by the continued operation and maintenance of the line throughout the life of the Forest Plan.

The SFNF uses the Forest Service Scenery Management System to “determine the importance of scenery and identify scenic resources as they relate to people” (USDA 2022); therefore, the SIO within the SNTUC would not affect other resources analyzed within this EA.

National Historic Trails

The proposed plan amendment specific to the El Camino Real NHT changes the SIO from high or very high within 0.5 miles of the trail to low within the SNTUC. The construction phase of the Proposed Action could have short-term recreational use impacts where the proposed project crosses the trail and in the adjacent area; however, additional trails are available nearby. Recreational experiences could be affected by the establishment of the ROW and the addition of infrastructure to the landscape for users who enjoy the area for its scenic value. Mitigation measures and BMPs, such as locating the proposed transmission line along an existing transmission line corridor and using weathering-steel monopole transmission line structures in locations where feasible (Appendix C), would be used to minimize effects.

3.2 Caja del Rio Wildlife and Cultural Interpretive Management Area

3.2.1 *Affected Environment*

The Caja MA is located on the Caja del Rio plateau on the SFNF (Figure 3-1). This area is managed by the SFNF, with an emphasis on wildlife and cultural importance and ecosystem service. The 2022 Forest Plan (USDA 2022) describes the Caja MA:

The area provides supporting ecosystem services through the rich biodiversity found in the area. The area also provides abundant cultural ecosystem services through the preservation of sites that are an important part of the historic fabric of the region.

The area is diverse in plant and animal species, both in overall numbers as well as which species are found in the area. The remote setting, limited motorized routes, and continuity with recommended and designated wilderness—along with inventoried roadless area and the corridor of the Rio Grande—provide habitat connectivity for daily and seasonal wildlife movement along and across the river and potential for long distance range shifts of species.

The area contains nationally significant resources including the ancestral homes of modern Pueblo communities, numerous petroglyphs, and remains of historic roads and trails such as Route 66 and the El Camino Real NHT. The area is archaeologically valuable based on integrity, location, and physical environment, materials and workmanship, and design.

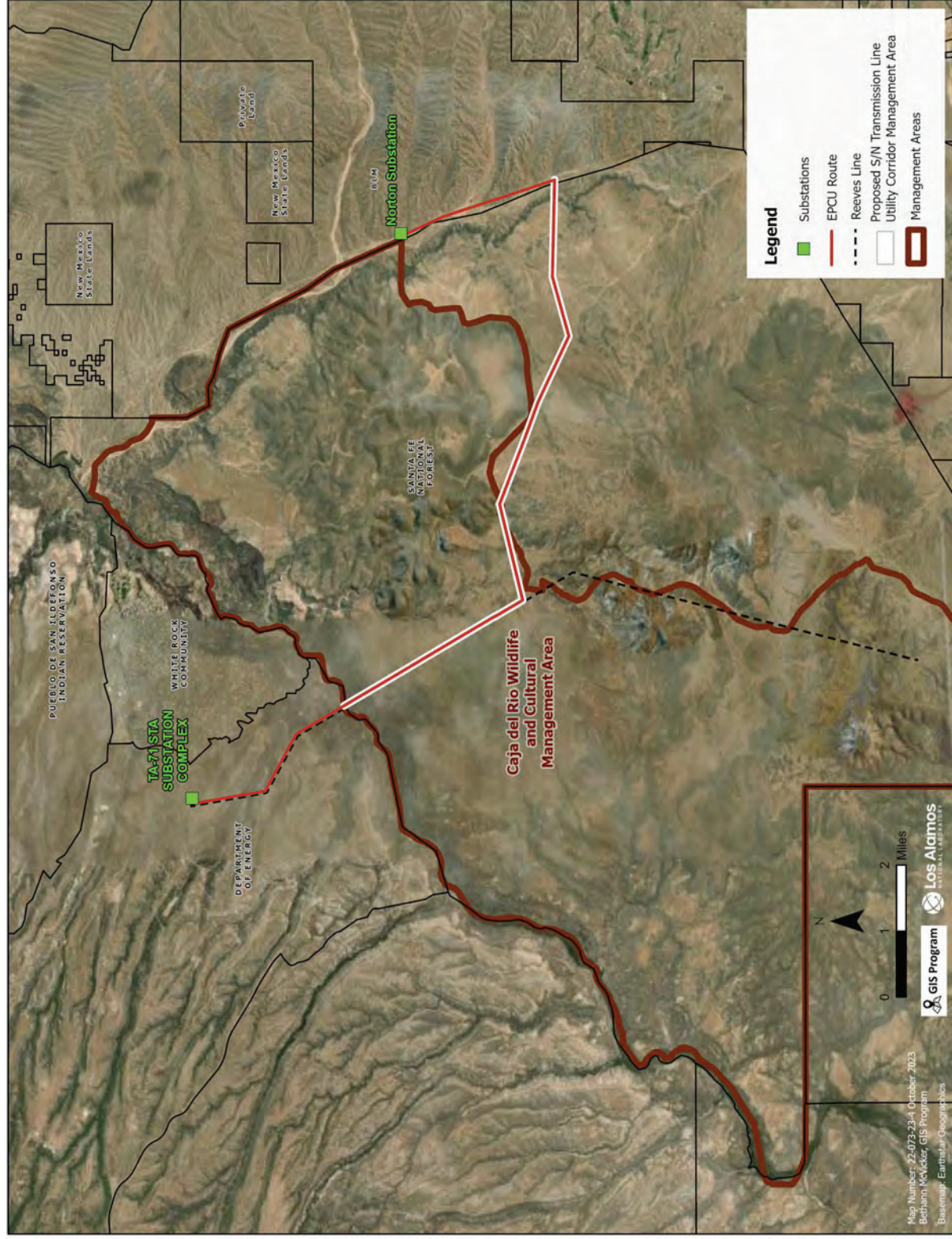


Figure 3-1. Caja del Rio Wildlife and Cultural Interpretive Management Area in relation to the Proposed Action.

Affected Environment and Environmental Consequences

3.2.2 *Environmental Consequences*

No Action Alternative

Under the No Action Alternative, the proposed project would not be implemented. Amending the Forest Plan within the Caja MA for this project would not be necessary and would not occur. Impacts to the Caja MA would not occur. The purpose and need for the project would not be met.

Proposed Action

As part of the Proposed Action, a plan amendment would be made to the current Forest Plan direction for the Caja MA for implementation of the project. Effects relevant to the establishment of the SNTUC within the Caja MA are described in Section 3.1.2.

The project proposes to cross approximately 8.6 miles of the SFNF. Of the 8.6-mile-long proposed project, 4.2 miles would be constructed within the Caja MA. Construction and operation of the Proposed Action would be limited to the area established within the SNTUC. No new temporary roads are proposed within the Caja MA. Approximately 0.55 miles of permanent spur roads would be built between the existing ROW from the existing Reeves line to the newly established S/N transmission line. Use of the established ROW for the existing Reeves line minimizes the amount of disturbance to the landscape and mitigates additional impacts; however, to minimize wildfire risk and be consistent with engineering standards, vegetation removal would be necessary along the ROW.

Establishing the S/N transmission line and its associated ROW has the potential to impact wildlife and heritage resources. The proposed project and associated plan amendments would be implemented using mitigation measures and BMPs, such as the use of biological monitors, restricting vegetation removal during peak bird-breeding season, using archaeological and Tribal monitors during construction, and avoiding known cultural resources (Appendix C).

3.2.3 *Cumulative Effects*

Evaluation of the cumulative effects on the Caja MA includes assessing all past, present, and reasonably foreseeable future actions that would affect the Caja MA within and adjacent to the analysis area. Motorized and nonmotorized recreation, livestock grazing, road maintenance, and continued operation of the Reeves line in and near the project area have been identified as relevant from a cumulative effects context. Implementation of the Proposed Action could contribute to short-term impacts by increasing motorized use within the area, disrupting planned livestock grazing operations, increasing road maintenance activities necessary for construction access, and increasing vehicle use within the area. These activities could have short-term impacts to soil, vegetation, wildlife, recreational uses, and visual and scenic resources. Mitigation measures and BMPs (Appendix C) would be used to mitigate long-term cumulative impacts. The Caja MA is specific to the SFNF and does not occur on BLM- or DOE/NNSA-administered lands.

3.3 **Inventoried Roadless Area**

A complete IRA analysis can be found in Appendix H.

3.3.1 *Affected Environment*

IRAs are specific to Forest Service-administered lands. IRAs are defined as undeveloped areas that typically exceed 5,000 acres. IRAs are governed by the 2001 Roadless Conservation Rule (36 CFR 294).

Affected Environment and Environmental Consequences

IRAs are large, unfragmented, and undeveloped tracts of land (USDA 2022). IRAs provide relatively undisturbed habitat for wildlife and have ecosystem functions to provide for clean water, soil, and air; opportunities for dispersed outdoor recreation; and locations for study and research. IRAs are characterized by nine values or features:

- High-quality or undisturbed soil, water, and air
- Sources of public drinking water
- Diversity of plant and animal communities
- Habitat for threatened endangered proposed candidate and sensitive species and for those species dependent on large, undisturbed areas of land
- Primitive, semiprimitive nonmotorized, and semiprimitive motorized classes of dispersed recreation
- Reference landscapes
- Natural-appearing landscapes with high scenic quality
- Traditional cultural properties and sacred sites
- Other locally identified unique characteristics

The project area includes the Arroyo Montoso IRA located on SFNF-administered lands. The Arroyo Montoso, located between the northern edge of the Caja del Rio Plateau and the Rio Grande (Figure 3-2), comprises approximately 6,267 acres and consists of deep canyons. Approximately 2,290 feet of the proposed transmission line would cross over the Arroyo Montoso IRA at the existing Reeves Line crossing. No IRAs are located on DOE/NNSA or BLM portions of the project. The proposed SNTUC would run perpendicular to the existing IRA. The proposed plan components for the SNTUC would apply for the portion of the utility corridor that would intersect with the existing IRA. A full list of IRA characteristics found within the Arroyo Montoso IRA can be found in Appendix H.

The majority of the Arroyo Montoso IRA adjacent to the proposed project is also a part of the White Rock Canyon Recommended Wilderness Area. A second IRA, the Caja IRA, exists on the Caja del Rio Plateau; however, it is not adjacent to nor will it be impacted by the proposed project. This area is being analyzed for this project under the White Rock Canyon Recommended Wilderness Area Analysis presented in Chapter 3, Section 3.16, of this document.

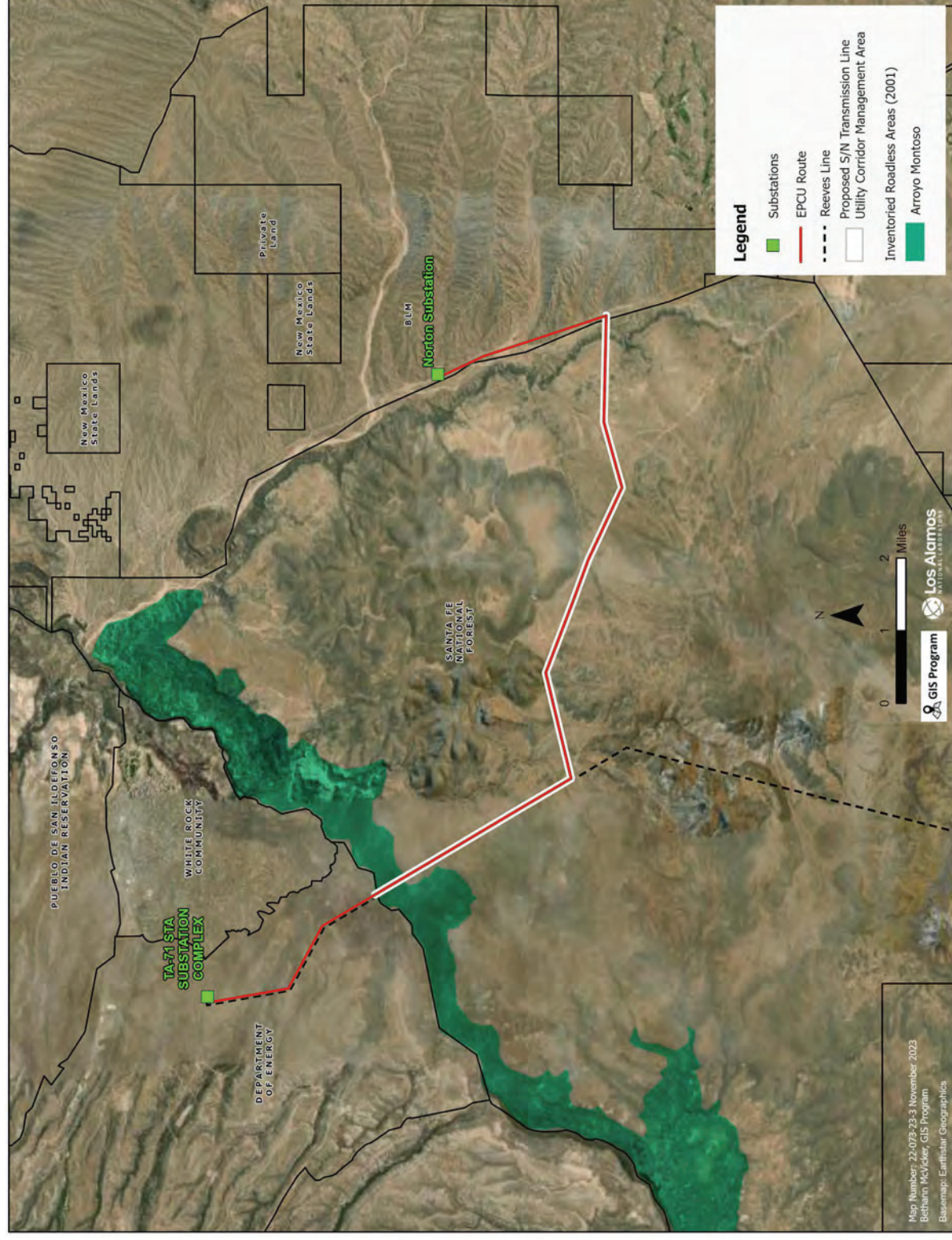


Figure 3-2. IRA location in relation to the proposed project.

3.3.2 *Environmental Consequences*

No Action Alternative

The No Action Alternative would result in the continuance of extant conditions and characteristics. No impacts to the Arroyo Montoso IRA would occur; however, the purpose and need for the project would not be met.

Proposed Action

The proposed transmission line structures would be sited 150 feet to the east of the existing Reeves Line crossing structure and the edge of the plateau (Figure 3-2). As currently identified, the Arroyo Montoso is located below the edge of the plateau, and the area is not desirable for the placement of transmission line structures. As such, it is anticipated that minimal ground-disturbing activities would occur. The IRA would be avoided to the extent possible for pole siting, although it is possible that one or two poles may be situated within the IRA. To analyze any potential impacts, a 100-foot buffer is used to define a project area. Although ground-disturbing activities are not expected, the 100-foot buffer allows for the identification of resources underneath the proposed transmission line.

With the implementation of BMPs to limit stormwater runoff from entering the IRA, any potential for erosion to change the local watershed classification would also be limited. Local air quality would not be impacted with the implementation of the Proposed Action. Any emissions from construction activities would be minor and temporary and are not likely to affect the nearest Class I Area. The existing characteristic of the IRA as contributing to sources of public drinking water would be unchanged with the implementation of the Proposed Action.

Overall, because of limited ground disturbance and the temporary nature of any construction-related noise in the area, the Proposed Action would not result in any long-term adverse impacts to wildlife or plant communities in the IRA. Effects to wildlife would be short-duration and temporary.

It is anticipated that the additional line would not change the desired recreation experiences because the additional line would repeat the existing angular patterns visible across the landscape and not contrast with the existing view of the Reeves Line. Overall, it is not anticipated that the Proposed Action would change the existing recreational characteristics of the IRA. Furthermore, the proposed transmission line would not significantly contrast with the existing transmission line, maintaining the existing visual composition of the IRA. It is anticipated that the Proposed Action, with the implementation of design features, would not affect the natural-appearing landscape because it would repeat the form, line, color, and texture found in the existing landscape within the IRA.

3.3.3 *Cumulative Effects*

Evaluation of the cumulative effects on the IRA includes assessing all past, present, and reasonably foreseeable future actions that would affect the IRA within and adjacent to the analysis area. Continued operations associated with the existing Reeves line was identified as relevant from a cumulative effects context. Continued operation of the Reeves line would occur within the IRA. The Proposed Action parallels the Reeves line in an effort to minimize the amount of disturbance to the landscape—particularly disturbance from roadways within the IRA. Minimal transmission line structures would be placed within the IRA, and BMPs would be used to mitigate long-term cumulative impacts, such as erosion and sedimentation. The IRA is specific to the SFNF and does not occur on BLM- or DOE/NNSA-administered lands.

3.4 Geology and Soils

3.4.1 *Affected Environment*

The Caja del Rio Plateau is a primitive landscape with less development than the Pajarito Plateau, although the former has multiple established utility ROWs, including electrical transmission lines (Reeves Line and Norton Line). The Pajarito Plateau is a much more developed landscape with numerous established utility ROWs, including transmission and distribution lines. The Caja del Rio Plateau landscape is generally flat to rolling, with more rugged terrain along the western edge. The plateau is bounded by the White Rock Canyon and Rio Grande on the northwestern edge; a large escarpment—known as La Bajada—along the western edge; the Santa Fe River on the southern edge; and the Cañada Ancha arroyo along the northeastern edge.

Near the Norton Substation at about 6,100 feet elevation, the soils consist of Zia fine sandy loam. Most of the area near the substation has minor or no slopes, although some features near the substation have up to 45 percent slope. The proposed transmission line gains nearly 400 feet in elevation as it approaches the southern portion of Ortiz Mountain, with the slope quickly increasing up to 120 percent. On this plateau and following the transmission lines route toward the Rio Grande, the soils are mostly dry, gravelly loam and gravelly clay, with 0 to 15 percent slope. Closer to the Rio Grande, the slope increases up to 120 percent at an elevation of approximately 6,500 feet before crossing the Rio Grande to LANL. The elevation changes approximately 1,000 feet when crossing the Rio Grande. The soils around Ortiz Mountain tend to have a neutral, mildly alkaline to moderately alkaline pH. These soils are well-drained and are subject to erosion, although slumping soils have not been identified.

The Pajarito Plateau is a volcanic plateau bound on the west by the Valles Caldera and on the east by the White Rock Canyon of the Rio Grande. Located on the plateau is Bandelier National Monument, the communities of Los Alamos and White Rock, and LANL. LANL is situated on the eastern flank of the Jemez Mountains. The Pajarito Plateau slopes downward toward the Rio Grande along the eastern edge of LANL and contains several finger-like mesa tops separated by relatively narrow and deep canyons.

The Proposed Action route follows existing transmission lines on the north and east portions of DOE lands, climbing to an elevation of nearly 7,600 feet. Soils at LANL have developed from decomposition of volcanic and sedimentary rocks within a semiarid climate and range in texture from clay and clay loam to gravel. Soils that formed on mesa tops of the Pajarito Plateau include the Carjo, Frijoles, Hackroy, Nyjack, Pogna, Prieta, Seaby, and Tocal soils series. All of these soils are well-drained and range from very shallow (0–10 inches) to moderately deep (20–40 inches), with the greatest depth to the underlying Bandelier Tuff being 40 inches (DOE 2015). Soils that develop in canyon settings can be locally much thicker. Soil erosion rates vary considerably on DOE lands due to the mesa and canyon topography. The highest erosion rates occur in drainage channels and on steep slopes. Roads, structures, and paved parking lots concentrate runoff. High erosion rates are also caused by past area-logging practices, livestock grazing, and loss of vegetative cover. The lowest erosion rates occur at the gently sloping central portions of the mesas, away from the drainage channels (DOE 2015). Slumping soils are not identified.

3.4.2 *Environmental Consequences*

No Action Alternative

The Reeves and Norton transmission lines would remain on the landscape. Continued road usage from visual inspections and occasional repairs of the existing lines would continue to have minor impacts to the

Affected Environment and Environmental Consequences

geology and soils on the landscape; however, no new impacts would occur as a result of the No Action Alternative. The purpose and need for the project would not be met.

Proposed Action

The U.S. Geologic Survey online tool was used to evaluate the presence of faults near the project area.¹¹ This tool indicates that no active faults exist in the immediate vicinity of the project area; therefore, no immediate impacts are expected.

The Proposed Action buffer areas would impact long-term productivity of approximately 119 acres of soil south of the Rio Grande on SFNF/BLM lands and 33 acres on DOE lands. Placement of transmission line structures would occur on the following soil components: Alanos, Carjo, Hackroy, Rock Outcrop, Tocal, and Totavi. The average slope at the transmission line structures is 8 percent, with a range of 0–69 percent. Pole placements across the Rio Grande and Mortandad Canyon would be on the mesa tops. No construction activities would occur on the canyon slopes nor introduce additional erosion or sedimentation.

Soil disturbance would occur during road improvement operations, the construction of new temporary and permanent road segments, and placement of new poles. Soil removed during placement of new pole structures and infrastructure upgrades could be temporarily stockpiled to be later re-spread during construction. Appropriate BMPs would be used on stockpiled soils. To the extent practical, excavated areas would be re-contoured to existing grades, and excavated areas would be reclaimed. Given the characteristics of the soils, restoration of disturbed areas through breaking up of compacted soils, and reseeding after construction, it is estimated that the implementation of the Proposed Action would not result in any significant adverse effects.

Mitigation measures would reduce the loss of soil, reduce the establishment of rill and gullies, and minimize water-quality deterioration that would be associated with construction of the power line and temporary and permanent roads and roadway use by project vehicles. This project requirement would further mitigate effects to soil resources for the duration of the project (Appendix C).

Disturbance to geology or soils from construction and operation of the proposed transmission line would be minimal to localized areas within the utility ROW. Erosion and/or compaction would be minimized with the implementation of BMPs and would not occur after construction is complete and disturbed areas are rehabilitated (Appendix C).

3.4.3 Cumulative Effects

Evaluation of the cumulative effects on the soil resource includes assessing all past, present, and reasonably foreseeable future actions that would affect soils within and adjacent to the analysis area. Road improvement and continued road use in and near the project area have been identified as relevant from a cumulative effects context. Due to the need across all three involved agencies to improve current road conditions for construction and continued maintenance of the line, it is expected that any cumulative effects to soils from the Proposed Action would improve soil conditions by decreasing erosion and improving drainage. The project would implement mitigation measures (Appendix C), which may include access controls on unauthorized routes to maintenance roads, reseeding of staging areas to improve soil conditions within the project area, and minimizing long-term cumulative impacts.

¹¹ U.S. Quaternary Faults (<https://www.arcgis.com>)

3.5 Water

3.5.1 Affected Environment

The proposed project crosses the Rio Grande, which is the primary hydrologic feature of the region. No other perennial streams have been identified within the project area. Arroyos and ephemeral and intermittent streams—which include named and unnamed features—are found in various locations throughout the project area and typically flow in summer months during periods associated with high-intensity rainfall. These features are important to the local watersheds by conveying stormwater runoff to the Rio Grande.

Two main watersheds exist within the project area: Water Canyon-Rio Grande and the Headwaters Cañada Ancha watersheds. As shown in Figure 3-3, the proposed project would cross over the northern Rio Grande groundwater aquifer. This aquifer and surface water are recharged primarily through snowmelt and heavy rains.

The New Mexico Water Quality Control Commission is the issuing agency of water quality standards for interstate and intrastate waters in New Mexico and has defined the Rio Grande-Santa Fe watershed as part of the Rio Grande Basin. Several reaches within the watershed are listed as Clean Water Act of 1987 (CWA 1987), Section 303 (d) impaired surface waters, including portions of the Rio Grande (NMED 2021). A watershed impaired function condition indicates that the watershed exhibits low geomorphic, hydrologic, and biotic integrity relative to their natural potential condition (USDA 2011).

The New Mexico Environment Department (NMED) prepares a biennial New Mexico Water Quality Assessment. This report fulfills requirements under CWA 1987, Section 305(b), including such elements as water quality condition, water pollutants, and designated uses. The information provided in the report is based on accepted numeric and narrative standards and assessment criteria. Surface waters are classified with “designated use” identifiers. Designated uses in the project vicinity are aquatic and wildlife (warm water or cold water), full body contact, partial body contact, fish consumption, domestic water source, agriculture irrigation, and agriculture livestock watering. The Rio Grande—from Cochiti Reservoir to the boundary with Pueblo de San Ildefonso—is identified by NMED as impaired by alpha particles, aluminum, total mercury (fish consumption advisory), polychlorinated biphenyls (PCBs), total selenium, temperature, and turbidity.

The Proposed Action would include an overhead crossing of a linear strip of riparian habitat characterized by a forested cottonwood-willow (*Populus-Salix*) located in the analysis area adjacent to Rio Grande and its floodplain. Riparian vegetation is an important habitat for many wildlife and aquatic species, and it provides enhanced water quality by moderating peak flows and sediment filter action of runoff from adjacent uplands. No activities (roads, vegetation removal, filling, etc.) would occur within the riparian area or floodplain of the Rio Grande. All activities would occur approximately 1,500 feet overhead.

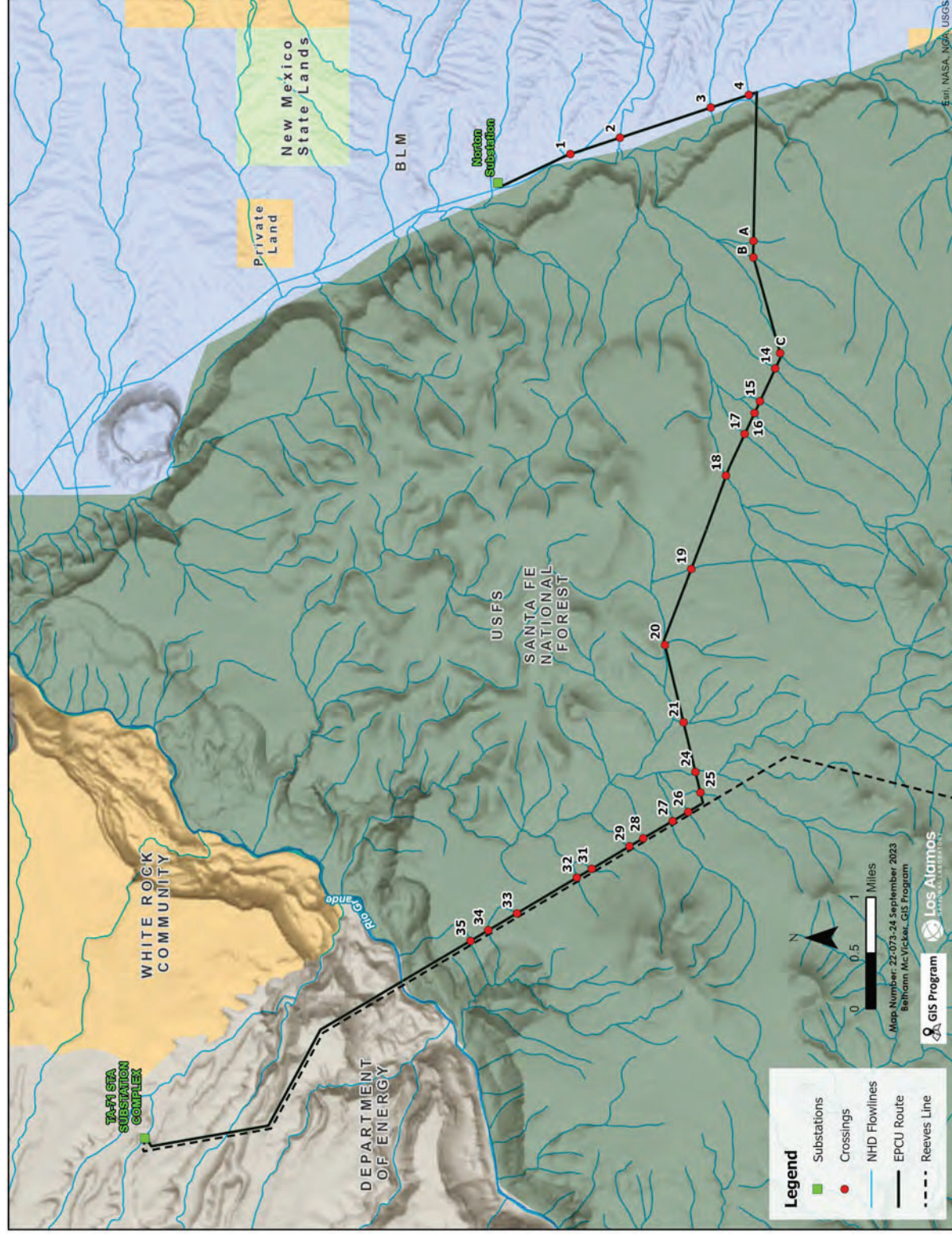


Figure 3-3. Ephemeral stream crossing along the proposed transmission line on SFNF- and BLM-managed lands.

3.5.2 *Environmental Consequences*

No Action Alternative

Under the No Action Alternative, a new transmission line would not be built. The existing Reeves and Norton transmission lines would remain on the landscape. Any impacts caused by the ongoing operation and maintenance of the existing transmission lines would continue to occur; however, no new impacts would occur as a result of the No Action Alternative. The purpose and need for the project would not be met.

Proposed Action

Construction and operation of the Proposed Action has limited potential to impact surface water resources. Localized short-term decreases in vegetative surface cover could result in decreased infiltration rates and increased runoff volume and velocity. This effect would cause increased erosion, topsoil loss, and sedimentation; however, soils in this region are generally stable with little erosion (USDOT 2017). With the use of equipment, vegetation removal within the ROW, staging, footings, and primitive roads, there is the potential for minor effects on drainage patterns during storm events with minimal sedimentation. Any increase in erosion and effects on drainage patterns would be limited by the implementation of appropriate BMPs until vegetative cover is restored (Appendix C). The local watershed would continue to be classified as impaired function. With the implementation of BMPs to limit stormwater runoff, any potential for erosion to change the local watershed classification would also be limited. The likelihood of project-caused erosion from project activities reaching the Rio Grande and registering an increase in turbidity is remote; however, any erosion would be minimal and short term. Short-term impacts would be reduced through design, BMPs, and implementation of any needed mitigation measures (Appendix C).

Impacts to the hydrologic features during the construction phase would be minimized through the implementation of BMPs as required by the U.S. EPA National Pollutant Discharge Elimination System (NPDES). Wetlands and floodplains would be avoided to the extent possible. An NPDES construction permit would be required because more than 5 acres of land would be disturbed. A storm water pollution prevention plan would be developed before construction. The plan would specify measures to prevent spills and leaks of fuel from fuel storage and or refueling activities; specify erosion and sediment migration controls (e.g., silt fences, hay bales); specify measures to protect drainages; and specify reseeding or revegetation requirements.

No direct impact to the Rio Grande is expected because the transmission lines would cross approximately 1,500 feet above the river channel, and no structures would be sited along its banks. For the Rio Grande crossing, structures would be erected on both sides of White Rock Canyon near existing crossing connections. The conductor would be strung between the two structures via a helicopter. The proposed project would not impact the riparian areas along the Rio Grande because the transmission line structures would not be sited in riparian areas.

Transmission lines would not be placed in ephemeral streams. The Proposed Action is not expected to impact local watersheds or the aquifer because of the shallow nature of disturbance relative to the depth of the water table. Standard practices or design features that would minimize impacts to the watershed and water quality include using existing surface disturbance, minimizing construction vehicle use, parking and staging on areas surfaced with caliche, and reclaiming any disturbed areas to quickly re-establish vegetation (Appendix C). No activities (roads, vegetation removal, etc.) would occur within the riparian

area or floodplain of the Rio Grande. All activities would occur approximately 1,500 feet overhead and would not impact the Rio Grande.

The proposed project would comply with applicable law, regulations, and policy, including Forest Service manuals and handbooks and the Forest Plan (USDA 2022) and United States Army Corps of Engineers requirements. Through avoidance and minimization (i.e., use of BMPs); use of existing utility easements, lines, and roadways; and reclamation of disturbed areas post construction, it is anticipated that the implementation would not result in any significant adverse effects.

3.5.3 Cumulative Effects

Evaluation of the cumulative effects on the water resource includes assessing all past, present, and reasonably foreseeable future actions that would affect water resources within and adjacent to the analysis area. Continued operations associated with the Buckman Water Diversion Project (Buckman Project) was identified as relevant from a cumulative effects context. Continued operation for the Buckman Project would occur within and along the Rio Grande on SFNF- and BLM-administered lands upstream from where the proposed project would cross the Rio Grande. The Proposed Action would not involve construction activities in or near the river that would impact the Buckman Project. Transmission line structures would be placed outside of waterways and riparian areas, and BMPs would be used to mitigate long-term cumulative impacts, such as erosion and sedimentation.

No projects are occurring on DOE/NNNSA-administered lands that would contribute to cumulative effects of the proposed project. Implementing the Proposed Action described in this analysis would not contribute to cumulative impacts to water resources.

3.6 Vegetation

3.6.1 Affected Environment

During the summers of 2020 and 2022, LANL biologists conducted vegetation surveys along the proposed transmission line route on the Caja del Rio Plateau. No sensitive plant species were documented during the vegetation surveys; however, biologists encountered a former sensitive species—the grama grass cactus (*Sclerocactus papyracanthus*). They also encountered several species of milkweed (*Asclepias* spp.), a host plant to Monarch butterflies (*Danaus plexippus*; LANL 2021a).

The Caja del Rio portion of the project area consists of piñon-juniper savanna and piñon-juniper woodland habitat types, which have similar vegetation species. The difference is that piñon-juniper savanna is dominated with understory species such as grasses and forbs, and piñon-juniper woodlands are dominated by tree and shrub species. Vegetation species likely to occur in these habitat types include two-needle piñon pine (*Pinus edulis*), one-seed juniper (*Juniperus monosperma*), fourwing saltbush (*Atriplex canescens*), apache plume (*Fallugia paradoxa*), and big sagebrush (*Artemisia tridentata*) with sideoats grama (*Bouteloua curtipendula*) and blue grama (*Bouteloua gracilis*) grasses (LANL 2021b; USDA 2022). These habitat types are typically found between 4,500 and 7,500 feet above sea level.

The Pajarito Plateau portion of the project area includes juniper savannas at the lowest elevations, piñon-juniper woodlands at intermediate elevations, and ponderosa pine (*Pinus ponderosa*) forests at higher elevations on the mesas. Ponderosa pine forests typically occur between 7,000 and 9,600 feet above sea level. Vegetation species likely to occur in this habitat type include Gambel oak (*Quercus gambelii*), two-needle piñon (*Pinus edulis*), mountain mahogany (*Cercocarpus ledifolius* Nutt.), snowberry (*Symphoricarpos* spp.), spirea (*Spirea* spp.), and grasses such as *Festuca* and *Agropyron* species.

Land use on the Caja del Rio Plateau and the Pajarito Plateau varies from undeveloped to areas that have been disturbed. The Caja del Rio Plateau has been disturbed by off-road vehicle use, shooting ranges, and other recreational activities. Livestock, including cattle (*Bos taurus*), feral horses (*Equus ferus*) and donkeys (*Equus asinus*) graze the area, resulting in grazing-associated impacts to the landscape (LANL 2021a). In addition, within the Caja del Rio Plateau, ranges comprise a high percentage of nonnative invasive species including Canada thistle (*Cirsium arvense*), Russian thistle (*Salsola tragus*), cheatgrass (*Bromus tectorum*), and dalmatian toadflax (*Linaria dalmatica*; Brownlee 2016).

3.6.2 Environmental Consequences

No Action Alternative

Under the No Action Alternative, a new transmission line would not be built, and any new potential impacts to vegetation would not occur. The current Reeves and Norton transmission lines would remain operational and on the landscape. Any vegetation removal or disturbance necessary for continued operation and maintenance of either transmission line would still occur. The purpose and need for the project would not be met.

Proposed Action

Potential impacts to vegetation on BLM- and SFNF-administered lands from the Proposed Action would be direct (e.g., ground disturbance). The construction and operation of the new transmission line would require some ground disturbance to install new power poles, establish a 100-foot-wide utility ROW, create temporary staging areas for construction equipment, and create temporary access roads and permanent road access. During construction, some overstory and understory vegetation would be disturbed or selectively cleared within a maximum 100-foot-wide utility ROW for the length of the proposed transmission line. Following construction, the disturbed corridor would be reseeded using appropriate native seed mix for the elevation and habitat type and stabilized, as required by the SUP. The operation and long-term maintenance of the proposed power line would have minimal effects on vegetation. Expected impacts include vegetation removal or disturbance necessary for construction and continued operations and maintenance of the transmission line. Removal of vegetation would occur in areas that pose a direct threat to the powerline. During vegetation-clearing activities, biological monitors would be on site to ensure that vegetation is cleared in accordance with project specifications. Should any sensitive plant species be identified, the plants would be flagged and worked around as best as practicable and/or, if feasible, individual plants would be transplanted outside the area of disturbance.

Construction activities in previously undisturbed areas could increase the potential for noxious weed establishment; therefore, all ground-disturbing work on the SFNF would follow the Guide to Noxious Weeds Prevention Practices (USDA 2001). In total, any impacts to vegetation, would be temporary and minor, with the implementation of BMPs during construction and operation activities.

3.6.3 Cumulative Effects

Evaluation of the cumulative effects on vegetation includes assessing all past, present, and reasonably foreseeable future actions that would affect vegetation within and adjacent to the analysis area. Ongoing livestock grazing that occurs on SFNF- and BLM-administered lands has been identified as relevant from a cumulative effects context. Livestock grazing occurs on herbaceous vegetation. Herbaceous vegetation is expected to recover as construction is completed on the project and disturbed sites are rehabilitated, minimizing long-term cumulative impacts. Implementing the Proposed Action described in this analysis would not contribute to cumulative impacts to vegetation.

3.7 Wildlife

3.7.1 Affected Environment

The project area provides habitat for a variety of terrestrial mammal species including the Colorado chipmunk (*Neotamias quadrivittatus*), Gunnison's prairie dog (*Cynomys gunnisoni*), black-tailed jackrabbit (*Lepus californicus*), western spotted skunk (*Spilogale gracilis*), badger (*Taxidea taxus*), desert cottontail (*Sylvilagus audubonii*), Mexican woodrat (*Neotoma mexicana*), silky pocket mouse (*Perognathus flavus*), western harvest mouse (*Reithrodontomys megalotis*), several kangaroo rat species (*Dipodomys sp.*), and several deer mouse (*Peromyscus sp.*) species. Larger mammal species that could exist within the project area include mule deer (*Odocoileus hemionus*), elk (*Cervus canadensis*), gray fox (*Urocyon cinereoargenteus*), and coyote (*Canis latrans*).

Surveys

A desktop review was performed to identify the special-status wildlife and plant species that have the potential to occur within the project area and to determine if the project will impact these species, which include

- federally listed T&E species,
- New Mexico state-listed species,
- Forest Service “at-risk” species and species of conservation concern (SCC),
- BLM sensitive species, and
- migratory birds and bald eagles (*Haliaeetus leucocephalus*).

Vegetation and avian point count surveys were conducted in the summers of 2020, 2021, and 2022. The plant species present were mostly early successional species that tend to do well in overgrazed and disturbed habitats, including common purslane (*Portulaca oleracea*), cheatgrass (*Bromus tectorum*), rubber rabbitbrush (*Ericameria nauseosa*), broom snakeweed (*Gutierrezia sarothrae*), and various cholla species (*Cylindropuntia spp.*). No sensitive plant species were documented; however, LANL biologists identified a former sensitive species—the gramma grass cactus (*Sclerocactus papyracanthus*). Multiple species of milkweed (*Asclepias spp.*), a host plant to monarch butterflies (*Danaus plexippus*) were identified, including spider milkweed (*Asclepias asperula*), horsetail milkweed (*Asclepias subverticillata*), butterfly milkweed (*Asclepias tuberosa*) and broadleaf milkweed (*Asclepias latifolia*).

During the avian point count surveys, avian species identified were gray vireo (*Vireo vicinior*), pinyon jay (*Gymnorhinus cyanocephalus*), and Bendire's thrasher (*Toxostoma bendirei*). Additional species documented include juniper titmouse (*Baeolophus ridgwayi*), mourning dove (*Zenaida macroura*), and hairy woodpecker (*Dryobates villosus*).

Biologists also surveyed the cliff-side area of White Rock Canyon where the new transmission line will cross for evidence of golden eagle (*Aquila chrysaetos*) or peregrine falcon (*Falco peregrinus*) habitat or presence. No eagles or peregrine falcons were detected. A previously occupied raptor nest was surveyed in 2021 and 2022 and was observed inactive.

Federally Threatened and Endangered Species

The list of federally listed T&E species that have the potential to occur in the vicinity of the project was developed via review of the U.S. Fish and Wildlife Service (USFWS) Information for Planning and

Consultation (IPaC) website for a list of federally listed species and critical habitat (USFWS 2023a). This list was supplemented by a search of Santa Fe County and Los Alamos County on the USFWS Environmental Conservation Online System Threatened & Endangered Species website (USFWS 2023b). According to the IPaC list, a total of six federally listed species potentially occur in the project vicinity (Table 3-1). The rationale for the Effect Determination can be found in Appendix E.

Table 3-1. Threatened, Endangered, and Candidate Species with Potential to Occur within the Project Area

Species	Federal Status*	Effect Determination
Mammals		
Mexican wolf (<i>Canis lupus baileyi</i>)	LE, XN	The project will have No Effect on the Mexican wolf.
Birds		
Mexican spotted owl (<i>Strix occidentalis lucida</i>)	LT	The project will have No Effect on the Mexican spotted owl.
Southwestern willow flycatcher (<i>Empidonax traillii extimus</i>)	LE	The project will have No Effect on the Southwestern willow flycatcher.
Yellow-billed cuckoo (western distinct population) (<i>Coccyzus americanus</i>)	LT	The project will have No Effect on the yellow-billed cuckoo.
Fish		
Rio Grande cutthroat trout (<i>Oncorhynchus clarkii virginalis</i>)	C	The project will have No Effect on the Rio Grande Cutthroat Trout.
Insects		
Monarch butterfly (<i>Danaus plexippus</i>)	C	The project will have No Effect on the Monarch butterfly.

* C = Candidate; DL = Delisted; LE = Listed Endangered; LEXPN, XN = Listed Experimental Population, Nonessential; LT = Listed Threatened; NL = Not Listed

Sources: Biota Information System of New Mexico (BISON) 2023, Natural Heritage New Mexico (NHNM 2023), USFWS 2023a,b.

Based on the analysis in Chapter 4, DOE has determined that the project would comply with Section 7 of the ESA, would not require New Mexico Department of Game and Fish clearance or concurrence for the take of any state-listed T&E animal species, and would not require New Mexico Energy, Minerals, and Natural Resources Department concurrence or clearance for the take of any state-listed plant species (EMNRD 2008).

The Project will have “No Effect” on all six federally listed species that have potential to occur in the project area (Table 3-1) because their specific range or baseline habitat requirements do not occur within or adjacent to the project area (DOE 2023a).

New Mexico State-Listed Species

The list of state-listed T&E species that have the potential to occur in the vicinity of the project was developed via review of online and hardcopy resources, agency database requests, and agency consultation. DOE reviewed the BISON (BISON 2023) website and the New Mexico Rare Plant Technical Council New Mexico Rare Plants website (NMRPTC 1999) for T&E species that could occur in the project area. According to the generated lists of T&E species by county, 20 state-listed species have potential to occur in the vicinity of the project area (15 in Santa Fe County, New Mexico; and 13 in Los Alamos County, New Mexico; some species could occur in both counties). The rationale for the Project Impacts can be found in Appendix E.

U.S. Forest Service “At-Risk” Species and Species of Conservation Concern

At-risk species include federally classified endangered, threatened, proposed, and candidate species, as described under the ESA (1973), and SCC (USDA 2022). Federally classified species are analyzed in a previous section. This section will focus on SCC.

SCC are species, other than federally recognized species, that are known or expected to occur on the SFNF and for which the regional forester has determined that the best available scientific information indicates substantial concern about the species’ capability to persist over the long term. For SCC, habitat management and compatible multiple uses will be accomplished in a way that ensures species’ persistence on the SFNF, in accordance with the 2012 Planning Rule (36 CFR 219.9(b)).

Analysis of biological resource data, including habitat assessment and field reconnaissance, determined that the following eight SCC species may occur or have suitable habitat within the project area: American peregrine falcon, Chaco milkvetch, Chama blazing star, Greene’s milkweed, Gunnison’s prairie dog, pinyon jay, tufted sand verbena, and western burrowing owl. These species were evaluated for forest plan compliance, specifically for Standards (S), Guidelines (G), and Desired Condition (DC). Twenty-four SCC species, including one federal candidate species (Rio Grande cutthroat trout), were not considered for further analysis based on lack of suitable habitat or occurrence (USDA 2022). The rationale for the project consistency with the Forest Plan can be found in Appendix E.

BLM Sensitive Species

DOE reviewed the BLM New Mexico Sensitive Status Species List (BLM 2018) for sensitive species that could occur in the project area. According to BLM’s list of sensitive species by county, 16 BLM sensitive species have potential to occur in the vicinity of the project (15 in Santa Fe County, New Mexico; and 13 in Los Alamos County, New Mexico; some species could occur in both counties). Two additional “potential” sensitive species also are included due to their perceived vulnerability in this region. The Mexican long-tongued bat (*Choeronycteris Mexicana*) and the western yellow bat (*Lasiurus xanthinus*) were added because they have been detected near the project area (USGS 2023).

The project will “have no impact” on the 16 BLM sensitive species and the two potential sensitive species that may occur or have habitat present within and adjacent to the project area because the species’ preferred habitat exists adjacent to the project area (Table 3-2). The rationale for the Effects Determination can be found in Appendix E.

Table 3-2. BLM Sensitive Species Assessment

Species	Status	Comments
Mammals		
Gunnison’s prairie dog (<i>Cynomys gunnisoni</i>)	BLM Sensitive	The proposed Alternatives would have no impact on the Gunnison’s prairie dog.
Spotted bat (<i>Euderma maculatum</i>)	BLM Sensitive	The proposed Alternatives would have no impact on the Spotted bat.
Townsend’s big-eared bat (<i>Corynorhinus townsendii</i>)	BLM Sensitive	The proposed Alternatives would have no impact on the Townsends’s big-eared bat.
Black-tailed prairie dog (<i>Cynomys ludovicianus</i>)	BLM Sensitive	The proposed Alternatives would have no impact on the black-tailed prairie dog.
Birds		
Pinyon jay (<i>Gymnorhinus cyanocephalus</i>)	BLM Sensitive	The proposed Alternative would have no impact on the pinyon jay.

Western burrowing owl (<i>Athene cunicularia</i>)	BLM Sensitive	The proposed Alternative would <u>have no impact</u> on the burrowing owl.
McCown's longspur (<i>Calcarius mccownii</i>)	BLM Sensitive (Potential)	The proposed Alternative would <u>have no impact</u> on the McCown's Longspur.
Chestnut-collared longspur (<i>Calcarius ornatus</i>)	BLM Sensitive	The proposed Alternative would <u>have no impact</u> on the Chestnut-collared Longspur.
Bendire's thrasher (<i>Toxostoma bendirei</i>)	BLM Sensitive (Potential)	The proposed Alternative would <u>have no impact</u> on the Bendire's Thrasher.
Mexican whip-poor-will (<i>Antrostomus arizonae</i>)	BLM Sensitive	The proposed Alternative would <u>have no impact</u> on the Mexican Whip-poor-will.
Virginia's warbler (<i>Vermivora virginiae</i>)	BLM Sensitive	The proposed Alternative would <u>have no impact</u> on the Virginia's Warbler.
Plants		
Santa Fe cholla (<i>Opuntia viridiflora</i> x)	BLM Sensitive	The proposed Alternative would <u>have no impact</u> on the Santa Fe Cholla.
Galisteo sand verbena (<i>Abronia bigelovii</i>)	BLM Sensitive	The proposed Alternative would <u>have no impact</u> on the Galisteo Sand Verbena.
Todilto stickleaf (<i>Mentzelia todiltoensis</i>)	BLM Sensitive	The proposed Alternative would <u>have no impact</u> on the Galisteo Sand Verbena.
Fish		
Rio Grande sucker (<i>Catostomus plebeius</i>)	BLM Sensitive	The proposed Alternative would <u>have no impact</u> on the Rio Grande sucker.
Peppered chub (<i>Macrhybopsis tetranema</i>)	BLM Sensitive	The proposed Alternative would <u>have no impact</u> on the Peppered Chub.
Amphibians		
Northern leopard frog (<i>Lithobates (Rana) pipiens</i>)	BLM Sensitive	The proposed Alternative would <u>have no impact</u> on the Northern Leopard frog.
Insects		
Monarch butterfly (<i>Danaus plexippus</i>)	BLM Sensitive	The proposed Alternative would <u>have no impact</u> on the Monarch butterfly.

Migratory Birds and Bald Eagles

The Migratory Bird Treaty Act (MBTA; 16 United States Code [USC] 703–708, 710–712, MBTA 1918) prohibits the take of a migratory bird or its parts, nests, or eggs unless specifically permitted to do so by regulations (USFWS 2017). According to the MBTA and its implementing regulations, “take” is defined as “pursue, hunt, shoot, wound, kill, trap, capture, or collect” (50 CFR 10.12). Currently, 1,093 species are protected under the MBTA (FR 2020).

A golden eagle (*Aquila chrysaetos*) nest is reportedly situated 1.3 miles north/northeast of the project area on the cliff of White Rock Canyon. A survey of the cliff-side area of White Rock Canyon where the new transmission line will cross did not detect the presence of eagles or peregrine falcons. The nest was located in 2021 and 2022 and was observed as inactive.

3.7.2 *Environmental Consequences*

No Action Alternative

Under the No Action Alternative, a new transmission line would not be built, a SUP for an additional utility ROW would not be needed, and any potential changes to wildlife species and their habitats would not occur. The existing Reeves and Norton transmission lines would remain on the landscape. Any impacts caused by the ongoing operation and maintenance of the existing transmission lines would continue to occur; however, no new impacts would occur as a result of the No Action Alternative. The purpose and need for the project would not be met.

Proposed Action

During vegetation-clearing activities, biological monitors would be onsite to ensure that sensitive species and active migratory bird nests are not disturbed. Wildlife in and adjacent to the proposed transmission line utility ROW would be temporarily affected by loss or disturbance of habitat during construction. Wildlife that inhabits the project area would be temporally displaced during construction while vegetation is removed, and soil is disturbed. Displaced wildlife would temporarily relocate to undisturbed areas adjacent to the project area. Following reseeding and stabilization activities, some of the displaced wildlife would return to the new habitat within the utility ROW. The proposed project would not affect the wildlife diversity or affect the connectivity for daily or seasonal wildlife migrations; wildlife would be able to transect the utility ROW because no permanent fencing or other barriers would be installed.

The proposed project will use existing utility ROWs and roads wherever possible, minimizing vegetation removal and subsequent adverse impacts to nesting and foraging habitat for migratory birds and other special-status species. New proposed temporary and permanent roads would be created which could result in additional impacts. Indirect impacts, such as disturbance from construction noise, would be minimized by construction activities that occur outside breeding season.

As analyzed in the project Wildlife, Fish, and Rare Plant Biological Report (DOE 2023a):

- The project will have “no effect” on the six federally listed species because the species do not occur within the project area due to lack of suitable habitat. Additionally, mitigation measures will be employed to minimize impacts to wildlife and raptors, as well as their habitat.
- Of the 20 New Mexico state-listed species with the potential to occur in the project area, 18 have no potential impacts to species (potential project impacts denoted as “**none**” in Table 4-2) because their specific range or baseline habitat requirements do not occur within or adjacent to the project area. With the implementation of mitigation measures, the two remaining species are characterized as having “**low**” potential to be affected by the project.
- Project activities are found to be consistent with the SFNF Forest Plan for the eight FS SCC species that could occur or have suitable habitat within the project area (DOE 2023a).
- With implementation of mitigation measures, the project will “**have no impact**” on the 16 BLM sensitive species that may occur or have habitat present within and adjacent to the project area.
- Implementation of mitigation measures will minimize the potential of an incidental “take” of migratory birds or bald and golden eagles. If construction is anticipated to occur during migratory bird nesting season (April through August), nesting activity will be monitored to ensure that there will be no affirmative and purposeful actions, such as tree felling, that reduce migratory birds, their nests, or their eggs, by killing or capturing, to human control. The one eagle nest observed during surveys was inactive and was located more than 1 mile from the proposed project; thus, adverse impacts are not expected.

3.7.3 Cumulative Effects

Evaluation of the cumulative effects on vegetation includes assessing all past, present, and reasonably foreseeable future actions that would impact wildlife and their habitat within and adjacent to the analysis area. Population growth and expansion, as well as increased recreational use on SFNF- and BLM-administered lands, have been identified as relevant from a cumulative effects context. Wildlife habitat fragmentation from population growth (residential and commercial expansion) and recreation has decreased available habitat for all species analyzed as part of this project. Projects such as the Buckman Project are needed to support further population growth. Overall, wildlife species disperse to other undeveloped areas. Temporary displacement of wildlife is a primary result of construction activities. Minor direct and indirect impacts—such as displacement, loss of cover, and loss of forage—could occur to some species. Mitigation measures and design features would minimize long-term cumulative impacts.

3.8 Heritage Resources

This cultural resource assessment is mandated by the NHPA. Section 106 of the NHPA requires that federal agencies consider the effects of a federal undertaking on cultural resources that are included in or eligible for inclusion in the National Register of Historic Places (NRHP). NRHP eligibility is evaluated through the integrity of a resource and its significance under National Register criteria, which include links to important events or persons, design or construction features, or information potential. DOE/NNSA, the Forest Service, and the BLM identified the area of potential effects (APE) for the proposed undertaking. Within that APE, cultural resources were identified and their NRHP eligibility evaluated by the respective agency's cultural resource specialist. The effect of the undertaking on historic properties is also determined by the cultural professional in their respective land-managing agency. The agencies then request concurrence by the SHPO.

3.8.1 Affected Environment

The Caja del Rio Plateau and the Pajarito Plateau are culturally important regions to Native American tribes in the Southwest, with evidence of human occupation going back over 12,000 years for ancestral and descendant populations of Native American tribes. In 2021, the All Pueblo Council of Governors described the Caja del Rio as a traditional cultural landscape that contains Pueblo cultural properties with which they maintain ongoing connections. Since the late 1500s (about 420 years ago), Spanish/Hispanic, Euro-American, and other settlers have also resided on and around the Caja del Rio Plateau and the Pajarito Plateau; therefore, numerous and diverse cultural resources across these regions (Table 3-3) include Archaic artifact scatters with hearths, Ancestral Pueblo room blocks, petroglyphs, agricultural fields, and Hispanic and Anglo homestead sites.

Table 3-3. Cultural Resources Identified within the Project Area (LANL 2020; Tierra ROW 2021)

Land Administrator	Number of Resources	Eligible to NRHP	Not Eligible to NRHP	Unevaluated to NRHP ^a
Forest Service	67	31	21	15
BLM	7	3	3	1
DOE/NNSA	27	17	10	0
Totals	101	51	34	16

^a Cultural resources that are unevaluated for eligibility to the NRHP are treated as eligible under the NHPA (16 USC 470). Some of the eligibility determinations are subject to final SHPO concurrence.

Class III cultural resource inventories were conducted in 2020, 2021, 2022, and 2023 within the Proposed Action's APE (Tierra ROW 2021) in accordance with DOE/NNSA, Forest Service, and BLM protocols (LANL 2022, USDA 2007, BLM 2005). The APE for direct physical effects includes a 200-foot-wide corridor for the proposed route that parallels the Reeves Line and the portion on DOE/NNSA property and a 400-foot-wide corridor for the proposed route east of the Reeves Line on SFNF and BLM land. The APE also encompasses the staging areas and access roads, with an additional 50-foot buffer around these areas of proposed disturbance. The visual area of potential effects is identified as a 3-mile radius around the proposed powerline.

Some of the cultural resource inventories were conducted along proposed routes that, as a result of Tribal consultation, were later determined not viable alternatives (Figure 2-7). In total, 1,735 acres were subject to cultural resource inventories for the Proposed Action. Within that area, there were 44 previously recorded cultural resources (31 eligible for inclusion in the NHRP, 7 not eligible, and 6 unevaluated). During the course of the multiple class III inventories, 57 cultural resources and Traditional Cultural Properties were newly documented (20 eligible for inclusion in the NRHP, 27 not eligible, and 10 unevaluated). Tribal monitors from affiliated Pueblos and Tribes were present during the cultural resource inventories in 2022 and 2023 and provided input on Traditional Cultural Properties.

The Proposed Action APE for direct physical effects includes portions of existing roads on BLM land that commemorate the El Camino Real NHT and in a single location crosses the nearby hiking trail that commemorates this national historic trail. The El Camino Real NHT begins in Mexico City and goes north into New Mexico, ending at Ohkay Owingeh Pueblo. This extensive trail is affiliated with the Spanish Historic Period of the American southwest and has several designations throughout the State of New Mexico. The El Camino Real NHT recognizes the primary route between the colonial Spanish capital of Mexico City and the Spanish provincial capitals at San Juan de Los Caballeros (1598–1600); San Gabriel (1600–1609); and then Santa Fe (1610–1821). The El Camino Real NHT is listed on the NRHP in compliance with the NHPA and was added to the National Trails System in October 2000. In 2018, a memorandum of understanding (MOU) was signed and issued to collaborate on interpretive efforts across the El Camino Real NHT in New Mexico and Texas. The trail is co-administered by the NPS and the BLM (NPS 2019).

3.8.2 Environmental Consequences

No Action Alternative

Under the No Action Alternative, a new transmission line would not be built, a SUP for a utility ROW would not be needed, and any potential changes to existing cultural resources would not occur. Therefore, the No Action Alternative would result in no impacts from this proposed project to cultural resources. The purpose and need for the project would not be met.

Proposed Action

The construction and operation of the new transmission line and upgrades to LANL electrical infrastructure could adversely affect cultural resources. Potential impacts to cultural resources could be direct (ground disturbance, construction/maintenance of roads, use of staging areas, rehabilitation post construction, etc.) and indirect (visual impacts, increased use of area for utilities maintenance, recreational purposes, etc.). If a property is eligible or unevaluated for listing in the NRHP because all or part of the significance is the setting, feeling, or association created by the viewshed, and the transmission line obstructs the view in such a way that the site's integrity is acutely compromised, then the construction of that transmission line could result in an adverse effect to that property under the NHPA.

Negative impacts to the visual experience of visitors could occur to cultural resources, particularly in the central Caja del Rio Plateau, where no powerline currently exists.

Improvement of the dirt roads, the development of new access roads, and roads used for construction and maintenance of this project could result in increased use of Forest Road 24 and increased recreational use of unofficial two-tracks, which could result in direct or indirect impacts to cultural resources, Traditional Cultural Properties, and traditional use areas.

Transmission structures and access roads proposed as a part of this project will not be sited within identified cultural resource boundaries. Consultation with culturally affiliated Tribal Nations will be completed to ensure that impacts to known cultural resources—including traditional cultural properties—are avoided to the maximum extent possible. Federal agencies and tribal monitors will monitor ground-disturbance activities during construction. BMPs to avoid cultural resources would be employed throughout the duration of the project (Appendix C). If inadvertent discoveries are found, then the project will halt work, and the lead archaeologist of the appropriate land management agency (Forest Service, BLM, or DOE) will be notified immediately to implement the correct Native American Graves Protection and Repatriation Act process. This process includes notification of and consultation with the New Mexico SHPO and affiliated Tribe(s). The project will adjust pole structure and powerline placement to the maximum extent possible to avoid visual adverse effects to any historic property for which the viewshed is a major contributor to its significance and integrity.

The siting of ground-disturbing activities near the El Camino Real NHT will be completed in consultation with Forest Service, BLM, and NPS cultural resource and recreation specialists to ensure that potential impacts are avoided or minimized. Mitigations to address potential impacts will also be implemented (Appendix C).

If the NHPA Section 106 process results in a determination of adverse effects to cultural resources, for example due to indirect impacts, then a separate set of mitigations would be developed in consultation with DOE/NNSA, Forest Service, BLM, SHPO, the Advisory Council on Historic Preservation, and affiliated tribes and incorporated into a memorandum of agreement.

3.8.3 Cumulative Effects

Evaluation of the cumulative effects on cultural resources includes assessing all past, present, and reasonably foreseeable future actions that would affect cultural resources within and adjacent to the analysis area. Road use and improvement, new access roads, and recreational uses have been identified as relevant from a cumulative effects context. Road use and improvement, along with new access roads, could lead to increased accessibility. Recreational use of those areas could lead to indirect impacts to visual surroundings. Cumulative impacts to cultural resources would be minimized through the implementation of mitigations described in Appendix C, including locating structures, staging areas, and roads away from cultural resources, the use of BMPs to prevent soil erosion, and the presence of Tribal monitors during construction activities.

3.9 Recreation and Trails

3.9.1 Affected Environment

The Caja del Rio area provides numerous recreation opportunities, including hiking, mountain biking, rock climbing, horseback riding, primitive camping, all-terrain vehicle riding, and gun range shooting. Forest Road 24 is the primary travel route through the Caja del Rio area, providing access to additional

Forest Service roads and trails throughout the area. Access to Forest Road 24 is through the Caja del Rio Headquarters Trailhead.

Forest Service trails within the Caja del Rio area include Dead Dog, Soda Springs, Cuesta Colorado, and the designated El Camino Real NHT. Recreational water activities—rafting, kayaking, and canoeing—are available on the Rio Grande to the west (Figure 3-4).

The SFNF uses ROS management to provide a range of opportunities that allow visitors diverse experiences depending on their preferences and interests. The SFNF Forest Plan indicates that the ROS represents desired conditions and not actual existing conditions. The physical setting is defined by the absence or presence of human sights and sounds, size of area, and the amount of environmental modification caused by human activity (Table 3-4; USDA 2022). The ROS uses the following descriptors for recreation settings ranging from least to most developed: primitive, semiprimitive nonmotorized, semiprimitive motorized, roaded natural, rural, and urban. The desired condition for ROS for the project area within SFNF-managed land is primarily semiprimitive motorized and semiprimitive nonmotorized- (Figure 3-5).

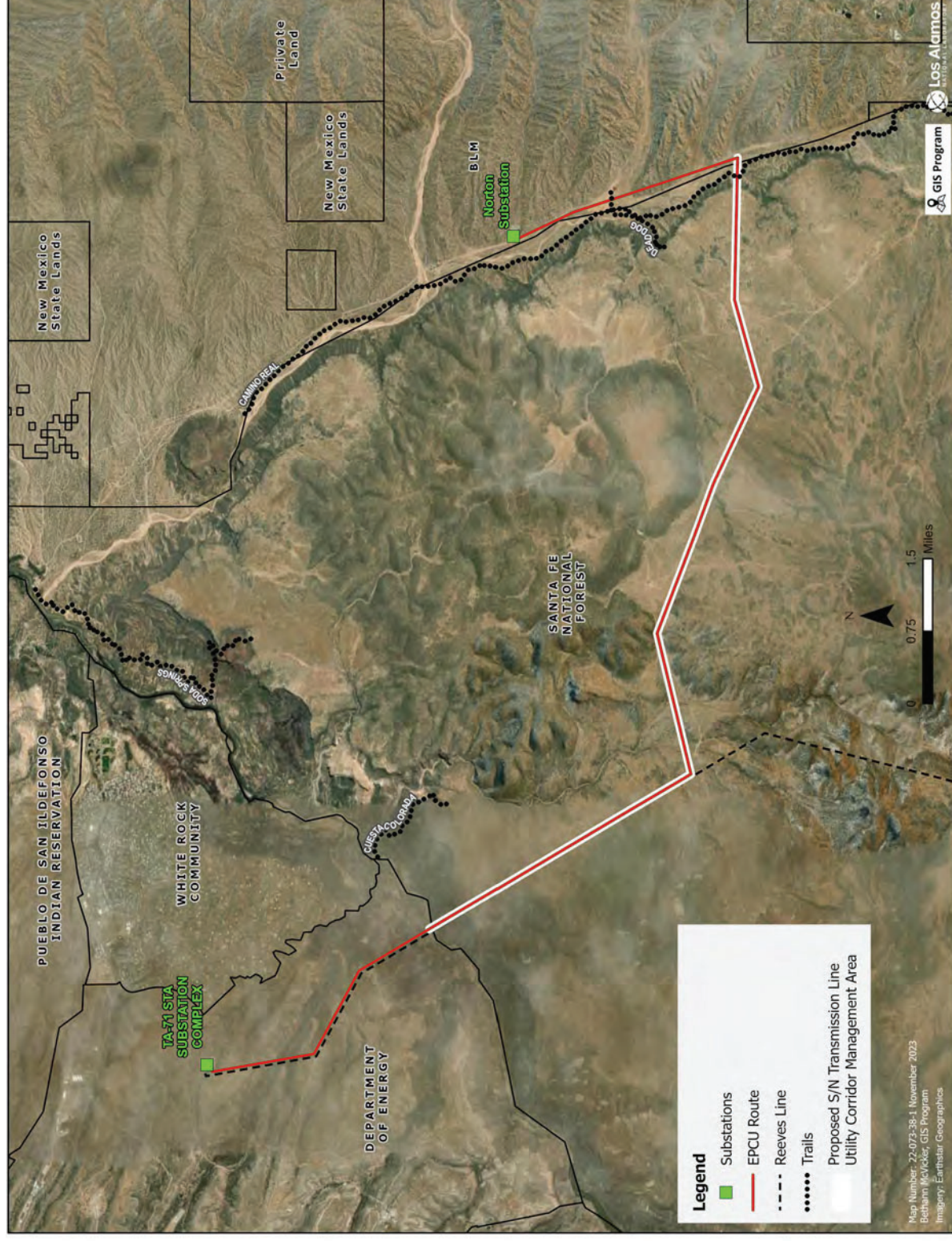


Figure 3-4. Trails adjacent to the Proposed Action on SNF-administered land.

Table 3-4. Recreation Opportunity Spectrum on Forest Service–Managed Lands (USDA 2022)

Recreation Setting Class	Definition
Primitive	Areas are characterized by essentially unmodified natural environments of fairly large size. Interaction between users is very low and evidence of other users is minimal. The area is managed to be essentially free from evidence of human-induced restrictions and controls. Motorized use and mechanized equipment within primitive areas is not permitted. Primitive areas in the SFNF are found within the Pecos, San Pedro Parks, Dome, and Chama River Canyon wilderness areas.
Semiprimitive Nonmotorized	Areas are characterized by a predominantly natural or natural-appearing environment of moderate-to-large size. Interaction between users is low, but there is often evidence of other users. The area is managed in such a way that minimum onsite controls and restrictions may be present but are subtle. An example of an semiprimitive nonmotorized area would be White Rock Canyon just west of the Caja del Rio Plateau near the City of Santa Fe.
Semiprimitive Motorized	Areas are characterized by a predominantly natural or natural-appearing environment of moderate-to-large size. Concentration of users is low, but there is often evidence of other users. The area is managed in such a way that minimum onsite controls and restrictions may be present but are subtle. Most of Rowe Mesa and the Anton Chico area are examples of this classification.
Roaded Natural	Areas are characterized by predominantly natural-appearing environments with moderate evidence of the sights and sounds of people. Such evidence usually harmonizes with the natural environment. Interaction between users may be low to moderate, but with evidence of other users prevalent. Resource modification and utilization practices are evident but harmonize with the natural environment. Conventional motorized use is provided for in construction standards and design of facilities. Examples of roaded natural areas include parts of the Caja del Rio Plateau and mesas in the Jemez and Cuba areas.
Rural	Areas are characterized by a substantially modified natural environment. Resource modification and utilization practices are to enhance specific recreation activities and to maintain vegetative cover and soil. Sights and sounds of people are readily evident, and the interaction between users is often moderate to high. Many facilities are designed for use by large numbers of people. Facilities are often provided for special activities, such as amphitheaters, group pavilions, group fire rings and cooking units, and so forth. Facilities for intensified motorized use and parking are available. Some facilities may be designed primarily for user comfort and convenience. Some synthetic but harmonious materials may be incorporated. Design may be more complex and refined. Examples of rural areas in the SFNF are along NM Highway 475 to the Santa Fe Ski Basin, NM Highway 4 through the Jemez Mountains, and NM Highway 63 through the Pecos River Canyon.
Urban	Areas are characterized by a substantially urbanized environment, although the background may have natural-appearing elements. Renewable resource modification and utilization practices are to enhance specific recreation activities. Vegetative cover is often exotic and manicured. Sights and sounds of people on site are predominant. Urban areas in the SFNF are primarily restricted to administrative facilities but also include Ski Santa Fe facilities.

The Proposed Action would be in close proximity to the Dead Dog Trail, the El Camino Real NHT, and trails accessed via Forest Road 24, with numerous offshoots. The El Camino Real NHT is a Congressionally designated trail—one of 32 historic trails nationwide. It was added to the National Trails System in October 2000. The El Camino Real NHT recognizes the primary route between the colonial Spanish capital of Mexico City and the Spanish provincial capitals at San Juan de Los Caballeros (1598–1600); San Gabriel (1600–1609); and then Santa Fe (1610–1821). As designated, the El Camino Real NHT extends 404 miles from El Paso, Texas, to Ohkay Owingeh Pueblo, New Mexico. The BLM and NPS are charged with joint planning and administration of the trail under the 2018 MOU (Figure 3-6).

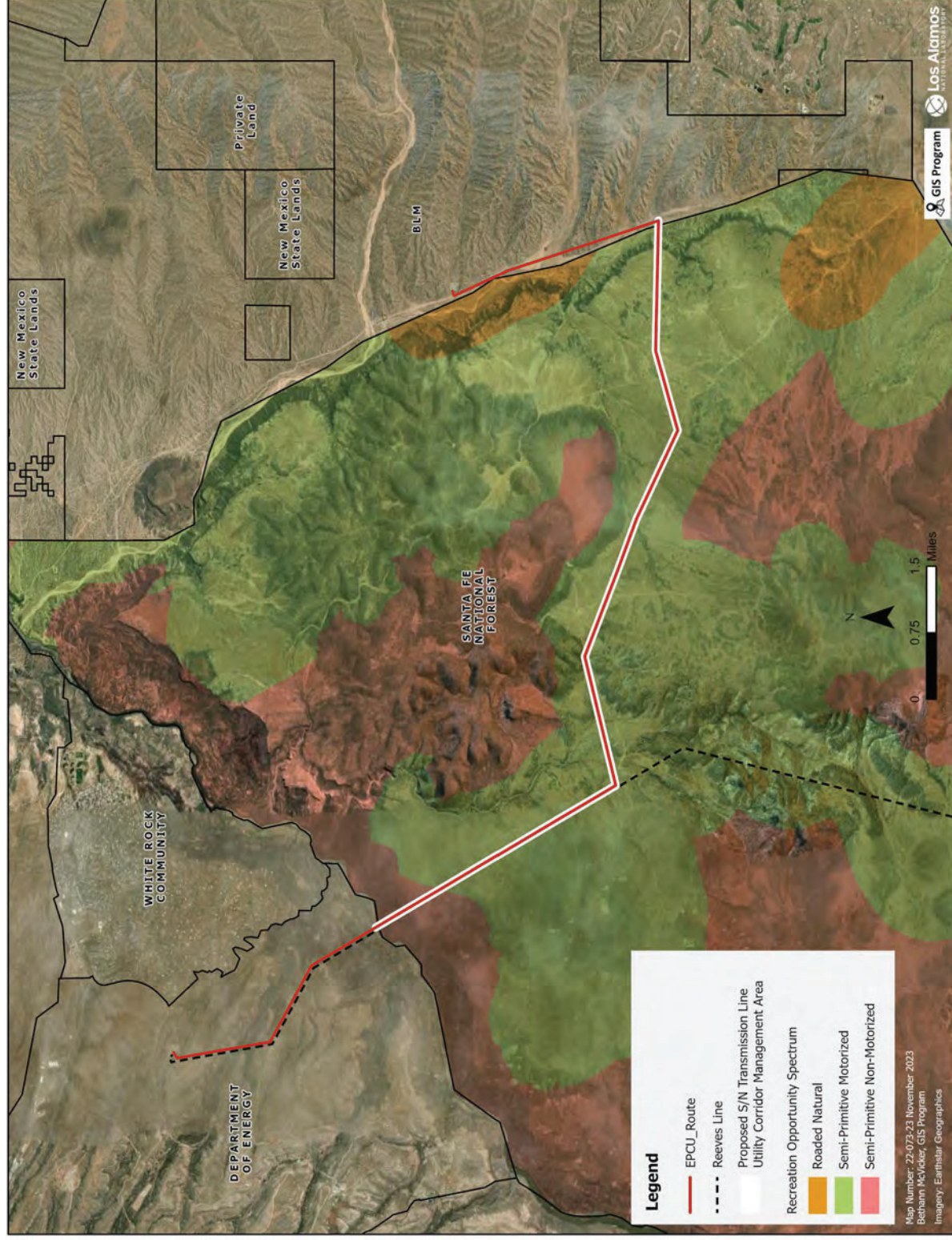


Figure 3-5. Recreation opportunity spectrum within the Santa Fe National Forest.

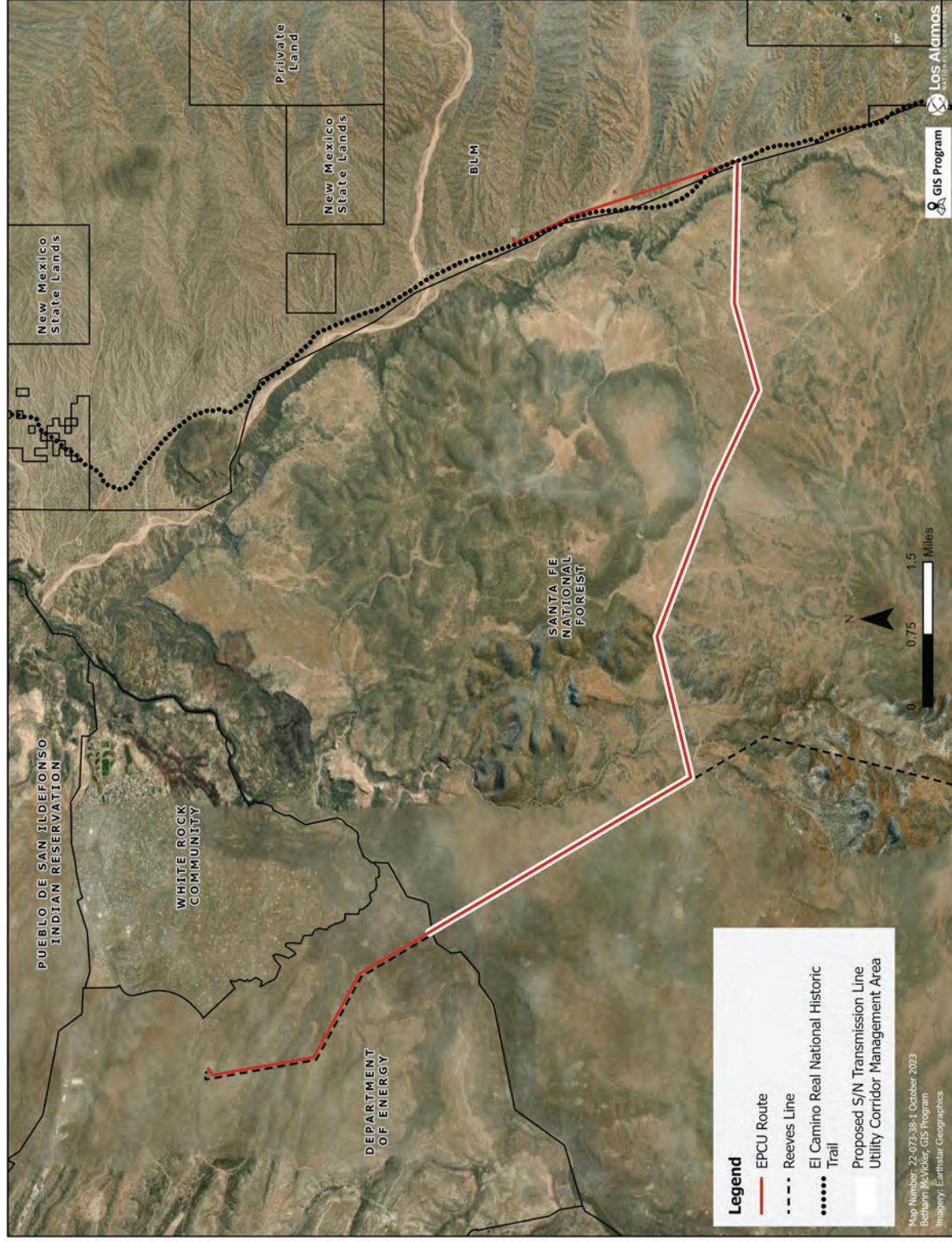


Figure 3-6. El Camino Real NHT in relation to the Proposed Action.

In 2003, DOE directed LANL to establish a Trails Management Program when it issued the Final Environmental Assessment for the Proposed Los Alamos National Laboratory Trails Management Program. Trails at LANL are managed according to the LANL Trails Management Program to ensure that use does not impact the Laboratory's mission and operations and that environmental resources are protected. Approximately 50 miles of recreational trails exist at LANL on DOE/NNSA lands. Several trails are open to the public, and others are open only to DOE/NNSA and LANL employees.

3.9.2 Environmental Consequences

No Action Alternative

Under the No Action Alternative, a new transmission line would not be built, a SUP for a utility ROW would not be needed, and any potential changes to existing recreation resources would not occur; therefore, the No Action Alternative would result in no impacts to recreation resources and the purpose and need for the project would not be met.

Proposed Action

Within the Caja del Rio Plateau, the proposed transmission line would be located parallel and cross a section of the El Camino Real NHT, and near the Dead Dog Trailhead. Potential transmission-line-related adverse impacts to trail recreation include possibly discouraging users whose activities are associated with the aesthetics of natural surroundings. Short-term recreational experiences could also be impacted during construction activities by no or limited access to trails, construction noise, and dust.

The proposed Forest Plan amendments would change the ROS setting for the SNTUC, which would allow semiprimitive motorized use to occur for this project within the management area, directly adjacent to and parallel with the existing Reeves transmission line. The intent for the ROS setting change is solely for the implementation of the project and operation and maintenance of the transmission line. The ROS setting would apply only to the SNTUC.

These potential impacts to trail recreation have been minimized or eliminated through use of existing disturbance (i.e., existing roads), project design that minimizes proximity to trail resources, and avoidance of locating new poles or wires in vehicle paths near roads/trails. An example of minimization includes crossing over El Camino Real NHT (which follows Old Buckman Road running roughly northeast/southwest) rather than locating the lines overhead north of the Dead Dog Trailhead. The proposed project would cross over the trail. The Proposed Action is entirely within the ROW corridor designated under the Taos RMP for the purpose of colocating land-use authorizations to the extent possible to avoid impacts to resources. The proposed project would be located within the 0.25-mile utility corridor designated along the Old Buckman Road (USDOI 2012).

The NHT Comprehensive Management Plan/Final Environmental Impact Statement (USDOI 2004) does not give specific guidance or mitigation regarding powerlines across the trail. Under this plan, archaeological and historic sites and visible trail route segments would be identified and protected. Generally, the trail is within a Class 2 viewshed, which for the BLM, specifies that the existing character of the landscape should be retained, and the level of change should be low. Management activities might be seen but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.

The Forest Plan provides management standards for the El Camino Real NHT to be consistent with its respective comprehensive management plan. It also provides management guidelines for the El Camino

Real NHT corridor to be consistent with or make progress toward achieving scenic integrity objectives of high or very high within the foreground of the trail (up to 0.5 mile on either side) or within the identified trail viewshed—the landscape visible from the trail based on topography. Because the proposed project would intersect the El Camino Real NHT, the Forest Plan would be amended to allow for the project.

The adjacent Dead Dog Trail would not be included within the SNTUC because it is outside of the proposed route for the project. For public safety, access and use of the trail could be interrupted during construction activities along BLM-managed lands. The trail could be closed for a period of days. Alternative trails are available throughout the SFNF- BLM- and DOE-managed property.

Relatively short-term traffic delays that could discourage or interrupt recreational activities could occur for those driving Forest Road 24 during construction. During the construction phase of the project Table 2-2it is expected that adverse impacts for both workers and recreationists could occur due to aesthetic and safety reasons. These impacts could include safety-related temporary closures while construction activities are proximate to the El Camino Real NHT and Dead Dog trailheads, thus potentially and temporarily impacting trail connectivity. After construction activities are completed, safety and connectivity would no longer be impacted, and the effects would not contribute to a decrease in recreational activity.

Trails located on DOE/NNSA lands could be temporarily impacted during construction activities. Impacts to trails, such as safety-related closures, would be coordinated and communicated in advance. Potentially impacted LANL trails include the (public) Broken Mesa and Powerline Point Trails located in TA-70, and the (DOE/NNSA/LANL employee only) Fitness Trail located in TA-03 and TA-58.

3.9.3 Cumulative Effects

Evaluation of the cumulative effects on recreation includes assessing all past, present, and reasonably foreseeable future actions that would affect recreation within and adjacent to the analysis area. Recreational uses have been identified as relevant from a cumulative effects context. The Proposed Action would cumulatively contribute short-term impacts to recreational opportunities on the Caja del Rio Plateau from construction activities.

Additional recreational uses would continue to occur in or adjacent to the project area. Recreation would continue to occur within the Diablo Canyon Recreation Area, which is located on the border of SFNF-and BLM-administered lands north of the proposed project. Trail use, dispersed camping, and dispersed target shooting on SFNF- and BLM-administered lands would also continue to occur.

Cumulative impacts and access to recreational areas may occur during the construction of the proposed transmission line. Short-term effects due to the construction of the project would be negligible because other areas would be available for recreational use. Hiking trails are available throughout other areas of SFNF- and BLM-administered lands. Cumulative, long-term effects are not expected to impact recreation and trail use as a result of this project. Cumulative effects are not expected to occur on DOE/NNSA lands.

3.10 Visual and Scenic Resources

A complete analysis can be found in Appendix F.

3.10.1 Affected Environment

The visual character of a landscape is described by the topography, land use, scale, form, and natural resources depicted in a casual observer's general view. The visual character of the project area can best be

summarized as relatively flat terrain dominated by piñon-juniper savannas and woodlands bounded by steep topographical relief at the edges of the Caja del Rio and Pajarito plateaus. Within the foreground views, users can see transportation, utilities, grazing infrastructure, and recreational trails. Background views include the Sangre de Cristo Mountains to the east and the Jemez Mountains to the north.

The SFNF uses the Forest Service Scenery Management System to determine the importance of scenery and to identify scenic resources as they relate to people. Scenic integrity measures the degree to which the scenic character attributes are intact. Scenic integrity objectives are defined by degrees or levels of alteration from the existing scenic character, and the intent is to achieve the highest scenic integrity possible and move toward the desired conditions (Table 3-5, Figure 3-7).

As with all desired conditions, projects implemented under the Forest Plan are designed to maintain or move toward desired conditions. Due to the forest-wide scale of mapping for scenic integrity objectives (SIO), some inconsistencies may be present. Examples of this are existing features with long-term impacts that will not achieve the desired SIO in the life of the Forest Plan (e.g., roads or trails, power lines, recreation facilities, pipelines, utility corridors), or geospatial data inconsistencies, especially along SIO boundaries (USDA 2022).

The forest is divided into levels of desired scenic integrity: very high, high, moderate, and low. These levels set objectives for variation from the existing scenic character that is permissible within the scenic integrity level. The current SIOs for the project area are high and moderate.

The BLM Taos RMP, published in May 2012, identifies goals, objectives, and guidance for managing visual resources within BLM-managed public land (BLM 2012). The overarching goal is to manage public land in a manner that maintains the overall visual quality of the region, certain open-space landscapes, undisturbed views, and other high-quality visual resources. Visual landscapes within BLM-managed public land were assessed and assigned visual resource management (VRM) classes based on the BLM Visual Resource Inventory Handbook (H-8410-1; BLM 1986). The general management guidance is for management activities and projects to maintain the VRM class assigned to a particular area.

For the portion of the project area sited on BLM-administered land, VRM is conducted in accordance with BLM Manual H-8410-1 (BLM 1986). VRM classes are used as minimum management objectives for identified visual management units.

Each VRM class describes differing degrees of modification allowable in basic landscape elements, which is accomplished by completing the Visual Impact Contrast Worksheet (Appendix F). The VRM class for the BLM portion of the project area is VRM Class IV, which allows major modifications to the existing character of the landscape. The level of change may be high, and management activities may dominate the view.

Visual resources within DOE/NNSA-managed lands are limited to what is visible to the public from accessible roadways and trails.

Table 3-5. Scenery Management System Scenery Integrity Objectives and How They Relate to Public Perceptions of Scenery (USDA 2022)

Scenic Integrity Objective	Public Perceptions of Scenery
Very High	Unaltered; scenic character is intact; naturally evolving
High	Appear unaltered; alterations to scenic character may be present but are not evident; naturally appearing
Moderate	Slightly altered; alterations are subordinate to scenic character being viewed (scenic character is dominant, not the alteration); relatively naturally appearing
Low	Moderately altered; alteration begins to dominate the valued scenic character being viewed.

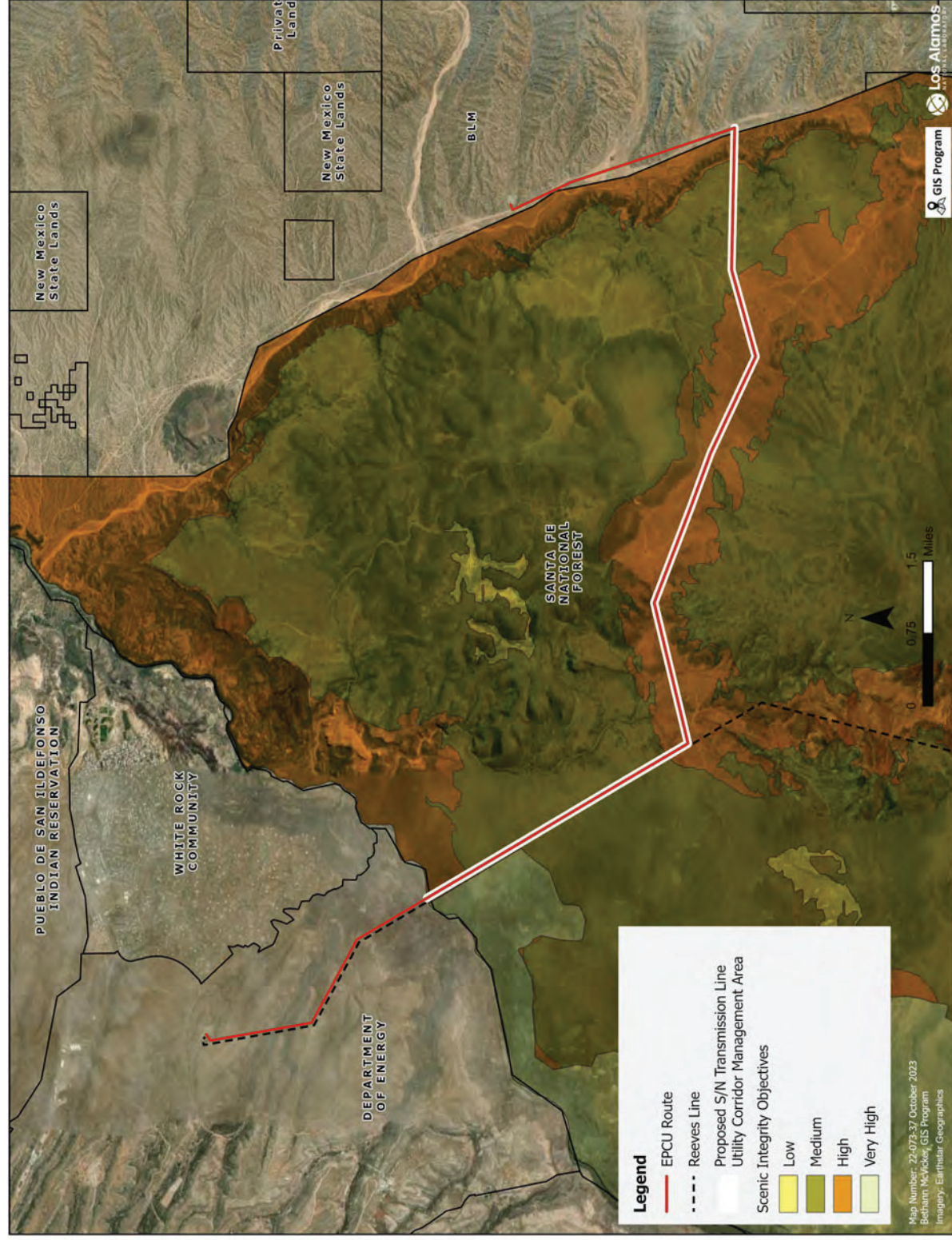


Figure 3-7. Desired scenic integrity levels in relation to the Proposed Action on the Santa Fe National Forest.

3.10.2 *Environmental Consequences*

No Action Alternative

Under the No Action Alternative, a new transmission line would not be built, and any potential changes to existing visual landscape would not occur; therefore, the No Action Alternative would result in no impacts to visual resources. The purpose and need for the project would not be met.

Proposed Action

The implementation of the Proposed Action would introduce a new linear visual element from the Norton Substation across the Caja del Rio Plateau to the Reeves Line. At the Reeves Line and White Rock Canyon crossing, an additional linear visual element would be introduced. The new and additional visual elements would include 70-foot-tall transmission line structures approximately 800 feet apart, conductor, and additional crossing structures at White Rock Canyon.

The section of the proposed transmission line on DOE/NNSA-managed lands parallels an existing transmission line. The distribution lines and electrical system upgrades will also parallel existing above-ground infrastructure, will be below ground in areas as feasible, and will be expanded within existing infrastructure. The proposed project is not considered a change or reduction in the visual characteristic of the landscape. Similarly, the portion of the proposed project on BLM-managed lands is consistent with the goal to maintain the overall visual quality of the region, certain open-space landscapes, undisturbed views, and other high-quality visual resources. The proposed transmission line would be within a VRM Class IV area, which allows major modifications to the existing character of the landscape. The level of change may be high, and management activities may dominate the view.

Analysis of the visual resources on the northern section of the Caja del Rio (the SFNF-managed lands for this proposed project) is provided in Appendix F, which quantifies the impact of constructing this powerline across the Caja del Rio management unit and effectively measures the significance of predicted impacts. Results from the cumulative viewshed analyses, in conjunction with locational data from regular users of the Caja del Rio landscape, suggest an overall visual impact to 5.1 percent of roads and/or trails within 3 miles of the proposed powerline route—1.1 percent of which is located in areas with High desired scenic integrity, and 4.0 percent is located in areas with Medium desired scenic integrity.

The proposed Forest Plan amendment to establish the SNTUC establishes a 100-foot corridor that allows for scenic integrity, recreation access, and archaeological resources preservation and protection to be compliant with the Forest Plan. Mitigation measures would be incorporated into the planning and design of the EPCU project to minimize and reduce potentially adverse visual impacts (Appendix C).

3.10.3 *Cumulative Effects*

Evaluation of the cumulative effects on the visual resources includes assessing all past, present, and reasonably foreseeable future actions that could affect visual resources within and adjacent to the analysis area. The continued use of the Norton and Reeves transmission lines has been identified as relevant from a cumulative effects context. As a result of this project, cumulative effects to the visual resources are expected to occur because the proposed project would be constructed in an area that currently does not have a utility line—the Caja del Rio Plateau between the Norton Substation and the area where the line will meet the existing Reeves Line. The implementation of the Proposed Action would introduce an additional visual feature to the landscape that does not currently exist on SFNF- and BLM-administered lands. Mitigations (such as colocating poles as feasible, minimizing color contrast, using low-reflective conductor, using weathering steel monopole transmission line structures, restoring vegetation after

construction, and locating the transmission line as closely as feasible to the existing Reeves line) would minimize the cumulative effects on visual resources (Appendix C).

The Pajarito Plateau within DOE/NNSA-managed lands is highly developed, and cumulative effects are not expected to occur.

3.11 Land Tenure and Use

3.11.1 *Affected Environment*

The project area is located entirely within federally administered lands and within Santa Fe and Los Alamos counties (New Mexico). The region that surrounds the proposed project area contains an expanse of undeveloped/semi-developed land characterized by steep and rough terrain, rangeland, and shrub/scrub woodlands. No privately owned land exists within the proposed project area. Within the surrounding project area, the SFNF-administered land is used as open space for livestock grazing, recreation, the harvesting of forest products, and traditional uses by Tribes. The DOE/NNSA land is used to conduct LANL mission-related work.

Developed land near the project area includes residential areas of the City of Santa Fe, Santa Fe County, Los Alamos County, and LANL. Developed infrastructure includes federal, state, county, and municipal roads; utility ROWs; airports; livestock-grazing structures; landfills; and water treatment facilities. LANL facilities, including those supported by the powerline described in the Proposed Action, are located throughout the DOE/NNSA boundary.

The SFNF Forest Plan and the BLM Taos Resource Management Plan comprise the governing land-use management plans for the Caja del Rio area (USDA 2022; BLM 2012). Both plans establish goals and objectives for land use, natural resources, cultural resources, visual quality, transportation, recreation, and resource management.

DOE/NNSA-managed lands have designated zoning and land-use requirements for operations at LANL. Areas affected by the Proposed Action are designated as reserve areas with limited trail use; high explosives operations; environmental management; experimental science; physical and technical support; administration, service, and support; and theoretical and computational science.¹² Throughout the Laboratory, land-use areas have established BMPs for mitigating potential impacts, including the protection of cultural resources and T&E species habitat.

The proposed area is not under the jurisdiction of any municipal zoning or land-use approvals.

3.11.2 *Environmental Consequences*

No Action

Under the No Action Alternative, a new transmission line would not be built, a SUP for the utility easement would not be needed, and any potential changes to existing land-management plans or undeveloped land would not occur; therefore, the No Action Alternative would result in no impacts to land use.

¹² Land-use areas at LANL are analyzed under the 2008 Final Site-Wide Environmental Impact Statement for Continued Operation of Los Alamos National Laboratory (2008 LANL SWEIS; DOE 2008).

Proposed Action

Implementation of the Proposed Action would require a new utility ROW on SFNF- and BLM-administered lands. Generally, the utility ROW would be consistent with local management plans. About 85 acres of previously undeveloped/semi-developed land in the Caja del Rio Plateau region would be designated as a utility ROW.

Direct impacts could include the clearing of vegetation. During construction, public areas would be temporarily restricted from access but would be accessible after construction and reclamation. Disturbance or development of existing undeveloped areas within the DOE/NNSA-managed lands would be minimal because proposed activities would be sited in previously developed areas.

It is anticipated that a new utility ROW would be consistent with existing land-management plans upon approval of the proposed Forest Plan amendments and issuance of the SUP.

3.11.3 Cumulative Effects

Evaluation of the cumulative effects on the land tenure and use includes assessing all past, present, and reasonably foreseeable future actions that would affect land tenure and use within and adjacent to the analysis area. No past, present, or reasonably foreseeable projects were identified to cumulatively impact land tenure and use from the Proposed Action.

3.12 Livestock Grazing

3.12.1 Affected Environment

The project area is located within two grazing allotments—one on BLM-administered lands and one on SFNF-administered lands. A description of each allotment is provided in the following paragraphs. No grazing allotments or permitted livestock grazing occurs within the DOE/NNSA-managed land.

- The Santa Fe grazing allotment administered by the BLM totals 20,496 acres and is located on public, state, and private lands. The allotment permits 271 head of cattle and 5 horses. The allotment includes seven wells, two corrals, several storage tanks and troughs, and five pastures (i.e., Dutch, Home, Midway, Boondocks, and Artesian).
- The Caja del Rio grazing allotment administered by the SFNF totals 66,873 acres and is located in Santa Fe and Sandoval counties. Located year-round are 520 head of cattle (10 current permit holders), and the grazing system is a three-pasture, deferred rotational system. Livestock fencing, corrals, storage tanks, and troughs are located within the project area.

3.12.2 Environmental Consequences

No Action Alternative

Under the No Action Alternative, a new transmission line and upgrades to LANL infrastructure would not occur, a SUP for an additional utility ROW would not be needed, and any potential impacts to livestock grazing would not occur. Therefore, the No Action Alternative would result in no impacts to livestock grazing. The purpose and need for the project would not be met.

Proposed Action

The implementation of the project would not require permanent removal, addition, or alteration of existing livestock fencing. Some fencing might need to be removed temporarily to access certain areas

within the Cañada Ancha. This fencing would be replaced once the construction is complete. Other portions of the project area that have livestock fencing include gates, and no temporary changes would be required.

No changes to allotment acreage, available animal unit months, or pasture rotations are expected. Some transmission lines have the potential to be a source for chronic or acute exposure to electromagnetic fields (EMFs), which are electrically charged molecules floating in the atmosphere. EMFs include ultraviolet rays from the sun, discharges of electricity after a lightning strike, and an electrical field around transmission lines. Based on multiple scientific studies, no evidence exists that EMFs effect or disrupt livestock conception, calving, growth rate, or survival (Angell et al. 1990; Renaud 1999).

The construction of the new access roads is unlikely because the proposed transmission line would follow existing roads whenever possible. If temporary roads were constructed, additional interactions could occur between livestock and recreational users, which could result in additional stress to livestock when grazing in areas within proximity to the new transmission line; however, with proper public education and collaborative land management, any negative interactions can be reduced (Wolf et al. 2017).

The proposed transmission line is not likely to have short- or long-term impacts to livestock because the project would not permanently alter allotment functions or disrupt livestock conception, calving, growth rate, or survival (Wolf et al. 2017). The proposed project would not affect feral/wild horses that could be present in the project area.

3.12.3 Cumulative Effects

Evaluation of the cumulative effects on livestock grazing includes assessing all past, present, and reasonably foreseeable future actions that would affect livestock within and adjacent to the analysis area. No past, present, or reasonably foreseeable projects were identified to cumulatively impact livestock grazing from implementation of the Proposed Action on SFNF- and BLM-administered lands. DOE/NNSA does not permit livestock grazing; therefore, no cumulative effects would occur on DOE/NNSA-administered lands.

3.13 Environmental Justice

3.13.1 Affected Environment

In 1994, President Clinton issued Executive Order (EO) 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, to ensure that such populations are not subject to disproportionately high levels of environmental risk (59 Federal Register 7629 1994). EO 12898 provides that “each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations.” EO 12898 makes it clear that its provisions apply fully to programs involving Native Americans. Since then, EO 14008, Tackling the Climate Crisis at Home and Abroad, signed by President Biden, has articulated a commitment to the issue of environmental justice. This commitment includes the creation of two new White House councils to address environmental justice implementation as well as the future creation of a Climate and Economic Justice Screening Tool by the CEQ. DOE/NNSA evaluated the distribution of minority and low-income communities within the 20-mile ROI and determined that the ROI was consistent with population distributions presented in the CEQ Climate and Economic Justice Screening Tool and the EPA EJ Screening Tool.

The threshold used for identifying minority communities surrounding LANL was developed consistent with CEQ guidance (CEQ 1997) for identifying minority populations using either the 50-percent threshold or a “meaningfully greater” percentage of minority individuals in the general population. The average minority population percentage of New Mexico is 64 percent, and the average minority population percentage of the counties surrounding LANL is 62 percent (USCB 2022a).

For the Proposed Action, a meaningfully greater minority population percentage relative to the general population of the state and surrounding counties would exceed the CEQ’s 50-percent threshold; therefore, this analysis uses the CEQ threshold of 50 percent to identify areas with minority populations surrounding LANL. To evaluate the potential impacts on populations in closer proximity to LANL and the Proposed Action, additional radial distances were also analyzed.

Environmental Justice Communities in the Region of Influence

The Region of Influence (ROI) comprises a 20-mile radius from the DOE/NNSA-managed land that includes the Caja del Rio region and surrounding communities that would be directly affected by the Proposed Action. This ROI accounts for all potentially affected counties within its radius for the Proposed Action and includes communities within Los Alamos, Rio Arriba, Sandoval, and Santa Fe Counties (Figure 3-8). The total population of the ROI is approximately 78,428 individuals (USCB 2022a).

DOE/NNSA shares a property boundary with the Pueblo de San Ildefonso, one of several sovereign, federally recognized Native American tribes with a government-to-government relationship. The SFNF and BLM share property boundaries with the Pueblo de Cochiti and the Pueblo de San Ildefonso; these boundaries are in close proximity to the Pueblo of Tesuque. Other sovereign federally recognized Native American tribes within the ROI include the Pueblos of Jemez, Nambé, Ohkay Owingeh, Picuris, Pojoaque, Sandia, Santa Ana, Santa Clara, San Felipe, Santo Domingo, Taos, and Zia. The Caja del Rio area is a significant and sacred landscape for modern-day Pueblo people. The landscape and its cultural and natural resources are culturally and spiritually significant to the modern-day Pueblos. Each Pueblo maintains their own spiritual, unique, and significant connection to the landscape based on their own respective history. The project is being designed and would be implemented in a manner to respect these vital connections.

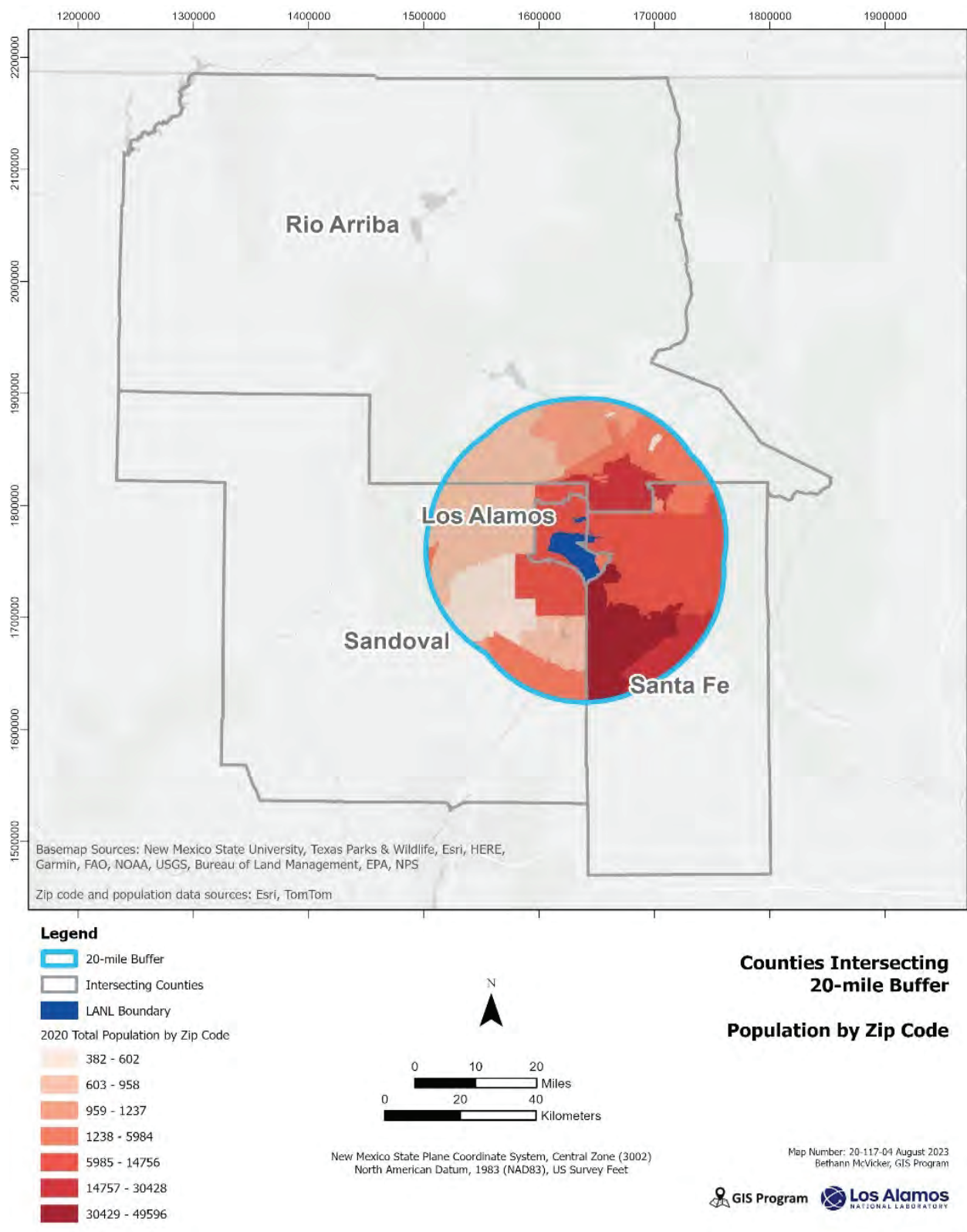


Figure 3-8. Twenty-mile region of influence for environmental justice.

Minority and Low-Income Populations

Race and ethnicity are correlated with disparities in health, exposure to environmental stressors, and vulnerability to natural and anthropogenic hazards (EJIWG 2019). Population information regarding race and ethnicity and low-income information for the ROI is presented in Table 3-6 and Table 3-7. As shown in Table 3-6, the area within 5 miles contains the lowest percentage of minority populations. The overall composition is predominantly non-minority within 5- and the 10-mile radius for the ROI. This population distribution changes when the area is expanded to 20 miles; it contains the highest concentration of minority populations in the ROI. Distribution of low-income populations in surrounding counties of the ROI (Table 3-7) is generally consistent with the national average of 12.8 percent, with a notably high percentage in Rio Arriba County.

Table 3-6. Population Distribution by Race and Ethnicity (Non-Hispanic and Hispanic) in the Region of Influence Compared with National Percentage for 2020 (USCB 2020b)

Population Group	5-Mile Population	5-Mile % of Total	10-Mile Population	10-Mile % of Total	20-Mile Population	20-Mile % of Total	National Average %
Non-Minority	12,953	68.7	13,706	65.0	26,735	34.1	57.8
Hispanic or Latino	3,349	17.8	4,177	19.8	41,488	52.9	18.7
Black or African American	156	0.8	160	0.8	377	0.5	12.0
American Indian or Alaska Native	168	0.9	160	0.8	5,930	7.6	0.7
Asian	1,216	6.4	1,233	5.8	1,641	2.1	5.9
Native Hawaiian and Other Pacific Islander	15	0.1	15	0.1	35	0.0	0.2
Other Race	128	0.7	136	0.6	392	0.5	0.5
Two or More Races	868	4.6	1,501	7.1	1,830	2.3	4.2
Total Minority	5,900	31.3	7,382	35.0	51,693	65.9	42.2
Total Population ^a	18,853	100.0	21,088	100.0	78,428	100.0	100.0
Low-Income ^{b,c}	2,790	13.2	6,284	19.4	30,400	31.4	12.8

^a Minority population estimates are based on the 2020 Census. Population of Census blocks that intersect or were within the 20-mile radius were wholly included in population counts.

^b Low-income population estimates are based on the U.S. Census Bureau's American Community Survey 5-year estimates (2016–2020). Populations of Census Block groups that intersect or were within the 20-mile radius were wholly included in population counts.

^c NNSA defines low-income as households below twice the federal poverty level.

Table 3-7. Distribution of Low-Income Populations within the Region of Influence

County	Population Considered for Poverty Status	Population below Poverty Level	Percent below Poverty Level
Los Alamos	18,266	959	5.3%
Rio Arriba	39,159	10,338	26.4%
Sandoval	142,955	18,838	13.2%
Santa Fe	147,907	16,947	11.5%
ROI Total	348,287	47,082	13.5%
New Mexico	2,053,909	381,026	18.6%
National	318,564,128	40,910,326	12.8%

Source: NEPAAssist 2021, U.S. Census Bureau 2021.

3.13.2 *Environmental Consequences*

No Action Alternative

Under the No Action Alternative, a new transmission line would not be built, a SUP for a utility ROW would not be needed, and any potential changes to minority and low-income populations would not occur. The purpose and need for the project would not be met.

Proposed Action

Development of the Proposed Action was conducted in consultation with affiliated Tribes to avoid and mitigate to the greatest extent feasible any potentially disproportionate high and adverse impacts to minority and low-income populations. For the proposed project, environmental justice considerations were analyzed for potential disproportionate and adverse impacts from several resource areas, including construction-generated air emissions and noise; visual impacts to the surrounding communities; impacts to cultural resources and traditional cultural properties; and access to recreational areas. The project area is residentially uninhabited on both the SFNF- and DOE/NNSA-administered lands. All persons, regardless of race or income, who would be present within the project area would experience the same potential impacts related to air emissions and noise and temporary restricted access for recreational use. These impacts would be considered as low because construction is temporary and ambient air conditions and noise would return to pre-construction levels. Access to recreation areas would be restored once construction is complete. Temporary impacts from construction activities would be low because construction would be localized to specific areas. Upon completion, visual impacts from the power line would be considered low-impact, permanent changes to the visual setting in the project area. Such permanent impacts are considered low intensity because they are not significant alterations to this portion of the Caja del Rio Plateau considering other utility corridors that currently exist on the Plateau. All potential impacts, both temporary and permanent, from construction and operation from the proposed project would not be disproportionately high or adverse to minority and low-income populations within the ROI.

3.13.3 *Cumulative Effects*

Evaluation of the cumulative effects on environmental justice includes assessing all past, present, and reasonably foreseeable future actions that would affect minority populations within the ROI within and adjacent to the analysis area. Projects in and near the project area have not been identified as relevant from a cumulative effects context. Cumulative effects are not anticipated from implementation of the Proposed Action.

3.14 **Climate, Greenhouse Gases, and the Social Cost of Carbon**

Affected Environment

GHGs include water vapor, carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O). GHGs in the earth's atmosphere contribute to regulating the temperature of the planet by trapping solar heat. When solar radiation (sunlight) reaches the earth, part is reflected back into space, and about half is absorbed by the earth's surface and then re-emitted as infrared radiation. The greenhouse effect occurs when GHGs absorb some of this emitted infrared radiation, causing the earth's surface and lower atmosphere's temperature to rise.

In January 2023, the Biden Administration CEQ published interim guidance regarding how to evaluate GHG emissions and climate change under NEPA (hereafter the 2023 GHG guidance). The interim

guidance updates CEQ's 2016 GHG guidance with commitments that address climate change in EOs 13990, 14008, and 14057 and states that agencies should quantify a project's reasonably foreseeable direct and indirect GHG emissions as well as monetize the social cost of those GHG emissions (i.e., calculate the social cost of greenhouse gas). The 2023 GHG guidance also encourages agencies to avoid and mitigate GHG emissions to the greatest extent possible. A more detailed explanation relating to this section is presented in Appendix I.

The Proposed Action would be constructed to National Electrical Safety Code standards using calculation criteria as design input for extreme weather events, including wind and temperature. In addition, Chapter 2, Section 2.3, of this document identifies structural design features to increase the resilience of the Proposed Action to wildfire.

3.14.1 *Environmental Consequences*

No Action Alternative

Under the No Action Alternative, a new transmission line would not be built, and associated construction would not occur; therefore, the No Action Alternative would result in no impacts associated with the emissions of GHG. Ongoing operation and maintenance activities associated with the existing Reeves and Norton transmission lines would continue to occur. The purpose and need for the Proposed Action would not be met.

Proposed Action

Construction of the proposed transmission line could cause a temporary minor increase in GHG emissions. Because construction activities use diesel fuel, heavy equipment can generate measurable amounts of GHG emissions.

Tree growth and future carbon sequestration rates are highly variable and dependent on several factors, including the species and age of the tree, climate, forest density, and soil conditions. Given the projection found in Appendix I, the impact of vegetation removal on GHG emissions would be low.

During operation and maintenance of the transmission line, it is assumed that routine patrols and structure maintenance would occur at a minimum of once per year and that emergency maintenance would occur once every 4 years on average. See Appendix I for more details. The proposed transmission line would not exceed the EPA mandatory reporting threshold for large sources of GHG emissions.

GHG emissions from the proposed LANL activities would have no significant increase as missions change with power demands. DOE/NNSA will continue to evaluate the potential impacts from GHG emissions in accordance with EO 13990 and the 2023 CEQ Guidance.

3.14.2 *Cumulative Effects*

Evaluation of the cumulative effects on GHG emissions includes assessing all past, present, and reasonably foreseeable future actions that would affect GHG emissions within and adjacent to the analysis area. No cumulative effects for air quality are anticipated from implementation of the Proposed Action. GHG emissions directly attributed to the construction of the proposed transmission line are not anticipated to be significant. A potential increase in GHG emissions from the additional capacity could occur; however, it is expected that any increase would be offset with additional access to renewable energy markets.

Social Cost of Greenhouse Gases

Estimates of the social cost of greenhouse gases (SC-GHG) emissions provide an aggregated monetary measure (in U.S. dollars) of the net harm to society associated with an incremental metric ton of emissions in a given year. As a member of the IWG, DOE agrees that the interim SC-GHG estimates included in Appendix I represent the most appropriate estimates of the SC-GHG until revised estimates are developed that reflect the latest, peer-reviewed science. Table 3-8 summarizes the life cycle SC-GHG estimate for the Proposed Action.

Table 3-8. Social Cost of Carbon-Greenhouse Gas Emissions by Project Phase

Project Phase	Social Cost of CO ₂ , CH ₄ , and N ₂ O			
	CO ₂	CH ₄	N ₂ O	CO ₂ e
Construction/Decommissioning	\$1,258,646.41	\$3,898.84	\$11,417.26	
Operations				\$1,240,440.79

3.15 Public and Worker Health and Safety/Accidents

This section applies only for DOE/NNSA. The requirement for public and worker health and safety/accidents does not apply to Forest Service or BLM.

3.15.1 Affected Environment

The health of workers is considered because they would be involved with performance activities throughout the project life cycle. Construction of the proposed project could involve typical construction-related accidents and injuries. The health of workers would be routinely monitored. Health-monitoring programs at LANL for workers considers a wide range of concerns, including routine workplace hazards. Workers involved in hazardous operations are protected by engineering controls and are required to wear appropriate personal protective equipment (PPE). Because of the various health-monitoring programs and the requirements for PPE, LANL workers are generally considered to be a healthy workforce with a below-average incidence of work-related injuries and illnesses (DOE 2002).

LANL monitors environmental media for contaminants that could affect non-LANL workers or members of the public. This information is reported to regulatory agencies, such as the NMED and the EPA, and to the public through various permits and reporting mechanisms, and it is used to assess the effects of routine operations at LANL on the general public holistically.

3.15.2 Environmental Consequences

No Action Alternative

The No Action Alternative would result in the continuance of extant conditions with no impacts to public and worker health and safety. The purpose and need for the Proposed Action would not be met.

Proposed Action

The entire proposed transmission line and upgrades to LANL electrical infrastructure would be designed and maintained to minimize hazards. The proposed transmission line would be maintained to the high

standard for electrical power infrastructures managed on federal and other public lands. Along the utility ROW, access for emergency service providers would be maintained.

The proposed project is not expected to result in an adverse effect on the health and safety of the public nor the workers who would be actively involved in potentially hazardous activities, such as heavy equipment operations, inspections, maintenance, decommissioning, and demolition of supporting infrastructure. Potential exposures to various hazards or injuries are possible during the construction of the proposed project. Adverse effects could range from relatively minor incidents (e.g., cuts, sprains, slips, trips, and falls) to more major injuries (e.g., electrical contact, broken bones). The greatest worker health hazard would be associated with operation and maintenance.

To prevent serious injuries, all site construction contractors would be required to adhere to site-specific construction safety and health planning as described in the Proposed Action. Adherence to an approved plan and the use of PPE and engineered controls would minimize adverse health effects.

Routine maintenance of electrical power transmission infrastructure may be performed. Mechanical equipment might be needed for maintenance that requires the removal of debris or performance of repairs. Maintenance activities would meet all electrical safety requirements.

Broader concerns of public interest, such as EMFs and the potential for triggering wildland fires, have also been considered. A magnetic field is generated when electric current flows through any line or wire. Given the common sources and ubiquitous nature of EMFs in modern settings, nearly everyone is exposed to a wide range and complex mix of these fields every day.

A growing body of research has not been able to establish a causal relationship between EMFs and human health; emerging scientific consensus is that power lines are not likely responsible for adverse public health effects (PSC 2013).

Proactive design and planning efforts have been incorporated into the proposed project design to prevent a transmission-line-initiated wildland fire. These features include the use of

- robust insulators to reduce spark sources,
- grounded pole structures to reduce lightning-initiated wildland fire,
- periodic pole and insulator inspections by qualified linemen,
- regular fuel reduction within the transmission line utility ROW following a vegetation management plan,
- limited access to utility ROW to prevent vandalism, and
- power-flow monitoring and fast reacting relays/circuit breakers to identify vulnerable areas and response.

Overall, be limited long-term impacts would occur to public and worker health and safety or accidents. Short-term impacts would be minimized through BMPs and implementation of site-specific controls (Appendix C).

3.15.3 Cumulative Effects

Evaluation of the cumulative effects on worker health and safety include assessing all past, present, and reasonably foreseeable future actions that would affect worker health and safety within and adjacent to the analysis area. Projects in and near the project area have not been identified as relevant from a

cumulative effects context. Cumulative effects to the public and worker health are not anticipated from implementation of the Proposed Action.

3.16 White Rock Canyon Recommended Wilderness Area

The White Rock Canyon Recommended Wilderness Area is located on the SFNF, on the western portion of the Caja del Rio plateau along the Rio Grande. Although not a Congressionally designated wilderness area, through previous planning efforts, the SFNF determined that this area has existing wilderness characteristics. The intent of the management area is to provide management direction that preserves the existing wilderness characteristics so they are present should Congress designate it as such (Forest Service 2022). The White Rock Canyon Recommended Wilderness Area applies only to lands administered by the SFNF. For an area to be considered as a recommended wilderness area, it must meet the criteria in the Wilderness Act of 1964 section 2(c):

- (1) generally appears to be affected primarily by the force of nature,
- (2) has outstanding opportunities for solitude or primitive and unconfined types of recreation,
- (3) may contain unique features or values, and
- (4) can be managed to preserve its wilderness characteristics (USDA 2022).

3.16.1 *Affected Environment*

White Rock Canyon Recommended Wilderness Area comprises 10,280 acres. It is situated within two inventoried roadless areas and the southwest half of the Arroyo Montoso IRA and encompasses most of the Caja IRA (USDA 2022). The area is bound on the west by the Cochiti Reservation, follows the Rio Grande up to the forest boundary along the Bandelier Wilderness within the Bandelier National Monument to the north and the IRAs to the east. The existing Reeves line is located to the northeast of the White Rock Canyon Recommended Wilderness Area (Figure 3-9).

The piñon-juniper-dominated landscape is considered an important bird area and contains historic petroglyphs and archaeological sites (USDA 2022). The area is currently managed primarily for semiprimitive nonmotorized remote recreation; however, minor areas along the eastern edge are managed for semiprimitive motorized around SFNF-authorized roads. The area is expansive, and a sense of solitude can be easily achieved in the rarely visited area (USDA 2022).

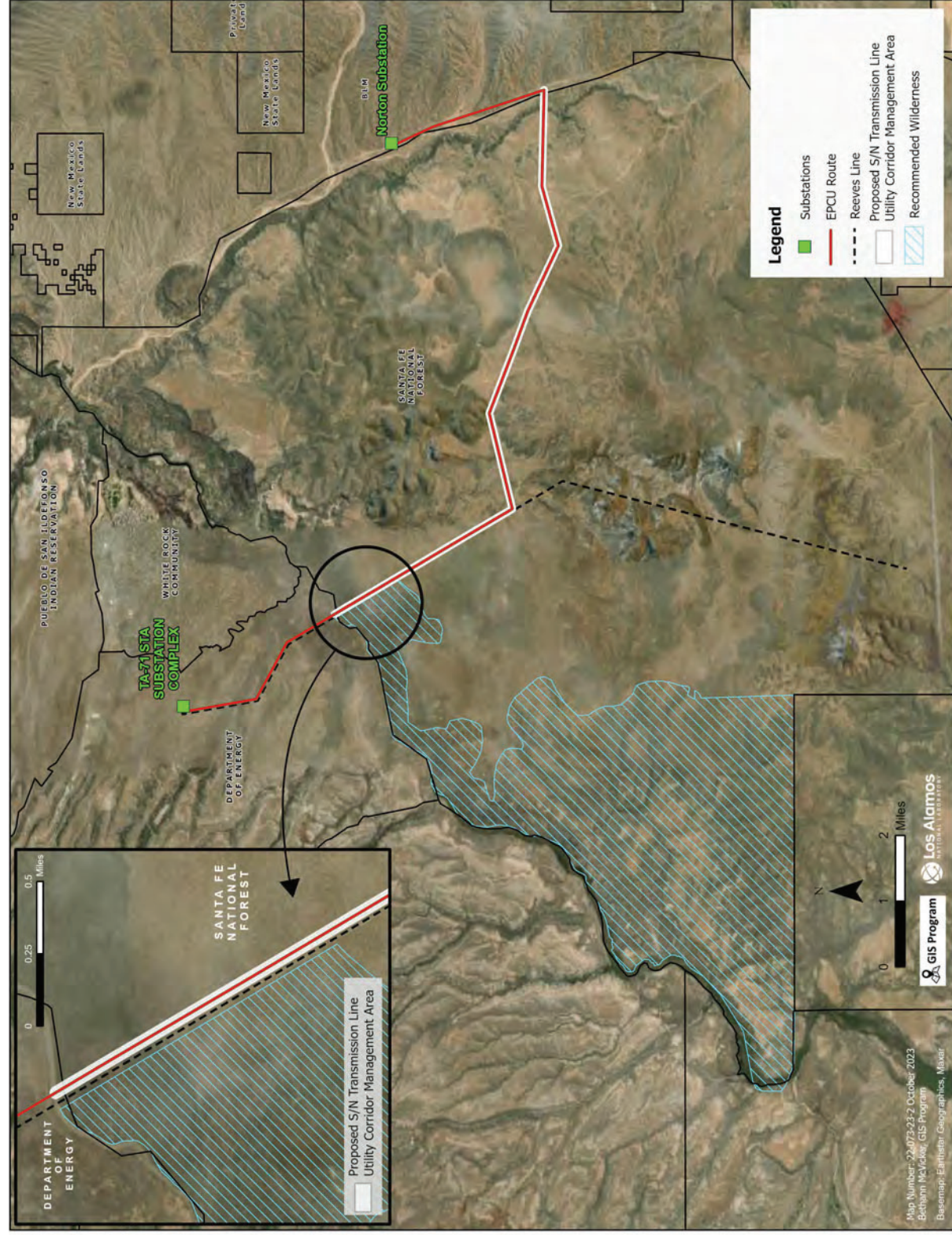


Figure 3-9. White Rock Canyon Recommended Wilderness in Relation to the Proposed Action.

3.16.2 *Environmental Consequences*

No Action Alternative

The No Action Alternative would not change the White Rock Canyon Recommended Wilderness Area characteristics because the project would be not implemented. The purpose and need for the Proposed Action would not be met.

Proposed Action

The existing Reeves line is located outside of the eastern boundary. The proposed EPCU line would be built approximately 150 feet to the east of the Reeves line, resulting in the proposed project being further away from the boundary; however, noise from construction efforts could temporarily impact the sense of solitude. Noise and visual temporary impacts could occur from the use of pneumatic hammers when placing poles at the canyon edge. Noise and visual impacts could also occur from the use of a helicopter when stringing the transmission line across the canyon. These impacts would be of short duration and not expected to have lasting effects to the White Rock Canyon Recommended Wilderness Area because ground-disturbing activities would not occur within the recommended wilderness boundary. Project implementation would not impact any criteria that make the wilderness area eligible as such.

3.16.3 *Cumulative Effects*

Evaluation of the cumulative effects on the White Rock Canyon Recommended Wilderness area includes assessing all past, present, and reasonably foreseeable future actions that would affect the area within and adjacent to the analysis area. The proposed project is not expected to have effects on the White Rock Canyon Recommended Wilderness Area or its recommended wilderness criteria; therefore, cumulative effects from the proposed project are not expected to occur.



4 Consultation and Coordination

DOE/NNSA is the lead agency for the EA; therefore, consultation with potentially impacted tribal nations from elements of the Proposed Action is conducted in accordance with DOE Order 144.1, Department of Energy American Indian Tribal Government Interactions and Policy. Coordination and consultation among DOE/NNSA, USDA Forest Service SFNF, USDOJ BLM, and nearby tribal nations have been ongoing. Interaction between federal agencies and tribes would continue throughout project phases, including planning, initiation, and potential mitigations. Various federal interagency meetings were conducted to share project information and determine the scope of the EA and throughout the development of the EA.

4.1 Agencies Involved

The DOE/NNSA (lead agency) was assisted by the USDA Forest Service-Santa Fe National Forest (cooperating agency) and the USDOJ Bureau of Land Management-Taos Field Office (participating agency) in preparing this EA.

4.2 Agencies Contacted

U.S. Department of the Interior, National Park Service, U.S. Fish and Wildlife Service, State Historic Preservation Office, and Advisory Council on Historic Preservation (ACHP)

4.3 Tribal NEPA Coordination

On April 15, 2021, NNSA sent notifications to New Mexico Tribal Nations announcing the NEPA EA scoping period and inviting Tribes to provide comments regarding potential environmental impacts related to the proposed EPCU project. The following Tribal Nations received notifications:

- Pueblo de San Ildefonso
- Pueblo de Cochiti
- Pueblo of Jemez
- Pueblo of Santa Clara
- Pueblo of Tesuque
- Hopi Tribe of Arizona
- Ohkay Owingeh
- Pueblo of Acoma
- Pueblo of Laguna
- Pueblo of Nambé
- Pueblo of Isleta
- Pueblo of Picuris
- Pueblo of Pojoaque
- Pueblo of Sandia
- Pueblo of San Felipe
- Pueblo of Santa Ana
- Pueblo of Santo Domingo
- Pueblo of Zia
- Pueblo of Taos
- Pueblo of Zuni
- Jicarilla Apache Nation
- Mescalero Apache Tribe
- Navajo Nation
- Southern Ute Indian Tribe
- Ute Mountain Ute Tribe



NNSA provided presentations on the EPCU project to the ENIPC and at the NNSA and DOE-Environmental Management lead ATEM, which includes environmental staff from the DOE Accord Pueblos (Pueblos of San Ildefonso, Santa Clara, Jemez, and Cochiti). In addition, NNSA provided individual briefings and/or onsite field tours of the EPCU project to Pueblo Nations who requested briefings:

- Pueblo de San Ildefonso
- Pueblo de Cochiti
- Pueblo of Tesuque
- Pueblo of San Felipe

On December 17, 2021, the All Pueblo Council of Governors (APCG) sent a letter to the SFNF supervisor requesting that the SFNF fully comply with tribal consultation requirements under the NEPA and NHPA before publishing the EA for the proposed EPCU project. In addition, the APCG passed a resolution on November 29, 2021, that supported the preservation of the Caja de Rio traditional cultural landscape and urging the Forest Service and the DOE to fully assess potential environmental and cultural resource impacts of the proposed EPCU project.

On January 10, 2022, the SFNF sent a letter to all 22 tribes in New Mexico, the Hopi Tribe in Arizona, the Ute Mountain Ute Tribe, and the Southern Ute Indian Tribe in Colorado informing the tribes about the EPCU project and the proposal for a SUP that the SFNF would issue for the portion of the Proposed Action that crosses National Forest System–managed lands. Through this letter, the SFNF invited tribes to consult under Section 106 of the NHPA. On February 4, 2022, the SFNF sent a reply letter to Chairman Mitchell of the APCG acknowledging the significance of the Caja del Rio, committing to meeting all legal requirements related to the portion of the proposed EPCU located on National Forest System–managed lands, and informing the APCG of the letter invitation to the 25 Tribes initiating Tribal consultation with the SFNF under Section 106 of the NHPA. Following this letter, the SFNF scheduled a virtual listening session on the EPCU project for March 21, 2022.

On March 18, 2022, the APCG sent a letter to the SFNF requesting to postpone and reschedule the proposed virtual listening session for DOE’s EPCU project. The letter stated that several member Pueblos have raised concerns to the APCG that the SFNF might understand this session to be formal NHPA Section 106 government-to-government consultation, which it cannot be without sufficient and adequate notice of its intent to the Pueblos. The SFNF decided to postpone the virtual listening session. Following the receipt of this letter, the NNSA, SFNF, and BLM-TFO met and decided to conduct Tribal NHPA consultation on the EPCU project jointly to ensure that Tribal Nations were receiving consistent information from all the federal partners involved.

Consultation and Coordination

Under the authorities of the NHPA and NEPA, NNSA, the SFNF, and the TFO-initiated Tribal consultation on May 23, 2022, to apprise Tribal Governments of the Proposed Action for the EPCU project and to begin formal government-to-government consultation. DOE/NNSA, with the support of SFNF and TFO as co-leads for NHPA, sent letter notifications and invitations to consult to the following Tribes and Pueblos:

- Pueblo de San Ildefonso
- Pueblo de Cochiti
- Pueblo of Jemez
- Pueblo of Santa Clara
- Pueblo of Tesuque
- Hopi Tribe of Arizona
- Ohkay Owingeh
- Pueblo of Acoma
- Pueblo of Laguna
- Pueblo of Nambé
- Pueblo of Isleta
- Pueblo of Picuris
- Pueblo of Pojoaque
- Pueblo of Sandia
- Pueblo of San Felipe
- Pueblo of Santa Ana
- Pueblo of Santo Domingo
- Pueblo of Zia
- Pueblo of Taos
- Pueblo of Zuni
- Jicarilla Apache Nation
- Mescalero Apache Tribe
- Navajo Nation
- Southern Ute Indian Tribe
- Ute Mountain Ute Tribe
- Ysleta Del Sur

On June 23, 2022, a virtual government-to-government consultation, co-led by NNSA, SFNF, and BLM-TFO, was held to discuss two additional potential transmission line routes that were being considered for analysis in the EA. Invitations for this consultation, along with maps of the proposed routes with information that outlined the rationale for each proposed route, were mailed and emailed to all Tribes and Pueblos previously listed. The routes presented during this consultation resulted from Tribal and Pueblo input and discussions during previous briefings and onsite field tours. During the June 23 consultation session, both the Pueblo of Tesuque and the Pueblo de Cochiti provided positive feedback on the two new proposed routes. Now one of those updated routes, with additional adjustments based on additional tribal input, has become the single Proposed Action alternative analyzed within this document. Additionally, during this consultation, Pueblo de San Ildefonso and Pueblo of Tesuque requested formal individual government-to-government consultation with NNSA, SFNF, and BLM-TFO.

All three agencies consulted with Pueblo de San Ildefonso's governor and staff on July 18, 2022. The following day, July 19, 2022, a field visit to the two updated EPCU routes was conducted with Pueblo de San Ildefonso's Tribal Historic Preservation Officer. On October 17, 2022, NNSA attended a meeting with the governor and staff from the Pueblo of Tesuque to discuss the EPCU project.

An additional consultation request was received on August 23, 2022, from the Southern Ute Indian Tribe. NNSA responded to set up a government-to-government consultation on August 31, 2022, with the three agencies. NNSA reached out three times via email to Southern Ute Indian Tribe, and no response was received. Scheduling of that consultation is still pending.

NNSA met with Pueblo de Cochiti on December 13, 2022, to discuss the EPCU project and concerns regarding some traditional cultural places and project impacts. SFNF met with Pueblo de Cochiti on March 28, 2023, to discuss similar concerns. NNSA and SFNF continue to collaborate with the Pueblo to devise recommendations for the project.

Government-to-government consultation and coordination is ongoing and will continue. To date, 42 outreach Tribal activities have been conducted that have included consultations, information sharing, field visits, notifications, and coordination meetings.

5 Acronyms and Definitions

Acronym	Definition
APCG	All Pueblo Council of Governors
APE	area of potential effects
ATEM	Accord Technical Exchange Meeting
BISON	Biota Information System of New Mexico
BLM	Bureau of Land Management
BMP	best management practice
Buckman Project	Buckman Water Diversion Project
Caja MA	Caja del Rio Wildlife and Cultural Interpretive Management Area
CEQ	Council on Environmental Quality
CFE	carbon-pollution-free electricity
CFR	Code of Federal Regulations
CWA	Clean Water Act
dB	decibels
DOE	Department of Energy
EA	environmental assessment
EMF	electromagnetic field
ENIPC	Eight Northern Indian Pueblos Council
EO	Executive Order
EPA	U.S. Environmental Protection Agency
EPCU	Electrical Power Capacity Upgrade
ESA	Endangered Species Act
ETA	Eastern Technical Area
FY	fiscal year
GHG	greenhouse gases
IPaC	Information for Planning and Consultation
IRA	inventoried roadless area
IWG	Interagency Working Group
LANL	Los Alamos National Laboratory
LAPP	Los Alamos Power Pool
MOU	memorandum of understanding
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act of 1969
NHPA	National Historic Preservation Act
NHT	El Camino Real de Tierra Adentro (“Royal Road of the Interior”) National Historic Trail
NL	Norton Transmission Line

Acronyms

Acronym	Definition
NMED	New Mexico Environment Department
NNSA	National Nuclear Security Administration
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRHP	National Register of Historic Places
OPGW	optical ground wire
PNM	Public Service Company of New Mexico
PPE	personal protective equipment
PV	photovoltaic
RMP	resource management plan
ROI	region of influence
ROS	recreation opportunity spectrum
ROW	right-of-way
S/N	South Technical Area Substation-Norton Substation (transmission line)
SCC	species of conservation concern
SC-GHG	social cost of greenhouse gases
SFNF	Santa Fe National Forest
SHPO	State Historic Preservation Office
SIO	scenic integrity objectives
SNTUC	S/N Transmission Line Utility Corridor Management Area
STA	Southern Technical Area
SUP	special use permit
T&E	threatened and endangered
TA-03	Technical Area 3
TA-06	Technical Area 6
TA-71	Technical Area 71
TFO	(BLM) Taos Field Office
THPO	Tribal Historic Preservation Officer
U.S.	United States
USDA	U.S. Department of Agriculture
USDOI	U.S. Department of the Interior
USFWS	U.S. Fish and Wildlife Service
VRM	visual resource management
WTA	Western Technical Area
ZEV	zero-emissions vehicle

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Appendix A Need for a Programmatic Forest Plan Amendments

A programmatic plan amendment to the 2022 Santa Fe National Forest Land Management Plan (hereafter referred to as the “LMP” or “Forest Plan”), as amended, is needed because the LMP includes direction that requires updating. The current LMP needs to be amended to include areas needed for energy development and improvement.

How the 2012 Planning Rule Applies to the Plan Amendments

The LMP would be amended under the 2012 Planning Rule (36 CFR 219).

Purpose of the Amendments

The purpose of these amendments is to implement updated management direction for the Caja del Rio Wildlife and Cultural Interpretive Management Area, Caja Inventoried Roadless Area (IRA), and National Historic Trail (NHT) based on the need to include areas for energy development and improvement. The plan amendment would allow the proposed transmission line to cross an area known as the Caja del Rio, which is a landscape on the SFNF with high scenic integrity and significant cultural importance. In addition, the purpose of the amendment is to allow construction and maintenance of the new proposed linear feature in a designated roadless area (IRA) that is characterized by high scenic integrity and semiprimitive nonmotorized recreation opportunity spectrum.

By proposing a new management area to encompass the Proposed Action, the plan amendment would lessen the Proposed Action’s impacts to the Caja del Rio Management Area, IRA, and NHT. The addition of the S/N Transmission Line Utility Corridor Management Area would provide an energy corridor for the existing Reeve’s powerline and the proposed S/N transmission line.

In cases where the direction in the Forest Plan is not amended, it is because the language does not conflict with project needs.

Proposed Action Amendment Language

Amend the Santa Fe National Forest Plan to allow for the establishment of a new energy management area named the S/N Transmission Line Utility Corridor Management Area.

Establishment of a new energy management area would have defined Desired Conditions and Guidelines. Desired Conditions and Guidelines are described as (USDA 2022):

Desired Conditions describe the vision for the Santa Fe NF. They are the ecological, cultural, and socioeconomic aspirations toward which management of the land and resources of the plan area is directed. They are not commitments or final decisions approving specific projects or activities; rather, they guide the development of projects and activities. Projects are designed to maintain or move toward desired conditions and to be consistent with the plan over the long term. The desired conditions in this forest plan have been written to contain enough specificity so that progress toward their achievement may be determined. In some cases, desired conditions may already be achieved, while in other cases, they may only be achievable over hundreds of years.

Guidelines are required technical design features or constraints on project and activity decision making that help make progress toward desired conditions. Along with standards, guidelines make up the “rules” that we must follow. However, different from standards, guidelines allow for departure from their terms, so long as the intent of the guideline is met. Deviation from a guideline must be specified in the site-

Need for a Programmatic Forest Plan Amendment

specific National Environmental Policy Act (NEPA) decision document or the project's record with the supporting rationale. When deviation from a guideline does not meet the original intent, a plan amendment is required.

Amend the 2022 Santa Fe National Forest Plan to establish a new management area for energy development and improvement to: (1) describe desired conditions for the management area managed for energy development and maintenance; (2) described the guidelines for the management area managed for energy development and maintenance; (3) define the management area as the area containing the existing Reeves powerline and the proposed EPCU powerline.

S/N Transmission Line Utility Corridor Management Area

Desired Conditions

MA-SNTUC-DC-1: The S/N Transmission Line Utility Corridor Management Area is managed for utility infrastructure that provides reliable electrical power, ensuring continuity of Los Alamos National Laboratory operations.

Guidelines

MA-SNTUC-G-1: Construction of utility infrastructure for the S/N transmission line (e.g. towers, poles) or associated above-ground facilities should blend in with the general landscape to help minimize scenery impacts (e.g., coloration of towers and poles, use of wood poles, non-glare tint on wires, aligning of infrastructure with topography).

MA-SNTUC-G-2: Management activities should be consistent with the scenic integrity objective of "low."

MA-SNTUC-G-3: The S/N Transmission Line Utility Corridor Management Area should be managed for semiprimitive motorized recreation opportunity spectrum.

Table A-1. Comparison of Existing Santa Fe Forest Plan Guidelines and the Proposed Programmatic Amendments

Existing Management Area and Plan Components	Existing Guideline Language Forest Plan (2022 Forest Plan)	Rationale for Change	Proposed New Programmatic Guideline Language
MA-CAJA-S-1	Maximize use of existing utility line corridors for additional utility line needs. New utility corridors and communication sites will not be allowed.	Identifies the need for the S/N Transmission Line Utility Corridor Management Area to maintain its measures without following the most restrictive measures of the overlapping management area.	Maximize use of existing utility line corridors for additional utility line needs. New utility corridors and communication sites will not be allowed except for the Los Alamos National Laboratory Electrical Power Capacity Upgrade Project, S/N transmission line.
DA-IRA-G-2	Management activities should be consistent with the scenic integrity objective of high.	Identifies the need for the S/N Transmission Line Utility Corridor Management Area to maintain its measures without following the most restrictive measures of the overlapping management area.	Management activities should be consistent with the scenic integrity objective of high except within the S/N Transmission Line Utility Corridor Management Area.
DA-NHT-G-1	Management activities in NHT corridors should be consistent with, or make progress toward achieving, scenic integrity objectives of high or very high within the foreground of the trail (up to 0.5 mile either side) or within the identical trail viewshed, the landscape area visible from the trail based on topography.	Identifies the need for the S/N Transmission Line Utility Corridor Management Area to maintain its measures without following the most restrictive measures of the overlapping management area.	Management activities in NHT corridors should be consistent with or make progress toward achieving scenic integrity objectives of high or very high within the foreground of the trail (up to 0.5 mile either side) or within the identical trail viewshed—the landscape area visible from the trail based on topography except within the S/N Transmission Line Utility Corridor Management Area.

Compliance with the Rule's Applicable Substantive Provisions

The 2012 Planning Rule requires the Forest Service to identify which, if any, of the substantive requirements, i.e., 36 CFR 219.8–219.11, are affected or addressed by any amendment. The applicable substantive provisions apply only within the scope and scale of the amendment (36 CFR 219.13(b)(5)).

Scope and Scale of the Amendments

Overall, the purpose of the amendment is to allow continuity of LANL operations through improved energy infrastructure. The scope of the amendment is the development of four plan components in a new management area known as the S/N Transmission Line Utility Corridor Management Area. The scale of the amendment is the addition of the S/N Transmission Line Corridor Management Area, which will include approximately 104 acres. By proposing a new management area to encompass the Proposed Action, the plan amendment would lessen the Proposed Action's impacts to the Caja del Rio Management Area, IRA, and NHT.

Rule Provisions Directly Related to the Amendment

The 36 CFR 219 regulations pertaining to NFS land management planning (the 2012 Planning Rule) require that the responsible official provide notice “about which substantive requirements of 36 CFR 219.8–219.11 are likely to be directly related to the amendment” (36 CFR 219.13(b)(2)). Whether a rule provision is directly related to an amendment is determined by any one of the following:

- The purpose of the amendment (Subpart 219.13[b][5][i])
- Beneficial effects of the amendment (Subpart 219.13[b][5][i])
- Substantial adverse effects associated with a rule requirement (Subpart 219.13[b][5][ii][A])
- Substantial lessening of protections for a specific resource or use (Subpart 219.13[b][5][ii][A])
- Substantial impacts to a species or substantially lessening protections for a species (Subpart 219.13[b][6])

Application of a substantive rule requirement directly related to the amendment may demonstrate that the amendment is compliant and need not be changed, or it may necessitate modification of the amendment to meet the requirements. The following specific substantive rule requirements contained in rule sections 219.8–219.10 would directly relate to this amendment:

- 219.8(b)(2) Sustainability, Social and economic sustainability. Specifically, Sustainable recreation; including recreation settings, opportunities, and access; and scenic character.
- 219.8(b)(5) Sustainability, Social and economic sustainability. Specifically, Cultural and historic resources and uses.
- 219.10(a)(1) Multiple use, Integrated resource management for multiple use. Specifically, cultural and heritage resources, recreation settings and opportunities, scenery, viewsheds, and other relevant resources and uses.

219.8—Sustainability

According to 36 CFR 219.8(b), “a plan developed or revised under this part must provide for social, economic, and ecological sustainability within Forest Service authority and consistent with the inherent capability of the plan area . . .” Specifically, the activities that would be authorized by the amendment could potentially influence protections for the following:

2) Sustainable recreation; including recreation settings, opportunities, and access; and scenic character.

As stated in 36 CFR 219.8(b)(2), “the plan must include plan components, including standards and guidelines, to sustain recreation; including recreation settings, opportunities, and access; and scenic character.” All proposed modifications to the Forest Plan under this amendment would allow the project to be implemented in a manner to support recreation settings, opportunities, and access, including scenic character. The methods for implementing the project consider sustainable recreation during design, construction, and maintenance—contributing not only to sustainable recreation but also providing long-term benefits for social and economic sustainability for the area’s future. The Forest Plan amendment to update management by establishing a new management area will allow for increased critical energy needs while establishing objectives, standards, and guidelines for which the energy development must follow. This effort will allow for responsible establishment of energy resource needs while establishing and maintaining responsible scenic character while maintaining the mission of multiple use.

5) Cultural and historic resources and uses

As stated in 36 CFR 219.8(b)(5), “the plan must include plan components, including standards and guidelines, to sustain cultural and historic resources and uses.” All proposed modifications to the Forest Plan under this amendment would allow the project to be implemented in a manner that sustains cultural and historic resources and uses. The methods for implementing the project consider the cultural and historic resources and uses during design, construction, and maintenance—contributing to acknowledge cultural and historic resources and continued uses. The Forest Plan amendment to update management by establishing a new management area will allow for increased critical energy needs while establishing objectives, standards, and guidelines for which the energy development must follow. This effort will allow for responsible establishment of energy resource needs, establish and maintain responsible cultural and historic resources and uses, and maintain the mission of multiple use.

219.10—Multiple Uses

According to 36 CFR 219.10, “a plan developed or revised under this part must provide for ecosystem services and multiple uses, including outdoor recreation, range, timber, watershed, wildlife, and fish, within Forest Service authority and the inherent capability of the plan area . . .” Specifically, the activities that would be authorized by the amendment could potentially influence provisions for integrated resource management for multiple use, including the following:

- aesthetic values
- air quality
- cultural and heritage resources
- ecosystem services
- fish and wildlife species
- forage
- grazing and rangelands
- habitat and habitat connectivity
- recreation settings and opportunities
- riparian areas
- scenery
- soil
- surface and subsurface water quality
- timber
- trails
- vegetation
- viewsheds
- other relevant resources and uses

The discussion of the proposed amendment's ability to support and enhance sustainable recreation and cultural and historic resources and uses within the Electrical Power Capacity Upgrade Project area is provided under 36 CFR 219.8(2) Sustainable Recreation and 36 CFR 219.8(5) Cultural and Historic Resources and Uses. Beneficial impacts to these resources would also improve the associated multiple uses; for example, by identifying consistent management area desired conditions and guidelines for an energy corridor that has multiple electrical transmission lines ensures consistent management. It allows for consistent identification of desired conditions and guidelines.

Project and Activity Consistent with Plan

In conclusion, no conflicts or inconsistencies with the 2012 Planning Rule substantive requirements have been identified for the proposed amendment described herein. The proposed amendment would allow for consistent management within management areas. Although short-term adverse impacts would occur from the project, the resulting long-term benefits would include a sustainable recreation program and support multiple uses valued by local communities and visitors.

The impacts of the proposed Forest Plan amendments are fully analyzed in this EA.



Appendix B Figures

Appendix B provides figures for typical structures, river crossings, and excavation work that generally occur on similar projects.



Figure B-1. Typical tangent structure (consistent with existing pole structure along the proposed route).

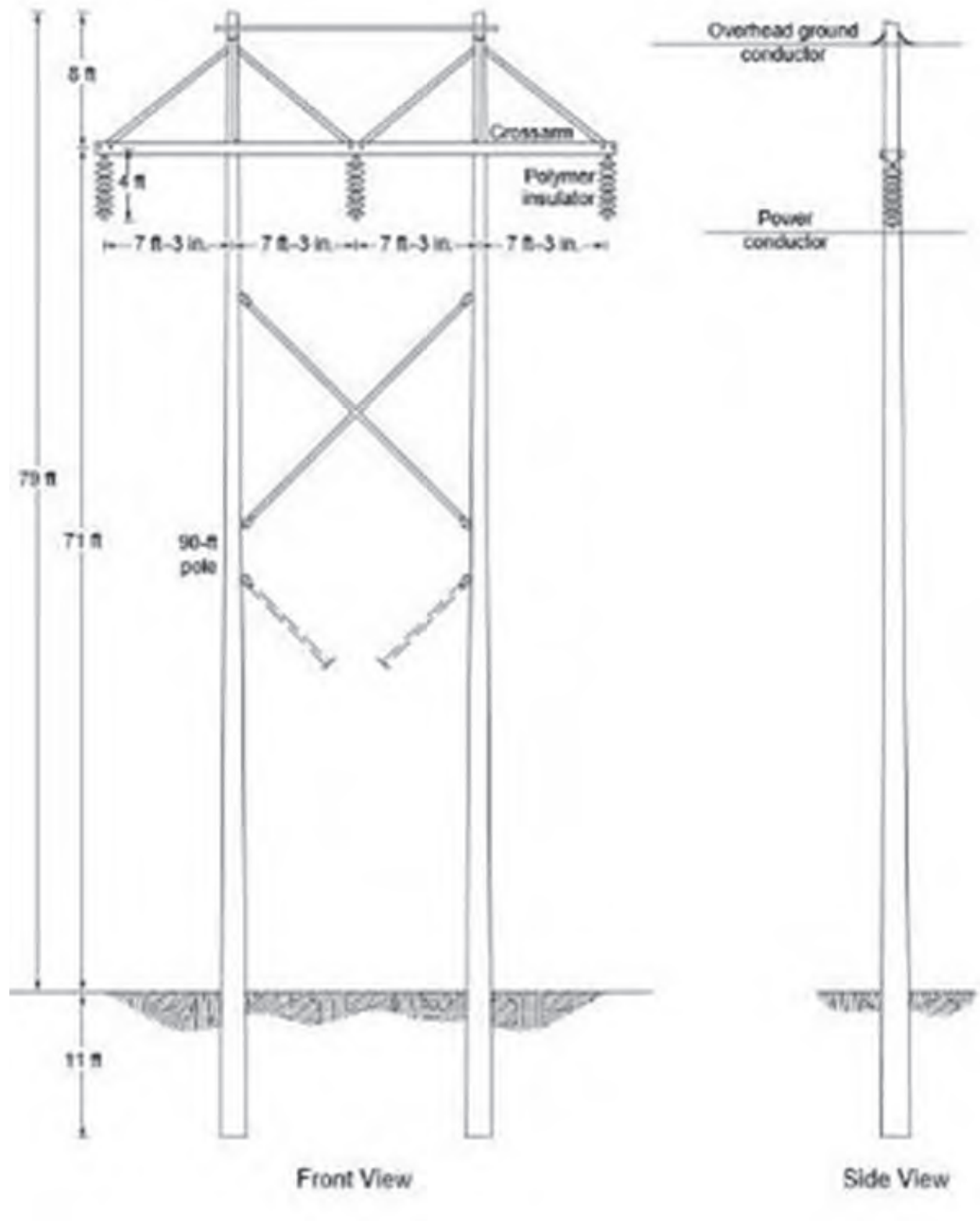


Figure B-2. Diagram of typical two-pole structure.

Figures

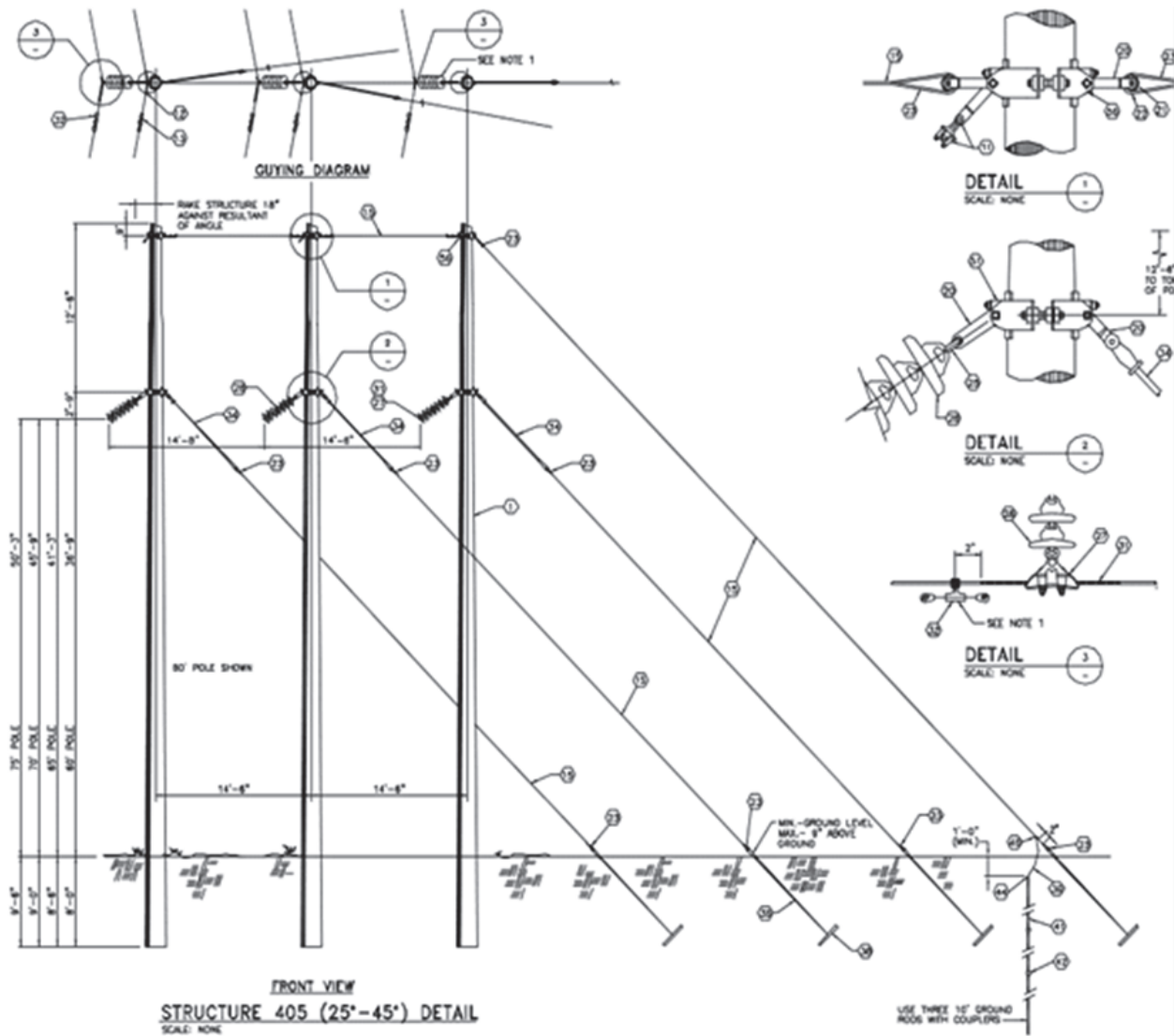


Figure B-3. Diagram of a typical three-pole structure



Figure B-4. Typical four-pole structure.

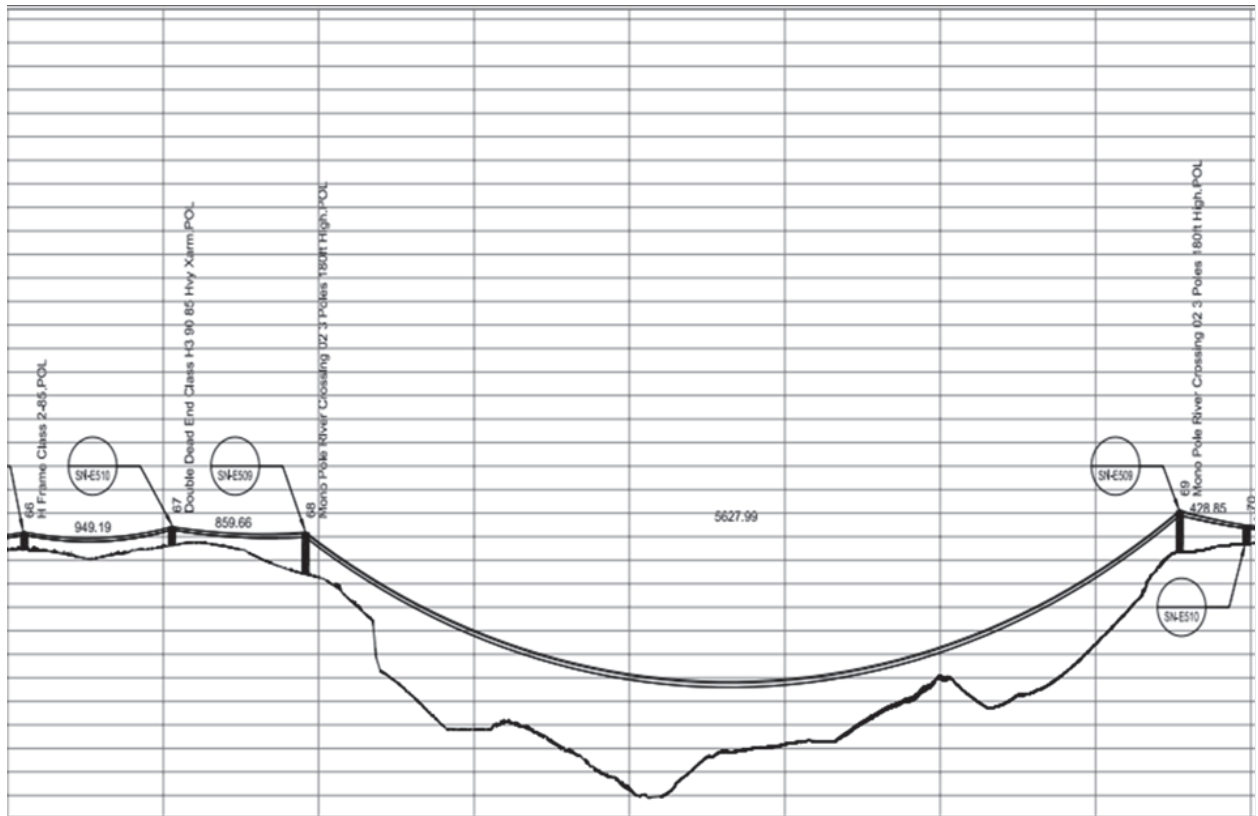


Figure B-5. Cross section of planned river crossing and pole structure at canyon rim



Figure B-6. Example tangent structure under construction, similar to the proposed structure at the river crossing.



Figure B-7. Typical overhead markers.

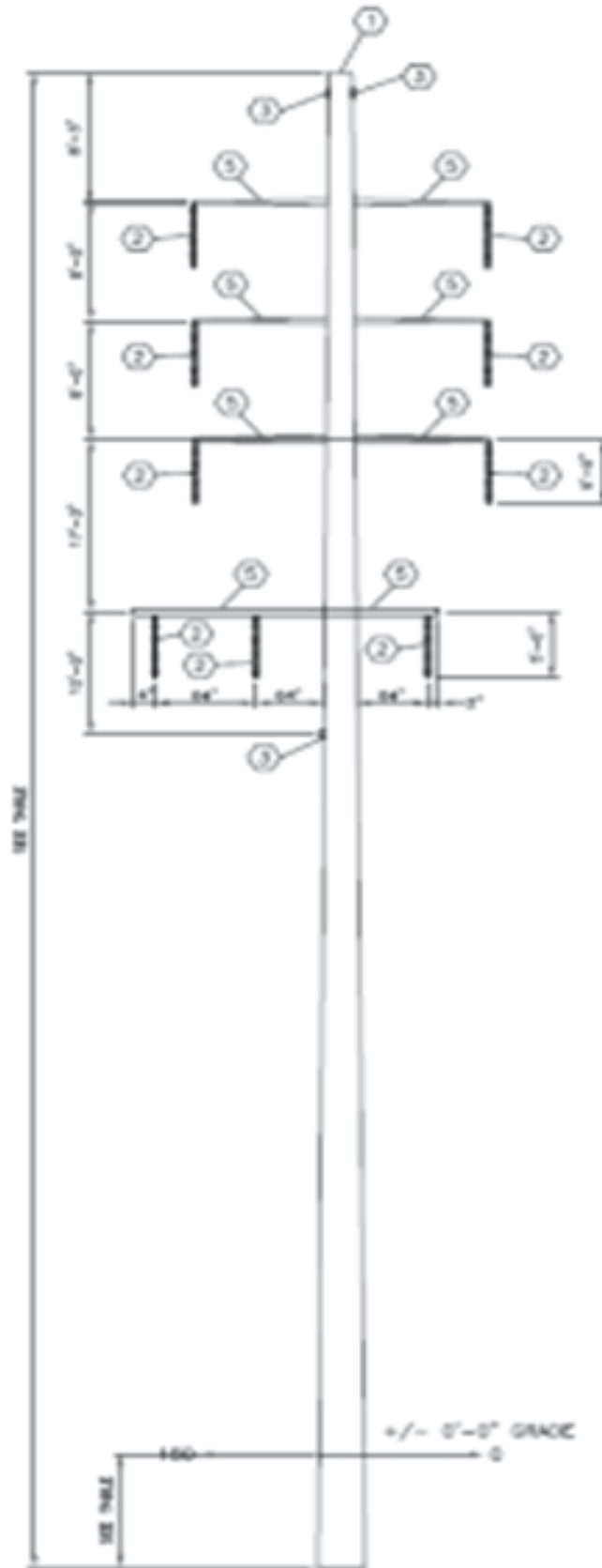


Figure B-8. Typical profile for a double transmission circuit structure.



Figure B-9. Typical trench excavation.

Appendix C Mitigation Measures and Best Management Practices

Geology and Soils
<ul style="list-style-type: none"> • Stabilize permanent disturbance areas by applying a weed-free gravel top layer to avoid erosion and suppress dust. • Save topsoil removed for structure construction and use onsite for restoration activities to promote regrowth from the native seed bank in the topsoil. • Use existing roadways and other previously disturbed areas to the maximum extent practicable to reduce ground disturbance. • Cover exposed piles of soil (or use other erosion control measures) to reduce erosion potential when threat of rain occurs. Rights-of-way and utility corridors should use areas adjoining or adjacent to previously disturbed areas whenever possible, rather than traverse undisturbed vegetation communities. • Conduct project construction, including tree removal, during a time of year when rainfall and runoff are low to minimize erosion, compaction, and sedimentation to the extent practicable. • Install appropriate erosion-control devices where needed to minimize soil transport. • Leave erosion and sediment control devices in place and monitor their effectiveness until all disturbed sites are revegetated and erosion potential has returned to pre-project conditions. • Apply water from water trucks on an as-needed basis to minimize dust and reduce erosion due to wind. • Retain existing low-growing vegetation, whenever possible, to prevent sediment movement offsite. • Revegetate disturbed areas to help stabilize soils as soon as work in that area is completed and appropriate environmental conditions exist according to the requirements identified in 36 CFR 251 for the Caja del Rio Plateau (USDA 2018); for the requirements of the 2012 Taos RMP; and LANL Engineering Standards within DOE/NNSA-managed lands. • Inspect revegetated areas to verify adequate growth, and implement contingency measures as needed. • Inspect and maintain access roads to ensure proper function and nominal erosion levels after construction.
Vegetation
<ul style="list-style-type: none"> • Use existing roadways, whenever possible, to access project area. • Minimize the disturbance to vegetation to the extent practicable. • Ensure that biological monitors are onsite during construction activities to flag sensitive species for avoidance. • Cut trees and leave existing root systems intact to help prevent erosion. • Return temporarily disturbed areas to their original, pre-construction contours and conduct site restoration and revegetation measures before or at the beginning of the first growing season following construction. • Revegetate disturbed areas with grasses, forbs, and shrubs to ensure appropriate vegetation coverage and soil stabilization according to 36 CFR 251. • Conduct post-construction site-restoration monitoring. • Identify noxious weed infestation areas before construction for avoidance (as practicable) and implement measures to minimize noxious weed spread (USDA 2001, USDA 2018).
Wildlife
<ul style="list-style-type: none"> • Maintain compliance with the MBTA by restricting vegetation removal during the peak bird-breeding season (May 15 through July 31). If construction activities occur during this period, biological monitors will conduct nest checks to ensure that no nesting birds are present. • Biological monitors will be present during construction activities on Forest Service and BLM lands. • Use transmission structures and conductors that are designed to minimize risk of injury or electrocution to nesting, roosting, or flying birds. • Install collision-deterrence devices (wire markings) on conductor that crosses the Rio Grande. • Install the portion of the transmission line that crosses the Rio Grande outside the timeframe of November through December and February through March to avoid the highest migration periods of sandhill cranes (<i>Grus canadensis</i>) and other migratory waterfowl along the Rio Grande.

Mitigation Measures and Best Management Practices

- The portion of the project located within the LANL boundary is subject to the requirements identified in the LANL Habitat Management Plan. Follow these requirements, including limiting the following: noise production during Mexican spotted owl breeding and nesting season, unnecessary vegetation removal, tree size and amount of vegetation removed in sensitive species habitat, and amount of light production in sensitive species habitat.
- Maintain clean work sites and implement good housekeeping practices.

Cultural Resources

- Locate transmission structures, staging areas, and new access roads to avoid historic properties.
- Locate transmission structures to minimize visual, auditory, and atmospheric impacts to historic properties for which those attributes contribute to their integrity and significance.
- Limit ground disturbance by using existing roadways whenever possible.
- Vegetation clearance and maintenance within the 100-foot perpetual ROW within archaeological site boundaries will be hand cut only, and hand-carried (not dragged) outside of site boundaries, and hazard trees will be felled to avoid historic properties.
- For work on Forest Service and BLM administered lands, have archaeological monitors and tribal monitors present during construction activities and initial vegetation clearance activities.
- For work within the LANL boundary, follow requirements identified in the LANL Programmatic Agreement (LANL 2022) and the LANL Cultural Resources Management Plan (LANL 2019) and have archaeological monitors present for construction activities within 100 feet of historic properties.
- If an inadvertent discovery of cultural resources occurs, immediately pause all work in the vicinity in accordance with Section 106 of the National Historic Preservation Act and the Native American Graves Protection and Repatriation Act. For inadvertent discoveries on DOE/NNSA land, contact the LANL Cultural Resource team, who will notify the SHPO and the identified Tribal Historic Preservation Officer (THPO) immediately. For inadvertent discoveries on lands, contact the Forest archaeologist; for discoveries on BLM lands, contact the Field Office archaeologist, who will notify the SHPO and the identified THPO immediately.
- Provide cultural resource awareness training to explain cultural-resource-related avoidance and mitigation measures to construction crews and contractors during preconstruction meetings.
- Temporarily mark historic properties for avoidance during the construction phase as needed and in consultation with tribal monitors.
- Minimize potential increases in user-related impacts to historic properties as a result of improved or new access roads and staging areas by revegetating disturbed areas wherever possible and installing permanent gates at selected locations to minimize unauthorized use of access roads.

Recreational Resources (including Trails)

- Create irregular edges for treatment units to mimic natural vegetation patterns. “Feather” vegetation treatment unit edges by leaving trees in irregular edge alignments and of various heights and sizes.
- Trees that are felled whole that will not be burned, removed, or chipped should be felled in different random patterns in foreground and middle ground viewsheds on slopes greater than 20 percent.
- Trees that are felled within BLM-managed lands should be removed entirely.
- Minimize skid trails across the route. If necessary, skid trails that are perpendicular to the trail are preferable to parallel skid trails. Skid trails should be returned to their original state.

Visual Resources

- Co-locate portions of the proposed transmission line in existing transmission line corridors to minimize the effects of new corridors.
- Locate new transmission line structures in proximity to existing development, including roadways, to minimize potential visual impacts to undeveloped areas.
- Match materials with existing transmission line structures to minimize contrasts in color, form, line, and pattern/texture and contribute to a sense of visual continuity within the Caja del Rio region (PSC 2013), including the use of low-reflective conductor.
- Design transmission line structures with a relatively narrow profile that minimizes the amount of clearing required within the existing corridor.

- Use weathering steel monopole transmission line structures in certain locations. This type of structure has a dark brown color commonly found in the regional landscape, which minimizes color contrasts. Monopole structures have a thinner profile and simpler appearance than lattice structures.
- Maintain and/or restore vegetation in areas disturbed by construction activities to minimize discordant views and concentrate viewer attention in the immediate foreground. Vegetation specified in the vicinity of the transmission line must be non-capable (i.e., not capable of achieving a height tall enough to interfere with electrical conductor).

Other Resources

- Maintain, to the extent practicable, existing access to public land users during construction.
- Use traffic safety signs to inform motorists and recreationists and manage traffic during construction activities on affected roads.
- When needed, install permanent gates at selected locations to minimize unauthorized use of access roads and associated impacts.
- Keep all vehicles in good operating condition to minimize exhaust emissions.
- Turn off construction equipment during prolonged periods of nonuse.
- Drive vehicles at low speeds during construction to minimize dust.
- Recycle or salvage nonhazardous construction and demolition debris where practicable.
- Use rock and fill sources during construction from local vendors.
- Require that contractors maintain a clean construction site and remove all construction debris.
- Require that contractors use appropriate PPE and that PPE is not damaged.



Appendix D Summary of Public Scoping Comments Received

DOE/NNSA received a total of 671 public comments emails, letters, or comments from the public webpage during the public scoping period (April 19, 2021, through May 21, 2021). The public scoping comments touched upon several topics or scoping issues. Of the 671 scoping comments, 642 came in the form of a campaign letter from an unknown source.

The following table provides a summary of the comments by scoping issue. DOE/NNSA will use this information to define the scope of the environmental assessment (EA) and issues to be analyzed in the EA as appropriate. DOE/NNSA will notify the public when the EA is complete and available for public review and comment.

Scoping Issue Identified	Number of Comments	Proposed Response Action in the EA
Provide information on the potential for use of alternative energy and onsite energy generation, including photovoltaic arrays, wind energy, gas-fired power plant, battery storage	5	Provide a discussion on the Analysis of Alternatives to the proposed third transmission line
Provide information on the need for the proposed transmission line and the alternative of upgrading the existing transmission line	649	Provide a discussion on the Analysis of Alternatives to the proposed third transmission line
Potential adverse impacts to Ecological Resources from proposed transmission line	644	Provide a detailed Ecological Resources impact assessment
Potential adverse impacts to Cultural Resources, Traditional Cultural Properties, and El Camino Real de Tierra Adentro Historical Trail from proposed transmission line	647	Provide a detailed Cultural Resources impact assessment and engage local tribal entities in identifying potential cultural properties
Project siting and potential damage to the landscape, including impacts to potential wilderness areas, the new Forest Plan, and overall public land for the proposed transmission line	648	Provide a discussion of the alternative routes and the route selection process for avoiding existing and proposed protected areas; provide an assessment for the Forest Plan amendment
The Caja del Rio Plateau is a popular destination for outdoor enthusiasts. Potential adverse impacts to recreational opportunities within the region, including hiking, biking, rafting, and horseback riding	643	Provide a detailed Recreational Resources impact assessment
Potential adverse impacts to Aesthetic and Visual Resources and limiting ground disturbance, including viewshed effects on the region from the proposed transmission line	3	Provide a detailed visual impact assessment
Other Comments: Overall NEPA process, including segmentation, need of the project, and the connection to the overall LANL mission, including pit production; consultation with traditional peoples	13	Provide a description of the NEPA process, the need for an EA versus an EIS, and a purpose and need section

Appendix E Wildlife Report

LA-UR-23-31909
October 2023

**Wildlife, Fish and Rare Plants Biological
Report for the Los Alamos National
Laboratory Electrical Power Capacity
Upgrade Project**



Prepared for: U.S. Department of Energy/National Nuclear Security Administration,
Los Alamos Field Office

Prepared by: Biological Resources Staff, Environmental Protection and Compliance Division,
Environmental Stewardship Group, Los Alamos National Laboratory

Cover Photo: Looking south from the Norton Substation



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1. PROJECT DETAILS

1.1. Project Description

The United States (U.S.) Department of Energy, National Nuclear Security Administration Los Alamos Field Office is proposing to upgrade the electrical power capacity at Los Alamos National Laboratory (LANL) via the Electrical Power Capacity Upgrade Project (EPCU) to ensure reliable and resilient electrical power to meet current and future national security mission requirements. The EPCU will require construction and operation of a new 115-kilovolt power transmission line that will originate at the Norton Substation, which is owned and operated by Public Service Company of New Mexico (PNM) on U.S. Department of Interior, Bureau of Land Management land managed by the Taos Field Office.

The Proposed Action includes new transmission line construction from the Norton substation to LANL, and distribution improvements, within the LANL property boundary (Figure 1). NNSA would coordinate with BLM and SFNF to determine specific ground-disturbing locations in compliance with applicable laws, policies, and procedures. The Proposed Action would allow for an approximately 16.8 mile-long, 3-phase, overhead 115-kV electric power transmission line which would originate at the Norton Substation and cross approximately 3.6 miles on Bureau of Land Management (BLM)-administered land, then cross approximately 10.2 miles on SFNF-administered land, and ultimately span White Rock Canyon onto DOE/NNSA-managed lands at LANL for approximately 3 miles. The Project will include a 300-foot-wide CROW of the pipeline (100-foot-wide permanent ROW and 200-foot-wide Temporary ROW).

1.2. Project Location

The project is located in Los Alamos and Santa Fe Counties in northern New Mexico. The project will span multiple land-ownership jurisdictions, including the BLM, SFNF, and DOE/NNSA.

1.3. Purpose

The purpose of this report is to identify the special status wildlife and plant species that have the potential to occur within the project area and to determine if the project will impact these species. The species includes 1) Federally Threatened and Endangered Species, 2) New Mexico State-listed Species, 3) US Forest Service "at-risk" species including Species of Conservation Concern (SCC), 4) BLM sensitive species, and 5) Migratory Birds, Bald Eagles, and Golden Eagles.

This report assesses and documents Project compliance with Section 7 of the Endangered Species Act of 1973 (ESA), the Migratory Bird Treaty Act of 1918 (MBTA), the Bald and Golden Eagle Protection Act of 1940 (BGEPA), and Title 19, Chapters 21 and 33 of the New Mexico Administrative Code (NMAC).



Figure 1. Transmission line from Norton Substation to LANL Switching Station.

2. CURRENT ENVIRONMENTAL CONDITIONS

Landscape

The project area is primarily on an undeveloped mesa top, with vegetation cover consisting of Two-needle piñon (*Pinus edulis*) and One-seed Juniper (*Juniperus monosperma*) for an overstory. The shrub components are primarily Fourwing Saltbush (*Atriplex canescens*), Apache Plume (*Fallugia paradoxa*), and Big Sagebrush (*Artemisia tridentata*) with Sideoats Gramma (*Bouteloua curtipendula*) and Blue Gramma (*Bouteloua gracilis*) grasses as understory. This habitat varies between a piñon-juniper savannah and woodland. Most of the new line installation will occur along existing roads and along PNM's RL transmission line. The habitat quality varies from completely undeveloped areas to areas that have been disturbed by off-road vehicle use, shooting sports, and other recreational activities. In addition, cattle (*Bos taurus*), feral horses (*Equus ferus*), and donkeys (*Equus asinus*) graze the entire route, which has caused significant erosion and vegetation damage in some places.

Vegetation Communities Characterizations

In the Southwest the US Forest Service uses a system of ecosystem types, "Ecological Response Units" (ERUs), to facilitate landscape analysis and strategic planning. The ERU framework represents all major ecosystem types of the region and a coarse stratification of biophysical themes. The ERUs are groupings of finer vegetation classes —of finer scale vegetation classes from the National Vegetation Classification, with similar range of plant associations (Wahlberg et al. 2013). The Project route crosses 10 ERU vegetation communities, as described below.

Piñon Juniper Sagebrush (53.8 acres – occurs throughout all project land ownership): The piñon-juniper sagebrush ERU is concentrated in geographic areas dominated by cold (winter) season precipitation regimes and frigid soils. These systems have a distinct appearance of open woodland canopies interspersed by Colorado Plateau and Great Basin shrub species such as big sagebrush (*Artemisia tridentata*; including subspecies: var: *tridentata*, *vaseyana*, and *wyomingensis*), rubber rabbitbrush (*Ericameria nauseosa*), fourwing saltbush (*Atriplex canescens*), and winterfat (*Krascheninnikovia lanata*). Trees occur as individuals or in smaller clumps and range from young to old. Tree clumps are often even-aged. The understory is dominated by moderate to high-density shrubs, and the development of the herb layer is limited and concentrated in canopy openings. The tree and shrub species composition varies throughout the Forest; piñon is absent at lower elevations, but one or more juniper species are always present. Generally, the sparse native understory grass development includes perennial species, while forbs consist of both annuals and perennials. Shrubs are characteristically well-distributed, and usually achieve high canopy closure during mature successional phases or where livestock grazing has favored their development over herb species.

Piñon Juniper Woodland (50.6 acres – occurs throughout all project land ownership): Persistent piñon-juniper woodlands are mostly found on lower slopes of mountains and in upland rolling hills at approximately 5,500 to 8,500 feet in elevation. They have broad grouping of different plant associations with trees occurring as individuals or in smaller groups and range from young to old, but more typically as large, multi-aged, structured patches. Persistent Piñon Juniper Woodland characteristically has a moderate to dense tree canopy and a sparse understory of perennial grasses, annual and perennial forbs, and shrubs. Woodland development occurs in distinctive

phases, ranging from open grass-forb, to mid-aged open canopy, to mature closed canopy. Piñon Juniper Woodland on broken or rocky terrain exhibits little to no natural fire, and insects and disease may be the only disturbance agents. Most common piñon pine is the two-needle piñon occurring in limited areas. One-seed juniper is most common; however, there are areas of Utah juniper and Rocky Mountain juniper. In addition, annual and perennial grasses and graminoids, forbs, half-shrubs and shrubs can be found beneath the woodland overstory. Piñon Juniper Woodland is a climax community and shifts to grasslands following fire events, which are historically infrequent (e.g., up to 400 years).

Colorado Plateau / Great Basin Grassland (37.4 acres – occurs throughout all project land ownership): The Colorado Plateau and Great Basin Grasslands are found along elevational and temperature gradients above semi-desert grasslands and below montane-subalpine grasslands. It occupies cooler and wetter sites than semi-desert grasslands. This ERU is typically associated with piñon-juniper grass along the grassland-woodland ecotone in cool climates. Vegetation coverage consists of mostly grasses and interspersed shrubs. Grass species may include but are not limited to Indian ricegrass, threeawn, blue grama, needle and thread grass, spike fescue, muhly, James' galleta, and Sandberg bluegrass. Shrub species may include but are not limited to various species of sagebrush, saltbush, Ephedra, snakeweed, winterfat, one-seeded juniper, Utah juniper and wax currant.

Juniper Grass (9.1 acres - occurs on DOE land only): The Juniper Grass ERU is typically found on warmer and drier settings beyond the environmental limits of piñon, and just below and often intergrading with the piñon-juniper zone. The Juniper Grass ecosystem is generally uneven aged and very open in appearance, primarily on mollisol soils. Trees occur as individuals or in smaller groups and range from young to old. A dense herbaceous matrix of native grasses and forbs characterize this type. Typical disturbances (fire, insects, and disease) are low severity and high frequency. These disturbance patterns create and maintain the uneven-aged, open-canopy nature of this type. The tree and grass species composition varies throughout the Region, consisting of a mix of one or more juniper species. Typically, native understory grasses are perennial species, while forbs consist of both annuals and perennials. Shrubs are characteristically absent or scattered. This type is typically found on sites with well-developed, loamy soil characteristics, generally at the drier edge of the woodland climatic zone.

Piñon Juniper Grass (7.9 acres – occurs on DOE land only): The Piñon Juniper Grass ERU occurs across the states of Arizona and New Mexico, in what were historically more open woodlands with grassy understories. Tree species include one seed juniper (*Juniperus monosperma*), Utah juniper (*Juniperus osteosperma*), Rocky Mountain juniper (*Juniperus scopulorum*), and alligator juniper (*Juniperus deppeana*). Piñon trees include two-needle piñon (*Pinus edulis*). Native understories were made up of perennial grasses, with both annual and perennial forbs, and shrubs that were absent or scattered. Contemporary understories often include invasive grasses and uncharacteristically high shrub cover. The Pinon Juniper Grass ERU is typically found on sites with well-developed, loamy soil characteristics (typically mollisols), within areas of warm summer seasons and a bi-modal precipitation regime.

Mountain Mahogany Mixed Shrubland (3.8 acres - occurs on DOE land only): The Mountain Mahogany Mixed Shrubland ERU occurs in the foothills, canyon slopes, and lower mountain slopes of the Rocky Mountains and on outcrops and canyon slopes in the western Great Plains. These shrublands are associated with exposed sites, rocky substrates, dry conditions, and recurrent historic fire that limited tree growth. Scattered trees or inclusions of grassland patches or steppe may be present, but the vegetation is typically dominated by a variety of shrubs including *Cercocarpus montanus* and *Rhus trilobata*. Historically this ERU had less than 10% tree canopy.

Intermountain Salt Scrub (3.5 acres – occurs on DOE and BLM lands only): The Intermountain Salt Scrub ERU is found in cold climate gradients and the Great Plains. Soils associated with this ERU are typically sodic, saline, or saline-sodic. The vegetation is characterized by a typically open to moderately dense shrubland composed of one or more *Atriplex* species such as *Atriplex confertifolia*, *Atriplex canescens*, *Atriplex polycarpa*, or *Atriplex spinifera*. Other shrubs present to codominate may include *Artemisia tridentata* ssp. *wyomingensis*, *Chrysothamnus viscidiflorus*, *Ericameria nauseosa*, *Ephedra nevadensis*, *Grayia spinosa*, *Krascheninnikovia lanata*, *Lycium* spp., *Picrothamnus desertorum*, *Tetradymia* spp., or *Sarcobatus vermiculatus*.

Ponderosa Pine - Evergreen Oak (0.9 acre - occurs on DOE land only): The Ponderosa Pine—Evergreen Oak ERU occurs in the mild climate gradients of central and southern Arizona and in southern New Mexico, particularly below the Mogollon Rim, where warm summer seasons and bi-modal (winter-summer) precipitation regimes are characteristic. This type occurs at elevations ranging from 5,500-7,200 ft, on cool and moist sites. This system is dominated by ponderosa pine (*Pinus ponderosa* var. *scopulorum*) and is well-represented by evergreen oaks (e.g., Emory oak (*Quercus emoryi*), Arizona white oak (*Quercus arizonica*), silverleaf oak (*Quercus hypoleucoides*), grey oak (*Quercus grisea*), alligator juniper, and piñon pine (e.g., *Pinus edulis*). In the Sky Islands, Ponderosa Pine – Evergreen Oak communities can alternatively be dominated or codominated by Apache pine (*Pinus englemannii*) and Chihuahuan pine (*P. leiophylla*), both site potential indicators. Though not an indicator in the ponderosa pine life zone, border piñon (*P. discolor*) can occur as a dominant or codominant component of the ERU. In terms of disturbance, the Ponderosa Pine – Evergreen Oak averaged greater fire severity than the ponderosa pine forests above the Mogollon Rim, and greater patchiness with less horizontal uniformity and more even-aged conditions. Understory shrubs include manzanita (*Arctostaphylos* sp.), turbinella oak (*Quercus turbinella*), skunkbush sumac (*Rhus trilobata*), and mountain mahogany (*Cercocarpus montanus*).

Willow - Thinleaf Alder (0.6 acre – occurs only along the Rio Grande River): The Willow-Thinleaf Alder ERU is a riparian Ecological Response Units. These systems are more strictly bounded by landform than their upland counterparts due to their reliance on available soil moisture. As a result, riparian ERU's are typically found in valley bottoms, floodplains, and depressional areas, and tend to occur in smaller, more linear configurations distributed within upland ERUs. The Project route will span approximately 900 feet above this vegetation classification; no ground disturbing activities will occur within willow – thinleaf alder ecosystem.

Sparsely Vegetated (0.3 acre - occurs on DOE land only): Sparsely Vegetated is a non-vegetation ERU. These are environments where plants are slow to establish and easily disturbed. These rocky places are fragile habitat with less than 10% coverage of low vegetation; however, where conditions permit, they support a few wildflowers and even the odd shrub or hardy tree.

3. SPECIES AND HABITAT SURVEYS

Vegetation Surveys

3.1.1. Methods

During the summers of 2020, 2021 and 2022, DOE biologists conducted in-field surveys using meandering transects of all Project areas (the survey included a 300-foot-wide corridor encompassing all potential construction workspace along the Project) for the presence/absence of special status plant and animal species (Section 4) potential habitat, individuals, or their sign (e.g., nests, tracks, scat, and burrows).

3.1.2. Results

The project route is primarily comprised of rocky or bare soil, with plants dispersed irregularly. The species present were mostly early successional species that tend to do well in overgrazed and disturbed habitats, including Common Purslane (*Portulaca oleracea*), Cheatgrass (*Bromus tectorum*), Rubber Rabbitbrush (*Ericameria nauseosa*), Broom Snakeweed (*Gutierrezia sarothrae*), and various Cholla species (*Cylindropuntia* spp.). No sensitive plant species were documented; however, a former sensitive species—the Gramma Grass Cactus (*Sclerocactus papyracanthus*) was identified. Multiple species of milkweed (*Asclepias* spp.), a host plant to Monarch Butterflies (*Danaus plexippus*) were identified, including Spider Milkweed (*Asclepias asperula*), Horsetail Milkweed (*Asclepias subverticillata*), Butterfly Milkweed (*Asclepias tuberosa*) and Broadleaf Milkweed (*Asclepias latifolia*).

3.2. Avian Point Count Surveys

3.2.1. Methods

The project crosses the SFNF's Caja del Rio, which is an Important Bird Area (IBA) designated by Audubon. To date, Audubon has identified 2,758 IBAs that cover 417 million acres of public and private lands in the U.S. Due to the increased focus on conservation in IBAs, we selected 19 survey points along the preferred project route, each spaced approximately 0.5 miles apart. During a point count survey, the surveyors observe and listen for 5 minutes, documenting all species. All species were recorded along with the number of individuals, and their approximate distance.

3.2.2. Results

During the avian point count surveys, avian species identified were Gray Vireo (*Vireo vicinior*), Pinyon Jay (*Gymnorhinus cyanocephalus*), and Bendire's Thrasher (*Toxostoma bendirei*).

During vegetation surveys, additional species were documented which include Juniper Titmouse (*Baeolophus ridgwayi*), Mourning Dove (*Zenaida macroura*) and Hairy Woodpecker (*Dryobates villosus*).

Results from the 2021 avian point count surveys are shown in Table 3-1 below. Surveys were conducted on April 22 and 29, and May 6 and 24, 2021.

Table 3-1 Avian Point Survey Results, Spring 2021.

Species Common Name	Species Scientific Name	Total Number Identified
Ash-throated Flycatcher	<i>Myiarchus cinerascens</i>	19
Barn Swallow	<i>Hirundo rustica</i>	3
Bendire's Thrasher	<i>Toxostoma bendirei</i>	1
Bewick's Wren	<i>Thryomanes bewickii</i>	20
Black-headed Grosbeak	<i>Pheucticus melanocephalus</i>	1
Black-throated Gray Warbler	<i>Setophaga nigrescens</i>	1
Black-throated Sparrow	<i>Amphispiza bilineata</i>	7
Blue-gray Gnatcatcher	<i>Polioptila caerulea</i>	1
Brewer's Sparrow	<i>Spizella breweri</i>	1

Brown-headed Cowbird	<i>Molothrus ater</i>	2
Canyon Towhee	<i>Melospiza fusca</i>	5
Cassin's Finch	<i>Haemorhous cassinii</i>	1
Cassin's Kingbird	<i>Tyrannus vociferans</i>	10
Chipping Sparrow	<i>Spizella passerina</i>	52
Common Raven	<i>Corvus corax</i>	27
Curve-billed Thrasher	<i>Toxostoma curvirostre</i>	5
Evening Grosbeak	<i>Coccothraustes vespertinus</i>	7
Gray Flycatcher	<i>Empidonax wrightii</i>	30
Gray Vireo	<i>Vireo vicinior</i>	6
Horned Lark	<i>Eremophila alpestris</i>	24
House Finch	<i>Haemorhous mexicanus</i>	47
Juniper Titmouse	<i>Baeolophus ridgwayi</i>	84
Lark Sparrow	<i>Chondestes grammacus</i>	12
Lesser Goldfinch	<i>Spinus psaltria</i>	2
Mountain Bluebird	<i>Sialia currucoides</i>	2
Mourning Dove	<i>Zenaida macroura</i>	19
Northern Mockingbird	<i>Mimus polyglottos</i>	14
Pinyon Jay	<i>Gymnorhinus cyanocephalus</i>	87
Plumbeous Vireo	<i>Vireo plumbeus</i>	2
Red-shafted Flicker	<i>Colaptes auratus</i>	2
Red-tailed Hawk	<i>Buteo jamaicensis</i>	1
Say's Phoebe	<i>Sayornis saya</i>	3
Spotted Towhee	<i>Pipilo maculatus</i>	19
Townsend's Solitaire	<i>Myadestes townsendi</i>	36
Vesper Sparrow	<i>Poocetes gramineus</i>	11
Violet-green Swallow	<i>Tachycineta thalassina</i>	22
Western Bluebird	<i>Sialia mexicana</i>	7
Western Kingbird	<i>Tyrannus verticalis</i>	2
Western Wood-Pewee	<i>Contopus sordidulus</i>	2
Woodhouse's Scrub-Jay	<i>Aphelocoma woodhouseii</i>	28

Additional Observation Surveys

3.3.1. Methods

While conducting vegetation surveys along the proposed routes during the summer of 2020, biologists documented additional sightings of potential interest. Surveyors investigated any earthen mounds or burrows for the presence or sign of Gunnison's Prairie Dogs (*Cynomys gunnisoni*) or Burrowing Owls (*Athene cunicularia*). We recorded sightings and checked all burrows and mounds found within the survey routes by looking for visible tracks or scat within the immediate area of the mound or burrow, as well as listening for alert calls.

3.3.2. Results

Most of the mounds that we investigated were likely Kangaroo Rat (*Dipodomys* spp.) in origin rather than from Gunnison's Prairie Dogs. Most burrows did not have any recent sign of use, although some burrows did have recent signs of tracks and stockpiling of freshly clipped vegetation. Surveyors did not document any Gunnison's Prairie Dog activity. Surveyors did observe feral horses and donkeys, as well as their scat, on numerous occasions along the proposed route.

4. SPECIAL STATUS SPECIES ANALYSES

4.1. Federally Threatened and Endangered Species

4.1.1. Regulatory Framework

Section 7 of the ESA Applicability

As currently planned, the Project crosses federally-owned and -administered lands under the jurisdiction of the Santa Fe National Forest (SFNF), Department of Energy (DOE) National Nuclear Security Administration (NNSA) lands, and the Bureau of Land Management (BLM) lands. Projects that cross federal lands require National Environmental Policy Act of 1969 (NEPA) compliance. As such, DOE will act as Federal Lead Agency. As the Federal Lead Agency, the DOE has the regulatory responsibility to ensure the Project complies with the ESA of 1973 (16 United States Code [USC] §§ 1531-1544), as amended. Specifically, Section 7 of the ESA requires federal agencies to ensure that any action authorized or carried out by the agency is not likely to jeopardize the continued existence of any T&E species, protected species habitat, or result in the destruction or adverse modification of designated critical habitat. These statutes have been taken into account in preparation of this Wildlife, Fish, and Rare Plant Species Report to facilitate DOE in their informal or formal consultation with the U.S. Fish and Wildlife Service (USFWS).

Section 10 of the ESA Applicability

Pursuant to Section 9(a)(1)(B) of the ESA, it is unlawful for any "person" (*i.e.*, company or agency) subject to the jurisdiction of the United States to "take" any federally-listed fish or wildlife species within the United States, except under USFWS permit issued pursuant to Section 10 of the ESA. In the event that a project does not require a Federal authorization, the project must demonstrate compliance with Section 10 of the ESA. However, the Project crosses federally-owned and -administered BLM lands and requires a Federal authorization whereby the Federal Lead Agency (DOE) will conduct informal or formal Section 7 consultation with USFWS. In addition, the entire Project regardless of land ownership is covered under DOE's NEPA Environmental Assessment (EA) and thereby is subsumed under Section 7 consultation. Therefore, Section 10 of the ESA does not apply to this Project.

4.1.2. Impacts

The list of federally-listed T&E species having the potential to occur in the vicinity of the Project was developed via review of the USFWS *Information for Planning and Consultation* (IPaC) website for a list of federally-listed species and critical habitat (USFWS 2023a). This list was supplemented by a search of Santa Fe and Los Alamos Counties on the USFWS *Environmental Conservation Online System Threatened & Endangered Species* website (USFWS 2023b).

According to the IPaC list (Appendix A), a total of six federally-listed species potentially occur in the project vicinity.

Table 4-1 outlines the federally-listed T&E species that have potential to occur in the project area. In addition, a brief description of habitat and life history requirements is provided as well as the effects determination.

Table 4-1. Federally Listed Species and Critical Habitat Assessment

Species	Federal Status*	Habitat and Life History Requirements	Effect Determination
Mammals			
Mexican Wolf (<i>Canis lupus baileyi</i>)	LE	Mexican wolves are not limited to any particular habitat type but are primarily found in montane habitat. They also are associated with Madrean evergreen woodland. Wolves travel between mountain ranges and are therefore occasionally sighted outside of their regular range. Young are born in a den that may be on a bluff or slop among rocks or in an enlarged badger hole. The historic range of the Mexican wolf included Arizona, New Mexico, Texas, and Mexico. The wolf was extirpated until the reintroduction of an experimental, non-essential population into the Mexican Wolf Experimental area in Arizona and New Mexico, south of Interstate 40. The counties in New Mexico included in the Mexican Wolf Experimental Population area include Bernalillo, Catron, Cibola, Doña Ana, Grant, Hidalgo, Lincoln, Luna, McKinley, Otero, Sierra, Socorro, Torrance, and Valencia. This species does not have any Designated Critical Habitat.	Species range is outside of the project area; Santa Fe County, NM is not located within the Mexican Wolf Experimental Population area, where individuals have been released. The project area does not contain the preferred montane habitat. Project disturbance will primarily be along an existing road, and potential impacts from removing vegetation from foraging habitat will be very limited. Any individuals present are likely to be transient and would avoid the project area. The project will have No Effect on the Mexican wolf.
Birds			
Mexican Spotted Owl (<i>Strix occidentalis lucida</i>)	LT	The Mexican Spotted owl inhabits canyon and forest habitats across a range that extends from southern Utah and Colorado, through Arizona, New Mexico, and west Texas, to the mountains of central Mexico. Habitat characteristics include high canopy closure, high stand density, a multi-layered canopy, uneven-aged stands, numerous snags, and downed woody matter. These are best expressed in old-growth mixed-conifer forests (usually more than 200 years old). They also use Madrean pine-oak forests. There is approximately 8.6 million acres of designated critical habitat in Arizona, Colorado, New Mexico, and Utah, on Federal lands.	The species does not occur in the project area due to lack of suitable habitat. The project does not cross designated critical habitat. The project will have No Effect on the Mexican spotted owl.
Southwestern Willow Flycatcher (<i>Empidonax traillii extimus</i>)	LE	The southwestern willow flycatcher is known to or is believed to occur in Arizona, California, Colorado, Nevada, New Mexico, Texas, and Utah. It occurs in riparian habitats along rivers, streams, or other wetlands, in close association with dense groves of willows (<i>Salix sp.</i>), arrowweed (<i>Pluchea sp.</i>), buttonbush, tamarisk (<i>Tamarix sp.</i>), Russian olive, and some other riparian vegetation, often with a scattered overstory of cottonwood (<i>Populus sp.</i>). This species builds its nest in shrubs and small trees in willow thickets, shrubby mountain meadows, and deciduous woodlands along streams, lakes, and bogs. Although this species occurs widely in New Mexico during migration, willow flycatchers are confined to riparian woodlands in the breeding season. These habitats are typically dominated by cottonwoods (<i>Populus spp.</i>), often with an understory of small trees or tall shrubs and surface water nearby. Approximately 1,227 stream miles have been being designated as critical habitat. These areas are designated as stream segments, with the lateral extent including the riparian	The species does not occur in the project area due to lack of suitable habitat. The project does not cross designated critical habitat; the nearest designated critical habitat is located approximately 15 miles north of project area. The project disturbance will primarily be along an existing road, will not occur in associated habitat types. Any individuals present are likely to be transient and would avoid the project area. The project will have No Effect on the Southwestern willow flycatcher.

Appendix E. Wildlife Report

Species	Federal Status*	Habitat and Life History Requirements	Effect Determination
		areas and streams that occur within the 100-year floodplain or flood-prone areas encompassing a total area of approximately 208,973 acres. The critical habitat is located on a combination of Federal, State, tribal, and private lands. Counties in New Mexico with designated critical habitat include Catron, Grant, Hidalgo, Mora, Rio Arriba, Socorro, Taos, and Valencia Counties.	
Yellow-billed Cuckoo (western distinct population) (<i>Coccyzus americanus</i>)	LT	<p>The species is known to or is believed to occur in Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Texas, Utah, Washington, Wyoming. This species is associated with lowland deciduous woodlands, willow and alder thickets, second-growth woods, deserted farmlands, and orchards. It is a riparian obligate species; therefore, they nest almost exclusively in low-mid elevation riparian/riverine habitat dominated by a cottonwood-willow matrix with standing water or nearby streams, pools, or cienegas.</p> <p>Approximately 298,845 acres have been designated as critical habitat for the western distinct population segment of the yellow-billed cuckoo in Arizona, California, Colorado, Idaho, New Mexico, Texas, and Utah.</p>	<p>The species does not occur in the project area due to lack of suitable habitat. Woodlands, orchards, pastures, and willow groves are absent from Project area; riparian habitat absent in the Project area. The project does not cross designated critical habitat; the nearest designated critical habitat is located approximately 24 miles north of project area. The project disturbance will primarily be along an existing road, and will not occur in associated habitat types. Any individuals present are likely to be transient and would avoid the project area. The project will have No Effect on the yellow-billed cuckoo.</p>
Fish			
Rio Grande Cutthroat Trout (<i>Oncorhynchus clarkii virginalis</i>)	C	The Rio Grande cutthroat trout is a subspecies of cutthroat trout, endemic to the Rio Grande, Pecos, and possibly the Canadian River Basins in New Mexico and Colorado. They inhabit high elevation streams where they need clear, cold, highly oxygenated water, clean gravel substrates, a network of pools and runs, and an abundance of food (typically aquatic and terrestrial invertebrates). There is no Designated Critical Habitat for this species.	The Project route will span the Rio Grande River approximately 900 feet above potential habitat for this species; no ground disturbing activities will occur within the Rio Grande River, nor the adjacent riparian habitat. The project will have No Effect on the Rio Grande Cutthroat Trout.
Insects			
Monarch Butterfly (<i>Danaus plexippus</i>)	C	The Monarch butterfly is found throughout the United States. This species prefers warm areas with flowering plants [particularly goldenrods (<i>Solidago</i> spp.), and asters (<i>Aster</i> spp.)] and suitable roosting vegetation. Monarchs lay their eggs on milkweed, which is the sole source of food for monarch caterpillars.	Milkweed is not a common species within the Project area, however several species were identified during project surveys. Milkweeds and any other occurrence of obligate vegetation will be protected and cordoned off from project impacts. If construction is to occur between May 1 and October 15, areas with actively growing milkweed/host plants will be flagged for avoidance during construction. Plants will be searched for eggs, larvae, and chrysalises prior to construction and notice given to the respective land management agency Wildlife Biologist. Dense milkweed stands will be avoided by a 50-foot buffer until determined otherwise by a qualified biologist. The project will have No Effect on the Monarch butterfly.
<p>* C – Candidate, DL – Delisted, LE – Listed Endangered, LEXPN, XN – Listed Experimental Population, Nonessential, LT – Listed Threatened, NL – Not Listed</p> <p>Sources: Biota Information System of New Mexico (BISON) 2023, Natural Heritage New Mexico (NHNM) 2023, USFWS 2023a,b.</p>			

New Mexico State-listed Species

4.2.1. Regulatory Framework

New Mexico has separate provisions for endangered animals and plants (Natural Heritage New Mexico [NHNM] 2023). The New Mexico Department of Game and Fish (NMDGF), through its Conservation Services Division, administers the New Mexico Wildlife Conservation Act which was passed in 1978 (§ 17-2-37 through 17-2-46 New Mexico Statutes Annotated [NMSA] 1978). The Forestry Division of the New Mexico Energy, Minerals, and Natural Resources Department (EMNRD) administers the Endangered Plant Species Act which was passed in 1985 (§ 75-6-1 NMSA 1978).

Per the New Mexico Wildlife Conservation Act, the NMDGF designates wildlife species in the state as threatened or endangered. The NMDGF also is responsible for the conservation of T&E species and their habitat. Title 19, Chapter 33 of the NMAC (19 NMAC 33) pertains to T&E animal species. State endangered (E) species are any species of fish or wildlife whose prospect of survival or recruitment in New Mexico are in jeopardy (19 NMAC 33.6.7.A.). State threatened (T) species are any fish and wildlife species that are likely to become state endangered species in the foreseeable future throughout all or a significant portion of its range in New Mexico (19 NMAC 33.6.7.B.).

The Forestry Division of the New Mexico EMNRD administers the Endangered Plant Species Act which was passed in 1985 (§ 75-6-1 NMSA 1978). Through the Endangered Plant Species Act, the take of endangered plant species is prohibited, with the exception of permitted scientific collections or propagation and transplantation activities that enhance the survival of endangered species. Title 19, Chapter 21 of the NMAC (19 NMAC 21) pertains to endangered plant species. Endangered plant species include: taxon that is listed as threatened, endangered, or proposed under the ESA; or taxon that is a rare plant across its range within the state, and of such limited distribution and population size that unregulated taking could adversely impact it and jeopardize its survival in New Mexico (19 NMAC 21.2.8.A. and B.).

New Mexico state regulations prohibit the “take” of state-protected plant species except for scientific studies and transplantation. State regulations do not apply to the destruction of plants during land disturbances, however, the New Mexico EMNRD seeks the cooperation of private industry and state and federal agencies in locating and protecting state-protected plant species that might be affected by such activities (New Mexico EMNRD 2008). New Mexico state regulations prohibit the “take” of state-protected animal species, except for scientific and educational purposes and for falconry.

NMDGF indicates it is the responsibility of the entity undertaking a proposed action to know, understand, and abide by the laws related to state-listed T&E species. It is DOE/NNSA' obligation to know, understand, and abide by the laws related to threatened and endangered species (State of New Mexico 2023). In exercising their obligation regarding potential effects of the Project on state-listed T&E species, DOE/NNSA coordinated with the USFWS, SFNF, and the BLM regarding New Mexico federally- and state-listed species. Commitments to execute USFWS and BLM recommended construction and operation best management practices (BMPs) and voluntary conservation measures will ensure state-listed T&E animal species and endangered plant species (where applicable) in and surrounding the Project area will not be adversely affected by the Project. These items have been incorporated into DOE/NNSA' Environmental BMPs.

4.2.2. Impacts

The list of state-listed T&E species having the potential to occur in the vicinity of the Project was developed via review of online and hard copy resources, agency database requests, and agency

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consultation. DOE reviewed the Biota Information System of New Mexico (BISON) (BISON 2023), and New Mexico Rare Plant Technical Council (NMRPTC) New Mexico Rare Plants Website (NMRPTC 1999) for T&E species that could potentially occur in the Project area. According to the generated lists of T&E species by county, a total of 20 state-listed species have potential to occur in the vicinity of the Project (15 in Santa Fe County, New Mexico and 13 in Los Alamos County, New Mexico).

Table 4-2 outlines the state-listed T&E species that are listed by the NMDGF for the counties crossed by the proposed transmission line. In addition, a brief evaluation of the potential effect of the Project on each species is provided. The state-listed (threatened, endangered, full protection, or limited protection) species noted in Table 4-2 potential effects are characterized as "low" or "none".

Table 4-2 New Mexico State-Listed Threatened and Endangered Species and Species of Greatest Conservation Concern Assessment

Species	State Status*	Habitat and Life History Requirements and Potential Project Impacts on Species
Mammals		
New Mexico Meadow Jumping Mouse (<i>Zapus hudsonius luteus</i>)	E, SGCN	<p>The New Mexico meadow jumping mice are endemic to New Mexico, Arizona, and small portions of southern Colorado. The jumping mouse is a habitat specialist that nests in dry soils, but uses moist, streamside, dense riparian/wetland vegetation up to an elevation of about 8,000 feet. The jumping mouse appears to only utilize two riparian community types: 1) persistent emergent herbaceous wetlands (i.e., beaked sedge and reed canary grass alliances); and 2) scrub-shrub wetlands (i.e., riparian areas along perennial streams that are composed of willows and alders. It especially uses microhabitats of patches or stringers of tall dense sedges on moist soil along the edge of permanent water.</p> <p>None: The species does not occur in the project area due to lack of suitable habitat. The project does not cross riparian habitat, with the exception of the high crossing at the Rio Grande River. The crossing at the river will span the entire canyon, and utility poles will not be placed in riparian habitat.</p>
Pacific Marten (<i>Martes caurina</i>)	T, SGCN	<p>In New Mexico, the Pacific marten is known only from the north-central mountains including the San Juan and Sangre de Cristo ranges. Reports of martens in the Jemez Mountains have not been substantiated, despite recent efforts including the use of camera traps. Habitat in New Mexico includes mature, high elevation spruce-fir (Picea-Abies) forests. Mature/old-growth spruce-fir forests with greater than 30% canopy cover and abundant coarse woody debris (i.e., snags, down fall, etc.) have been identified as preferred marten habitat throughout the range of the species.</p> <p>None: The project only crosses a small portion of high elevation spruce forests. Adjacent to this portion is a vast amount of similar habitat.</p>
Spotted bat (<i>Euderma maculatum</i>)	T, SGCN	<p>The range of the spotted bat encompasses western North America from southern British Columbia and south-central Montana south through central and eastern Washington, eastern Oregon, Idaho, western Wyoming, western Colorado, western and southern Nevada, California, Arizona, western and central New Mexico, and western Texas to central Mexico. Distribution appears to be patchy with availability of suitable habitat (suitable roosting cliffs and water sources). The elevational range extends from below sea level to 10,600 feet (3,230 meters). It is a cliff roosting bat whose primary roosting habitat is generally not vulnerable to loss or excessive disturbance; foraging habitat appears to be extensive and not limiting.</p> <p>None: The project route will span the Rio Grande River in a canyon area that provides roosting habitat. However, the project will not impact the canyon cliffs or water resources.</p>
Birds		

Appendix E. Wildlife Report

Species	State Status ^a	Habitat and Life History Requirements and Potential Project Impacts on Species
Baird's Sparrow (<i>Centronyx bairdi</i>)	T, SGCN	<p>Baird's Sparrow breeds in a fairly small geographic area of south-central Canada, Montana, and North and South Dakota. It winters on grasslands of the northern Mexican plateau, primarily in Chihuahua and Durango but including portions of bordering states. The winter range extends into small portions of southeast Arizona, southern New Mexico, and southwest Texas. In New Mexico, Baird's Sparrow has been found on Otero Mesa and in the Animas Valley and may occur in other areas of suitable winter habitat, particularly in the southeast portion of state.</p> <p>Nesting habitat includes ungrazed or lightly grazed mixed-grass prairie, prairie with scattered low bushes and matted vegetation, local pockets of tallgrass prairie, wet meadows, and some types of disturbed habitats. This species most often occurs in tracts of native, mixed-grass prairie that is ungrazed or lightly grazed. It may use wet meadows and tallgrass prairie in dry years. Generally, the species winters in areas of dense and expansive grasslands, with only a minor shrub component.</p> <p>None: The species does not occur in the project area due to lack of suitable habitat. The project disturbance will primarily be along an existing road, and potential impacts from removing vegetation from foraging habitat will be very limited. Any individuals present are likely to be transient and would avoid the project area.</p>
Bald Eagle (<i>Haliaeetus leucocephalus</i>)	T, SGCN	<p>The historic range of the bald eagle was from Alaska and Canada, across the contiguous United States and down to northern Mexico. Traditionally, bald eagles were found nesting near rivers, lakes and marshes. Their habitat can include estuaries, large lakes, reservoirs, rivers and some seacoasts. They're also increasingly found in drier areas that are farther from water sources such as farmland and urban and suburban habitat.</p> <p>In winter, the birds congregate in large numbers near open water in tall trees that they use for spotting prey. These trees also provide night roosts for sheltering. These areas can be found below artificial dams or river tributaries that will keep larger channels open. Winter roost sites may be used all winter or only for short periods of time when other food sources are not available. They require a good food base, perching areas and nesting sites.</p> <p>Low: The project crosses suitable habitat along the Rio Grande River. The project also crosses areas of pine forests with tall trees. Mitigation measures will be employed to minimize impacts to raptors (section 5.3).</p>
Bell's vireo (<i>Vireo bellii</i>)	T, SGCN	<p>Dense, low, shrubby vegetation, generally early successional stages in riparian areas, brushy fields, young second-growth forest or woodland, scrub oak, coastal chaparral, and mesquite brushlands, often near water in arid regions.</p> <p>None: The project will span the Rio Grande River which has suitable habitat; however, no construction activities will occur in the riparian habitat.</p>
Boreal Owl (<i>Aegolius funereus</i>)	T, SGCN	<p>In North America, the distribution is generally confined to the forest areas of the Rocky Mountains and the northern coniferous belt. To the east of the Rockies they occur as far south as New Mexico, and to the west they occur in forests from Alaska to Oregon. Preferred habitat varies throughout its range but includes mainly old-growth forests with woodpecker cavities for nesting. They inhabit a range of forests from pure coniferous to pure deciduous forests. Southern populations tend to occur in high sub-alpine forests. Hunting habitat includes forest meadows and open forests. When roosting they need dense conifers where they roost 5-6 meters and up.</p> <p>None: The project only crosses a small portion of forest lands with tall trees for roosting. Adjacent to this portion is a vast amount of similar habitat.</p>
Broad-billed Hummingbird (<i>Cynanthus latirostris</i>)	T, SGCN	<p>This species utilizes arid scrub, open deciduous forest, semi-desert and other open situations in arid habitats.</p> <p>None: The project does cross suitable habitat; however, limited vegetation will be removed. Additionally, there is vast amounts of similar habitat adjacent to the project area.</p>
Common Black Hawk (<i>Buteogallus anthracinus</i>)	T, SGCN	<p>Characteristically found in the southwest in cottonwood and other riparian mature, well-developed woodlands along permanent lowland streams providing sufficient moisture for a narrow band of trees and shrubs along the margins.</p> <p>None: The project will span the Rio Grande River which has suitable habitat; however, no construction activities will occur in the riparian habitat.</p>

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Species	State Status ^a	Habitat and Life History Requirements and Potential Project Impacts on Species
Gray Vireo (<i>Vireo vicinior</i>)	T, SGCN	<p>The Gray Vireo breeds in the southwestern U.S., covering southeastern Nevada and Utah, southwestern Colorado, western New Mexico, most of Arizona, and the mountains of southern California. They winter on the southern half of the Baja Peninsula as well as the northwestern edge of Mexico. They are found in desert scrub, mixed juniper or piñon pine and oak scrub associations, and chaparral, in hot, arid mountains and high plains scrubland.</p> <p>None: The project does cross suitable habitat and this species was documented during vegetation surveys in summer 2020; however, very limited vegetation will be removed. Additionally, there is vast amounts of similar habitat adjacent to the project area.</p>
Least Tern (<i>Sterna antillarum athalassos</i>)	E, SGCN	<p>Interior Least Terns breed in the interior of North America, primarily along major river systems. A single breeding colony exists in New Mexico, at Bitter Lake National Wildlife Refuge. In New Mexico, they breed regularly only at Bitter Lake NWR, and they occur occasionally elsewhere. It nests along sand and gravel bars within braided streams and rivers; also known to nest on man-made structures (inland beaches, wastewater treatment plants, gravel mines, etc.); eats small fish and crustaceans, when breeding forages within a few hundred feet of colony.</p> <p>None: The project will span the Rio Grande River which has suitable habitat; however, no construction activities will occur in the riparian habitat.</p>
Northern Beardless- Tyrannulet (<i>Camptostoma imberbe</i>) ^b	E, SGCN	<p>Typically occurs at lower elevations in dense strands of mesquite and associated growth, typically along stream courses.</p> <p>None: The project will span the Rio Grande River which has suitable habitat; however, no construction activities will occur in the riparian habitat.</p>
Mexican Spotted Owl (<i>Strix occidentalis lucida</i>)	SGCN, FP	<p>The Mexican Spotted owl inhabits canyon and forest habitats across a range that extends from southern Utah and Colorado, through Arizona, New Mexico, and west Texas, to the mountains of central Mexico. Habitat characteristics include high canopy closure, high stand density, a multi-layered canopy, uneven-aged stands, numerous snags, and downed woody matter. These are best expressed in old-growth mixed-conifer forests (usually more than 200 years old). They also use Madrean pine-oak forests. There is approximately 8.6 million acres of designated critical habitat in Arizona, Colorado, New Mexico, and Utah, on Federal lands.</p> <p>None – The species does not occur in the project area due to lack of suitable habitat. The project does not cross designated critical habitat.</p>
Peregrine Falcon (<i>Falco peregrinus</i>)	T, SGCN	<p>Peregrines are patchily distributed across the entire continent, from Pacific to Atlantic and from northern Alaska and Canada south to central Mexico. In New Mexico, Peregrine Falcons breed locally in mountains and river canyons of western New Mexico east to the Sangre de Cristo, Sandia/Manzano, and Sacramento mountains. The species is a rare winter visitor in lowlands statewide. In the western United States, Peregrines generally occupy mountain and canyon habitats, including high elevation areas above 10,000 ft. Breeding areas are usually associated with water. Traditional nest locations are cliffs ranging from about 3-400 m high; cliffs 50-200 m are preferred. However, first-time breeders in the expanding population often select suboptimal sites, including a variety of human structures. In New Mexico, almost all nests are constructed on ledges on relatively tall cliffs, in remote areas with minimal human disturbance. The same nest location is often re-used from year to year. Clutch size is typically 3 or 4, and a single brood per season is raised. Annual productivity may be variable due to changes in abiotic conditions and prey abundance (White et al. 2002). Peregrine Falcons prey mostly or entirely on birds. In New Mexico, a variety of locally available species are taken, including doves, swifts, flickers, jays, meadowlarks, and others.</p> <p>Low: The project crosses suitable habitat along the Rio Grande River. The project also crosses areas of pine forests with tall trees. Mitigation measures will be employed to minimize impacts to raptors (section 5.3).</p>

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Species	State Status ²	Habitat and Life History Requirements and Potential Project Impacts on Species
Southwestern Willow Flycatcher (<i>Empidonax traillii extimus</i>)	E, SGCN	<p>The southwestern willow flycatcher is known to or is believed to occur in Arizona, California, Colorado, Nevada, New Mexico, Texas, and Utah. It occurs in riparian habitats along rivers, streams, or other wetlands, in close association with dense groves of willows (<i>Salix</i> sp.), arrowweed (<i>Fluchea</i> sp.), buttonbush, tamarisk (<i>Tamarix</i> sp.), Russian olive, and some other riparian vegetation, often with a scattered overstory of cottonwood (<i>Populus</i> sp.). This species builds its nest in shrubs and small trees in willow thickets, shrubby mountain meadows, and deciduous woodlands along streams, lakes, and bogs. Although this species occurs widely in New Mexico during migration, willow flycatchers are confined to riparian woodlands in the breeding season. These habitats are typically dominated by cottonwoods (<i>Populus</i> spp.), often with an understory of small trees or tall shrubs and surface water nearby.</p> <p>Approximately 1,227 stream miles have been designated as critical habitat. These areas are designated as stream segments, with the lateral extent including the riparian areas and streams that occur within the 100-year floodplain or flood-prone areas encompassing a total area of approximately 208,973 acres. The critical habitat is located on a combination of Federal, State, tribal, and private lands. Counties in New Mexico with designated critical habitat include Catron, Grant, Hidalgo, Mora, Rio Arriba, Socorro, Taos, and Valencia Counties.</p> <p>None – The species does not occur in the project area due to lack of suitable habitat. The project does not cross designated critical habitat; the nearest designated critical habitat is located approximately 15 miles north of the project area. Any individuals present are likely to be transient and would avoid the project area.</p>
Violet-crowned Hummingbird (<i>Leucolia violiceps</i>)	T, SGCN	<p>The violet-crowned Hummingbird is found from southeastern Arizona and southwestern New Mexico south into Mexico to Michoacán and Hidalgo and possibly as far as the states of Puebla and México. In the United States the species is found primarily in riparian woodlands at low to moderate elevations. In Arizona and New Mexico it occurs almost entirely between 3,900 and 5,600 ft (1,200 and 1,700 m). In New Mexico, Violet-crowned Hummingbirds breed regularly only at Guadalupe Canyon in south Hidalgo County. Breeding may also occur in the Animas Mountains, where birds have been observed during the breeding season. In Guadalupe Canyon, these woodlands are characterized by Fremont cottonwood (<i>Populus fremontii</i>), Arizona sycamore (<i>Platanus wrightii</i>), Arizona white oak (<i>Quercus arizonica</i>), and netleaf hackberry (<i>Celtis reticulata</i>). Nests found in Guadalupe Canyon have all been in Arizona sycamore trees and have been 4-13 m above the ground.</p> <p>None: The species is not known to occur in the project area. Any individuals present are likely to be transient and would avoid the project area. The project disturbance will primarily be along an existing road, and potential impacts from removing vegetation from foraging habitat will be very limited.</p>
White-tailed Ptarmigan (<i>Lagopus leucura</i>)	E, SGCN	<p>White-tailed ptarmigan primarily inhabit alpine ecosystems at or above treeline throughout the year, though under some circumstances during winter they may forage and roost in riparian areas, meadows, or bums at lower elevations. In New Mexico, this species is only found above timberline in the Sangre de Cristo Mountains, as far south as Santa Fe Baldy.</p> <p>None: This species is not known to occur in the project area. The project does not cross alpine habitat.</p>
Yellow-billed Cuckoo (western distinct population) (<i>Coccyzus americanus</i>)	FP, SGCN	<p>The species is known to or is believed to occur: Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Texas, Utah, Washington, Wyoming. This species is associated with lowland deciduous woodlands, willow and alder thickets, second-growth woods, deserted farmlands, and orchards. It is a riparian obligate species; therefore, they nest almost exclusively in low-mid elevation riparian/riverine habitat dominated by a cottonwood-willow matrix with standing water or nearby streams, pools, or cienegas.</p> <p>Approximately 298,845 acres have been designated as critical habitat for the western distinct population segment of the yellow-billed cuckoo in Arizona, California, Colorado, Idaho, New Mexico, Texas, and Utah.</p>

Species	State Status*	Habitat and Life History Requirements and Potential Project Impacts on Species
		None – The species does not occur in the project area due to lack of suitable habitat. Woodlands, orchards, pastures, and willow groves are absent from Project area; riparian habitat absent in the Project area. The project does not cross designated critical habitat; the nearest designated critical habitat is located approximately 24 miles north of project area. The project disturbance will primarily be along an existing road, and potential impacts from removing vegetation from foraging habitat will be very limited. Any individuals present are likely to be transient and would avoid the project area.
Amphibians		
Jemez Mountains Salamander (<i>Plethodon neomexicanus</i>)	E, SGCN	Range is the New Mexico counties of Los Alamos, Rio Arriba, Sandoval, and Santa Fe. It is found in mixed conifer and spruce-fir forests above 7,200 feet in specific microhabitat conditions. Preferred microhabitat is generally characterized by relatively high humidity and soils with specific rock structure, although populations have been found outside these parameters. None: The species does not occur in the project area due to lack of suitable habitat. The portion of the project that is in mixed conifer habitat (west of the Rio Grande River) has elevations between 5,746 and 6,543 feet, which is below the species elevation requirements.
Molluscs		
Lilleborg's Peaclam (<i>Pisidium lilleborgi</i>)	T, SGCN	Lilleborg's Peaclam is a small (shell length up to 4.5 mm) freshwater peaclam that is distributed from Canada south to locally high elevations of northern California, Utah and New Mexico. In New Mexico it is only known from Nambe Lake in Santa Fe County. This species prefers large lakes and is common in the sublittoral zones and in the mud of profundal zones of lakes. It is also found in fine sand of rivers. None: The species does not occur in the project area due to lack of suitable habitat. There are no lakes within the project area.
* E – Endangered, FP – Sensitive taxa (informal) Full Protection, LP – Sensitive taxa (informal) Limited Protection, NL – Not Listed, T – Threatened, SGCN - Species of Greatest Conservation Concern		
Sources: Biota Information System of New Mexico (BISON) 2023, Natural Heritage New Mexico (NHNM) 2023, USFWS 2023a,b.		

4.3. US Forest Service “at-risk” species and Species of Conservation Concern (SCC)

USFS at-risk species include federally classified endangered, threatened, proposed, and candidate species, as described under the ESA (1973), and species of conservation concern (SCC) (USDA 2022). Federally classified species are analyzed in Section 4.1. This section will focus on SCC.

SCC are species, other than federally recognized species, that are known or expected to occur on the Santa Fe NF and for which the Regional Forester has determined that the best available scientific information indicates substantial concern about the species' capability to persist over the long term. For SCC, habitat management and compatible multiple uses will be accomplished in a way that ensures species' persistence on the Santa Fe NF, in accordance with the 2012 Planning Rule (36 CFR § 219.9(b)).

Analysis of biological resource data, including habitat assessment and field reconnaissance, determined that the following eight SCC species may occur or have suitable habitat within the

project area; American Peregrine Falcon, Chaco Milkvetch, Chama Blazing Star, Greene's Milkweed, Gunnison's Prairie Dog, Pinyon Jay, Tufted Sand Verbena, and Western Burrowing Owl. These species were evaluated for forest plan compliance, specifically for Standards (S), Guidelines (G) and Desired Condition (DC). Twenty SCC species, including one Federal Candidate species (Rio Grande cutthroat trout), were not considered for further analysis based on lack of suitable habitat or occurrence (USDA 2022).

Table 4-3 Forest Service Species of Conservation Concern and Project Consistency with the Forest Plan

Plan Code	Plan Component	SCC	Project Consistency
FW-ATRISK-DC-1	Ecological conditions (physical and biotic) contribute to the survival and recovery of federally listed, proposed, and candidate species; preclude the need for listing new species; and allow for the recovery and persistence of species of conservation concern.	American Peregrine Falcon Chaco Milkvetch Chama Blazing Star Greene's Milkweed Gunnison's Prairie Dog Pinyon Jay Tufted Sand Verbena Western Burrowing Owl	This project is consistent with the Forest Plan (USDA FS Santa Fe NF 2022) because project design criteria are incorporated into the proposed action which includes measures to protect milkweed plants for Monarch butterfly, migratory bird project restrictions, presence of a biological monitor during ground disturbing activities and pole placements to protect at-risk vegetation and avoid active burrows and nests, and disturbed areas will be revegetated (Appendix B).
FW-ATRISK-DC-3	Habitats for at-risk species, including rare and endemic populations, are known (locations) to be intact, functioning, well-connected, and sufficient for species' persistence and recovery.	American Peregrine Falcon Chaco Milkvetch Chama Blazing Star Greene's Milkweed Tufted Sand Verbena Western Burrowing Owl	This project is consistent with the Forest Plan (USDA FS Santa Fe NF 2022) because project design criteria are incorporated into the proposed action which includes measures to protect milkweed plants for Monarch butterfly, migratory bird project restrictions, presence of a biological monitor during ground disturbing activities and pole placements to protect at-risk vegetation and avoid active burrows and nests, and disturbed areas will be revegetated (Appendix B).
FW-ATRISK-G-1	All authorized activities should be designed and implemented to address threats to at-risk species and their habitats, including, but not limited to: a) Timing restrictions to encourage reproductive success; b) Prevention of introduction of non-game, invasive, competing, or predatory species (these are species directly and negatively impacting at-risk species populations), and prevention of introduction of nonnative game species to novel locations; c) Prevention of introduction of pathogens leading to population impacts; d) Creation or removal of obstructions that may alter natural migration or directly cause mortality to wildlife; and e) Avoiding or protecting small or isolated populations.	American Peregrine Falcon Chaco Milkvetch Chama Blazing Star Greene's Milkweed Gunnison's Prairie Dog Pinyon Jay Tufted Sand Verbena Western Burrowing Owl	This project is consistent with the Forest Plan (USDA FS Santa Fe NF 2022) because project design criteria are incorporated into the proposed action which includes restricting vegetation removal during peak bird-breeding season, avoiding construction over the Rio Grande River during the highest migration periods of migratory waterfowl, identify and avoid noxious weed infestation areas, maintain clean worksites, and installing collision-deterrence devices on the conductor across the Rio Grande River (Appendix B).

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Plan Code	Plan Component	SCC	Project Consistency
FW-ATRISK-G-10	In areas that produce piñon seeds, mitigation measures for the collection of forest products (e.g., collection of dead or down, tree diameter restrictions, restrictions on size of fuelwood area) should be used to reduce impacts to piñon-producing trees and benefit at-risk species.	American Peregrine Falcon Gunnison's Prairie Dog Western Burrowing Owl	This project is consistent with the Forest Plan (USDA FS Santa Fe NF 2022) because project design criteria are incorporated into the proposed action which includes the presence of a biological monitor during ground disturbing activities and pole placements to avoid cutting mast-producing trees with a diameter greater than eight inches. Dead or downed trees will remain in place or returned to place after construction (Appendix B).
FW-ATRISK-G-12	Large mature cottonwood trees should be retained as habitat for at-risk species unless necessary to meet management objectives or ensure public safety.	American Peregrine Falcon Chaco Milkvetch Tufted Sand Verbena Western Burrowing Owl	This project is consistent with the Forest Plan (USDA FS Santa Fe NF 2022) because ground disturbing activities will not occur within the Rio Grande River riparian habitat. No cottonwood trees or other large trees in riparian areas will be disturbed.
FW-ATRISK-G-6	Management activities along cliff faces, rock features, and other known nesting sites should avoid impacts during nesting season (April 1 through the end of September) to the same nesting site in consecutive years for at-risk bird species.	American Peregrine Falcon Gunnison's Prairie Dog Western Burrowing Owl	This project is consistent with the Forest Plan (USDA FS Santa Fe NF 2022) because project design criteria are incorporated into the proposed action which includes the presence of a biological monitor during ground disturbing activities and during the spanning of cable across the Rio Grande River.
FW-ATRISK-G-8	Heavy equipment should be kept out of streams during spawning, incubation, and emergence periods (e.g., spring to early summer for fish species) of aquatic at-risk species (per Guideline 1a in this section) except when short-term uses are required to improve resource conditions and maintain infrastructure.	American Peregrine Falcon Chaco Milkvetch Chama Blazing Star Greene's Milkweed	This project is consistent with the Forest Plan (USDA FS Santa Fe NF 2022) because ground disturbing activities will not occur within the Rio Grande River riparian habitat. Heavy equipment will not be used in or near streams.
FW-CPGB-DC-4	Depending on soil type, bare soil is no more than 50 percent of an area and averages 35 percent. Groundcover vegetation ranges between 10 and 40 percent.	Western Burrowing Owl	This project is consistent with the Forest Plan (USDA FS Santa Fe NF 2022) because project design criteria are incorporated into the proposed action which includes vegetation restoration. Return temporarily disturbed areas to their original, pre-construction contours and conduct site restoration and revegetation measures before or at the beginning of the first growing season following construction, revegetate disturbed areas with grasses, forbs, and shrubs to ensure appropriate vegetation coverage and soil stabilization according to 35 CFR 251, conduct post-construction site-restoration monitoring. For trees that are cut, the existing root systems will be kept intact to help prevent erosion.

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Plan Code	Plan Component	SCC	Project Consistency
FW-CPGB-DC-5	Disturbance and site potential result in a mosaic of vegetation densities (densely vegetated areas to bare areas) across the landscape.	Western Burrowing Owl	This project is consistent with the Forest Plan (USDA FS Santa Fe NF 2022) because implementation of the project will move the Forest toward this desired condition.
FW-CPGB-DC-7	Grasslands are connected with minimal (less than 5 percent) shrub and tree cover.	Western Burrowing Owl	This project is consistent with the Forest Plan (USDA FS Santa Fe NF 2022) because implementation of the project will move the Forest toward this desired condition.
FW-PJO-DC-2	Old growth includes old trees, dead trees (snags), downed wood (coarse woody debris) and structural diversity and is often concentrated in mid- and fine-scale units as patches of old growth. The location of old growth shifts on the landscape over time as a result of succession and disturbance. Very old trees (over 300 years old) are present, while snags and older trees with dead limbs and/or tops are scattered across the landscape. A) Snags 8 inches DRC or larger, average 5 snags per acre, while snags 18 inches DRC or larger average 1 snag per acre. B) Coarse woody debris increases in later successional stages and averages 2 to 5 tons per acre.	Chaco Milkvetch Chama Blazing Star Greene's Milkweed Gunnison's Prairie Dog Pinyon Jay Western Burrowing Owl	This project is consistent with the Forest Plan (USDA FS Santa Fe NF 2022) because project design criteria are incorporated into the proposed action which includes leaving dead or downed trees and snags in place or returned to place after construction.
FW-PJO-DC-7	Trees occur in even-aged patches ranging from young to old, where patch sizes range from tens to hundreds of acres.	Chaco Milkvetch Chama Blazing Star Greene's Milkweed Gunnison's Prairie Dog Pinyon Jay Western Burrowing Owl	This project is consistent with the Forest Plan (USDA FS Santa Fe NF 2022) because implementation of the project will move the Forest toward this desired condition.
FW-PJS-DC-4	Snags and old trees with dead tops or limbs are scattered across the landscape, with snags larger than 8 inches DRC averaging 6 snags per acre, and snags 18 inches and larger DRC averaging 1 snag per acre.	Chaco Milkvetch Greene's Milkweed Gunnison's Prairie Dog Pinyon Jay Western Burrowing Owl	This project is consistent with the Forest Plan (USDA FS Santa Fe NF 2022) because project design criteria are incorporated into the proposed action which includes leaving dead or downed trees and snags in place or returned to place after construction.
FW-PJS-DC-5	Coarse woody debris averages about 4 tons per acre.	Chaco Milkvetch Greene's Milkweed Gunnison's Prairie Dog Pinyon Jay Western Burrowing Owl	This project is consistent with the Forest Plan (USDA FS Santa Fe NF 2022) because implementation of the project will move the Forest toward this desired condition as any cut trees will remain on site.
FW-PJS-DC-6	The understory is dominated by moderate to high densities of shrubs (average greater than 30 percent cover), depending on successional stage. The shrub component consists of one or a mix of shrub species (e.g., sagebrush, evergreen shrub, oak, or other), which are well-distributed. Shrubs typically are in a closed canopy state during later successional stages.	Chaco Milkvetch Greene's Milkweed Gunnison's Prairie Dog Pinyon Jay Western Burrowing Owl	This project is consistent with the Forest Plan (USDA FS Santa Fe NF 2022) because implementation of the project will move the Forest toward this desired condition.

Plan Code	Plan Component	SCC	Project Consistency
FW-PJS-DC-7	Ground cover consists primarily of shrubs, perennial grasses, and forbs capable of carrying surface fire only infrequently, with basal vegetation values averaging between about 10 and 35 percent depending on site potential and the TEUI unit.	Chaco Milkvetch Greene's Milkweed Gunnison's Prairie Dog Pinyon Jay Western Burrowing Owl	This project is consistent with the Forest Plan (USDA FS Santa Fe NF 2022) because implementation of the project will move the Forest toward this desired condition.
FW-PJS-DC-8	Trees occur as individuals or in smaller groups and range from young to old. Groups are typically even aged in structure.	Chaco Milkvetch Greene's Milkweed Gunnison's Prairie Dog Pinyon Jay Western Burrowing Owl	This project is consistent with the Forest Plan (USDA FS Santa Fe NF 2022) because implementation of the project will move the Forest toward this desired condition.
FW-PJS-DC-9	Patch size of woodlands range from one to tens of acres, and occasionally includes patches of even-aged woodland structure, based on disturbance events and regeneration establishment.	Chaco Milkvetch Greene's Milkweed Gunnison's Prairie Dog Pinyon Jay Western Burrowing Owl	This project is consistent with the Forest Plan (USDA FS Santa Fe NF 2022) because implementation of the project will move the Forest toward this desired condition.

BLM sensitive species

The BLM manages habitat for all animal and plant species that inhabit BLM-managed public lands. When a particular native wildlife, fish or plant species occurring on BLM lands becomes at-risk, the BLM State Director can designate the species as Bureau Sensitive. Once designated, the BLM works cooperatively with other federal and state agencies and nongovernmental organizations to proactively conserve these species and ensure that activities on public lands do not contribute to the need for their listing under the Endangered Species Act. Conservation objectives for Bureau Sensitive species are established in BLM land use plans and guide the management of habitat while reducing conflicts with multiple uses of BLM lands. BLM periodically reviews and updates their Bureau Sensitive species list in coordination with state agencies. The next update is anticipated in 2023, and any revisions will be incorporated into the project record.

The list of BLM Sensitive species having the potential to occur in the vicinity of the Project was developed via review of online and hard copy resources, agency database requests, and agency consultation. DOE reviewed the BLM New Mexico Sensitive Status Species List (BLM 2018) for sensitive species that could potentially occur in the Project area. According to BLM's list of sensitive species by county, a total of 18 BLM sensitive species have potential to occur in the vicinity of the Project. (15 in Santa Fe County, New Mexico and 13 in Los Alamos County, New Mexico; some species could occur in both counties). Two additional "Potential" sensitive species are included as well due to their perceived vulnerability in this region. The Mexican long-tongued bat (*Choeronycteris Mexicana*) and Western yellow bat (*Lasiurus xanthinus*) were added because they have been detected near the project area (USGS 2023).

Table 4-4 outlines the 20 BLM Sensitive Species that may occur or have habitat present within and adjacent to the project area. In addition, a brief description of the species habitat associations and an evaluation of the potential effect of the Project on each species is provided.

Table 4-4 BLM Sensitive Species Assessment

Species	Status	Habitat Associations	Comments
Mammals			
Black-tailed prairie dog (<i>Cynomys ludovicianus</i>)	BLM Sensitive	Shortgrass prairies and plains.	Project surveys inspected present burrows and no Black-tailed prairie dogs were identified. Additionally, surveyors did not document any Black-tailed prairie dog activity. Active burrows identified during construction will be avoided. The proposed Alternatives would <u>have no impact</u> on the black-tailed prairie dog.
Gunnison's prairie dog (<i>Cynomys gunnisoni</i>)	BLM Sensitive	Great Basin desert-scrub from low valleys to montane meadows.	Project surveys inspected present burrows and no Gunnison's prairie dogs were identified. Additionally, surveyors did not document any Gunnison's prairie dog activity. Active burrows identified during construction will be avoided. The proposed Alternatives would <u>have no impact</u> on the Gunnison's prairie dog.
Mexican long-tongued bat (<i>Choronycteris Mexicana</i>)	BLM Sensitive	Thorn scrub, semidesert grassland, oak woodland and tropical deciduous forests. Although most frequently found in desert canyons, they have been observed in oak and ponderosa pine habitat (up to 8,200 feet).	The project route will cross through portions of semidesert grassland habitat. However, vegetation mitigation measures will be employed before or at the beginning of the first growing season following construction to counteract disturbance. Disturbed areas will be revegetated with grasses, forbs, and shrubs to ensure appropriate vegetation coverage and soil stabilization according to 36 CFR 251 (Appendix B). Additionally, a biological monitor would be present for any tree removals that may be necessary. The proposed Alternatives would <u>have no impact</u> on the Mexican long-tongued bat.
Spotted bat (<i>Euderma maculatum</i>)	BLM Sensitive	Roosting cliffs and water sources.	The project route will span the Rio Grande River in a canyon area that provides roosting habitat. However, the project will not impact the canyon cliffs or water resources. The proposed Alternatives would <u>have no impact</u> on the Spotted bat.
Townsend's big-eared bat (<i>Corynorhinus townsendii</i>)	BLM Sensitive	Montane forests thick with pine, fir and aspen trees and is bounded by shrub and grasslands. Roosting sites in caves, cliffs, and rock ledges.	The project route will span the Rio Grande River in a canyon area that provides roosting habitat. However, the project will not impact the canyon cliffs. The proposed Alternatives would <u>have no impact</u> on the Townsend's big-eared bat.
Western Burrowing Owl (<i>Athene cunicularia</i>)	BLM Sensitive	Grasslands and desert scrub. Usually in association with burrowing rodents.	The species does not occur in the project area due to lack of suitable habitat. The project does not cross designated critical habitat. The proposed Alternative would <u>have no impact</u> on the burrowing owl.
Western yellow bat (<i>Lasiurus xanthinus</i>)	BLM Sensitive	Riparian woodlands in arid regions; they also occur in oak or piñon-juniper woodland areas.	The project route will span the Rio Grande River riparian habitat and will cross through portions of piñon-juniper woodland habitat. However, the project will not impact the canyon cliffs, and vegetation mitigation measures will be employed before or at the beginning of the first growing season following construction to counteract disturbance. Disturbed areas will be revegetated with grasses, forbs, and shrubs to ensure appropriate vegetation coverage and soil stabilization according to 36 CFR 251 (Appendix B). Additionally, a biological monitor would be present for any tree removals that may be necessary. The proposed Alternatives would <u>have no impact</u> on the Western yellow bat.
Birds			
	BLM Sensitive	Pinon-Juniper woodlands.	

Appendix E. Wildlife Report

Species	Status	Habitat Associations	Comments
Pinyon Jay (<i>Gymnorhinus cyanocephalus</i>)			The project route will cross through portions of piñon-juniper woodland habitat. However, vegetation mitigation measures will be employed before or at the beginning of the first growing season following construction to counteract disturbance. Disturbed areas will be revegetated with grasses, forbs, and shrubs to ensure appropriate vegetation coverage and soil stabilization according to 36 CFR 251 (Appendix B). Additionally, a biological monitor would be present for any tree removals that may be necessary. The proposed Alternative would <u>have no impact</u> on the pinyon jay.
McCown's Longspur (<i>Calcarius mccownii</i>)	BLM Sensitive (Potential)	Native shortgrass prairie, or structurally similar habitats such as overgrazed pastures, plowed fields, and dry lake beds. In New Mexico, McCown's Longspur has been observed in heavily grazed habitat with considerable bare ground.	The project route will cross through portions of this species preferred habitat. However, vegetation mitigation measures will be employed before or at the beginning of the first growing season following construction to counteract disturbance. Disturbed areas will be revegetated with grasses, forbs, and shrubs to ensure appropriate vegetation coverage and soil stabilization according to 36 CFR 251 (Appendix B). The proposed Alternative would <u>have no impact</u> on the McCown's Longspur.
Chestnut-collared Longspur (<i>Calcarius ornatus</i>)	BLM Sensitive	Shortgrass prairies, rangelands, and desert grasslands.	The project route will cross through portions of rangeland and desert grasslands. However, vegetation mitigation measures will be employed before or at the beginning of the first growing season following construction to counteract disturbance. Disturbed areas will be revegetated with grasses, forbs, and shrubs to ensure appropriate vegetation coverage and soil stabilization according to 36 CFR 251 (Appendix B). The proposed Alternative would <u>have no impact</u> on the Chestnut-collared Longspur.
Bendire's Thrasher (<i>Toxostoma bendirei</i>)	BLM Sensitive (Potential)	Nest in dense low shrubs, trees, yuccas, or cacti. Live in dry semi-open habitats including juniper savannahs, and Sonoran desert with shrubs, cactus and some grass understory.	The project route will cross through portions of habitat that include trees and shrubs. However, vegetation mitigation measures will be employed before or at the beginning of the first growing season following construction to counteract disturbance. Disturbed areas will be revegetated with grasses, forbs, and shrubs to ensure appropriate vegetation coverage and soil stabilization according to 36 CFR 251 (Appendix B). The proposed Alternative would <u>have no impact</u> on the Bendire's Thrasher.
Mexican Whip-poor-will (<i>Antrostomus arizonae</i>)	BLM Sensitive	Woodlands of oaks and pines.	The project route will cross through portions of piñon-juniper woodland habitat. However, vegetation mitigation measures will be employed before or at the beginning of the first growing season following construction to counteract disturbance. Disturbed areas will be revegetated with grasses, forbs, and shrubs to ensure appropriate vegetation coverage and soil stabilization according to 36 CFR 251 (Appendix B). Additionally, a biological monitor would be present for any tree removals that may be necessary. The proposed Alternative would <u>have no impact</u> on the Mexican Whip-poor-will.
	BLM Sensitive		

Appendix E. Wildlife Report

Species	Status	Habitat Associations	Comments
Virginia's Warbler (<i>Vermivora virginiae</i>)		Mixed woodlands with steep draws, drainages, or slopes with oak or other shrubby vegetation.	The project route will cross through portions of mixed woodland habitat. However, vegetation mitigation measures will be employed before or at the beginning of the first growing season following construction to counteract disturbance. Disturbed areas will be revegetated with grasses, forbs, and shrubs to ensure appropriate vegetation coverage and soil stabilization according to 36 CFR 251 (Appendix B). Additionally, a biological monitor would be present for any tree removals that may be necessary. The proposed Alternative would have no impact on the Virginia's Warbler.
Plants			
Santa Fe Cholla (<i>Cylindropuntia viridiflora</i> x)	BLM Sensitive	Gravelly rolling hills in open piñon-juniper woodlands.	The project route will cross through portions of Santa Fe Cholla habitat. However, a biological monitor would be present during ground disturbing activities / pole placements to avoid impacts to this species. Any occurrence of this species will be protected and cordoned off from project impacts. Additionally, vegetation mitigation measures will be employed before or at the beginning of the first growing season following construction to counteract disturbance. Disturbed areas will be revegetated with grasses, forbs, and shrubs to ensure appropriate vegetation coverage and soil stabilization according to 36 CFR 251 (Appendix B). The proposed Alternative would have no impact on the Santa Fe Cholla.
Galisteo Sand Verbena (<i>Abronia bigelovii</i>)	BLM Sensitive	Hills and ridges of calcareous Todilto gypsum and clay soils. The soil is largely barren of vegetation, but associated species include oneseed juniper (<i>Juniperus monosperma</i>), alkali sacaton (<i>Sporobolus airoides</i>), and tawny catseye (<i>Cryptantha fulvocanescens</i>).	The project route will cross through portions of Galisteo Sand Verbena habitat. However, a biological monitor would be present during ground disturbing activities / pole placements to avoid impacts to this species. Any occurrence of this species will be protected and cordoned off from project impacts. Additionally, vegetation mitigation measures will be employed before or at the beginning of the first growing season following construction to counteract disturbance. Disturbed areas will be revegetated with grasses, forbs, and shrubs to ensure appropriate vegetation coverage and soil stabilization according to 36 CFR 251 (Appendix B). Adjacent to the project area preferred habitat of juniper exists, the proposed Alternative would have no impact on the Galisteo Sand Verbena.
Todilto Stickleaf (<i>Mentzelia todiltoensis</i>)	BLM Sensitive	Outcrops of gypsum in the Todilto Formation.	The project route will cross through portions of Galisteo Sand Verbena habitat. However, a biological monitor would be present during ground disturbing activities / pole placements to avoid impacts to this species. Any occurrence of this species will be protected and cordoned off from project impacts. Additionally, vegetation mitigation measures will be employed before or at the beginning of the first growing season following construction to counteract disturbance. Disturbed areas will be revegetated with grasses, forbs, and shrubs to ensure appropriate vegetation coverage and soil stabilization according to 36 CFR 251 (Appendix B). The proposed Alternative would have no impact on the Galisteo Sand Verbena.
Fish			
	BLM Sensitive		

Species	Status	Habitat Associations	Comments
Rio Grande Sucker (<i>Catostomus plebeius</i>)		Cool mid elevation streams with gravel and or cobble.	The Project route will span the Rio Grande River approximately 900 feet above potential habitat for this species; no ground disturbing activities will occur within the Rio Grande River, nor the adjacent riparian habitat. The proposed Alternative would <u>have no impact</u> on the Rio Grande sucker.
Peppered Chub (<i>Macrhybopsis tetranema</i>)	BLM Sensitive	Main channels of wide, shallow, sandy bottomed rivers and larger streams.	The Project route will span the Rio Grande River approximately 900 feet above potential habitat for this species; no ground disturbing activities will occur within the Rio Grande River, nor the adjacent riparian habitat. The proposed Alternative would <u>have no impact</u> on the Peppered Chub.
Amphibians			
Northern Leopard Frog (<i>Lithobates (Rana) pipiens</i>)	BLM Sensitive	Aquatic habitats, including marshes, streams, ponds, irrigation ditches, wet meadows, and shallow portions of reservoirs.	The Project route will span the Rio Grande River approximately 900 feet above potential habitat for this species; no ground disturbing activities will occur within the Rio Grande River, nor the adjacent riparian habitat. The proposed Alternative would <u>have no impact</u> on the Northern Leopard frog.
Insects			
Monarch Butterfly (<i>Danaus plexippus</i>)	BLM Sensitive	Fields and meadows; wherever milkweed is growing.	Milkweed is not a common species within the Project area, however several species were identified during project surveys. Project lacks suitable habitat. Additionally, Milkweeds and any other occurrence of obligate vegetation will be protected and cordoned off from project impacts. If construction is to occur between May 1 and October 15, areas with actively growing milkweed/host plants will be flagged for avoidance during construction. Plants will be searched for eggs, larvae, and chrysalises prior to construction and notice given to the respective land management agency Wildlife Biologist. Dense milkweed stands will be avoided by a 50-foot buffer until determined otherwise by a qualified biologist. The proposed Alternative would <u>have no impact</u> on the Monarch butterfly.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) (16 United States Code [USC] §§ 703-708, 710-712) prohibits the take of a migratory bird or its parts, nests, or eggs unless specifically permitted to do so by regulations (USFWS 2017). Per the MBTA and its implementing regulations, "take" is defined as "pursue, hunt, shoot, wound, kill, trap, capture, or collect" (50 Code of Federal Regulations § 10.12). There are currently 1,093 species protected under the MBTA (Federal Register 2020). A migratory bird species is included on the list if it meets one or more of the following criteria: 1) it occurs in the U.S. or U.S. territories as the result of natural biological or ecological processes and is currently, or was previously listed as, a species or part of a family protected by one of the four international treaties or their amendments; 2) revised taxonomy results in it being newly split from a species that was previously on the list, and the new species occurs in the U.S. or U.S. territories as the result of natural biological or ecological processes; and 3) new evidence exists for its natural occurrence in the U.S. or U.S. territories resulting from natural distributional changes and the species occurs in a protected family (USFWS 2020).

On October 5, 2021, the USDOJ issued Director's Order Number 225 with the purpose of stating that the USFWS interprets the MBTA to prohibit incidental take of migratory birds and will enforce the statute accordingly. This order confirms the USFWS has reestablished its longstanding policy and practice of enforcing the MBTA pursuant to its interpretation of the MBTA as prohibiting the incidental take of birds federally protected on the List of Migratory Birds (USDOJ 2021). The USFWS recognizes a wide range of activities may result in incidental take of migratory birds. The USFWS will focus enforcement efforts on specific types of activities that both foreseeably cause incidental take and where the proponent fails to implement known beneficial practices to avoid or minimize incidental take (USDOJ 2021).

The DOE will employ mitigation measures to ensure compliance with the MBTA. Such mitigation measures may include conducting clearing activities outside the nesting and brood rearing periods for migratory birds potentially in a project area, or, if seasonal timing windows cannot be adopted, conducting pre-construction surveys in advance of clearing to identify the presence/absence of breeding birds. If active nests are located, coordination with the USFWS is recommended to develop further mitigation measures, such as establishing buffers around nests until the young fledge, relocating nests off-right-of-way, or monitoring nest activity and delaying vegetation clearing until the young fledge. Implementing mitigation measures will demonstrate good-faith efforts to adhere to the MBTA regulations and reduce the potential for violations if an inadvertent "take" does occur in conjunction with construction.

Bald and Golden Eagle Protection Act

The BGEPA of 1940 (16 USC §§ 668-668d, 54 Stat. 250 and as amended) protects the bald eagle and golden eagle and is administered by the USFWS (16 USC §§ 1801-1884 and 668-668c). The BGEPA makes it unlawful to, without a permit, "take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import... any bald eagle... or any golden eagle, alive or dead, or any part, nest, or egg thereof" (16 USC § 668(a)). "Take" is defined as: "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, or molest or disturb." "Disturb" is defined as: "to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available (1) injury to an eagle, (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior".

The DOE will employ mitigation measures to ensure compliance with the BGEPA. Such mitigation measures may include conducting clearing activities outside the nesting and brood rearing periods, or, if seasonal timing windows cannot be adopted, conducting pre-construction surveys to identify and inventory stick nests in the vicinity of the Project that are potentially constructed by raptors or corvids and protected under the BGEPA. If active nests are located, coordination with the USFWS is recommended to develop further mitigation measures, such as establishing buffers around nests until the young fledge, relocating nests off-right-of-way, or monitoring nest activity and delaying vegetation clearing until the young fledge. If Project construction is anticipated to occur during the migratory bird nesting season (March through August), any nesting activity will be monitored by on-site environmental inspectors to ensure the Project does not result in the "take" of migratory bird species. Implementing mitigation measures will demonstrate good-faith efforts to adhere to the BGEPA regulations and reduce the potential for violations if an inadvertent "take" does occur in conjunction with construction.

5. IMPACT ASSESSMENT SUMMARY

5.1. Vegetation

Based on desktop and field investigations, the Project right-of-way will cross a total of approximately 168 acres of land, including 112 acres in the Temporary ROW and 56 acres in the Permanent ROW. Within the 56 acres of Permanent ROW, project construction and operation impacts will be limited to pole placements, averaging every 800 feet. Impacts from each pole placement averages 400 square feet.

5.2. Special Status Species

Based on the analysis in Section 4, DOE has determined that the project would comply with Section 7 of the ESA, would not require NMDGF clearance or concurrence for the take of any state-listed T&E animal species, and would not require New Mexico EMNRD concurrence or clearance for the take of any state-listed plant species.

Summary of findings:

- The project will have **"No Effect"** on all six federally listed species that have potential to occur in the project area (Table 4-1), as their specific range or baseline habitat requirements do not occur within or adjacent to the Project area.
- Of the 20 New Mexico State-Listed species with the potential to occur in the Project area, 18 have no potential impacts to species (potential Project impacts denoted as **"none"** in Table 4-2), as their specific range or baseline habitat requirements do not occur within or adjacent to the Project area; the two (2) remaining species are characterized as having **"low"** potential to be affected by the Project.
- The project activities are found to be consistent with the SFNF Forest Plan for the eight FS SCC species that may occur or have suitable habitat within the project area.
- The project will **"have no impact"** on the 18 BLM Sensitive Species and the two potential sensitive species that may occur or have habitat present within and adjacent to the project area, as the species preferred habitat exists adjacent to the project area.

5.3. MBTA and BGEPA Compliance

The project route will span the Rio Grande River, which provides suitable habitat for eagles. Additionally, there have been recent reports of Golden Eagle nests in the project vicinity.

Implementation of mitigation measures will minimize the potential of an incidental "take" of migratory birds or bald and golden eagles. If construction is anticipated to occur during migratory bird nesting season (March through August), nesting activity will be monitored to ensure there will be no affirmative and purposeful actions, such as hunting and poaching that reduce migratory birds, their nests, or their eggs by killing or capturing, to human control.

Additional mitigation measures:

- Maintain compliance with the MBTA by restricting vegetation removal during the peak bird-breeding season (April 1 through the end of September). If construction activities occur during this period, biological monitors will conduct nest checks to ensure that no nesting birds are present.
- Use transmission structures and conductors that are designed to minimize risk of injury or electrocution to nesting, roosting, or flying birds.
- Install collision-deterrence devices (wire markings) on conductor that crosses the Rio Grande.
- Install the portion of the transmission line that crosses the Rio Grande outside the timeframe of November through December and February through March to avoid the highest migration periods of sandhill cranes (*Grus canadensis*) and other migratory waterfowl along the Rio Grande.

6. REFERENCES

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Appendix A: IPaC – Information for Planning and Consultation



United States Department of the Interior

FISH AND WILDLIFE SERVICE
New Mexico Ecological Services Field Office
2105 Osuna Road NE
Albuquerque, NM 87113-1001
Phone: (505) 346-2525 Fax: (505) 346-2542



In Reply Refer To:

October 04, 2023

Project Code: 2024-0001465

Project Name: Los Alamos National Laboratory Electrical Power Capacity Upgrade Project

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

Thank you for your recent request for information on federally listed species and important wildlife habitats that may occur in your project area. The U.S. Fish and Wildlife Service (Service) has responsibility for certain species of New Mexico wildlife under the Endangered Species Act (ESA) of 1973 as amended (16 USC 1531 et seq.), the Migratory Bird Treaty Act as amended (16 USC 701-715), and the Bald and Golden Eagle Protection Act as amended (16 USC 668-669(c)). We are providing the following guidance to assist you in determining which federally imperiled species may or may not occur within your project area, and to recommend some conservation measures that can be included in your project design.

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the ESA of 1973, as amended (16 U.S.C. 1531 et seq.).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the ESA, the accuracy of this species list should be verified after 90 days. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the IPaC system by completing the same process used to receive the enclosed list.

The purpose of the ESA is to provide a means whereby threatened and endangered species and

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the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the ESA and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (NEPA; 42 USC 4332(2) (c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at <https://www.fws.gov/sites/default/files/documents/endangered-species-consultation-handbook.pdf>.

Candidate Species and Other Sensitive Species

A list of candidate and other sensitive species in your area is also attached. Candidate species and other sensitive species are species that have no legal protection under the ESA, although we recommend that candidate and other sensitive species be included in your surveys and considered for planning purposes. The Service monitors the status of these species. If significant declines occur, these species could potentially be listed. Therefore, actions that may contribute to their decline should be avoided.

Lists of sensitive species including State-listed endangered and threatened species are compiled by New Mexico State agencies. These lists, along with species information, can be found at the following websites.

Biota Information System of New Mexico (BISON-M): www.bison-m.org

New Mexico State Forestry. The New Mexico Endangered Plant Program:
<https://www.emnrd.nm.gov/std/rare-plants/>

New Mexico Rare Plant Technical Council, New Mexico Rare Plants: nmcareplants.unm.edu

Natural Heritage New Mexico, online species database: nhnm.unm.edu

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WETLANDS AND FLOODPLAINS

Under Executive Orders 11988 and 11990, Federal agencies are required to minimize the destruction, loss, or degradation of wetlands and floodplains, and preserve and enhance their natural and beneficial values. These habitats should be conserved through avoidance, or mitigated to ensure that there would be no net loss of wetlands function and value.

We encourage you to use the National Wetland Inventory (NWI) maps in conjunction with ground-truthing to identify wetlands occurring in your project area. The Service's NWI program website, www.fws.gov/wetlands/Data/Mapper.html, integrates digital map data with other resource information. We also recommend you contact the U.S. Army Corps of Engineers for permitting requirements under section 404 of the Clean Water Act if your proposed action could impact floodplains or wetlands.

MIGRATORY BIRDS

In addition to responsibilities to protect threatened and endangered species under the ESA, there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the Service (50 CFR 10.12 and 16 USC 668(a)). For more information regarding these Acts, see <https://www.fws.gov/program/migratory-bird-permit/what-we-do>.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a Federal nexus) or a Bird/Eagle Conservation Plan (when there is no Federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures, see <https://www.fws.gov/library/collections/threats-birds>. We also recommend review of the Birds of Conservation Concern list (<https://www.fws.gov/media/birds-conservation-concern-2021>) to fully evaluate the effects to the birds at your site. This list identifies migratory and non-migratory bird species (beyond those already designated as federally threatened or endangered) that represent top conservation priorities for the Service, and are potentially threatened by disturbance, habitat impacts, or other project development activities.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 thereby provides additional protection for both migratory birds and migratory bird habitat. Please visit <https://www.fws.gov/partner/council-conservation-migratory-birds> for information regarding the implementation of Executive Order 13186.

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We suggest you contact the New Mexico Department of Game and Fish, and the New Mexico Energy, Minerals, and Natural Resources Department, Forestry Division for information regarding State protected and at-risk species fish, wildlife, and plants.

For further consultation with the Service we recommend submitting inquiries or assessments electronically to our incoming email box at nmesfo@fws.gov, where it will be more promptly routed to the appropriate biologist for review.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New Mexico Ecological Services Field Office
2105 Osuna Road Ne
Albuquerque, NM 87113-1001
(505) 346-2525

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PROJECT SUMMARY

Project Code: 2024-0001465

Project Name: Los Alamos National Laboratory Electrical Power Capacity Upgrade Project

Project Type: Transmission Line - New Constr - Above Ground

Project Description: The United States Department of Energy (DOE), National Nuclear Security Administration (NNSA) proposes to upgrade the electrical power supply system for Los Alamos National Laboratory (LANL). The Proposed Action would be constructing an approximately 16.8 mile-long, 3-phase, overhead 115-kV electric power transmission line.

Project Location:

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@35.77038695,-106.2094084,14z>



Counties: Los Alamos and Santa Fe counties, New Mexico

10/04/2023

ENDANGERED SPECIES ACT SPECIES

There is a total of 6 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Mexican Wolf <i>Canis lupus baileyi</i> Population: Wherever found, except where listed as an experimental population No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/3916	Endangered

BIRDS

NAME	STATUS
Mexican Spotted Owl <i>Strix occidentalis lucida</i> There is final critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6196	Threatened
Southwestern Willow Flycatcher <i>Empidonax traillii eximius</i> There is final critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6749	Endangered
Yellow-billed Cuckoo <i>Coccyzus americanus</i> Population: Western U.S. DPS There is final critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3911	Threatened

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FISHES

NAME	STATUS
Rio Grande Cutthroat Trout <i>Oncorhynchus clarkii virginalis</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/920	Candidate

INSECTS

NAME	STATUS
Monarch Butterfly <i>Danaus plexippus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

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10/04/2023

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IPAC USER CONTACT INFORMATION

Agency: Department of Energy
Name: Kim Hould
Address: Bikini Atoll Rd
City: Los Alamos
State: NM
Zip: 87545
Email: kimhould@gmail.com
Phone: 5208209233

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Appendix B: Mitigation Measures and Best Management Practices

Vegetation

- Use existing roadways, whenever possible, to access project area.
- Minimize the disturbance to vegetation to the extent practicable.
- Ensure that biological monitors are onsite during construction activities to flag sensitive species for avoidance.
- Cut trees and leave existing root systems intact to help prevent erosion.
- Dead or downed trees will remain in place or returned to place after construction.
- Return temporarily disturbed areas to their original, pre-construction contours and conduct site restoration and revegetation measures before or at the beginning of the first growing season following construction.
- Revegetate disturbed areas with grasses, forbs, and shrubs to ensure appropriate vegetation coverage and soil stabilization according to 36 CFR 251.
- Conduct post-construction site-restoration monitoring.
- Identify noxious weed infestation areas before construction for avoidance (as practicable) and implement measures to minimize noxious weed spread (USDA 2018).

Wildlife

- Maintain compliance with the MBTA by restricting vegetation removal during the peak bird-breeding season (April 1 through September 1). If construction activities occur during this period, biological monitors will conduct nest checks to ensure that no nesting birds are present.
- Use transmission structures and conductors that are designed to minimize risk of injury or electrocution to nesting, roosting, or flying birds.
- Install collision-deterrence devices (wire markings) on conductor that crosses the Rio Grande.
- Install the portion of the transmission line that crosses the Rio Grande outside the timeframe of November through December and February through March to avoid the highest migration periods of sandhill cranes (*Grus canadensis*) and other migratory waterfowl along the Rio Grande.
- The portion of the project located within the LANL boundary is subject to the requirements identified in the LANL Habitat Management Plan. Follow these requirements, including limiting the following: noise production during Mexican spotted owl breeding and nesting season, unnecessary vegetation removal, tree size and amount of vegetation removed in sensitive species habitat, and amount of light production in sensitive species habitat.
- Maintain clean work sites and implement good housekeeping practices.

Appendix F Visual Impact Analysis

A Cumulative Visual Impact Analysis for the Electrical Capacity Upgrade Project on Lands Managed by the United States Forest Service

LA-UR-23-31828
October 2023



Prepared for: Los Alamos Field Office
National Nuclear Security Administration
United State Department of Energy

Prepared by: Kelsey M. Reese, PhD
Environmental Stewardship Group
Environmental Protection and Compliance
Triad National Securities, LLC.



A Cumulative Visual Impact Analysis for the Electrical Capacity Upgrade Project

Introduction

The Electrical Power Capacity Upgrade (EPCU) is a project designed and funded by the Department of Energy to increase the “capacity, capability, reliability, and resiliency” (LANL 2022) of the available electric power to Los Alamos National Laboratory (LANL). The resulting electrical infrastructure will provide LANL with a 115 kV transmission system to meet the needs of mission operations as directed by the Department of Energy (DOE) and National Nuclear Security Administration (NNSA).

The National Environmental Protection Act requires the Department of Energy to assess the potential environmental impacts of constructing a permanent powerline across the Bureau of Land Management (BLM), United States Forest Service (USFS), and DOE managed lands resulting from the EPCU Project (Figure 1)—and present those finding in an Environmental Assessment (EA). While the EA presents a multitude of analyses and assessments, the following document presents an analysis independent of the broader EA and describes a novel approach to quantifying visual impacts centered on the northern half of the USFS Caja del Rio management unit.

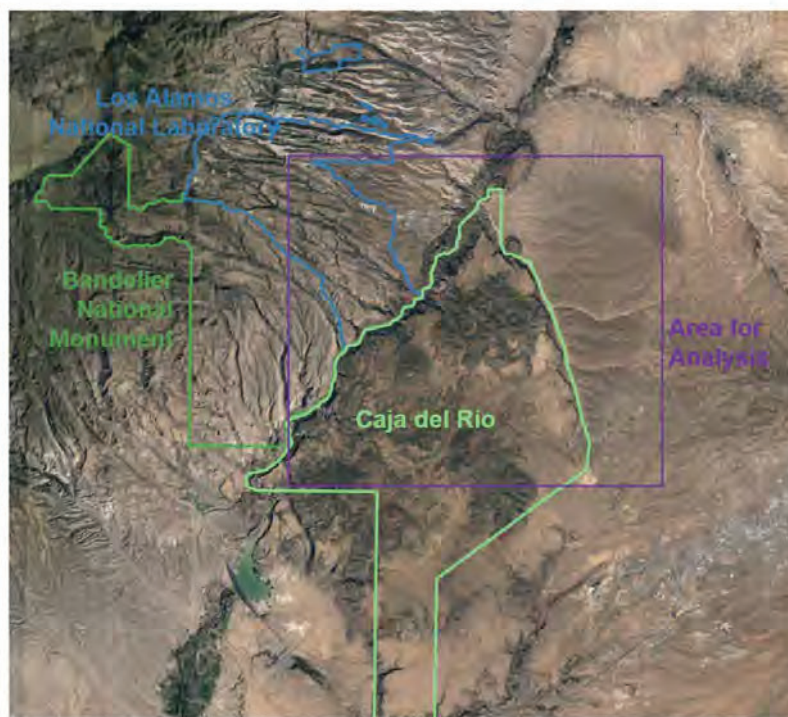


Figure 1. Area of analysis presented in current study, showing land management boundaries for the US Forest Service and US Department of Energy.

A Cumulative Visual Impact Analysis for the Electrical Capacity Upgrade Project

The document will define impacts and the geographic scope of the analysis, present the existing impacts of the constructed landscape within the project area, assess how landscapes in the project area are currently used, describe a predictive model for visual impacts from the proposed powerline route, and quantify the visual impact the EPCU project will have within the USFS management area.

The analysis is performed within QGIS 3.22.16 software environment using the Visibility Analysis Plug-in Version 1.8 across a 1-meter resolution lidar-derived digital terrain model (DTM). Lidar point cloud data used to create the DTM was downloaded from the United States Geologic Survey (USGS) TNM Viewer 2.0 (<https://apps.nationalmap.gov/downloader/>), processed, and merged in R (Roussel and Auty 2023; Roussel et al. 2020) into a single raster file for the extent of the study area (Figure 2).

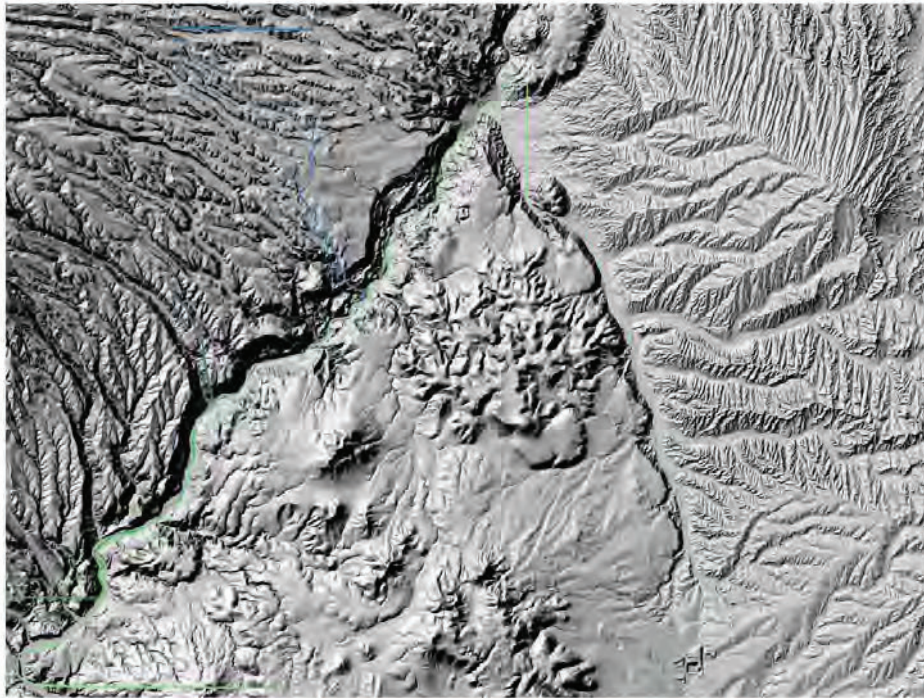


Figure 2. A 1-meter resolution lidar-derived digital terrain model of the area for analysis, focusing on the northern management extent of the USFS Caja del Río.

The Visibility Analysis Plug-in provides the framework to perform a “cumulative viewshed analysis” that iteratively assesses intervisibility between user-defined viewpoints and each cell within the DTM. The plug-in creates an output raster with the total number of user-defined

A Cumulative Visual Impact Analysis for the Electrical Capacity Upgrade Project

viewpoints visible to each cell, creating a spatialized assessment of visual impacts across the totality of a landscape.

The cumulative viewshed analysis offers a comprehensive understanding of visual impacts on a landscape-wide scale, allowing for an assessment of changes to viewsheds from anywhere within the study area at once. The cumulative viewshed analysis was chosen to remove the need to presume Key Observations Points (KOPs) from which a landscape is thought to be experienced (Palmer 2019). By performing a cumulative analysis, every 1 x 1 m cell within the study area is treated as a KOP, and impacts to every KOP can be observed simultaneously. The exact parameters and results for each iteration of the cumulative viewshed analysis are provided in the following sections.

Defining impacts and scope

The proposed powerline route assessed in the current document—the Proposed Transmission Line - Alternative 2—is one of six total routes explored during planning periods of the EPCU Project, and is currently the only route actively being assessed for development. The Area of Potential Effects (APE) for the following visibility impact analysis is limited to a 3-mile buffer surrounding the proposed powerline route—following the APE defined for assessing impacts to cultural resources under the National Historic Preservation Act.

Visual impacts from this NEPA-focused analysis assess changes to the individual user experience when traveling or recreating within the USFS Caja del Rio landscape. Visual impacts on the user-experience are calculated for both existing and proposed powerline routes using a cumulative viewshed analysis and assuming powerlines are located 80 feet (24.4 m) above the terrain surface, and the average viewer is approximately 5 feet 3 inches (1.6 meters) tall—a standard height used in intervisibility analyses. User-defined viewpoints used in the cumulative viewshed analysis are placed every 500 feet (152.4 meters) along existing and proposed powerline routes, and the cumulative intervisibility to all viewpoints is ultimately what is used to quantify current visual impacts, and predict future visual impacts.

Quantifying existing constructed landscapes

The USFS Caja del Rio management area has been used throughout the past century for ranching, homesteading, recreation, and camping; and pre-existing infrastructure associated with these activities include fence lines, structures associated with cattle ranching, approved roadways for motor vehicle use, unapproved informal roadways, and existing powerlines. To assess the potential visual impacts of the proposed powerline for the EPCU Project, a null model capturing visual impacts of existing powerline infrastructure in and around the USFS Caja del Rio is created.

Existing powerline locations are provided by Google in OpenStreetMap, and a shapefile of power line locations extracted from the Google dataset was downloaded

A Cumulative Visual Impact Analysis for the Electrical Capacity Upgrade Project

(<https://mygeodata.cloud/data/download/osm/power-line-path/united-states-of-america--new-mexico>) for this analysis. Locations of existing approved motor-vehicle roads were also downloaded from the USGS TNM Viewer 2.0 (<https://apps.nationalmap.gov/downloader/>) and are displayed in each of the following figures for reference. Existing powerlines are represented in this dataset with one feature in the shapefile per powerline route—or rather, only one spatial line is used to represent a powerline, even if the powerline itself has more than one cable. User-created viewpoints were placed along each spatial line every 500 feet (152.4 meters) and 80 feet (24.4 meters) above the ground surface. The viewpoints, in this case, mimic locations of existing powerlines (Figure 3).

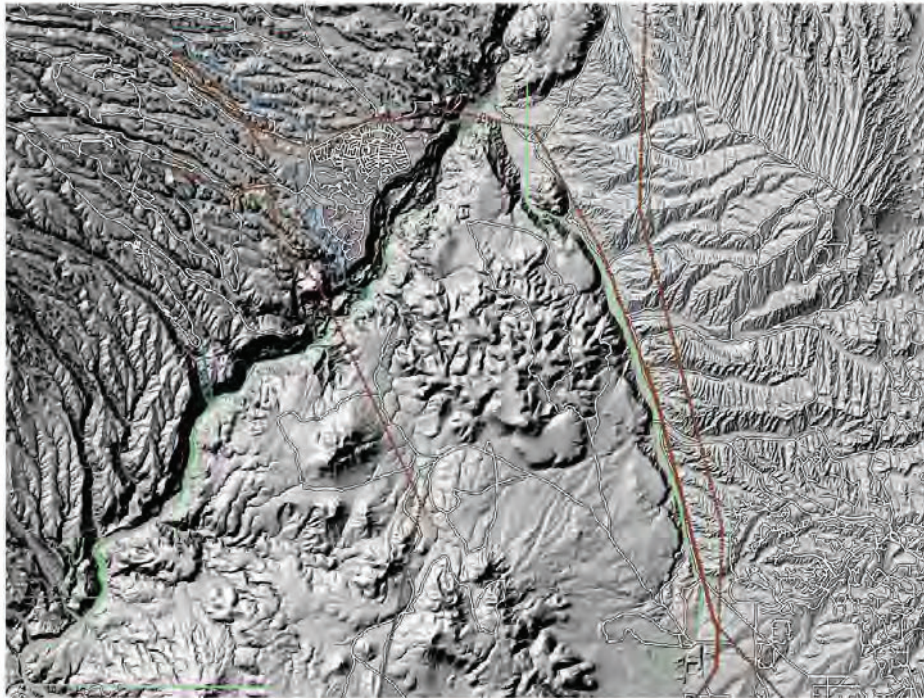


Figure 3. The USFS Caja del Rio with existing roads (white) and powerline viewpoints (brown) located every 500 feet along existing powerline infrastructure.

A cumulative viewshed analysis was then performed by calculating the total number of viewpoints visible by a 5-foot 3-inch person standing on the ground surface. Performing this analysis on a DTM, with all vegetation and buildings artificially removed, maximizes the results by assuming there is nothing on the ground surface that would inhibit intervisibility between a person and the defined viewpoints. Results provide a continuous scale of intervisibility that assess how many viewpoints are visible from a person standing on every pixel of the Caja del Rio landscape (Figure 4) from no intervisibility (no color) to very highest intervisibility (red).

A Cumulative Visual Impact Analysis for the Electrical Capacity Upgrade Project

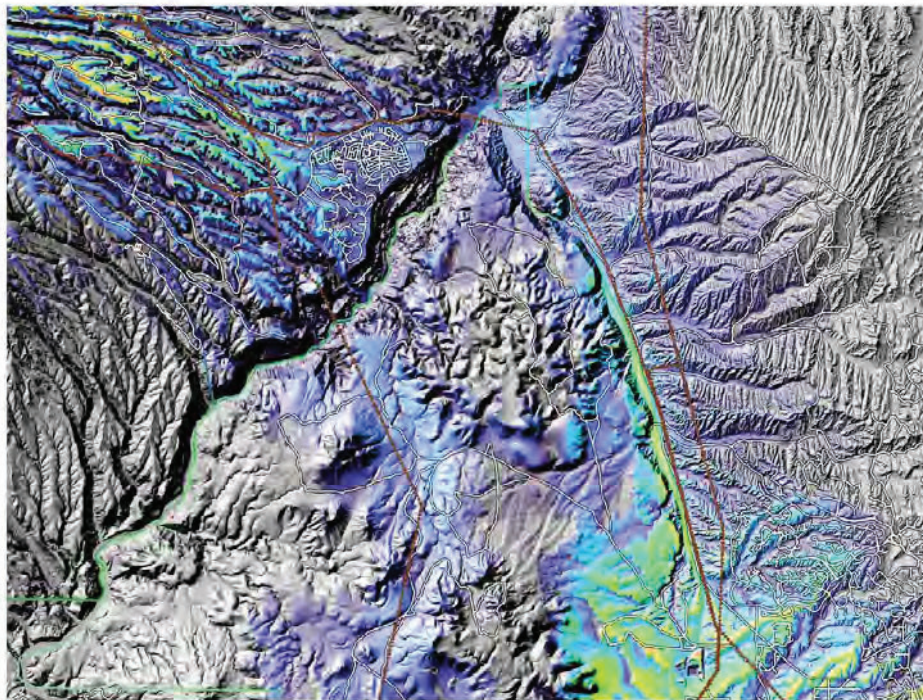


Figure 4. Cumulative viewshed analysis quantifying the visual impacts of existing powerlines in and around the USFS Caja del Rio. Intervisibility results are shown with a continuous colorscale (representing values 1–322): none (gray), very low (purple), low (blue), medium (yellow), high (orange), and very high (red).

Assessing land use in existing spaces

Assessing existing user-experience is traditionally implemented in visual impact analyses by defining Key Observation Points (Palmer 2019) that reflect where people are experiencing views within a particular management area. The advantage of a cumulative viewshed analysis is the ability to effectively make all areas on a landscape a Key Observation Point that can be assessed for impact.

The landscape, however, is not necessarily being used in its entirety. To understand the degree of existing visual impacts on the user experience, the Strava Global Heatmap (<https://www.strava.com/heatmap>) was used to identify where people are actively using the USFS Caja del Rio. The Strava Global Heatmap is an aggregated dataset that compiles and anonymizes GPS data from cell phones with the Strava application installed. The Strava application is typically used to track workout activity, but the location data is continuously pulled from 95 million users worldwide, and location data from the previous 13 months is

A Cumulative Visual Impact Analysis for the Electrical Capacity Upgrade Project

aggregated and made public by Strava (<https://www.strava.com/heatmap>). Using aggregated location data from millions of users over the previous year, we can isolate areas within the USFS Caja del Rio management unit that are routinely used by the public (Figure 5); which helps guide our understanding of how the landscape is actually being experienced, and quantify visual impacts of existing powerline infrastructure in a meaningful way.

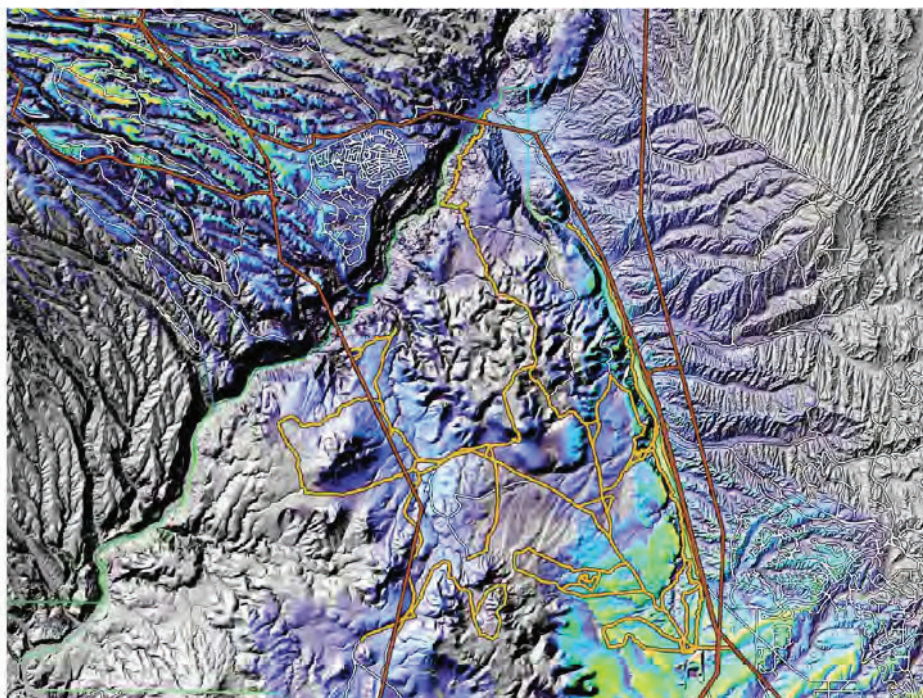


Figure 5. The cumulative viewshed analysis (gradient, purple [1] to red [322]) of existing powerlines (brown) with Strava Global Heatmap data representing user locations (goldenrod).

Overlaying the Strava Global Heatmap data onto the results of the cumulative viewshed analysis can illustrate the intersection of existing powerline infrastructure, landscape use, and the degree of visual impacts on the user experience.

To further understand the impacts of existing powerline infrastructure on the user experience, the Strava location data is used to extract the cumulative viewshed values in each pixel across the landscape to isolate areas that are actively being used *and* are visually impacted by existing powerline infrastructure. A density analysis, weighted by the cumulative viewshed values, is then used to show which locations across the USFS Caja del Rio are both regularly used and have an existing visual impact (Figure 6).

A Cumulative Visual Impact Analysis for the Electrical Capacity Upgrade Project

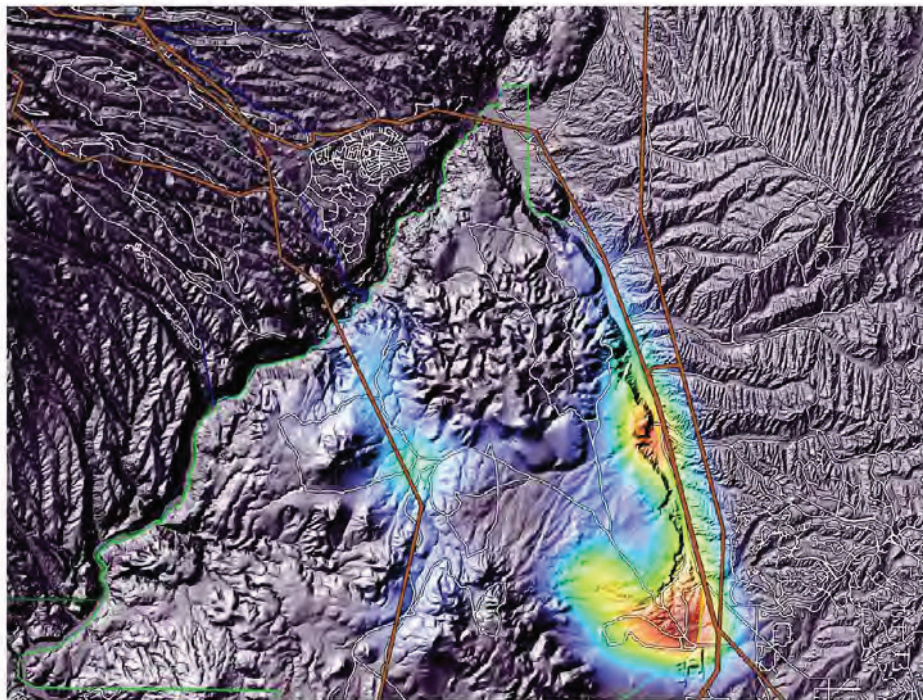


Figure 6. A density analysis of Strava locations weighted by results from the cumulative viewshed analysis. Intensity of visual impacts are displayed from lowest (purple) to highest (red).

Results from the density analysis reveal that visual impacts of powerline infrastructure in the existing landscape regularly intersect with the areas across the USFS Caja del Rio that are regularly experienced by most users. The greatest impacts shown in Figure 6 are concentrated around the USFS Headquarters location (red gradient to the southeast), the Dead Dog Trailhead (red gradient to the east), and near Tank Thirty-One (greenish-yellow gradient to the west).

Figure 5 and Figure 6 are ultimately two means of displaying the same information from the null model for this analysis—these figures display a baseline of pre-existing visual impacts within the USFS Caja del Rio management unit from which the significance of predicted future visual impacts can be measured.

Predicting future visual impacts

The same analyses used to quantify visual impacts from existing powerline infrastructure can be used to predict future impacts resulting from the EPCU Project. The route currently considered for development—Proposed Transmission Line - Alternative 2—is shown as viewpoints in Figure 7. The viewpoints are again placed every 500 feet (152.4 meters) and at a height of 80

A Cumulative Visual Impact Analysis for the Electrical Capacity Upgrade Project

feet (24.4 m) above the ground surface, and a cumulative viewshed analysis is run considering *only* the visual impacts from the proposed powerline route. The results from the cumulative viewshed analysis for the proposed route are shown in Figure 7.

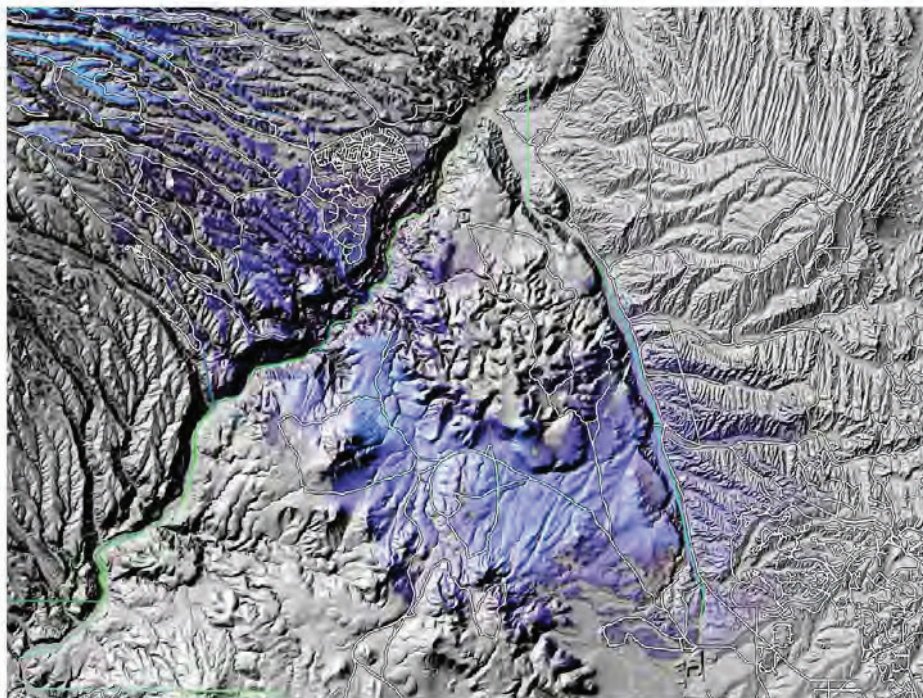


Figure 7. Cumulative viewshed analysis quantifying the visual impacts of the EPCU Project proposed powerline in and around the USFS Caja del Rio. Intervisibility results are shown with a continuous colorscale: none (grayscale), very low (purple), low (blue) medium (yellow), high (orange), and very high (red). The gradient shown here is on the same scale as Figure 4, making the results displayed here directly comparable to the existing cumulative viewshed analysis. The maximum value within the USFS Caja del Rio management unit is 81 (of a possible 322).

Results from the cumulative viewshed analysis show areas on the landscape that will be intervisible with the proposed powerline route, and therefore have some degree of visual impact on the user experience, but our interpretive value can be further refined by limiting our analysis to the Strava location data. Figure 8 presents a heatmap that combines Strava location data with the results of the cumulative viewshed analysis to highlight where users will be most visually impacted by construction of the proposed powerline route.

A Cumulative Visual Impact Analysis for the Electrical Capacity Upgrade Project

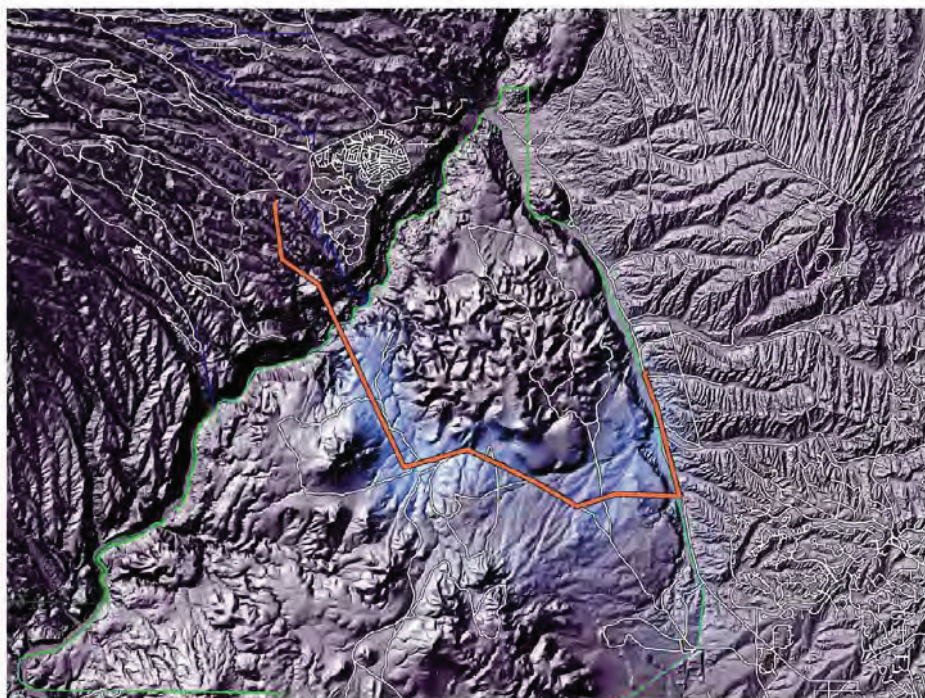


Figure 8. A density analysis of Strava locations weighted by results from the cumulative viewshed analysis. Intensity of visual impacts are displayed from lowest (purple) to highest (red) on the same colorscale as shown in Figure 6.

Measuring significance of visual impacts

Predicted visual impacts on the user-experience resulting from construction of the proposed powerline route in the USFS Caja del Rio landscape ultimately exist at the intersection of areas regularly utilized by the public that could not already see an existing powerline.

The cumulative viewshed results from existing powerlines (the null model) are used to mask the results from the cumulative viewshed of the proposed powerline to reveal areas on the landscape that will be able to see a powerline after construction of the EPCU Project that could not previously see a powerline. Figure 9 shows all areas on the landscape that will have new intervisibility with a powerline, where one could not previously be seen.

A Cumulative Visual Impact Analysis for the Electrical Capacity Upgrade Project

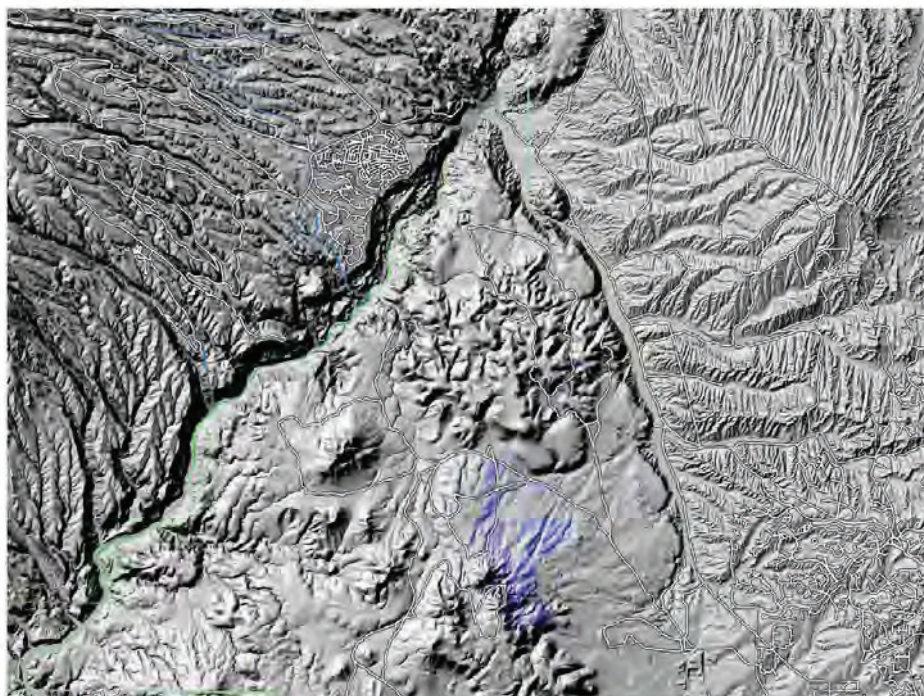


Figure 9. Absolute difference in cumulative viewshed analysis results between the null model (Figure 4) and predicted model (Figure 7). Intervisibility results are shown with a continuous colorscale: none (grayscale), very low (purple), low (blue), medium (yellow), high (orange), and very high (red). The gradient shown here is on the same scale as Figure 4 and Figure 7, making the results displayed here directly comparable to the other cumulative viewshed analyses. The maximum value within the USFS Caja del Rio management unit is 51 (of a possible 322).

Combining results from the difference model shown in Figure 9 with the Strava data provides an opportunity to quantify the exact extent of visual impacts from the proposed powerline route on the typical user-experience within the USFS Caja del Rio management unit.

Figure 10 shows the areas within the absolute difference viewshed that are also regularly experienced by the average user of the USFS Caja del Rio landscape. The proposed powerline route will have a visual impact on a total 4.6 miles of the 90.4 miles (5.1%) of routes regularly used within the project area. All other areas regularly used for recreation can either already see an existing powerline, or will still not be able to see a powerline after the EPCU Project is completed.

A Cumulative Visual Impact Analysis for the Electrical Capacity Upgrade Project

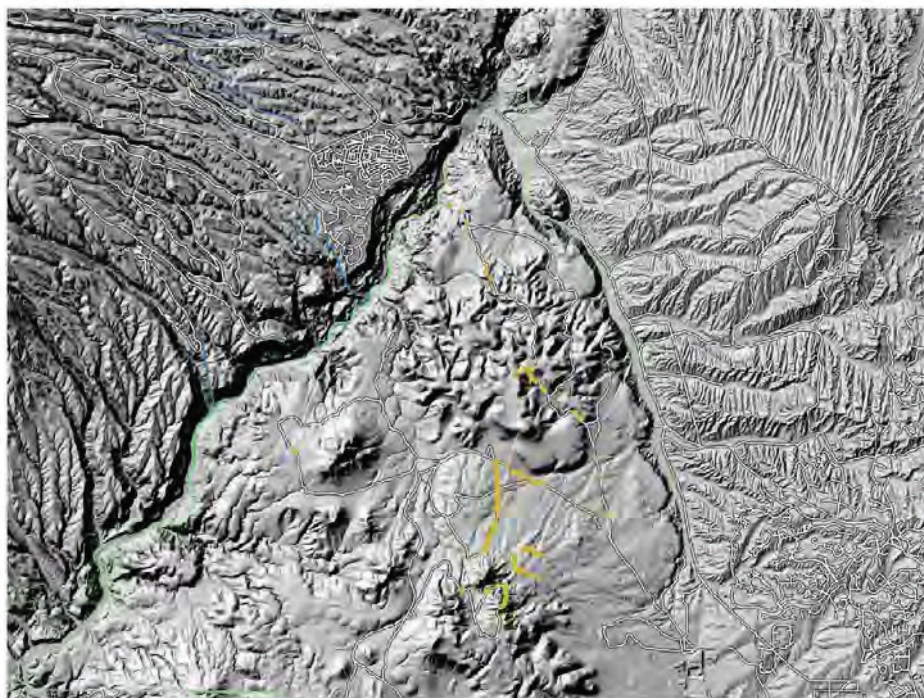


Figure 10. Strava areas (goldenrod) that overlap with the absolute difference cumulative viewshed model. The points are not colorized, but the maximum visual impact value is 42 (of a possible 322).

Areas where the user experience will be impacted from the new powerline can also be interpreted from a forest management perspective using the publicly available USGS Desired Scenic Integrity Levels

(https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd1053965.zip). The proposed powerline route will not result in new visual impacts to areas with desired Very High, Low, or Very Low scenic integrity (Figure 11). Of the areas that will be impacted, 21.3% are located within areas with High desired scenic integrity (totaling 0.98 miles), and 78.7% are in areas with a desired Medium scenic integrity (totaling 3.62 miles).

A Cumulative Visual Impact Analysis for the Electrical Capacity Upgrade Project

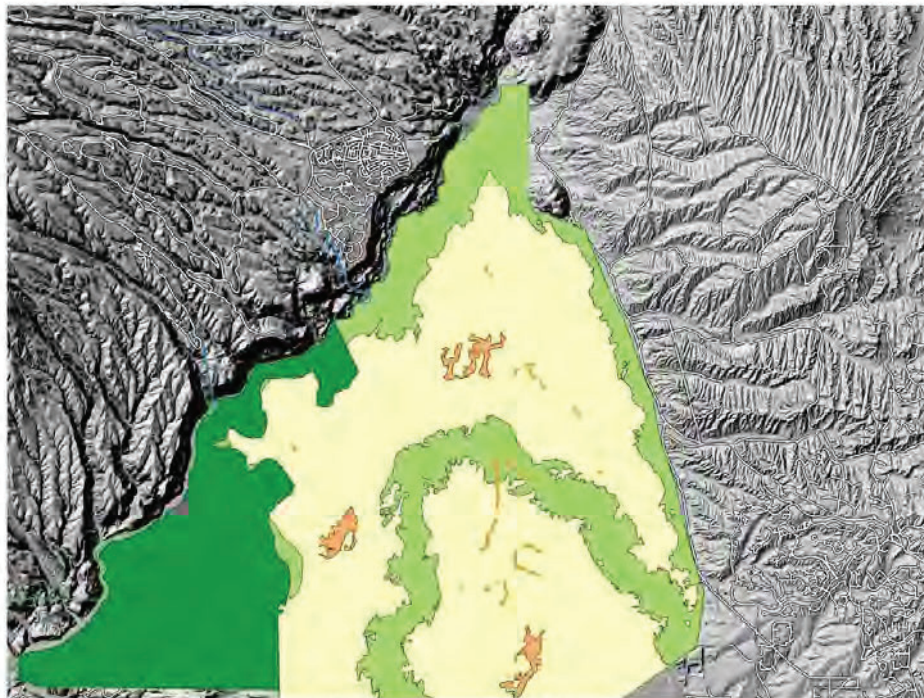


Figure 11. The USGS Desired Scenic Integrity levels for the Caja del Rio management unit. Locations that intersect with predicted visual impacts affecting the user-experience are shown as points (goldenrod). Very High (dark green) and Low (orange) levels are not affected. Areas with desired High (light green) and Medium (yellow) scenic integrity will be impacted for a total 0.98 and 3.62 miles, respectively.

Conclusions

The proposed powerline route for the EPCU Project is integral to supporting continuing operations at Los Alamos National Laboratory under the direction of the Department of Energy and National Nuclear Security Administration. The Visual Impacts Analysis presented here is meant to quantify the impact of constructing this powerline across the USFS Caja del Rio management unit and effectively measure the significance of predicted impacts.

Results from the cumulative viewshed analyses, described above, in conjunction with locational data from regular users of the Caja del Rio landscape suggest an overall visual impact to 5.1% of roads and/or trails within three miles of the proposed powerline route—1.1% of which is located in areas with High desired scenic integrity, and 4.0% is located in areas with Medium desired scenic integrity.

A Cumulative Visual Impact Analysis for the Electrical Capacity Upgrade Project

References Cited

LANL

2022 Electrical Power Capacity Upgrade Project: Project Overview. Los Alamos National Laboratory <https://environment.lanl.gov/epcu/>, accessed July, 2023.

Palmer, James F.

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Roussel, Jean-Romain, David Auty, Nicolas C. Coops, Piotr Tompalski, Tristan R.H. Goodbody, Andrew Sanchez Meador, Jean-Francois Bourdon, Florian de Boissieu, and Alexis Achim

2020 lidR: An R package for analysis of Airborne Laser Scanning (ALS) data. *Remote Sensing of Environment* 251(112061):1-15.

Appendix G Visual Contrast Rating Worksheet

Form 8400-4 (June 2018)	UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF LAND MANAGEMENT VISUAL CONTRAST RATING WORKSHEET	Date: 05/26/2021 District Office: Field Office: Taos Field Office Land Use Planning Area:
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SECTION A. PROJECT INFORMATION		
1. Project Name Electrical Power Capacity Upgrade Project	4. KOP Location (T.R.S) (Lat, Long)	5. Location Sketch See attached
2. Key Observation Point (KOP) Name Diablo Canyon Return		
3. VRM Class at Project Location Class II		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION			
FORM	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
	Undulating, gentle, horizontal, diagonal. Roadway and utility corridor.	Grassy plains and forests. Prior disturbance and degraded vegetation.	Overhead transmission lines, underground utility infrastructure, fencing. No structures associated with long term o
LINE	Horizontal, banded	Weak, horizontal, banded, diffuse	Horizontal
COLOR	Tans to dark browns	Light browns and greens to dark greens, mottled	Dark brown, some blues and yellows, metallic
TEXTURE	Fine to medium, uneven and random	Medium density, even/random regularity	Fine

SECTION C. PROPOSED ACTIVITY DESCRIPTION			
FORM	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
	Horizontal additions from transmission line structures	Liner forms created by clearing	Transmission line structures and temporary access corridors
LINE	Horizontal lines and vertical structures	Lines created from temporary access corridors and potential vegetation clearing under transmission line	Horizontal and vertical
COLOR	Light brown	Neutral	Brown and grey
TEXTURE	Fine and smooth	Fine	Fine

SECTION D. CONTRAST RATING SHORT TERM <input checked="" type="checkbox"/> LONG TERM																
1. DEGREE OF CONTRAST		FEATURES												2. Does project design meet visual resource management objectives? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) 3. Additional mitigating measures recommended <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No (Explain on reverse side)		
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)						
		STRONG	MODERATE	WEAK	NONE	STRONG	MODERATE	WEAK	NONE	STRONG	MODERATE	WEAK	NONE			
ELEMENTS	FORM			<input checked="" type="checkbox"/>						<input checked="" type="checkbox"/>					<input checked="" type="checkbox"/>	
	LINE		<input checked="" type="checkbox"/>							<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>				
	COLOR			<input checked="" type="checkbox"/>						<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>			
	TEXTURE			<input checked="" type="checkbox"/>						<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>			
(Continued on Page 2)														Date: 05/26/2021		

(Form 8400-4)

Bureau of Land Management Visual Impact Contrast Worksheet

SECTION D. (Continued)

Comments from item 2.

The proposed transmission line, including the structures and temporary construction corridors, are likely to retain the existing character of the landscape because it will not dominate the view of a casual user. It will not attract longer term attention and is consistent with the color, form, line, and pattern/textures of the existing transmission lines in the area. The proposed transmission line is consistent with the VRM Class II and cultural values for associated with the El Camino Real de Tierra Adentro National Historic Trail.

Additional Mitigating Measures (See item 3)

The proposed transmission line structure will be minimized to avoid unnecessary points of potential contrast to the viewshed. Efforts will be taken to restore disturbed areas following the completion of the transmission line construction.

(Form 8400-4, Page 2)

Appendix H Forest Service Inventoried Roadless Area Analysis

Affected Environment

Inventoried Roadless Areas (IRAs) are defined as undeveloped areas that typically exceed 5,000 acres. IRAs are governed by the 2001 Roadless Conservation Rule (36 CFR 294). IRAs are large, unfragmented, and undeveloped tracts of land (USDA 2022). IRAs provide relatively undisturbed habitats for wildlife and have ecosystem functions to provide for clean water, soil, and air; opportunities for dispersed outdoor recreation; and locations for study and research. IRAs are characterized by nine values or features:

- High-quality or undisturbed soil, water, and air;
- Sources of public drinking water;
- Diversity of plant and animal communities;
- Habitat for threatened, endangered, proposed, candidate, and sensitive species and for those species dependent on large, undisturbed areas of land;
- Primitive, semiprimitive nonmotorized, and semiprimitive motorized classes of dispersed recreation;
- Reference landscapes;
- Natural-appearing landscapes with high scenic quality;
- Traditional cultural properties and sacred sites;
- Other locally identified unique characteristics.

The project area includes two IRAs located on SFNF-managed lands. The Arroyo Montoso is located between the northern edge of the Caja del Rio Plateau and the Rio Grande (Figure H-1). The Arroyo Montoso is approximately 6,267 acres and consists of deep canyons. Approximately 2,290 feet of the proposed transmission line would cross over the Arroyo Montoso IRA at the existing Reeves Line crossing. There are no IRAs on DOE/NNSA or BLM portions of the project. The proposed S/N Transmission Line Utility Corridor Management Area would run perpendicular to the existing IRA. The proposed plan components for the utility corridor management area would apply for the portion of the utility corridor that would intersect the existing IRA.

A second IRA is the Caja IRA, present on the Caja del Rio Plateau; however, it is not adjacent to nor will it be impacted by the proposed project. The majority of the Arroyo Montoso IRA adjacent to the proposed project is also a part of the White Rock Canyon Recommended Wilderness Area. This area is being analyzed for this project under the White Rock Canyon Recommended Wilderness Area Analysis in Section 3.16 of this Environmental Assessment.

The nine values and features of the Arroyo Montoso IRA are summarized in Table H-1.

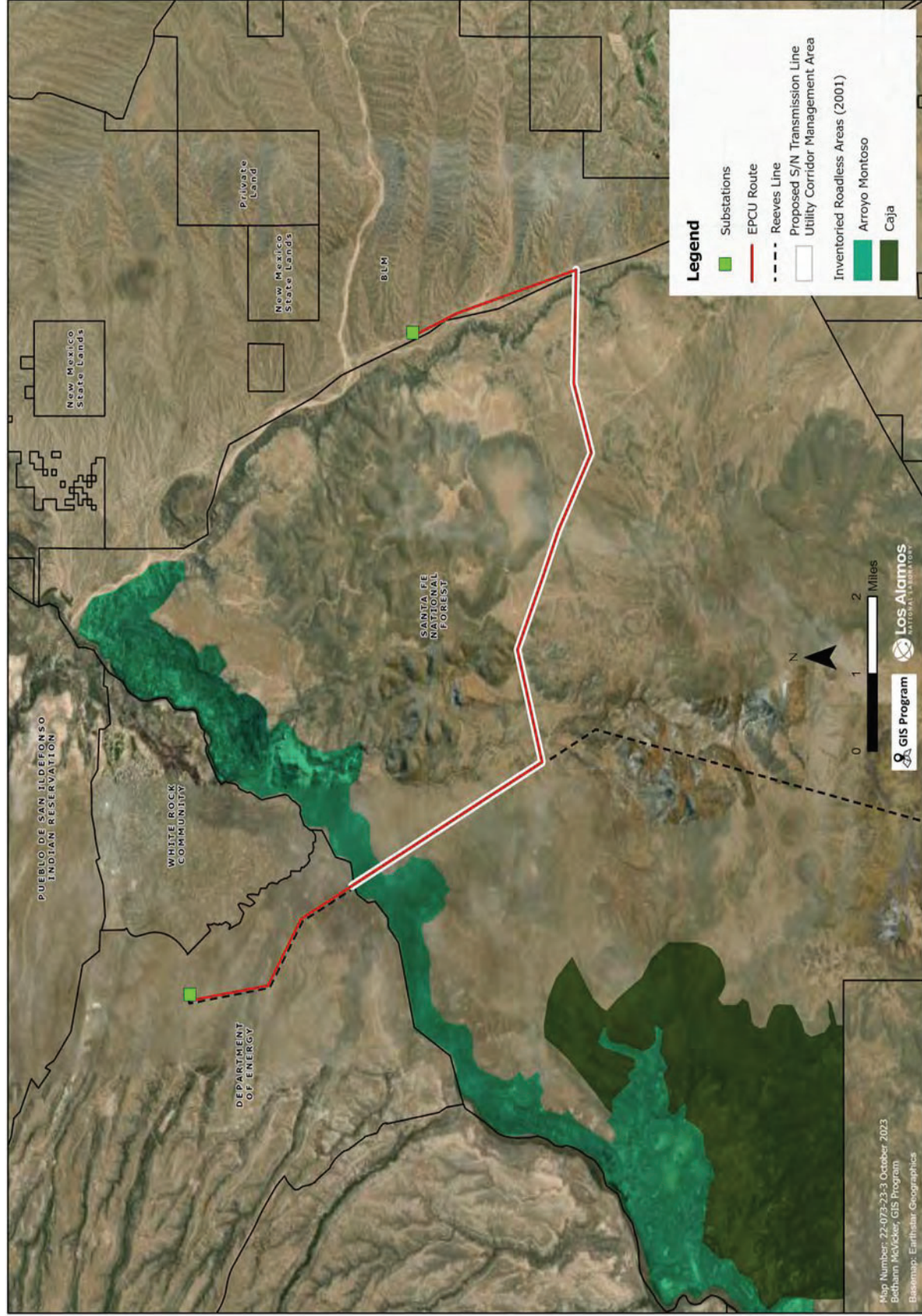


Figure H-1. IRA location in relation proposed alternative.

Table H-1. Characteristics of the Arroyo Montoso IRA

Value and Feature	Characteristic
High-Quality or Undisturbed Soil, Water, and Air	Undisturbed soils within this IRA are rated as severe ^a for potential soil erosion (NRCS 2021). The condition of the local watershed, Water Canyon-Rio Grande, is classified as impaired function. ^b No Class I ^c areas are managed for high air quality within the IRA or project boundary.
Source of Public Drinking Water	Based on the New Mexico Water Data from the NM Office of the State Engineer, no Points of Diversion ^d occur within the IRA (New Mexico 2021).
Diverse Plant and Animal Communities	The IRA is dominated by oneseed juniper (<i>Juniperus monosperma</i>) and sagebrush (<i>Artemisia spp.</i>). These woodland types are often encountered on steep/rocky slopes and are common on steep, colluvial slopes of escarpments with >15% slope (USDA 1997). These woodlands provide a variety of wildlife habitat; however, few species are obligate and can be found in adjacent ecosystems (USDA 1995). Whether an animal is present or absent or a permanent, summer, or winter resident depends on the species and geographic location. Obligatory bird species that may occur include the scrub jay (<i>Aphelocoma coerulescens</i>) and some bat species. Wetlands and riparian habitat types occur along the Rio Grande.
Habitat for Listed Species	Migratory bird species may occur within the IRA, including bald eagle, Bendire's thrasher (<i>Toxostoma bendirei</i>), black-chinned sparrow (<i>Spizella atrogularis</i>), Cassin's finch (<i>Haemorhous cassinii</i>), evening grosbeak (<i>Hesperiphona vespertina</i>), Grace's warbler (<i>Setophaga graciae</i>), lesser yellowlegs (<i>Tringa flavipes</i>), Lewis's woodpecker (<i>Melanerpes lewis</i>), long-eared owl (<i>Asio otus</i>), olive-sided flycatcher (<i>Contopus cooperi</i>), pinyon jay, and Virginia's warbler (<i>Leiothlypis virginiae</i>).
Primitive, Semiprimitive nonmotorized, and Semiprimitive motorized classes of dispersed recreation	The IRA is available for primitive, semiprimitive nonmotorized, ^e and semiprimitive motorized use.
Reference Landscape ^f	The current Forest Plan does not identify any reference landscapes within the SFNF; however, the IRA may represent desired conditions for ecosystem composition, structure, and processes in future planning efforts.
Natural-Appearing Landscape with High Scenic Quality	The IRA is included within the Caja del Rio Wildlife and Cultural Interpretive Management Area, which is managed a scenic integrity objective of high. However, for the portion of the proposed utility corridor that intersects the Caja del Rio wildlife and cultural interpretive management area, the scenic integrity objective would be low.
Traditional Cultural Properties and Sacred Sites	Cultural resources evaluation for this project included all areas that had a physical ground disturbance or temporary staging area component, including all areas to the end of plateau (where the Reeves Line is located) overlooking the Rio Grande. A literature review (Class I) and pedestrian (Class III) archaeological survey identified no known Traditional Cultural Properties or Traditional Cultural Landscapes within this area that are identified as properties under the National Historic Preservation Act of 1966, as amended.
Other Locally Identified Unique Characteristics	No characteristic of the IRA is anticipated to qualify as a locally identified unique characteristic.

Notes for Table H-1:

- ^a A severe potential erosion hazard indicates that significant soil erosion is expected if soil is disturbed. Any disturbance may require costly erosion-control measures (NRCS 2021).
- ^b A watershed impaired function condition indicates that the watershed exhibits low geomorphic, hydrologic, and biotic integrity relative to its natural potential condition (USDA 2011).
- ^c Class I Areas are wilderness areas and national parks that were singled out for special protection from air pollution under the Clean Air Act amendments of 1977 (Tonnessen 2000). The nearest Class I Area to the project boundary is the Bandelier Wilderness, located approximately 3 miles west.
- ^d A point of diversion is the geographic area from which water is diverted (using infrastructure) and put to beneficial use. Examples of infrastructure include groundwater wells, water storage dams, diversion dams, dugouts, and pump sites along a surface water source.
- ^e Semiprimitive nonmotorized is a designation given to an area characterized by a predominantly natural or natural-appearing environment of 2,500 or more acres. Interaction between users is low, and there is often evidence of other users. The area is managed so that minimum onsite controls and restrictions may be present but are subtle. Motorized use is not permitted. There is a moderately high probability of experiencing isolation from the sights and sounds of humans, independence, closeness with nature, tranquility, and self-reliance through the application of outdoor skills in an environment that offers challenge and risk.
- ^f Reference landscapes are defined as relatively undisturbed areas that serve as a barometer to measure of the effects of development in other parts of the landscape.

Environmental Consequences

No Action Alternative

The No Action Alternative would result in the continuance of extant conditions and characteristics. No impacts to the Arroyo Montoso IRA would occur.

Proposed Action

The proposed transmission line structures would be sited 150 feet to the east of the existing Reeves Line crossing structure and the edge of the plateau (Figure H-2). As currently identified, the Arroyo Montoso is located below the edge of the plateau, and the area is not desirable for the placement of transmission line structures. As such, it is anticipated that minimal ground-disturbing activities would occur. The IRA would be avoided to the extent possible for pole siting, although it is possible one or two poles may be situated within the IRA. To analyze any potential impacts, a 100-foot buffer is used to define a project area. Although ground-disturbing activities are not expected, the 100-foot buffer allows for the identification of resources underneath the proposed transmission line.

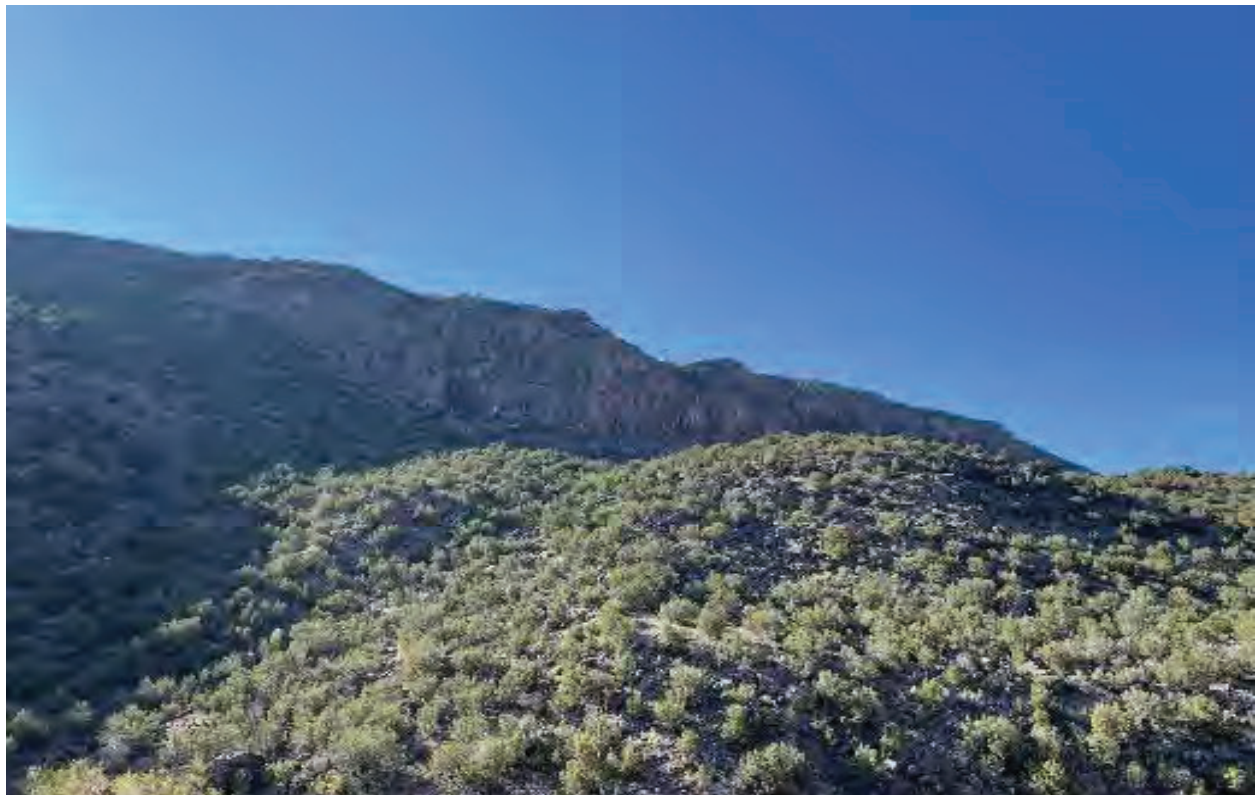


Figure H-2. Reeves Line crossing structure looking toward the NNSA side from the IRA.

High-Quality or Undisturbed Soil, Water, and Air

The existing characteristics for soil, water, and air quality would likely remain as currently constituted. The estimated 2,600 feet of the IRA that the proposed transmission line would cross would be minimally disturbed. Soil disturbance would be limited to pole locations, and the likelihood of erosion caused by project activities within the IRA is extremely low. Efforts would be taken to use appropriate BMPs during the construction of the proposed crossing structures to limit any construction-related erosion and

impacting the existing soil setting. The local watershed would continue to be classified as impaired function. With the implementation of BMPs to limit stormwater runoff from entering the IRA, any potential for erosion to change the local watershed classification would also be limited. Local air quality would not be impacted with the implementation of the Proposed Action. Any emissions from construction activities would be minor and temporary and are not likely to affect the nearest Class I Area.

Sources of Public Drinking Water

There are no points of diversion for public drinking water underneath the proposed transmission line nor within the IRA boundary. Potential impacts to the Rio Grande and downstream points of diversion are limited because minimal ground disturbance would occur within the IRA as a result of the Proposed Action. The likelihood of stormwater from the construction site outside the IRA reaching the river is extremely small because of the implementation of BMPs. The existing characteristic of the IRA as contributing to sources of public drinking water would be unchanged with the implementation of the Proposed Action.

Diversity of Plant and Animal Communities and Habitat for Threatened, Endangered, Proposed Candidate, and Sensitive Species and for Those Species Dependent on Large, Undisturbed Areas of Land

The primary habitat type within the project area IRA is juniper woodlands with sagebrush and non-vegetated rock face. A variety of plant and animal species can occupy these habitat types. Overall, because minimal ground disturbance would occur within the IRA, no vegetation would be removed, and no habitat loss would occur. Wildlife species could continue to occupy habitat within the IRA.

Any impact to wildlife species would be temporary and occur only during the construction phase of the Proposed Action. During the construction phase, the conductor would be strung on the crossing structures using helicopters. Noise from this activity may startle wildlife species; however, once the noise is abated, species would likely return (Larkin 1994; Delany et al. 1999).

Overall, because of limited ground disturbance and the temporary nature of any construction-related noise in the area, the Proposed Action would not result in any long-term adverse impacts to wildlife or plant communities in the IRA.

Primitive, Semiprimitive Nonmotorized, and Semiprimitive Motorized Classes of Dispersed Recreation

The Forest Service uses the recreation opportunity spectrum (ROS) to provide a spectrum of recreation opportunities that can be enjoyed in diverse settings (USDA 1986). The project area within the IRA consists of approximately 10.5 acres of semiprimitive, nonmotorized recreation areas, in accordance with the 1986 ROS definition (USDA 1986) and as analyzed in the 2022 Forest Management Plan Final EIS (USDA 2022). The Proposed Action would not create additional access to the semiprimitive, nonmotorized areas of the IRA because minimal ground-disturbing activities would occur in the IRA, and the proposed transmission line would be sited near the existing Reeves Line utility corridor. Recreational users within the IRA could notice construction activities, including the presence of workers and vehicles and noise above the escarpment.

After completion of the transmission line, familiar recreational users could notice an additional crossing structure and transmission line conductor above the IRA. It is anticipated that the additional line would not change the desired recreation experiences because the line would repeat the existing angular patterns

visible across the landscape and not contrast with the existing view of the Reeves Line. Overall, it is not anticipated that the Proposed Action would change the existing recreational characteristics of the IRA.

Reference Landscapes

Because the IRA is not identified in the Forest Plan as a reference landscape, the Proposed Action would have no effect on this characteristic of IRA. Regardless of the IRA's current status, it is anticipated that the Proposed Action would not reduce or detract from the desired conditions for ecosystem composition, structure, or processes because ground-disturbing activities are expected to be very limited within the IRA. Furthermore, the proposed transmission line would not significantly contrast with the existing transmission line, maintaining the existing visual composition of the IRA.

Natural Appearing Landscapes with High Scenic Quality

The portion of the IRA where the proposed transmission line would cross is managed for a scenic integrity objective of low. The Proposed Action would not remove any vegetation within the IRA boundary. The proposed transmission line would cross the IRA above the land surface near the existing Reeves Transmission Line, introducing a new visual element onto the landscape. The new crossing structure and conductors would produce linear contrast within the landscape; however, the line would not change the scenic integrity of the IRA. The proposed utility corridor management area would have a scenic integrity objective of low. Impacts from the new visual features would be low because the new features would be similar to the existing Reeves Line on the landscape. Any significant contrasts would be reduced with the implementation of design features as described in Appendix C. It is anticipated that the Proposed Action, with the implementation of design features, would not affect the natural-appearing landscape because it would repeat the form, line, color, and texture found in the existing landscape within the IRA.

Forest Plan Amendments

The proposed Forest Plan amendment would provide specific guidelines on scenic integrity, recreation access, and archaeological resources preservation and protection (Section 2); therefore, the amendment is not expected to result in significantly different effects on geology or soils than those likely by the Proposed Action.

Cumulative Effects

Evaluation of the cumulative effects on the IRA include assessing all past, present, and foreseeable future actions that would affect the IRA within and adjacent to the analysis area. Cumulative impacts are not expected to occur within the IRA. The project is being planned to have minimal ground disturbance within the IRA and as closely to the existing Reeves line as feasible.

Appendix I Climate, Greenhouse Gases, and Social Cost of Carbon Analysis

Affected Environment

Greenhouse gases (GHGs) include water vapor, carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O). GHGs in the earth's atmosphere contribute to regulating the temperature of the planet by trapping solar heat. When solar radiation (sunlight) reaches the earth, part is reflected back into space, and about half is absorbed by the earth's surface and then re-emitted as infrared radiation. The greenhouse effect occurs when GHGs absorb some of this emitted infrared radiation, causing the earth's surface and lower atmosphere's temperature to rise.

In January 2023, the Biden Administration CEQ published interim guidance regarding how to evaluate GHG emissions and climate change under NEPA (hereafter the 2023 GHG guidance). The interim guidance updates CEQ's 2016 GHG guidance with commitments that address climate change in EOs 13990, 14008, and 14057 and states that agencies should quantify a project's reasonably foreseeable direct and indirect GHG emissions, as well as monetize the social cost of those GHG emissions (i.e., calculate the social cost of greenhouse gas). The 2023 GHG guidance also encourages agencies to avoid and mitigate GHG emissions to the greatest extent possible.

Global GHG emissions have increased steadily since the onset of the Industrial Revolution around 250 years ago, with the rate of emissions accelerating rapidly in the 20th century. Roughly half of all CO₂ emissions from human activity have occurred in the decades since 1970. Global GHG emissions equaled approximately 48,940 million metric tons of CO₂ equivalent (CO₂e) in 2018, up from 22,341 million metric tons CO₂e in 1970 and 33,823 million metric tons CO₂e in 1990 (World Resources Institute 2022).

Within the United States (U.S.), overall anthropogenic GHG emissions in 2020 totaled approximately 5,981 million metric tons CO₂e. Annual U.S. emissions have decreased by 7.3 percent from 1990 to 2020; however, emissions decreased in 2008 and 2009 due to the economic slowdown and more recently due to the shift in power generation from coal to natural gas. Additionally, warmer winter conditions in 2016 resulted in decreased heating demand. Emissions also decreased in 2020 as a result of the economic slowdown caused by the global COVID-19 pandemic (USEPA 2022).

In 2018, New Mexico produced approximately 113.6 million metric tons of GHG emissions—an amount equal to approximately 1.8% of total U.S. GHG emissions (6,457 MMT). New Mexico's emissions are generated primarily by the oil and natural gas industry, cars and trucks, electricity production, industrial sources, and agriculture (NM 2021). New Mexico produces more than twice the national average of GHG emissions per capita. New Mexicans produce more than 50 tons per person per year, whereas the average in the U.S. is 18 tons per person per year. New Mexico's high per-capita emissions are largely the result of GHG-intensive oil and gas industry, which makes up a significant portion of the overall GHG emissions profile. CO₂ makes up 62 percent of New Mexico's emissions profile, followed by CH₄ at 35 percent. Nationally, CO₂ makes up 82 percent of the emissions profile, followed by CH₄ at 10 percent (NM 2021).

The global atmospheric CO₂ concentration in 2020 reached 412 parts per million (ppm), a level that is higher than at any point during the past 800,000 years. The annual rate of increase in atmospheric CO₂ over the past 60 years has been about 100 times faster than during any previous era in history, including the end of the last ice age 11,000–17,000 years ago when the earth underwent a natural warming period (NOAA 2022a). Like CO₂, atmospheric concentrations of other GHGs have also increased since the start

of the Industrial Revolution (pre-1750). CH₄ concentrations have increased from approximately 720 parts per billion (ppb) to around 1,896 ppb in 2021 (NOAA 2022b).

Global surface temperatures have increased by approximately 1.8 °F (1.0 °C) over the last 115 years (1901–2016), which is the warmest in the history of modern civilization (USGCRP 2017). Across the globe, 2020 and 2016 were the two warmest years on record, and the seven years leading up to 2021 were the seven warmest years on record (NASA 2021). Annual average temperature over the contiguous U.S. also increased by 1.8 °F (1.0 °C) since the beginning of the 20th century. Along with the increase in annual average temperatures across the U.S., the frequency of cold waves has decreased since the early 1900s, and the frequency of heat waves has increased since the mid-1960s. The number of high temperature records set in the past two decades far exceeds the number of low temperature records (USGCRP 2017).

The National Climate Assessment (USGCRP 2017) projects annual average temperature over the contiguous U.S. will continue to rise in the future. Increases of approximately 2.5 °F are projected for the period 2021–2050 relative to 1976–2005 in all future GHG emissions scenarios (also known as representative concentration pathways, or RCPs), and larger rises are projected by late century (2071–2100): 2.8 °F to 7.3 °F in a lower scenario (RCP4.5) and 5.8 °F to 11.9 °F in the higher scenario (RCP8.5). Extreme temperatures in the contiguous U.S. are projected to increase even more than average temperatures. The temperatures of extremely cold days and extremely warm days are both expected to increase. Cold waves are projected to become less intense, and the number of days below freezing is projected to decline. Heat waves will likely become more intense, and the number of days above 90 °F is expected to rise (USGCRP 2017).

Temperatures in New Mexico have risen more than 2 °F since the beginning of the 20th century. The number of extremely hot days and warm nights has also increased. Historically unprecedented warming is projected during this century. Across New Mexico, average temperatures and cooling degree days are projected to increase, with hotter, more frequent, and longer-lasting heat waves. Average and summer seasonal precipitation is projected to decrease, droughts are projected to intensify, and streamflow in major river basins is projected to decline. Spring thaws are projected to occur earlier, and a greater fraction of precipitation is projected to fall as rain rather than as snow, reducing mountain snowpack. The risk of wildfire and the average annual area burned is expected to increase across the region. Across the U.S. over the last 50 years, an increase has occurred in extreme weather events, including prolonged periods of excessively high temperatures, heavy downpours, more intense hurricanes and tornadoes, severe floods, and droughts. As average global temperatures have risen, extreme high temperatures have become more frequent and extreme cold temperatures less frequent. From 2001 to 2012, more than twice as many daily high temperature records were broken in the U.S. compared with low temperature records. In U.S. cities, heat waves—periods of abnormally hot weather that last days to weeks—have increased by more than 40 days since the 1960s (USGCRP 2018).

The principal contributor to power outages and their associated costs in the U.S. is extreme weather, which includes high winds, thunderstorms, hurricanes, heat waves, and intense cold periods. Potential impacts to the electric grid from extreme weather and climate change include winds, ice storms, and wildfires, which damage transmission and distribution towers/lines. Extreme heat reduces power line/transformer capacity. (Efficiency loss from heat in high-voltage lines has been estimated at 0.5–1.0 percent for every additional 1 °C of heat, and high heat can increase the failure rate of transformers.) Transformers and other elements of substations lose capacity and efficiency with higher heat and can suffer higher failure rates (taking 4 years off the average operating life for every additional degree of heat). Overloading can also knock assets offline, leading to outages. Flooding can damage substations,

transformers, and underground lines. As mentioned in EO 14057, climate-resilience infrastructure is a priority for federal agencies. The U.S. Climate Resilience Toolkit was referenced to identify hazards that could affect the Proposed Action. Specific to the ROI and important to the Proposed Action are the climate hazards of drought, wildfire, and extreme temperatures.

The National Electrical Safety Code (NESC) is the American National Standard for the safety of electric supply (power) and communication utility systems installed and maintained under qualified control by public or private utilities. The code applies to generation, transmission, and distribution of electric energy and communication signals from inception or receipt from another entity up to the service point where it is transferred to a premises wiring system (where it comes under the jurisdiction of the National Electrical Code NFPA 70 [NEC]). The NESC is adopted by state legislatures and public service commissions and is adopted in whole or part by most states in the U.S.

The Proposed Action would be constructed to NESC standards using calculation criteria as design input for extreme weather events, including wind and temperature. In addition, Section 2.4.2 of this EA identifies structural design features to increase the resilience of the Proposed Action to wildfire.

In December 2021, President Biden issued EO 14057, “Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability,” aiming to create a more robust, climate-ready economy and job force while supporting the goal of reaching net-zero emissions economy-wide by 2050. This goal is intended to align with the Paris Agreement’s mandate to limit global temperature increase to well below 2 °C and to pursue efforts to hold the rise to 1.5 °C. In April 2021, the Biden Administration committed the U.S. to reduce its emissions by 50–52 percent by 2030 compared with 2005, in line with the 2050 target. The requirements laid out by EO 14057 are meant to transform federal operations and procurement in response to the current climate crisis. The goal is to have the federal government lead by example to achieve a carbon-pollution-free electricity sector by 2035 and net-zero emissions economy-wide by no later than 2050. EO 14057 sets defined metrics that must be met by specific deadlines. The individual goals established are as follows:

- One hundred percent carbon-pollution-free electricity (CFE) by 2030, including 50 percent on a 24/7 basis:
 - Facilities will consume 100 percent carbon-pollution-free electricity on an annual basis and 50 percent carbon-pollution-free electricity on an hourly basis by FY2030.
- One hundred percent zero-emissions vehicle (ZEV) acquisitions by 2035, including 100 percent light-duty acquisitions by 2027:
 - Light-duty vehicle acquisitions must be ZEVs by FY2027. In addition, agencies must develop a strategy for obtaining a zero-emission fleet and set targets throughout the transition process.
- Net-zero emissions buildings by 2045, including a 50 percent reduction by 2032:
 - Net-zero emissions across all buildings, campuses, and installations by FY2045 and reduce greenhouse gas emissions by 50 percent by FY2032 (compared with FY2008 baseline data).
- Net-zero emissions procurement by 2050 - This goal includes policy to promote use of construction materials with lower embodied emissions (emissions from the production of a product).
 - Net-zero emissions operations by 2050, including a 65 percent reduction by 2030.
 - Climate-resilient infrastructure and operations.

LANL minimizes its direct and indirect GHG emissions under the Laboratory's environmental sustainability mission. The total emissions of carbon dioxide equivalent (CO₂e) during 2019 was approximately 261,677 metric tons, whereas indirect emissions were approximately 77,590 metric tons, totaling approximately 339,267 metric tons (LANL 2021b; LANL 2019). Reported GHG emissions from the Laboratory make up approximately 0.3 percent of the State of New Mexico's emissions and approximately 5.17×10^{-5} percent of the emissions in the U.S.

The Proposed Action of increasing line *capacity* does not necessarily mean increasing *usage*. Before achieving CFE by 2030, the average forecasted MWh above current capacity from 2027–2030 is 54,448.33, which would occur regardless of whether the Proposed Action was constructed. However, the forecasted exceedance could result in power fluctuations and disruptions without the additional line. In addition, the Proposed Action is anticipated to contribute to the EO 14057 goal of CFE by 2030 by transporting electricity that is CFE by 2030.

Environmental Consequences

No Action Alternative

Under the No Action Alternative, a new transmission line would not be built, and associated construction would not occur; therefore, the No Action Alternative would result in no impacts associated with the emissions of GHG.

Proposed Action

Construction of the proposed transmission line could cause a temporary minor increase in GHG emissions. Because construction activities use diesel fuel, heavy equipment can generate measurable amounts of GHG emissions. As previously mentioned in Table 2-2, the Install Footings construction phase may include an excavator used to dig footings. Excavators and similar equipment average between 10 and 14 gallons of diesel per hour, assuming 23,400 gallons consumed during a federal working year (i.e., adherence to 9-hour workdays), which then creates more than 240 metric tons of GHG emissions in a given year (EPA 2021). Excavators, supply trucks, boom trucks, and line trucks qualify as diesel heavy equipment, which would generate up to 2,400 metric tons of carbon dioxide equivalent (CO₂e) per year. This amount is an overestimation because equipment operates at idle or reduced power for much of the workday.

Tree growth and future carbon sequestration rates are highly variable and dependent on several factors, including the species and age of the tree, climate, forest density, and soil conditions. In the forests within northern New Mexico, the average carbon storage associated with forests is 48.7 tons per acre (Forest Service 2015). A maximum of 150 acres of vegetated area may be impacted. This amount is an overestimation because it is unlikely that the total acreage would be impacted, thereby minimizing impacts attributed to GHG emissions. Assuming that each affected acre contains an average carbon content of 48.7 tons, the net carbon footprint associated with the temporary removal of vegetation is an estimated 7,305 tons of CO₂e; however, this amount would not be a permanent loss because those areas would be reclaimed. Assuming that at least 70 percent of the corridor is successfully reclaimed, the net CO₂e (5,114 tons) is estimated to be considerably reduced. Given this projection, the impact of vegetation removal on GHG emissions would be low.

During operation and maintenance of the transmission line, it is assumed that routine patrols and structure maintenance would occur at a minimum of once per year. It is assumed that emergency maintenance would occur on average, once every 4 years, with all activities estimated to incur a 100-mile round trip. Assuming that an average passenger vehicle emits 4.04×10^{-4} tons of CO₂e per mile, the estimated GHG emissions from operation and maintenance for the 50-year life span of the transmission line would be approximately 2 metric tons of CO₂e (EPA 2021). Table I-1 provides the projected GHG emissions by project phase for comparison.

Climate, Greenhouse Gases, and Social Cost of Carbon Analysis

Table I-1. Projected Greenhouse Gas Emissions by Project Phase

Project Phase	GHG Emissions CO ₂ e (tons)
Construction	22,141.94
Operations	27,999.74
Decommissioning	2,812.02
Total	52,953.71

To provide context for this level of emissions, the EPA mandatory reporting threshold for large sources of GHG emissions is 25,000 metric tons of CO₂e emitted annually (74 Federal Register 56260). This threshold is approximately the amount of CO₂e generated by 10,690 passenger vehicles per year. The proposed transmission line would not exceed this threshold.

The overall GHG emissions at LANL are not expected to increase significantly because of either Action Alternative, which aims to increase capacity rather than demand for mission requirements, so any mission-attributed increase of emissions is not expected to be relevant to either Action Alternative. GHG emissions from the proposed LANL activities would have no significant increase as missions change with power demands. DOE/NNSA will continue to evaluate the potential impacts from GHG emissions in accordance with Executive Order 13990 and the 2023 CEQ guidance.

Cumulative Effects

Evaluation of the cumulative effects on GHG emissions includes assessing all past, present, and foreseeable future actions that would affect GHG emissions within and adjacent to the analysis area. No cumulative effects for air quality are anticipated from implementation of the Proposed Action. GHG emissions directly attributed to the construction of the proposed transmission line are not anticipated to be significant. A potential increase in GHG emissions from the additional capacity may occur; however, it is expected that any increase would be offset with additional access to renewable energy markets.

Social Cost of Greenhouse Gases

Estimates of the social cost of greenhouse gas (SC-GHG) emissions provide an aggregated monetary measure (in U.S. dollars) of the net harm to society associated with an incremental metric ton of emissions in a given year. These estimates include climate change impacts associated with net agricultural productivity, human health effects, property damage from increased risk of natural disasters, disruption of energy systems, risk of conflict, environmental migration, and the value of ecosystem services, among others. In this way, SC-GHG estimates can help the public and federal agencies understand or contextualize the potential impacts of GHG emissions and, along with information on other potential environmental impacts, can inform the comparison of alternatives. DOE used data from the Technical Support Document: Social Cost of Carbon, Methane, and Nitrous Oxide Interim Estimates under Executive Order 13990 released by the Interagency Working Group on Social Cost of Greenhouse Gases (IWG SC-GHG) in February 2021 to estimate SC-GHG for this EA. As a member of the IWG, DOE agrees that the interim SC-GHG estimates represent the most appropriate estimates of the SC-GHG until revised estimates are developed that reflect the latest, peer-reviewed science. Table I-2 summarizes the life cycle SC-GHG estimate for the Proposed Action.

Table I-2. Social Cost of Carbon - Greenhouse Gas Emissions by Project Phase

Project Phase	Social Costs of CO ₂ , CH ₄ , and N ₂ O			
	CO ₂	CH ₄	N ₂ O	CO ₂ e
Construction/Decommissioning	\$1,258,646.41	\$3,898.84	\$11,417.26	
Operations				\$1,240,440.79



Appendix J Santa Fe National Forest Plan Consistency Report

INTRODUCTION

The 2022 Santa Fe National Forest Land Management Plan (Forest Plan) implements the National Forest Management Act of 1976 (16 USC 1600). Projects carried out by the Santa Fe National Forest (SFNF) must be consistent with the Forest Plan so that, by extension, they also comply with National Forest Management Act. When a project is not consistent with the Forest Plan, the Forest Plan must be amended, or the project design must be altered.

To amend the Forest Plan, the proposed changes must be clearly listed, and the effects of the proposed changes analyzed in an environmental document, usually during the NEPA process. The Responsible Official must record their decision to amend the Plan in a Decision Notice or Record of Decision.

Purpose

The purpose of this report is to document the consistency of the proposed action with the Forest Plan. Alternative 1 (No Action) is not considered in this document because its purpose is to serve as a baseline to compare the other alternatives.

The following table lists select representative 2022 Forest Plan direction (desired conditions, standards, and guidelines) related to the project and displays how the project is consistent with the Forest Plan. In some instances, the proposed project is not consistent with the Forest Plan and must be amended. The table lists those proposed plan amendments where applicable.

Each resource area has been analyzed for the environmental effects of the proposed amendments; the Environmental Assessment discloses those analyses.

Santa Fe National Forest Plan Consistency Report

Forest Plan Section	Select Plan Direction*	Demonstrated Compliance with Proposed Project	Proposed Plan Amendment**
S/N Transmission Line Utility Management Area ¹³	<i>Creation of the S/N Transmission Line Utility Corridor Management Area</i>		Appendix A. MA-SNTUC-DC-1: The S/N Transmission Line Utility Corridor Management Area is managed for utility infrastructure that provides reliable electrical power, ensuring continuity of Los Alamos National Laboratory operations. [This amendment is necessary to meet the purpose and need for the project.]
			Appendix A. MA-SNTUC-G-1: Construction of utility infrastructure for the S/N transmission line (e.g., towers, poles) or associated above-ground facilities should blend in with the general landscape to help minimize scenery impacts (e.g., coloration of towers and poles, use of wood poles, non-glare tint on wires, aligning of infrastructure with topography). [This amendment is necessary to meet the purpose and need for the project.]
			Appendix A. MA-SNTUC-G-2: Management activities should be consistent with the scenic integrity objective of “low”. [This amendment is necessary to meet the purpose and need for the project.]
			Appendix A. MA-SNTUC-G-3: The S/N Transmission Line Utility Corridor Management Area should be managed for semiprimitive motorized recreation opportunity spectrum (ROS).

* *Italics* show proposed changes.

** **Bold text** shows proposed new language; regular text will not change. [Text in brackets explains rationale for additions and deletions].

¹³ The S/N Transmission Line Utility Corridor Management Area is a newly proposed management area.

Santa Fe National Forest Plan Consistency Report

Forest Plan Section	Select Plan Direction*	Demonstrated Compliance with Proposed Project	Proposed Plan Amendment**
Caja del Rio Wildlife and Cultural Management Area (MA) (45,527 acres)	MA-CAJA-S-1: Maximize use of existing utility line corridors for additional utility line needs. New utility corridors and communication sites will not be allowed.	2.3 Proposed Action Example text: “The line begins at the Norton Substation and continues south along the road within the existing Norton utility corridor. Once atop the plateau, the proposed transmission line will parallel Forest Service Road 24 until it reaches the existing Reeves Line. The proposed transmission line will then parallel the Reeves Line toward White Rock Canyon, cross the Rio Grande, and terminate at the LANL South Switching Station (STA).”	[This amendment is necessary to meet the purpose and need for the project.] Appendix A. MA-CAJA-S-1: Maximize use of existing utility line corridors for additional utility line needs. New utility corridors and communication sites will not be allowed except for the Los Alamos National Laboratory Electrical Power Capacity Upgrade Project, S/N transmission line. [This amendment is necessary to meet the purpose and need for the project.]
	MA-CAJA-G-1: Outside of the IRA, the designation of motorized cross-country areas and the construction of permanent or temporary roads should be avoided unless required by a valid permitted activity or for management actions that would help meet desired conditions (e.g., wildlife, ecological health, or managing cultural resources). Roads should be constructed and maintained at the lowest maintenance level needed for their intended purpose. Maintenance and reconstruction should be allowed on existing roads.	2.3 Proposed Action Example text: “Existing roads (see Figure 5) will be used for both construction and maintenance access. Existing access roads may be improved to provide safe access to allow pole placement and line spanning. Table 3 shows how the proposed action will use existing roads. Existing roads used will remain after the construction and be used along with existing rights-of-ways for maintenance access.” Figure 2-2. Table 2-1.	
White Rock Canyon Recommended Wilderness Area (RWA) (10,247 acres)	MA-RECWILD-DC1: Recommended wilderness management areas maintain the wilderness characteristics they were evaluated to possess until their designation as wilderness or other use is determined by Congress. MA-RECWILD-S-2: The following projects or activities shall not be authorized in	3.16. Recommended Wilderness Example Text: “. Project implementation would not impact any criteria that make the wilderness area eligible as such.” 3.16.2 White Rock Canyon Recommended Wilderness Area	

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	recommended wilderness management areas. c. Infrastructure related to special use permits for energy developments (e.g., wind, solar, electrical lines).	Example text: “The existing Reeves line is located outside of the eastern boundary. The proposed EPCU line would be built approximately 150 feet to the east of the Reeves line, resulting in the proposed project being further away from the boundary; however, noise from construction efforts could temporarily impact the sense of solitude.” Figure 3-9.	
	MA-RECWILD-G-1: Activities in recommended wilderness management areas should maintain or improve the wilderness characteristics until such time as Congress acts on the recommended area, either making it designated wilderness or releasing it for other management.	3.16.2 White Rock Canyon Recommended Wilderness Area Example text: “Project implementation would not impact any criteria that make the wilderness area eligible as such.” Figure 3-9.	
	MA-RECWILD-G-3: Recommended wilderness areas should be managed to preserve or enhance a very high scenic integrity objective.	3.16.2 White Rock Canyon Recommended Wilderness Area Example text: “The existing Reeves line is located outside of the eastern boundary. The proposed EPCU line would be built approximately 150 feet to the east of the Reeves line, resulting in the proposed project being further away from the boundary.” Figure 3-9.	
	MA-RECWILD-G-4: Recommended wilderness areas should be managed for primitive desired ROS classes.	3.16.2 White Rock Canyon Recommended Wilderness Area Example text: “The existing Reeves line is located outside of the eastern boundary. The proposed EPCU line would be built approximately 150 feet to the east of the Reeves line, resulting in the proposed project being further away from the	

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	MA-RECWILD-G-5: Existing structures necessary for administration of the area should be maintained, but not expanded, to protect the area's wilderness characteristics. Maintenance of existing structures should be carried out in a manner that does not expand the evidence of motor vehicle and mechanized equipment use beyond current conditions within the recommended wilderness area.	<p>boundary.” Figure 3-9.</p> <p>2.3 Proposed Action Example text: “The line begins at the Norton Substation and continues south along the road within the existing Norton utility corridor. Once atop the plateau, the proposed transmission line will parallel Forest Service Road 24 until it reaches the existing Reeves Line. The proposed transmission line will then parallel the Reeves Line toward White Rock Canyon, cross the Rio Grande, and terminate at the LANL South Switching Station (STA).” Figure 2-2.</p> <p>2.3 Proposed Action Example text: “Existing roads (see Figure 5) will be used for both construction and maintenance access. Existing access roads may be improved to provide safe access to allow pole placement and line spanning. Table 3 shows how the proposed action will use existing roads. Existing roads used will remain after the construction and be used along with existing rights-of-ways for maintenance access.”</p>	
Inventoried Roadless Area (IRA) (6,284 acres)	<p>DA-IRA-DC-3: IRAs appear natural, have high scenic quality, and provide opportunities for primitive recreation and solitude.</p> <p>DA-IRA-G-1: IRAs should be managed for primitive, semi-primitive non-motorized, and semi-primitive motorized recreation opportunity settings (ROS).</p>	<p>3.3 Inventoried Roadless Area</p> <p>3.3. Inventoried Roadless Area Example text: “The project area within the IRA consists of approximately 10.5 acres of semi-primitive, non-motorized recreation areas, in accordance with the</p>	

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		1986 ROS definition (USDA 1986) and as analyzed in the 2022 Forest Management Plan Final EIS (USDA 2022). The Proposed Action would not create additional access to the semi-primitive, non-motorized areas of the IRA because minimal ground-disturbing activities would occur in the IRA, and the proposed transmission line would be sited near the existing Reeves Line utility corridor.”	
	DA-IRA-G-2: Management activities should be consistent with the scenic integrity objective of high.		MA-LANL-G-2: Management activities should be consistent with the scenic integrity objective of high except within the S/N Transmission Line Utility Corridor Management Area [This amendment is necessary to meet the purpose and need for the project.]
National Historic Trails (NHT): Camino Real National Historic Trail (7 miles from northern extent of project area to intersection)	DA-NHT-G-1: Management activities in NHT corridors should be consistent with, or make progress toward achieving, scenic integrity objectives of high or very high within the foreground of the trail (up to 0.5 mile either side) or within the identified trail viewshed, the landscape area visible from the trail based on topography.		Appendix A. DA-NHT-G-1: Management activities in NHT corridors should be consistent with, or make progress toward achieving, scenic integrity objectives of high or very high within the foreground of the trail (up to 0.5 mile either side) or within the identical trail viewshed, the landscape area visible from the trail based on topography except within the S/N Transmission Line Utility Corridor Management Area.
Federally Recognized Tribes	FW-TRIBES-DC-1: The uniqueness and values of the Tribal cultures in the Southwest and the traditional uses important for maintaining these cultures are recognized and valued as important.	3.8 Heritage Resources Section Example Text: “Federal agencies and tribal monitors will monitor ground-disturbance activities during construction. BMPs to avoid cultural sites would be employed throughout the duration of the project.” Appendix C. Design Features, Best	

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	FW-TRIBES-DC-6: Traditional cultural properties, sacred sites, and other locations of traditional and cultural use identified as important to tribes are unimpaired.	Management Practices, and Mitigation Measures. 3.8 Heritage Resources Section Example Text: "Federal agencies and tribal monitors will monitor ground-disturbance activities during construction. BMPs to avoid cultural sites would be employed throughout the duration of the project." Appendix C. Design Features, Best Management Practices, and Mitigation Measures.	
	FW-TRIBES- G-2: Consultation with federally recognized tribes should occur at the early stages of project planning and design, to incorporate tribal perspectives, needs, and concerns, as well as traditional knowledge into project design and decisions.	4.3 Tribal Coordination Discusses detailed Tribal Coordination throughout the project.	
	FW-TRIBES-G-3: Management activities and uses should be planned and administered to prevent or minimize impacts to the physical and scenic integrity of places that the federally recognized tribes regard as sacred sites, traditional cultural properties, or part of an important cultural landscape.	4.3 Tribal Coordination Discusses detailed Tribal Coordination throughout the project.	
Rural Historic Communities	FW-RURALH-G-2: Management activities should be analyzed and mitigated to prevent or minimize the negative impacts to the physical and scenic integrity of places that rural historic communities regard as spiritually or culturally important.	3.8 Heritage Resources Section Appendix C. Design Features, Best Management Practices, and Mitigation Measures	
Cultural Resources and Archaeology	FW-ARCH-DC-1: Cultural and historic resources (including archaeological sites, historic buildings and structures, traditional cultural properties) are stable and are	3.8 Heritage Resources Section Example Text: "Federal agencies and tribal monitors will monitor ground-disturbance activities during construction.	

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	<p>maintained in a manner that does not adversely affect their integrity, including:</p> <ul style="list-style-type: none"> a. Visual and aesthetic integrity and physical association with culturally significant landscapes b. Surrounding landscapes that are resilient to natural ecological processes. c. Long-term stability with other forest uses and the absence of vandalism, looting, or other human impacts. d. Dual roles with administrative, recreational, or infrastructure facilities. 	<p>BMPs to avoid cultural sites would be employed throughout the duration of the project.”</p> <p>Appendix C. Design Features, Best Management Practices, and Mitigation Measures.</p>	
Facilities	<p>FW-FAC-G-1: New structures (e.g., buildings, campgrounds, and water systems) or other above-ground facilities should adhere to scenic integrity objectives and should not be located in areas of very high and high scenic integrity unless they are designed to blend in with the general landscape.</p>	<p>Section 2.3.2 Santa Fe National Forest Plan Amendment</p> <p>Example Text: “Construction of utility infrastructure for the Los Alamos National Laboratory Electrical Power Capacity Upgrade Project S/N transmission line (e.g., towers, poles) or associated above-ground facilities should blend in with the general landscape to help minimize scenery impacts (e.g., coloration of towers and poles, use of wood poles, non-glare tint on wires, aligning of infrastructure with topography).”</p> <p>Appendix C. Design Features, Best Management Practices, and Mitigation Measures</p>	
	<p>FW-FAC-G-2: Construction of new facilities in floodplains, wetlands, and other environmentally sensitive areas should be avoided. When this cannot be accomplished in a reasonable manner, the amount and area of disturbance should be as small as practical.</p>	<p>Section 3.5.2 Water</p> <p>Example Text: “Transmission lines would not be placed in ephemeral streams. The Proposed Action is not expected to impact local watersheds or the aquifer because of the shallow nature of disturbance relative to the depth of the water table. Standard practices or design features that would</p>	

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Northern New Mexico Traditional Communities and Uses	FW-TRIBES-G2 Consultation with federally recognized tribes should occur at the early stages of project planning and design, to incorporate tribal perspectives, needs, and concerns, as well as traditional knowledge into project design and decisions.	minimize impacts to the watershed and water quality include using existing surface disturbance, minimizing construction vehicle use, parking and staging on areas surfaced with caliche, and reclaiming any disturbed areas to quickly re-establish vegetation” 4.3 Tribal Coordination	
	FW-TRIBES-G3 Management activities and uses should be planned and administered to prevent or minimize impacts to the physical and scenic integrity of places that the federally recognized tribes regard as sacred sites traditional cultural properties, or part of an important cultural landscape.	3.8 Heritage Resources Section Example Text: “Federal agencies and tribal monitors will monitor ground-disturbance activities during construction. BMPs to avoid cultural sites would be employed throughout the duration of the project.” Appendix C. Design Features, Best Management Practices, and Mitigation Measures.	
	FW-RURALH-G2 Management activities should be analyzed and mitigated to prevent or minimize the negative impacts to the physical and scenic integrity of places that rural historic communities regard as spiritually or culturally important.	3.8 Heritage Resources Section Example Text: “Federal agencies and tribal monitors will monitor ground-disturbance activities during construction. BMPs to avoid cultural sites would be employed throughout the duration of the project.” Appendix C. Design Features, Best Management Practices, and Mitigation Measures.	
Recreation	FW-REC-DC-2: Recreation opportunities are commensurate with the desired ROS	3.9 Recreation and Trails Appendix C. Design Features, Best	

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	setting and enhance the economic, cultural, and social vitality and well-being of surrounding communities.	Management Practices, and Mitigation Measures	
	FW-REC-DC-7: Desired recreation opportunity spectrum (ROS) settings serve as the desired conditions for recreation (see Appendix A, Fig. 9-west and Fig. 9-east).	2.3.2 Santa Fe National Forest Plan Amendments Example Text: "MA-SNTUC-G-3: The S/N Transmission Line Utility Corridor Management Area should be managed for semiprimitive motorized recreation opportunity spectrum (ROS)."	
	FW-DISREC-S-2: Motorized uses are prohibited in semiprimitive-nonmotorized desired ROS settings, except for necessary administrative activities, permitted activities, and emergency access.	2.3.2 Santa Fe National Forest Plan Amendments Example Text: "MA-SNTUC-G-3: The S/N Transmission Line Utility Corridor Management Area should be managed for semiprimitive motorized recreation opportunity spectrum (ROS)."	
	FW-DISREC-S-3: In semiprimitive-nonmotorized desired ROS settings, no new permanent motorized routes or areas shall be constructed or designated. Temporary motorized routes or road construction in semiprimitive-nonmotorized settings must be rehabilitated within 2 years of project completion.	2.3.2 Santa Fe National Forest Plan Amendments Example Text: "MA-SNTUC-G-3: The S/N Transmission Line Utility Corridor Management Area should be managed for semiprimitive motorized recreation opportunity spectrum (ROS)."	
Roads	FW-ROADS-G7 Reconstruction and rehabilitation of existing roads should be emphasized over new road construction.	2.3 Proposed Action Example text: "Existing roads (see Figure 5) will be used for both construction and maintenance access. Existing access roads may be improved to provide safe access to allow pole placement and line spanning. Table 3 shows how the proposed action will use existing roads. Existing roads used will remain after the construction and be used along with existing rights-of-ways	

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Scenic Resources		for maintenance access.” Figure 2-2. Table 2-1.	
	FW-SCENIC-DC-1: The forest contains a variety of ecologically sound, resilient, and visually appealing forest landscapes that sustain scenic character in ways that contribute to visitors’ sense of place and connection with nature.	Appendix F Visual Impact Analysis	
	FW-SCENIC-DC-6: Scenic integrity objectives serve as the desired conditions for scenery (see Appendix A, Fig. 8-west and Fig. 8-east.	Section 2.3.2 Santa Fe National Forest Plan Amendments Example Text: “MA-SNTUC-G-2: Management activities should be consistent with the scenic integrity objective of “low”.	
	FW-SCENIC-G-1: Constructed features, facilities, and management activities should blend with the natural-appearing landscape. The concepts of form, line, color, texture, and pattern common to the desired scenic character being viewed should be applied during project planning and design.	Section 2.3.2 Santa Fe National Forest Plan Amendments Example Text: “Construction of utility infrastructure for the Los Alamos National Laboratory Electrical Power Capacity Upgrade Project S/N transmission line (e.g., towers, poles) or associated above-ground facilities should blend in with the general landscape to help minimize scenery impacts (e.g., coloration of towers and poles, use of wood poles, non-glare tint on wires, aligning of infrastructure with topography).”	
	FW-SCENIC-G-2: Management activities should minimize visual disturbances and be consistent with or move the area toward achieving scenic integrity objectives (as defined by the Scenic Integrity Objective map). a. In areas with very high scenic integrity	Section 2.3.2 Santa Fe National Forest Plan Amendments Example Text: “Construction of utility infrastructure for the Los Alamos National Laboratory Electrical Power Capacity Upgrade Project S/N transmission line (e.g., towers, poles) or associated above-	

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	<p>objectives, the scenic character should have only minor, if any, deviations. The areas should appear unaltered, and the majority of the area should be dominated by ecological changes.</p> <p>b. In areas with high scenic integrity objectives, the scenic character should appear intact but may include deviations that are not evident (e.g., completely repeat the scenic attributes of size, shape, form, line, color, texture, or patterns common to the scenic character).</p> <p>c. In areas with moderate scenic integrity objectives, the scenic character may appear slightly altered. Management activities, human-made structures and facilities should not dominate the scenic character (e.g., repeat the scenic attributes of size, shape, form, line, color, texture, or patterns common to the scenic character).</p> <p>d. In areas with low scenic integrity objectives, the scenic character may appear moderately altered. Management activities including human-made structures and facilities may begin to dominate the scenic character, but use scenic attributes to blend into the landscape (e.g., repeat the scenic attributes of size, shape, form, line, color, texture, or patterns common to the scenic character).</p>	<p>ground facilities should blend in with the general landscape to help minimize scenery impacts (e.g., coloration of towers and poles, use of wood poles, non-glare tint on wires, aligning of infrastructure with topography)."</p>	
	<p>FW-SCENIC-G-3: Management activities that result in short-term impacts inconsistent with the scenic integrity objectives should achieve the scenic integrity objectives over the long term. Short term and long-term timeframes should be defined during site</p>	<p>Section 2.3.2 Santa Fe National Forest Plan Amendments Example Text: "Construction of utility infrastructure for the Los Alamos National Laboratory Electrical Power Capacity Upgrade Project S/N transmission line (e.g., towers, poles) or associated above-</p>	

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	specific project planning.	ground facilities should blend in with the general landscape to help minimize scenery impacts (e.g., coloration of towers and poles, use of wood poles, non-glare tint on wires, aligning of infrastructure with topography).”	
	FW-SCENIC-G-4: Projects should include mitigation measures to address impacts to scenic resources.	Appendix C. Design Features, Best Management Practices, and Mitigation Measures	
Special Uses	FW-LANDSU-DC-1: Special use authorizations are responsive to demands for commercial or other use of NFS lands, while protecting sensitive ecological resources and maintaining multiple uses.	1.1 Background Example Text: “DOE/NNSA is seeking a special use permit (SUP) from the SFNF and a right-of-way (ROW) grant from the BLM to construct and operate a 115-kilovolt (kV) electrical transmission line from the Public Service Company of New Mexico (PNM)–owned Norton Substation to LANL and to upgrade the existing electrical infrastructure on the LANL campus to accommodate the additional transmission line proposed to be constructed across BLM- and SFNF-administered lands.”	
	FW-LANDSU-DC-5: Environmental, visual, and sound impacts of emerging technology, communication sites, utility corridors, and other authorized infrastructure are minimal as a result of coordination and co-location and are in harmony with the surrounding landscape.	Chapter 4. Consultation and Coordination Section 2.3.2 Santa Fe National Forest Plan Amendments Example Text: “Construction of utility infrastructure for the Los Alamos National Laboratory Electrical Power Capacity Upgrade Project S/N transmission line (e.g., towers, poles) or associated above-ground facilities should blend in with the general landscape to help minimize scenery impacts (e.g., coloration of towers and poles, use of wood poles, non-glare	

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Wildlife, At-Risk Species	FW-TERRASH-G-2: Infrastructure (e.g., fences and roads) should be designed, modified, or removed to minimize impacts on wildlife movement and improve habitat connectivity. If applicable within project area, refer to plan direction in 2022 SFNF LMP for At-Risk Species, including FW-ATRISK-G-1, FW-ATRISK-G-2, FW-ATRISK-G-3, FW-ATRISK-G-6, and FW-ATRISK-G-7.	tint on wires, aligning of infrastructure with topography).” 2.3 Proposed Action Appendix C. Design Features, Best Management Practices, and Mitigation Measures	
Weeds/Non-native invasive spp.	Refer to Nonnative Invasive Species section in 2022 SFNF LMP for compliance with applicable standards and guidelines.	3.7 Wildlife Appendix C. Design Features, Best Management Practices, and Mitigation Measures Appendix C. Design Features, Best Management Practices, and Mitigation Measures	