United States Department of the Interior
Bureau of Land Management
Socorro Field Office
901 S. Highway 85
Socorro, NM 87801

Environmental Assessment for

Arizona Interconnection Project Access Roads Permitting

In portions of

Catron, Socorro, Sierra, and Luna counties

NEPA Number

DOI-BLM-NM-A020-2014-0021-EA

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Signature and Title of Project Lead Date

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Signature and Title Lead of Reviewer Date

BLM

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ACEC	Areas of Critical Environmental Concern
AIP	Arizona Interconnection Project
AIRFA	American Indian Religious Freedom Act of 1978
APE	Area of Potential Effect
APLIC	Avian Power Line Interaction Committee
Applicant or EPE	El Paso Electric Company
ARMS	Archaeological Records Management Section
AZGFD	Arizona Game and Fish Department
BGEPA	Bald and Golden Eagle Protection Act
BISON-M	Biota Information System of New Mexico
BLM	Bureau of Land Management
CCC	Civilian Conservation Corps
CDNST	Continental Divide National Scenic Trail
CFR	Code of Federal Regulations
CP	Continental Divide Trail Plan
DO	District Office
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
EPE	El Paso Electric Company (applicant)
EPG	Environmental Planning Group
ERMA	Extensive Recreation Management Area
ESA	Endangered Species Act of 1973
FLPMA	Federal Land Policy Act of 1976
FO	Field Office
FSS	Forest Service Sensitive Species
GIS	Geographic Information System
GLO	Government Land Office
Gold Book	Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development
HCPO	Hopi Cultural Preservation Office
HPTP	Historic Properties Treatment Plan
Ibid	in the same place
IPaC	USFWS Information, Planning, and Conservation System
IRA	Inventoried Roadless Area
KOP	Key Observation Point
Kf	Soil Erodibility Factor - free of rock fragments (fine-earth)
kV	kilovolt
Kw	Soil Erodibility Factor - with rock fragments (whole soil)
LWC	Lands with Wilderness Character
MBTA	Migratory Bird Treaty Act
MIS	Management Indicator Species
MOA	Memorandum of Agreement

MOU	Memorandum of Understanding
MW	megawatt
MWEPA	Mexican Wolf Experimental Population Area
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NEP	Nonessential Experimental Population
NEPA	National Environmental Policy Act of 1969
NERC	North American Electric Reliability Corporation
NFSR	National Forest System Road
NHD	National Hydrography Dataset
NHPA	National Historic Preservation Act of 1966
NMBGMR	New Mexico Bureau of Geology & Mineral Resources
NMCRIS	New Mexico Cultural Resources Information System
NMDGF	New Mexico Department of Game and Fish
NMMNHS	New Mexico Museum of Natural History and Science
NMOS	New Mexico Ornithological Society
NMRPTC	New Mexico Rare Plant Technical Council
NMSLO	New Mexico State Land Office
NM SR	New Mexico State Route
NNHPD-TCP	Navajo Nation Historic Preservation Department-Traditional Cultural Program
NRC	National Research Council
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NTP	Notice-to-Proceed
OHV	Off-Highway Vehicle
OSHA	Occupational Safety and Health Administration
PFYC	Potential Fossil Yield Classification
PJD	Preliminary Jurisdictional Delineation
PM	Particulate Matter
POD	Plan of Development
Project	Arizona Interconnection Project Access Roads Permitting
RFFA	Reasonably Foreseeable Future Action
RMP	Resource Management Plan
ROW	Right of Way
SMA	Special Management Area
SR	State Route
SRMA	Special Area Management Area
SSURGO	Soil Survey Geographic Database
SVP	Society of Vertebrate Paleontology
TEP	Tucson Electric Power
TMP	Travel Management Plan
USDA	United States Department of Agriculture
Forest Service	U.S. Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

VMS	Visual Management System
VQO	Visual Quality Objective
VRI	Visual Resources Inventory
VRM	Visual Resource Management
WEG	Wind Erodibility Groups
WSA	Wilderness Study Area
WRCC	Western Regional Climate Control
WUI	Wildland-Urban Interface

CHAPTER 1. INTRODUCTION

The El Paso Electric Company (EPE, Applicant) is applying for amendments to right-of-way grants NMNM 057058 and NMNM 77514 with the Bureau of Land Management (BLM) and reissue of the Special Use Permit QRS4071 with the United States Forest Service for access to and along the existing Arizona Interconnection Project (AIP) 345-kilovolt (kV) transmission line to facilitate long term maintenance and operation of transmission line facilities. The AIP transmission line contains 1163 transmission structures and extends 213 miles from a tie-in point just east of the Luna Substation near Deming, New Mexico, to the Red Hill tie-in point 12 miles east of the Springerville Switchyard near Springerville, Arizona (Figure 1-1). EPE received right-of-way grants NMNM 057058 (southern half) and NMNM 77514 (northern half), on September 16, 1988, and October 11, 1988, respectively, from the BLM, and a Special Use Permit on September 21, 1988 (superseded on February 06, 1991), from the United States Forest Service (Forest Service). The AIP transmission line was constructed shortly afterward. The right-of-way grants and special use permit authorized the temporary use of public lands to construct temporary access roads and storage yards that were utilized for access during the two-year period of construction for the AIP transmission line. Temporary access roads to and along the right-of-way, as well as to most structures, were cleared and built to facilitate construction of the transmission line. Upon completion of construction activities, these roads were rehabilitated.

1.1. Background

The original need for the construction of the AIP transmission line was proposed in the Arizona Interconnection Project Proposed Plan Amendment and Final Environmental Impact Statement (EIS) (BLM 1987), and established with the Record of Decision and issuance of the right-of-way grants (BLM 1988a, 1988b; Forest Service 1988). The need for the operation and maintenance of the AIP transmission line remains as stated in its Final EIS (BLM 1987). The AIP transmission line is a component of EPE's regional transmission system, and provides critical redundancy and system connections. Without the specific redundant circuit that the AIP transmission line provides, the regional transmission system would be at risk of extended periods of outages and service disruptions affecting southern New Mexico.

Additionally, as part of an interconnected electrical system in the Texas, New Mexico, and Arizona region, the AIP transmission line allows EPE to provide adequate supplies of reliable and economical electricity to all customers. Without the operation of the AIP transmission line, EPE's options for accessing economical energy markets would be limited. Furthermore, the interconnected regional transmission system relies on the capacity of the AIP transmission line to transport firm power, which assists EPE in meeting regionally forecasted energy needs.

The Records of Decision for the Final EIS and Plan Amendments (BLM 1988, Forest Service 1988); the Plan of Development, Luna to Harlosa (EPE 1988a); and the AIP Construction, Operations and Maintenance Plan, Harlosa to Springerville (EPE 1988b) concluded that EPE would not need permanent access roads constructed for ongoing maintenance and operation of the transmission line. To protect sensitive environmental resources during the construction of the AIP transmission line, the original plan of development identified access/transportation measures required for access development during construction. Helicopter access was to be used in areas where the natural terrain precluded the use of conventional construction equipment. Two additional environmental assessments (EA) were conducted that documented alternative access methods to construct (1) the northern portion of the AIP Transmission line (Harlosa to Springerville), and (2) the southern portion (Luna to Harlosa). Both EAs resulted in a Finding of No Significant Impact. Consequently, right-of-way grants for the AIP transmission line were issued by the BLM and a Special Use Permit was issued by the Forest Service in the fall of 1988.

Each year all transmission line components are routinely inspected for integrity, and necessary maintenance activities are identified. Maintenance of transmission line components is scheduled based on the need, severity, and requirements to perform the maintenance activity. EPE recognizes that inspections along the AIP transmission line will likely continue to yield increasing frequencies of maintenance activities as the transmission line ages.

Both wood and steel structures require routine maintenance to provide continuous and reliable performance of the transmission line. Routine maintenance increases the longevity of individual components of the transmission line by allowing regular inspection and adjustment of structural fittings and metal fasteners. Routine maintenance also provides opportunities for inspection and replacement of aging hardware, such as insulators and cross arms that could affect transmission line performance or overall transmission structure integrity. Where maintenance needs are identified, they are addressed either by using bucket trucks or by linemen that climb individual structures. Maintenance vehicles provide ground support supplying operational tools and necessary safety measures. All of these maintenance activities require access to work areas around the base of the structures, and access for maintenance and ground support vehicles is often hindered by terrain, topography, and vegetation.

Under the current grant conditions, EPE consults with either or both of the Forest Service and BLM each time maintenance needs arise. EPE submits a request to the appropriate agency and provides a specific plan of action. The federal agency then circulates the proposed action for review by resource specialists who identify potentially affected resources. Requests are most frequently for improvement of access conditions, including vegetation clearing and grading, to allow the necessary vehicles safe access to the right-of-way and structures to conduct requisite maintenance. Depending on the intensity of a proposed action, EPE is generally required to provide specific localized information for biological, cultural, or other sensitive resources in advance of any ground disturbing activity. The extent of access improvement or potential ground disturbance is based on site-specific field conditions and the type of equipment necessary to conduct a particular activity.

To evaluate each maintenance access request individually is cost and time prohibitive. In many cases, EPE has short windows of opportunity to conduct this work, and the necessary environmental review process could delay needed maintenance activities. This method of review is inefficient from a time and cost perspective for both EPE and the federal agencies. Permitting access routes for the AIP transmission line would provide agency and EPE staff the necessary planning information regarding known environmental resource constraints, and would allow EPE more timely access to conduct necessary maintenance to comply with regulatory standards and ensure the safe and reliable delivery of service. It is for these reasons that EPE is requesting this right-of-way amendment.

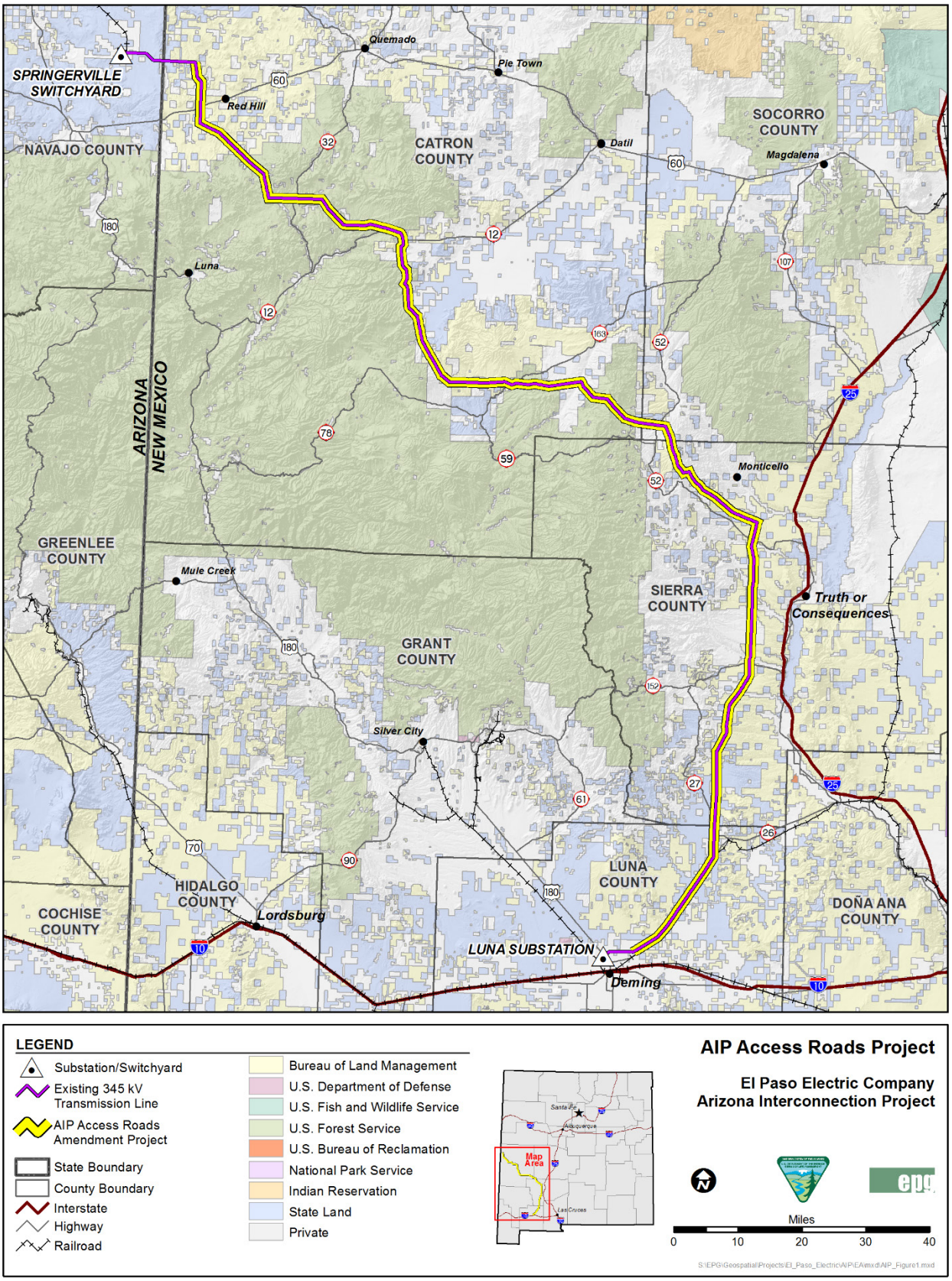

Figure 1-1. AIP Overview

1.2. Purpose and Need

The BLM's purpose is to respond to the Applicant's request for an amended right-of-way grant for the AIP transmission line for access necessary for its continued operation and maintenance. The need for the BLM's Proposed Action arises from the Federal Land Policy and Management Act of 1976 (FLPMA), which establishes a multiple-use mandate for management of federal lands, including energy generation and transmission facilities, as outlined in Title V of the FLPMA. The BLM's action in considering the Applicant's right-of-way application is provided under the authority of the Secretary of the Interior (BLM) to "grant, issue, or renew rights-of-way for generation, transmission, and distribution of electric energy" (43 Code of Federal Regulations [CFR] 2800).

Pursuant to 43 CFR 2801.2, it is the BLM's objective to grant rights-of-way and to control right-of-way use on public lands in a manner that: (a) protects the natural resources associated with public lands and adjacent lands, whether private or administered by a government entity; (b) prevents unnecessary or undue degradation to public lands; (c) promotes the use of rights-of-way in common, considering engineering and technological compatibility, national security, and land use plans; and (d) coordinates, to the fullest extent possible, all BLM actions under the regulations, in part with state and local governments, interested individuals, and appropriate quasi-public entities. The purpose and need is used to formulate a reasonable range of alternatives to be considered in this EA.

1.3. Applicant's Objective

EPE's objective for the proposed Arizona Interconnection Project Access Roads Permitting (Project) is to establish permanent access roads to facilitate operation and maintenance activities of the AIP transmission line. EPE is a regulated utility and must meet reliability and safety standards established by the Federal Energy Regulatory Commission, the North American Electric Reliability Corporation (NERC), and the National Electric Safety Code. Permanent access to the AIP transmission line is essential for EPE to conduct operational repair and maintenance activities to ensure compliance with these regulatory standards.

By permitting access, EPE's objective is to minimize the time and cost for both the Company and regulatory agencies associated with individual access requests. The permitting of access routes and work locations at each structure includes full environmental analysis in advance of access needs, allowing for better avoidance and minimization of adverse impact to resources while not delaying critical maintenance activities. This project will minimize the inefficiencies associated with the process of evaluating and permitting access requests on a case by case basis. The proposed project will reduce the potential for unforeseen resource impacts caused during emergency situations. EPE intends to only improve access routes and work areas as operations and maintenance activities warrant. In some cases, these may be emergency situations that do not allow for advance consultation. The proposed Project will assure EPE and the federal land management agencies that potential impacts have been analyzed and addressed in advance of both routine and emergency maintenance.

The access requested in the proposed Project is intended to serve EPE's future needs for both routine and emergency operation and maintenance activities for the AIP transmission facility.

1.4. Decisions to Be Made

1.4.1. Bureau of Land Management

The BLM Socorro Field Office (FO) is the lead agency for this EA, and the FO Manager is the deciding official for the Project. If the analysis demonstrates no significant impacts, the responsible official would then issue a Decision Record and Finding of No Significant Impact. The decision to be made is whether to approve an amended right-of-way grant for the construction, operation, and maintenance of the proposed access routes, and clearing of structure work areas on BLM land. The deciding official can:

- select the No Action alternative,
- select the Proposed Action with mitigation measures as necessary, or
- apply monitoring requirements, if necessary.

If the decision is made to approve an amended right-of-way grant, then improvements could begin upon issuance of a Notice to Proceed. Operation and maintenance activities, which would include improvement of access roads, would continue through the duration of operation of the AIP transmission facilities.

1.4.2. United States Forest Service

As an affected federal land management agency, the Gila National Forest must issue a separate Decision Notice and Finding of No Significant Impact. The decision to be made is whether to approve an application for a special use permit for the construction, operation, and maintenance of the proposed access routes, and clearing of structure work areas on Forest Service land, and renew the special use permit for the transmission line. As the deciding official for the Forest Service, the Forest Supervisor can:

- select the No Action alternative,
- select the Proposed Action with mitigation measures as necessary, or
- apply monitoring requirements, if necessary.

The National Forest System Roads (Forest Roads) identified as needed for access within this environmental assessment have been designated and authorized under the Travel Management Record of Decision (Sept. 2013). The proposed use of the roads is consistent with that decision and the associated Final Environmental Impact Statement. Any use of Forest Roads will require authorization to conduct light maintenance activities.

1.5. Plan Conformance

The proposed Project crosses land managed by the BLM, Forest Service, and New Mexico State Land Office (NMSLO), or privately owned land; and is located in Catron, Sierra, Socorro, and Luna counties in New Mexico. The permitting conforms to all relevant BLM resource management plans (RMP) and Forest Service plans in New Mexico as well as relevant federal, state, and local statutes, regulations, and plans. Applicable BLM RMPs and Forest Service plans are listed below.

- White Sands Resource Management Plan, 1986 (BLM Las Cruces District Office [DO] White Sands Resource Area)
- Mimbres Resource Management Plan, 1993 (BLM Las Cruces DO Mimbres Resource Area)
- Socorro Resource Management Plan, 2010 (BLM Socorro FO)
- Gila National Forest Plan (1986) as amended

1.5.1. Applicable Laws and Executive Orders

Shown below is a partial list of federal laws and executive orders pertaining to Project-specific planning and environmental analysis on federal land.

- National Environmental Policy Act (NEPA), as amended
- FLPMA of 1976
- National Historic Preservation Act of 1966 (NHPA), as amended
- Multiple Use – Sustained Yield Act of 1960
- Clean Air Act of 1970, as amended
- Endangered Species Act of 1973 (ESA)
- Forest and Rangeland Renewable Resources Planning Act of 1974
- National Forest Management Act of 1976
- Clean Water Act of 1977
- American Indian Religious Freedom Act of 1978 (AIRFA)
- Archaeological Resources Protection Act of 1979
- Executive Order 11593 (cultural resources)
- Executive Order 12898 (environmental justice)
- Executive Order 12962 (aquatic systems and recreational fisheries)
- Executive Order 13112 (invasive species)
- Executive Order 13186 (Migratory Bird Treaty Act[MBTA])

1.6. Scoping and Issues

The Council on Environmental Quality defines scoping as "an early and open process for determining the scope of issues to be addressed," related to a Proposed Action (40 CFR 1501.7). Scoping for this EA consisted of both internal and external scoping. The internal scoping process was used to identify intra- and inter-agency issues regarding potentially affected resources. The external scoping process was used to invite public participation to help identify issues and obtain public comment at various stages of the environmental analysis process. A scoping summary report was prepared of public comments and is included as Appendix A of this EA.

1.6.1. Internal Scoping

Monthly Project conference calls were initiated in November 2013, and included agency staff from the BLM Socorro FO and the BLM Las Cruces DO, Gila National Forest EPE, and third-party contractors tasked with the preparation of the EA. Representatives from EPE provided clarification of electrical transmission and Project description-related questions. These meetings were used to update agency staff on the progress of the Project and to assist in the identification of resource-specific issues.

1.6.2. External Scoping

A 30-day scoping period was initiated on March 4, 2014, and ended on April 15, 2014. Mailing lists of land owners within the study area were compiled from contact lists provided by BLM Socorro FO, BLM Las Cruces DO, and the Gila National Forest. A scoping packet (see Appendix A, Scoping Summary Report), which included the scoping letter, map of the proposed Project, and a self-addressed postage-paid comment form, were direct mailed to a total of 428 private land owners, local and county governments, and New Mexico state agencies that included the NMSLO and New Mexico Department of Game and Fish (NMDGF). The Project was published in the April 2014 quarterly Schedule of Proposed Actions for the Gila National Forest (http://www.fs.fed.us/sopa/forest-level.php?110306) and was listed

on the New Mexico BLM Website NEPA Log (http://www.blm.gov/nm/st/en/prog/planning/nepa_logs.htm). Additionally, paid display advertisements were placed in local newspapers throughout the Project study area a minimum of 15 days prior to the scoping period.

1.6.3. Resource Issues Identified

Comments from scoping were evaluated to identify potential issues. During the external scoping process and over the course of the Project, 30 comment letters and voicemails were received. Most of the general comments referenced Project support or opposition; however, a few comments requested additional information regarding permitting, access across privately owned lands, and sources of additional resource information.

Most comments received regarding specific resources and mitigation included concerns about how the Project may affect biological resources, including habitat fragmentation, potential for invasive or noxious weeds, sensitive biological resources such as the Nutt Grasslands, and how the Project may increase access to sensitive biological areas. A few comments were received regarding general concerns relating to soil erosion and potential effects to water and cultural resources around Walnut Canyon. Several comments requested that EPE minimize the amount of disturbance by only performing maintenance and clearing as needed to achieve facility maintenance objectives. Other comments offered suggestions for mitigation of these potential Project impacts, such as reclamation and restoration. Other comments discussed concerns related to how the Project may affect private property, which included both visual and economic concerns.

Internal scoping identified localized alternatives to avoid the use of Continental Divide National Scenic Trail (CDNST) for Project access on BLM lands. No new alternatives were identified through the external scoping process. Both internal and external scoping assisted in the development of design features and measures that were incorporated into the description of the proposed Project (see Chapter 2). A description of raised issues is included in Section 5.2.1 of this EA.

1.7. Tribal Consultation

On November 15, 2013, 15 tribes in New Mexico, Arizona, Texas, and Oklahoma were notified in writing and invited to comment and engage in government-to-government consultations on the Proposed Action in accordance with the NHPA, NEPA, and AIRFA to ensure that any concerns about the proposed Project are fully considered (see Section 5.3; Appendix A-3). The Hopi Tribe and Navajo Nation responded to express their desire to continue to engage in consultation regarding cultural resources. The Hopi Tribe expressed their preference for the avoidance and preservation of cultural resources.

CHAPTER 2. PROPOSED ACTION AND ALTERNATIVES

2.1. Description of Proposed Action

El Paso Electric proposes to amend its current right-of-way (ROW) authorizations on federal lands for the AIP transmission line to include the following two components:

1. Access to project facilities;

2. Clearing previously disturbed work areas under existing transmission structures when needed to facilitate structure maintenance or replacement.

For the location of Project components, please see Figure 2-1, Figure 2-2, and Figure 2-3.

2.1.1. Access to Project Facilities

EPE proposes to use the footprint of the original construction roads, to the greatest extent practicable, for access routes to maintain existing infrastructure along the existing 345kV transmission line. The original temporary access roads throughout the Project area are in various conditions of accessibility, and can generally be categorized as either visually evident improved roads, typical primitive or two-track roads, or non-accessible/evident/reclaimed roads. The location of the proposed access routes are (1) within the existing 150-foot transmission line right-of-way already encumbered by the transmission line, or (2) outside of the existing transmission line right-of-way. EPE is requesting to improve access routes in order to provide a travelway sufficient to allow for safe vehicular access for line trucks, cranes, pick-up trucks, bulldozers, backhoes, and all-terrain vehicles. EPE is requesting approval to maintain clear access routes to support the routine patrol and maintenance of the AIP facilities.

2.1.2. Work Areas at Transmission Structures

As part of routine line maintenance and the Proposed Action, EPE seeks the right to clear a 100-foot by 100-foot work area approximately centered at each structure, contained entirely within the transmission corridor right-of-way. In areas where structures are located on slopes of greater than 8 percent, work areas may need to be expanded to 150-foot by 150-foot to accommodate maintenance equipment (see Appendix B-3 for identification of structures located in slopes of greater than 8 percent). Work areas are proposed to coincide with areas previously disturbed during original construction. Approval to clear vegetation and grade work areas is requested, if deemed necessary based on operational constraints, to create a safe, level, and stable ground surface from which to conduct facility maintenance. Proposed clearing and leveling of work areas would be intermittent (when maintenance is required on structure). Structure work areas would be stabilized and rehabilitated upon completion of a maintenance activity at a given structure.

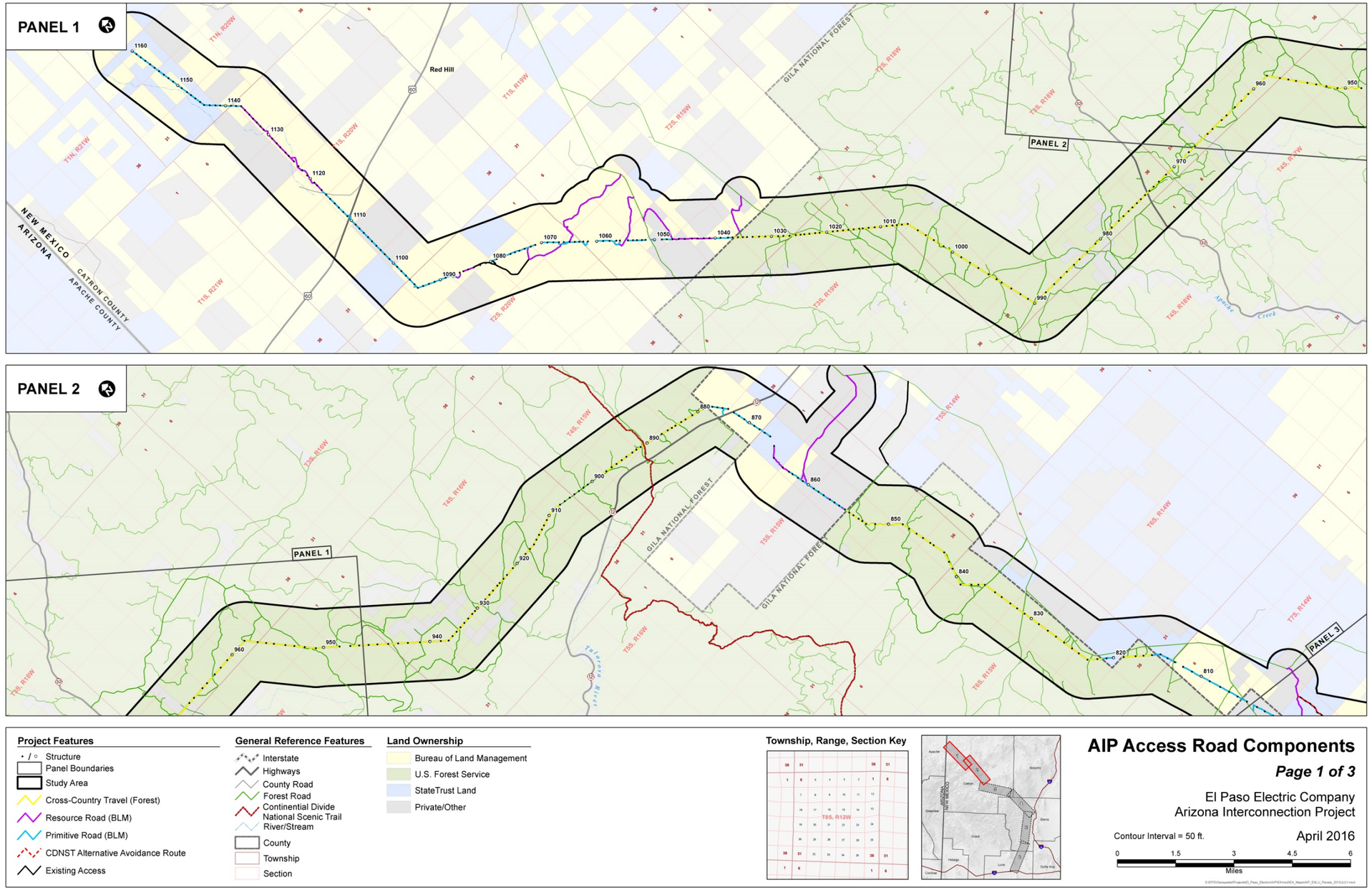

Figure 2-1. Existing Project Features and Proposed Improvements

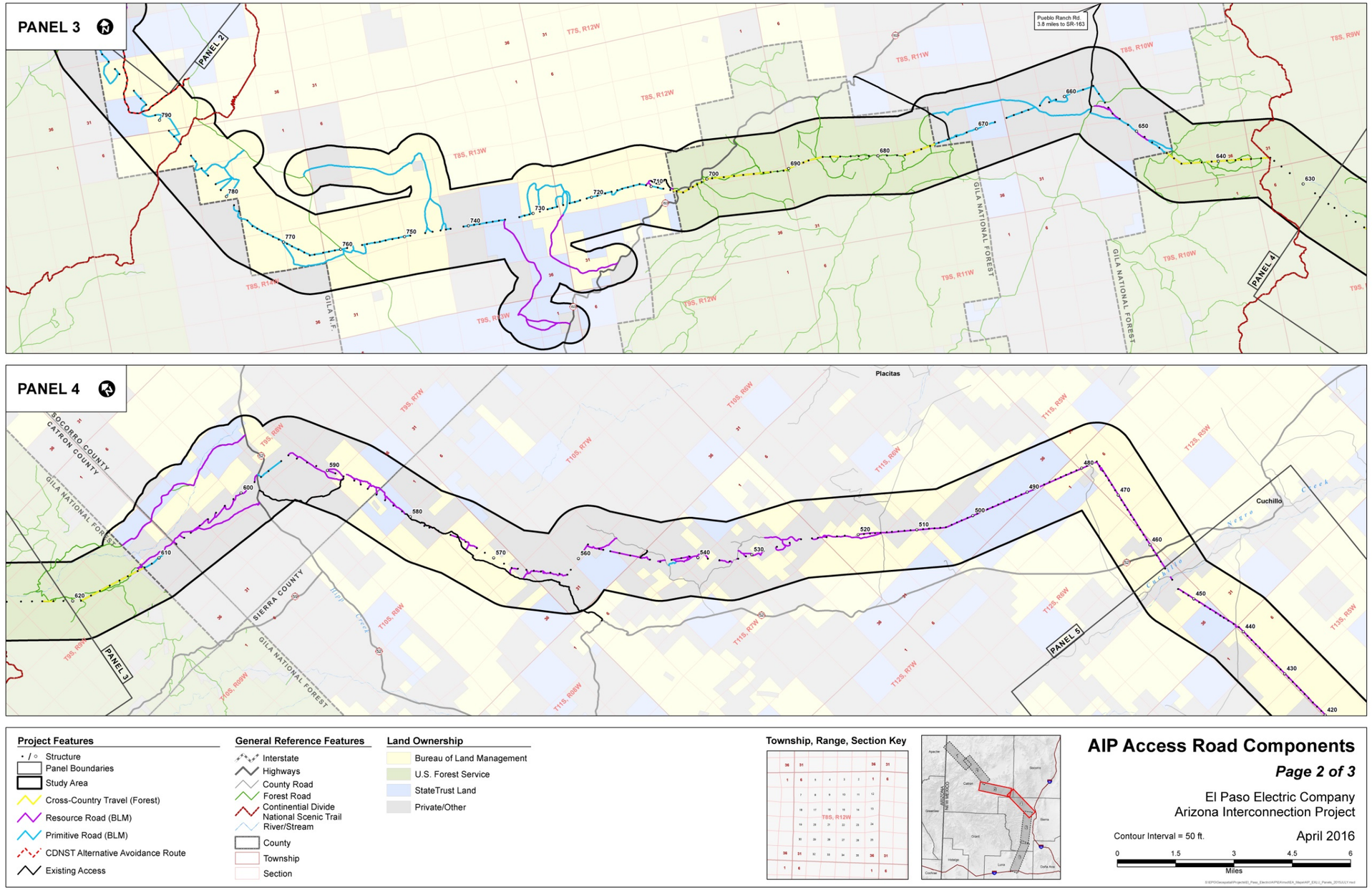

Figure 2-2. Existing Project Features and Proposed Improvements

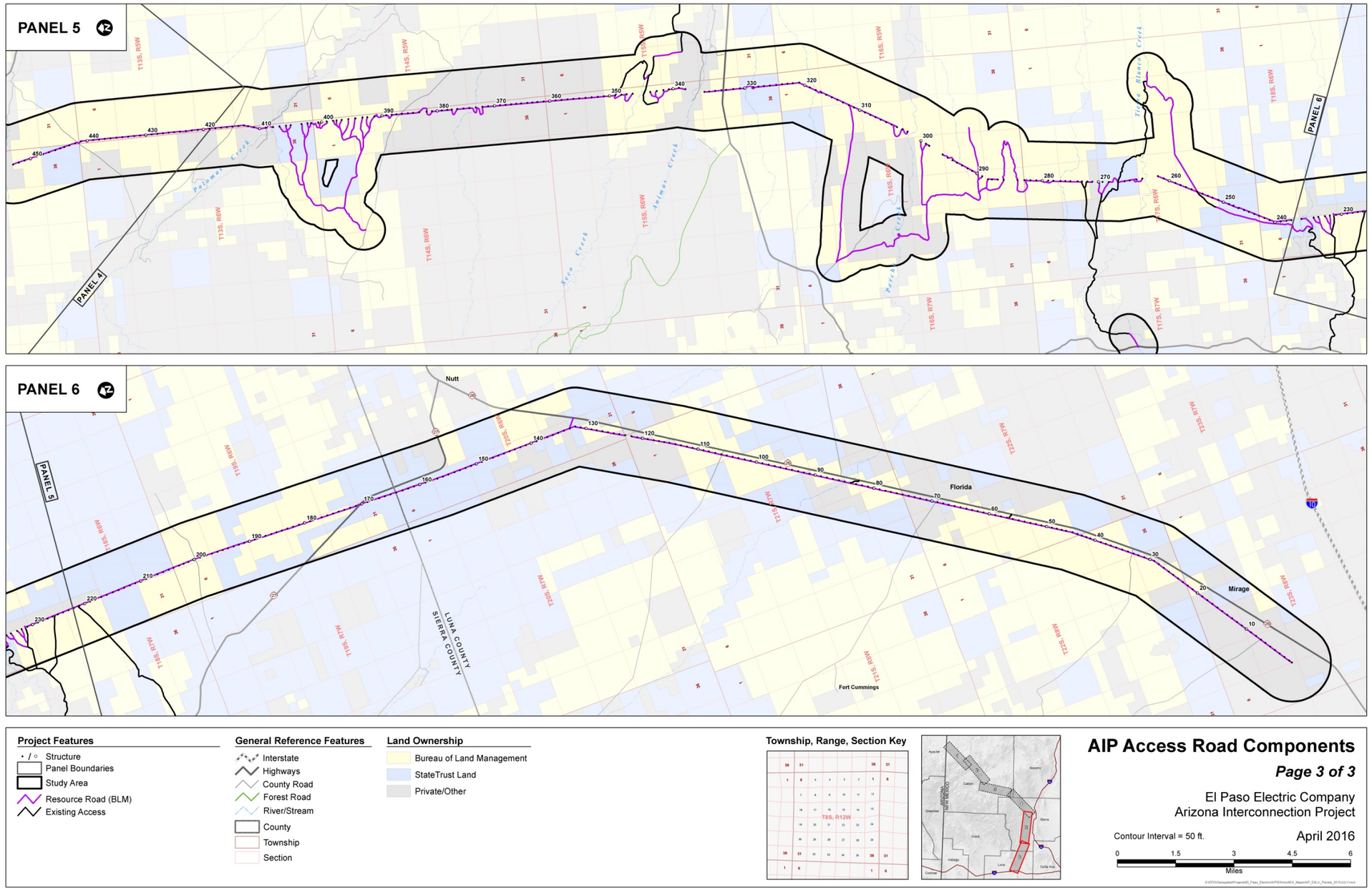

Figure 2-3. Existing Project Features and Proposed Improvements

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2.2. No Action Alternative

Under the No Action alternative, the right-of-way application to amend the existing ROW to include access roads and structure work areas would not be authorized. Routine inspections and maintenance activities on the existing 345kV transmission line would continue to be done under the existing ROW terms and conditions, which on federal lands authorize access for line inspections by fixed-wing aircraft, helicopter, horseback, or on foot. However, when maintenance is required, EPE, on approval of the authorized officer, would gain access to the problem area and rehabilitate any ground disturbance on the way out.

2.3. Continental Divide National Scenic Trail Avoidance Alternatives

The original AIP construction roads included a single access road to 8 structures (structures 787 to 794) on land managed by the Socorro Field Office (See Figure 2-4). Since construction, the original access has been designated as a portion of the CDNST. The original access was eliminated from detailed analysis because of conflicts with management prescriptions of the CDNST. Through consultation with BLM, three alternatives were identified to minimize impacts to the CDNST and limit unauthorized Off-Highway Vehicle (OHV) use along the trail by accessing structures 787 to 794 along different alignments. One alternative alignment was considered but eliminated from detailed analysis due to property owner denial of easement request across private land (see Section 2.4). The remaining alternatives are shown on Figure 2-4.

2.3.1. Alternative 1 – Approximately 1.6-mile BLM

Alternative 1 is located entirely on BLM land. It begins at Coyote Canyon Road and follows an approximately 1.6-mile existing two-track linear disturbance through the Pelona Mountain Area of Critical Environmental Concern (ACEC). The alternative connects with the ROW from the east between structures 790 and 791, approximately one mile north of the original access road and CDNST, and is proposed as a BLM Primitive Road. The terrain is relatively flat and would not require blading or construction, and access along this alternative would include driving over existing vegetation.

2.3.2. Alternative 2 – Approximately 2.8-mile BLM and State Land

Alternative 2 follows an existing two track road through a small canyon for approximately 2.8 miles of New Mexico State and BLM land. The alternative goes south across approximately 1 mile of State land and approximately 1.1 miles of BLM land through the Pelona Mountain ACEC, then across State land for approximately 0.7 miles. The alternative leads to a cattle tank on New Mexico State land in the canyon west of the transmission line ROW, and includes approximately 0.5 miles of access constructed on a slope greater than 10 percent to join the ROW between structures 790 and 791. The access road is proposed as a BLM Resource Road and would require blading in order to construct and maintain the travelway. This alternative would require a new ROW grant from the New Mexico State Land Office and would be subject to design and construction standards, including culverts and engineering design in areas of steep grade.

2.4. Alternatives Considered but Eliminated from Detailed Analysis

As originally scoped, line maintenance would clear a permanent 75-foot by 75-foot work area at each structure, and a temporary maintenance pad up to 100 feet wide by 100 feet long on one side or the other

of a structure when a structure requires replacement. This alternative was eliminated from detailed analysis because it is substantially similar in design to the Proposed Action, and could result in more ground disturbance.

Original access along the CDNST to structures 787 to 794 was eliminated from detailed analysis because of conflicts with management prescriptions of the CDNST. This access route began at Coyote Canyon Road and follows approximately 0.8 miles along the CDNST through the Pelona Mountain ACEC. This alternative considered but eliminated connected with the ROW north of Structure 787.

The third CDNST avoidance alternative was eliminated from detailed analysis due to property owner denial of easement request across private land. This alternative followed an existing two track road on private and New Mexico State Land for approximately 3.9 miles. The two track begins at Bursum Road and goes south for approximately 2.4 miles through a canyon located on private land. The two track then turns east for approximately 1.0 miles, where it leads to a cattle tank in the canyon west of the transmission line ROW. Where this alternative crosses private land, a new easement would need to be acquired at the discretion of the private land owner. Alternative 3 access would then head east from the cattle tank for approximately 0.5 miles on New Mexico State Land along the same alignment as Alternative 2, up a slope greater than 10 percent to join the ROW between structures 790 and 791. Although Alternative 3 does not cross BLM land, the access road is considered a BLM Resource Road and would require blading in order to maintain the travelway. This alternative would require a new ROW grant from the New Mexico State Land Office and will be subject to design and construction standards, including culverts and engineering design in areas of steep grade.

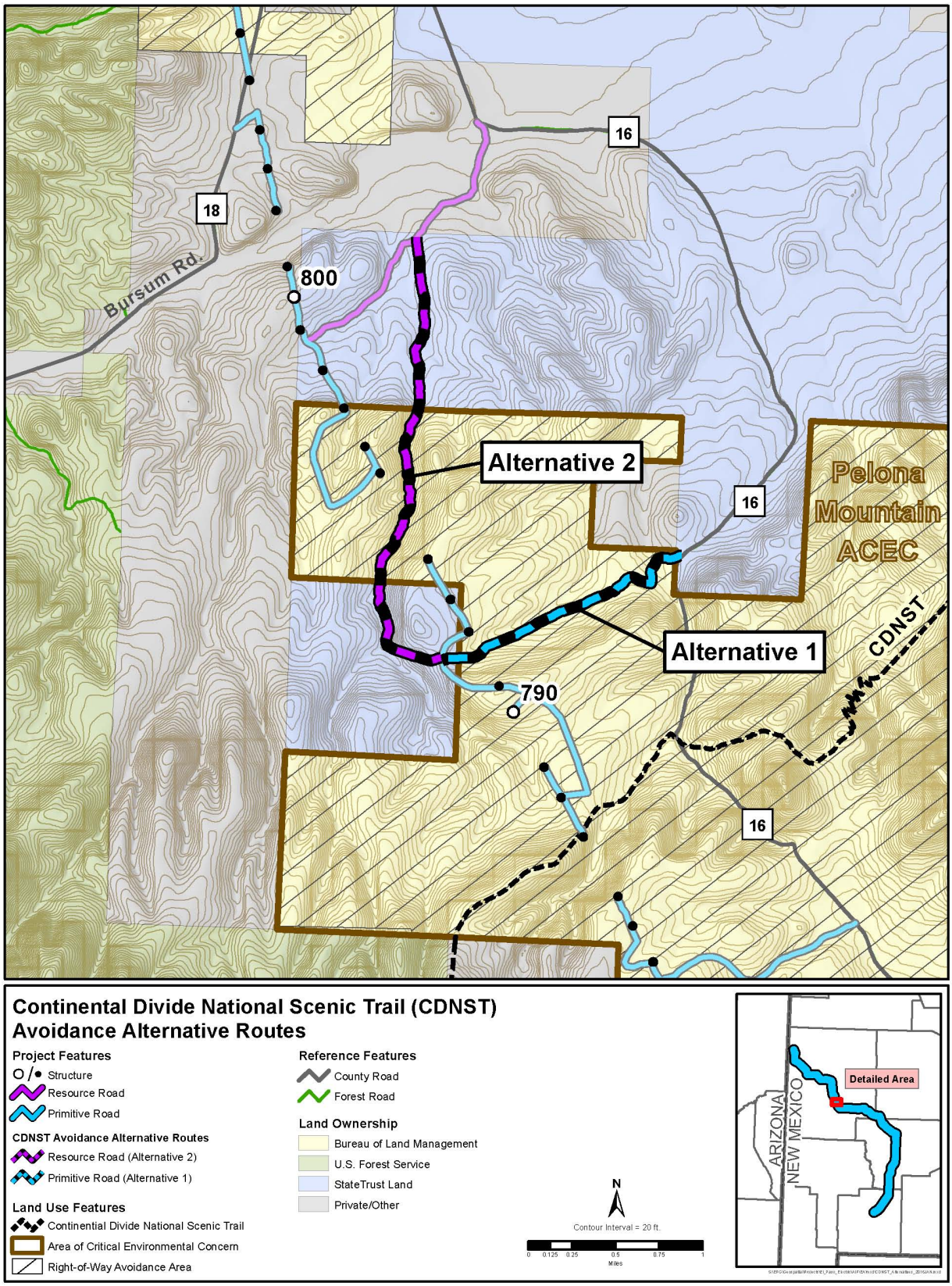

Figure 2-4. Continental Divide National Scenic Trail Avoidance Alternative Routes

2.5. Proposed Action Improvements and Activities

2.5.1. Expected Operations and Maintenance Activities

EPE conducts standard maintenance, operations, and emergency activities on its transmission lines. Routine patrols along the length of the transmission line occur once in the spring and once in the fall of each year. As a result of routine patrols, standard maintenance and operations activities are identified and occur as needed. Standard maintenance activities would consist of the following as needed:

- Pole Replacement
- Structure and equipment repairs
- Testing of facilities for proper function and structural integrity
- Hardware and conductor replacement
- Vegetation removal for vertical clearance (ground level and branch trimming at varying heights)
- Emergency activities typically involving repair and replacement of equipment damaged by weather, vandalism, or fire.

2.5.2. Access Roads

EPE seeks to improve (e.g., clear vegetation, remove obstacles, smooth, blade, level, berm, install drainage, etc.) existing access conditions that include former AIP construction access roads to create passable routes that allow EPE's vehicles access to AIP transmission facilities for maintenance and operational activities. It is EPE's intent to acquire legal access and authorization to improve routes "to a standard no higher than necessary to accommodate the intended use," as prescribed in The Gold Book (Department of Interior and U.S. Department of Agriculture [USDA] 2007). Project needs can be served by non-constructed Primitive Roads (two-track), Cross-country Travel corridors, or constructed "resource" (BLM classification) or existing Forest Roads (designated Forest Service Operational Maintenance Level-2) roads. Access conditions would be improved to a standard no higher than necessary to accommodate transmission line maintenance vehicles and equipment. Improvements would be timed to coincide with operational needs. Improving access to a standard no higher than necessary minimizes environmental impacts and discourages unnecessary access to critical infrastructure.

Access improvements would typically be made using a D-6 or D-8 bulldozer and backhoe, and would be conducted where terrain or vegetation restricts operational vehicle access. Disposal of any vegetation removed would be as recommended by the BLM, Forest Service, and/or land owner and may be used on the downslope of installed water bars or other drainage features to dissipate water flow and reduce erosion potential. To facilitate access to transmission facilities, EPE intends to improve previously disturbed areas of temporary access roads used for the original construction of the transmission line facilities; however, reroutes of original temporary access roads may be necessary to avoid sensitive resources identified in the course of the EA, or other environmental investigations. Potential rerouting would be coordinated with the BLM and/or Forest Service and specific locations identified in the Plan of Development (POD). Proposed improvements to access conditions would occur at irregular intervals over the life of the Project as standard maintenance necessitates, and would conform to the applicable design features identified in the Forest Service or BLM land management planning resources (see Section 2.5.7 of this EA). Access to AIP transmission facilities is categorized as follows—existing access, Cross-country Travel and Primitive Roads, and local roads and Resource Roads.

Existing Access

Existing access consists of public and private roads that are currently constructed and maintained at a level that can facilitate the movement of transmission line facility maintenance equipment. Existing access was identified through federal, state, and local planning documents and requires no further improvement for passable travel.

Cross-country Travel and Primitive Roads

The purpose of the following road designations is to preserve the maximum amount of native vegetation, minimize overall disturbance, and control erosion by preserving existing drainage conditions. While similar, "Cross-country Travel" is a Forest Service designation and "Primitive Roads" is a BLM designation.

Cross-country Travel (Forest Service designated) is unrestricted travel, allowed within the existing 150 foot wide AIP transmission line right-of-way on Forest Service-administered lands (see Figure 2-1, Figure 2-2, and Figure 2-3 for Project-specific locations).

Specific improvements for Cross-country Travel could consist of removal of obstacles, including vegetation, boulders, or earthen berms, and minor earthwork, such as smoothing rough patches or reduction of ruts or holes, to provide suitable access for equipment to structure work areas. Removal of vegetation would use above-ground cutting methods that leave the root crown intact. Woody vegetation would be cropped to 6" or less.

Primitive Roads (BLM designated) are linear routes managed for use by four-wheel drive or high-clearance vehicles (see Figure 2-1, Figure 2-2, and Figure 2-3 for Project-specific locations). Primitive Roads are not constructed and typically do not meet any BLM road construction standards. Specific improvements for Primitive Roads could include minor earthwork, such as smoothing rough patches or reduction of ruts or holes, and removal of above-grade irregularities such as boulders or earthen berms. Boulders and rocks would be placed immediately adjacent to access routes in a natural pattern, and any accumulated soil would be placed back onto the access route. The BLM definition of a Primitive Road does not preclude flat blading, but for this project, no flat blading of routes would occur. Vegetation would be removed using above-ground cutting methods that leave the root crown intact. Woody vegetation would be cropped to 6" or less. Any cropped vegetation or slash would also be placed adjacent to the access route, or as directed by the Authorized Officer. Route improvements shall be done in a manner that does not significantly alter overland water flow patterns or cause channeling of water within the road bed.

Forest Roads and Resource Roads

Forest Roads designated Operational Maintenance Level-2 and BLM-classified Resource Roads are constructed low volume single-lane roads (see Figure 2-1, Figure 2-2, and Figure 2-3 for Project-specific locations; a cross-walk table of Forest Roads is included in Appendix B-2. They normally have a 12- to 14-foot travelway with "intervisible turnouts," as appropriate (DOI and USDA 2007). A description of each road classification follows.

Forest Roads (Forest Service designated Operational Maintenance Level-2) are assigned to roads open for use by high-clearance vehicles. Passenger car traffic is not a consideration. Traffic is normally minor, usually consisting of one or a combination of administrative, permitted, dispersed recreation, or other specialized uses. (FSH 7709.59).

Forest Roads identified as needed for access within this environmental assessment have been designated and authorized under the Gila National Forest Travel Management Record of Decision (Sept. 2013). During preparation of this analysis, sensitive resources were identified on National Forest System Roads (NFSR) 4036 D, 4137 W and 4143 W. Short segments of these roads, totaling less than one mile, would be re-aligned to avoid and protect resources. The original road segments would be blocked, barricaded, or signed to prevent motorized travel on these segments. Also, resource concerns were identified on NFSR 4034 O, which was designated as open to all motorized uses. The 1.6 mile segment of NFSR 4034 O between 4034 N and 4034 Q is proposed to be changed to "open to administrative or written authorization use only". To maintain public access within this area, NFSR 4034 R, which parallels the segment of 4034 O, is proposed to be re-opened to all motorized uses. The proposed use of approximately 102 miles of other Forest Roads is consistent with Gila National Forest Travel Management Record of Decision, and the associated Final Environmental Impact Statement, and no further analysis is required on their designation or use. Any use of these Forest Roads will require authorization to conduct maintenance activities (see Appendix B-1 of this EA for a list of these Forest Roads).

Gates and signs and/or barriers will be installed at the following locations on Forest Service lands to restrict motor vehicles from accessing the powerline corridor or the CDNST, or to protect sensitive resources. Only authorized motorized uses would be allowed beyond the gates.

- Quemado Ranger District – Place a gate and, if needed, additional barriers across the powerline corridor where the corridor and NFSR 218 intersect (structures 890/891).

- Quemado Ranger District – Place a gate at the intersections of NFSR 4034 O and 4034 N and 4034 O and 4034 Q (structures 948 to 949). This segment of NFSR 4034 O will only be used as an administrative or written authorization use only road.

- Black Range Ranger District – Place a gate on NFSR 4141 at the intersection of NFSR 4141 and 4052 R (structure 642).

Resource Roads (BLM designated) "normally are spur roads that provide point access and connect to local or collector roads. They carry very low volume and accommodate only one or two types of use. Use restrictions are applied to prevent conflicts between users needing the road and users attracted to the road. The location and design of these roads are governed by environmental compatibility and minimizing Bureau costs, with minimal consideration for user cost, comfort, or travel time" (BLM 2011).

Improved access conditions classified as Forest Roads and Resource Roads would consist of the minimum required improvements to make the road passable for EPE maintenance equipment and vehicles. This could include any improvements associated with Cross-country Travel or Primitive Roads, as well as ground disturbing actions such as blading or grading travelways. Where travelways need to be bladed, surfaces would be no more than 14 feet wide (the original construction width of AIP access roads). Where access conditions need improvement for Project maintenance purposes, improvements would be made to a standard no higher than that matching typical BLM resource or Forest Roads.

Water bars would be installed in those areas where it is deemed necessary to protect roads or routes from erosion and divert runoff water in a natural manner. Culverts, bridges, or retaining walls are not anticipated and surfacing of access roads or routes is not proposed as part of the Project. Because the Project includes existing or previously used access roads, the need for sand and gravel supplies from public land or other sources is not anticipated.

Many of the original construction roads are perpendicular to the side slopes in steeper terrain. In order to minimize new disturbance and travelway footprints, EPE proposes to utilize the original travelways, thereby reducing the need for additional potential ground disturbance. Water bars would be installed on

these route segments at intervals dependent on slope and site specific conditions, including substrate and existing drainage features.

Disturbance associated with Forest Road and Resource Road access would be considered permanent in duration for purposes of evaluation and analysis in this EA. However, improvements may only include temporary disturbance in locations where improvements do not necessitate constructed roads. The purpose of Forest Road and Resource Road access would be to preserve the maximum amount of native vegetation, while allowing EPE the greatest flexibility for route or road improvements.

2.5.3. Structure Work Areas

Routine maintenance activities, which include structure replacement, may require a 100-foot by 100-foot cleared area around the base of each structure to safely operate equipment, specifically cranes and boom trucks, and to stage equipment and materials. In areas where structures are located on slopes of greater than 8 percent, work areas may need to be expanded to 150-foot by 150-foot to allow for necessary leveling to safely accommodate equipment. The length of the typical transmission structure cross-arm is 48 feet from insulator to insulator. The proposed clearing allows a 26-foot buffer beyond the length of the cross-arm to work the line. Cranes and boom trucks must be at an angle to properly operate and safely access the structures and appurtenant hardware. Manufacturers' specifications for cranes, boom trucks, and bucket trucks require the vehicles to be situated on level, stable surfaces to avoid tipping or other operating hazards. Furthermore, EPE line crews typically perform maintenance while the line is energized, when access angle to the line from outside the width of the cross-arm or conductor span is especially critical.

The duration of disturbance for structure work area improvements would be temporary. The extent of vegetation clearing and grading within each work area would be dependent on the type of maintenance being conducted. In the case of structure replacement, the entire 100-foot by 100-foot area would likely be cleared using above ground cutting methods that leave the root crown intact. In the case of less intensive maintenance needs, such as hardware replacement, only one side of a structure may need to be accessed. In such cases, a work area would only be cleared on the needed side of the structure, reducing the impacted area. Though these structure work areas would be considered for permanent use, structure work area improvements would occur only as needed for maintenance activities. If grading is necessary at the structure work areas, reclamation activities such as re-seeding with native grasses would occur after grading takes place, as directed by the authorized officer. It is anticipated that grading would only need to occur once to create a level working surface. Structure work areas would be stabilized and design features would be implemented to minimize erosion and reduce the spread of noxious weeds (see Section 2.5.7 for Design Features).

Beyond the base of the structures, NERC standards require minimum vegetation clearance along the overhead conductor. To meet these standards, EPE reviews vegetation encroachment into the line and selectively harvests trees where clearance violations exist or are imminent. EPE would continue this practice of tree removal to maintain clearance standards along the width of the ROW. EPE would contact and coordinate with government agencies to clear any violations found outside the width of the ROW. Removal activities would be conducted via access routes approved as part of the Proposed Action. On Forest Service administered lands, stumps would be left in place with no root crown disturbance and felled trees would be disposed of or left in place, in accordance with Forest Service direction.

2.5.4. Staffing and Safety

Existing paved and unpaved highways and roads would be used for the initial transportation of materials and equipment to locations where they would be needed along the proposed access routes and existing transmission line right-of-way.

Proposed access route improvements and clearing of work areas around structures would be scheduled to coincide with facility maintenance activities and would begin as soon as practicable upon issuance of the Notice to Proceed (NTP). The typical number of workers and type of equipment expected for proposed Project activities are provided in Table 2-1.

Table 2-1. Typical Construction and Maintenance Crews Estimated Personnel and Equipment

Activity	Number of People	Quantity and Type of Equipment	
Access route and Structure Work Area Improvements	4 to 6	1	Bulldozer (D-6/D-8 Cat or equivalent)
		1	Trackhoe with a bucket equipped with a thumb
		1	Backhoe
		2	Pick-up trucks
Transmission Line/Structure Maintenance*	8 to 10	1	Crane
		1	Trackhoe with a bucket equipped with a thumb
		2	Bucket trucks
		1	Boom truck
		2	Pick-up trucks

*Multiple crews may be working simultaneously at different locations along the project.

Safety Requirements

All construction, operation, and maintenance activities would comply with Occupational Safety and Health Administration (OSHA) regulations. Health and safety practices would be as mandated in EPE's Safety Manual, including compliance with OSHA Standard 1910.269 pertaining to electric transmission and distribution as described in EPE's Special Instructions for Transmission Distribution Meter Test Section and Substation Departments (EPE 2012). Notification procedures for emergencies would be as described in EPE's Environmental Health and Safety Incident Management Plan (EPE 2013).

Industrial Wastes and Toxic Substances

Construction sites, structure work areas, and access roads or routes would be kept in an orderly condition throughout the Project. All construction waste, including trash and litter, garbage, other solid waste,

petroleum products, and other potentially hazardous materials, would be removed and transported to a disposal facility authorized to accept such materials. No temporary storage of trash or refuse would be allowed. No open burning of construction trash would occur. Contaminants such as oils, hydraulic fluids, antifreeze, and fuels would not be dumped on the ground.

No hazardous material would be produced, transplanted, or stored on or within the right-of-way. Petroleum products, such as gasoline, diesel fuel, and lubricants, would be present onsite during access route improvements, establishment of work areas, and facility maintenance. These products would be used to fuel and lubricate vehicles and equipment, but would be contained within fuel trucks or in approved containers. Vehicle fueling and maintenance activities would not occur in any environmentally sensitive areas. When not in use, such materials would be stored properly to prevent drainage or accidents.

Construction and maintenance activities would comply with applicable federal, state, and local regulations regarding the use of hazardous substances. Spills, should they occur, would be immediately addressed in accordance with EPE's Emergency Spill Response Procedures (EPE 2013).

2.5.5. Right-of-Way Considerations

A right-of-way grant(s) with a width up to 50 feet for the portions of access routes outside of the existing 150-foot-wide AIP transmission line right-of-way that would cross BLM land has been requested. All access road improvements would be limited to those described in Section 2.5.2, and would occur within the designated right-of-way width.

State or private land necessary for the new access route right-of-way generally would be obtained as a right-of-way grant, easement, or fee purchase. Existing rights-of-way and easements for access across private or state lands have previously been acquired and are currently maintained.

Project activities would commence once an NTP has been issued by the BLM and Forest Service after all right-of-way preparation and preconstruction permitting have been completed, including any permitting that may be required by the U.S. Environmental Protection Agency such as a National Pollutant Discharge Elimination System Construction General Permit. Preconstruction actions (if any) would be identified by the BLM or Forest Service prior to the issuance of an NTP. Appropriate agencies and private landowners would be notified to the extent practicable in advance of Project-related activities.

2.5.6. Termination and Restoration

EPE requests that the access route rights-of-way be granted for the remainder of the right-of-way authorization by September 16, 2018, for the southern half and October 11, 2018, for the northern half. Prior to expiration, EPE has the option to file for renewal of the existing authorized right-of-way authorization.

One year prior to termination of the right-of-way, the holder shall contact the appointed BLM Authorized Officer to arrange a joint inspection of the right-of-way. This inspection would be held in order to agree to an acceptable termination and rehabilitation plan. The BLM and Forest Service Authorized officers must approve the plan in writing prior to commencement of any termination activities.

Restoration and termination procedures would attempt to restore and reclaim the landscape as near to original conditions as possible. The termination and restoration plan may include, but not be limited to, the following information:

- which access routes or roads are to be removed, restored, and/or rehabilitated
- how disturbed areas would be restored where access routes or roads are removed
- the time of year access routes or roads would be removed, restored, and/or rehabilitated
- stabilization and reclamation techniques to be used during restoration

2.5.7. Design Features

Design features are those specific means, measures, or practices that make up the proposed action and alternatives. Design features may reduce or eliminate adverse effects and are incorporated into the proposed action and/or alternatives, and are listed below.

1. Prior to issuance of FONSI or DR, a detailed POD would be developed to further describe Project features and procedures that have been outlined in this EA. At a minimum, the POD would address Project design, construction and operation considerations, biological considerations (including noxious weed management), cultural resources, paleontological considerations, hazardous materials management, and reclamation considerations, as analyzed in this EA.

2. All vehicle movement outside the right-of-way would be restricted to approved BLM or Forest Service-designated access, or public roads.

3. The boundary of improvement activities would be submitted in the POD, with activity restricted to and confined within those limits. No paint or permanent discoloring agents would be applied to rocks or vegetation to indicate survey or construction activity limits.

4. In areas of special concern for water erosion, water bars would be placed along access roads or routes and maintenance use areas, as directed by the authorized officer. They should approximate the contour of the slope. Runoff would be diverted to vegetated or rocky areas to dissipate the erosive forces of the concentrated flows.

5. In maintenance use areas where grading is not required, vegetation would be left in place wherever possible, and original contour would be maintained to avoid excessive root damage and allow for regrowth.

6. To limit new disturbance, existing linear disturbances, access roads or routes in the Project area would be used to the extent practicable, provided that doing so does not cause additional impacts to resource values.

7. Construction holes left open overnight would be appropriately fenced or covered to prevent damage to wildlife or livestock.

8. Watering facilities (e.g., tanks, developed springs, water lines, wells, etc.) would be repaired or replaced to their original, pre-disturbed condition, as required by the landowner or the BLM or Forest Service Authorized Officer, if damaged or destroyed by construction activities. Temporary watering facilities would be provided for wildlife and livestock until permanent repair or replacement is complete. Alteration/removal/replacement of watering facilities would be coordinated with the affected grazing permittee as well as the BLM or Forest Service in advance of construction activities.

9. Prior to construction, all supervisory construction personnel would be instructed on the protection of cultural and ecological resources. To assist in this effort, a resource specialist would address:

(a) federal and state laws regarding antiquities and plants and wildlife, including collection and removal; (b) the importance of these resources and the purpose and necessity of protecting them.

10. Access roads or routes would be improved as near as possible at right angles to the streams and washes. All construction and operations activities shall be conducted in a manner that would minimize disturbance to vegetation, drainage channels, and intermittent or perennial stream banks.

11. All requirements of the State of New Mexico Environment Department, or any other entities having jurisdiction over air quality matters, would be adhered to. Any necessary dust control plans would be developed, and permits for construction activities would be obtained. Open burning of construction trash would not be allowed unless permitted by appropriate authorities. Dust control plans would be prepared prior to any improvement or construction related activities where required. However, at this time, no improvements to access routes or maintenance use areas are of a magnitude expected to require permits.

12. Fences, cattle guards, and gates would be repaired or replaced to their original, pre-disturbed condition, as required by the landowner, or the BLM or Forest Service Authorized Officer, if they are damaged or destroyed by construction activities. All gates would be closed after passage of EPE vehicles. New temporary or permanent gates would be installed only with the permission of the landowner, BLM, or the Forest Service. Alteration/removal/replacement of range improvements such as fences or cattle guards would be coordinated with the affected grazing permittee as well as the BLM or Forest Service in advance of construction activities. Temporary gates not required for post-construction access control would be removed following construction completion.

13. Transmission line materials would be designed and tested to minimize corona. Bundle configuration and larger diameter conductors would be used along 345kV lines to limit the audible noise, radio interference, and television interference due to corona. Tension would be maintained on all insulator assemblies to ensure positive contact between insulators, avoiding sparking. Caution would be exercised during construction and operations to avoid scratching or nicking the conductor surface, which may provide points for corona to occur.

14. During operation of the transmission lines, the right-of-way would be maintained free of non-biodegradable debris. Slash would be left in place or disposed of in accordance with requirements of the land owner or management agency.

15. In consultation with appropriate land-management agencies, specific mitigation measures for paleontological resources would be developed and implemented to mitigate any identified adverse impacts. These measures may include: preparation of a Paleontological Resource Treatment Plan, paleontological surveys, personnel education, monitoring ground disturbance for fossils, curation of fossils, and deposition of fossils in a paleontological repository.

16. Preconstruction surveys for species listed under the ESA or specified by the appropriate land management agency as sensitive or of concern would be conducted as required in areas of known occurrence or suitable habitat. Preconstruction clearance surveys for nesting migratory birds, including raptors, would take place prior to construction activities during the nesting season. Timing and extent of the surveys would be determined by species, coordinated with agency wildlife biologists, and completed prior to construction. Monitoring of construction activities may be required in some areas to ensure that effects to these species are avoided during construction. If Bald Eagle or Golden Eagle nests are identified during preconstruction surveys, seasonal

restrictions on construction within a specified buffer would be implemented in coordination with the U.S. Fish and Wildlife Service (USFWS) and/or in accordance with species survey protocols, as appropriate, and comply with the Bald and Golden Eagle Protection Act (BGEPA). Preconstruction nesting-season surveys for migratory birds, and surveys for Burrowing Owls in suitable habitat, would be conducted as needed to comply with the MBTA.

17. Electrical facility design would be in accordance with "Suggested Practices for Raptor Protection on Power Lines" (Avian Power Line Interaction Committee [APLIC] 2012).

18. EPE would coordinate with the Forest Service and the USFWS wolf reintroduction program so that activities would not take place in sensitive areas during the denning period (April 15 – August 31) of the Mexican Gray Wolf (*Canus lupus baileyi*).

19. If unknown cultural resources are discovered, activities would cease at that location and the Forest Service or BLM Archaeologist would be notified to determine an appropriate plan of action to evaluate and avoid the project's impact on the resource. In the event of human remains, activities would cease at that location, and all subsequent actions would follow a Native American Graves Protection and Repatriation Act (NAGPRA) plan of action appropriate for use on BLM and Forest Service, as well as State and private lands. This plan of action would be developed with a Historic Properties Treatment Plan for the Project.

20. Where the CDNST crosses the transmission line corridor, a distinguishable trail tread across the corridor would be maintained to ensure users stay on the trail system. If activities involving mechanized equipment or ground disturbance obscures or alters the trail tread, EPE would restore the trail tread to maintain its Trail Class 2 design parameters. Additionally, any access used to cross the CDNST will be maintained at right angles to the trail.

21. Gates and signs and/or barriers will be maintained on Forest Service or BLM lands to restrict motor vehicles from accessing the CDNST. Only authorized motorized uses would be allowed beyond the gates. The following locations would be maintained on the Forest Service lands:

    - Quemado Ranger District –Gate and, if added, barriers placed across the powerline corridor where the corridor and NFSR 218 intersect (structures 890/891).
    - Quemado Ranger District – Gates placed at intersection of NFSR 4034 O and 4034 N and 4034 O and 4034 Q (structures 948 to 949). NFSR 4034 O will be for administrative or written authorization use only.
    - Black Range Ranger District – Gate on NFSR 4141 at the intersection of NFSR 4141 and 4052 R (structure 642).

22. Existing Forest Roads (Authorized under permit or under Road Maintenance Agreement) used by EPE for infrastructure maintenance would be maintained to Maintenance Level 2 (ML-2) standards concurrent with other EPE activities. Maintenance activities will follow applicable Best Management Practices (FS-990a-National Best Management Practices for Water Quality Management on National Forest System Lands).

23. Native vegetation that does not pose a hazard to the operation of the transmission line or block vehicle access for inspection and maintenance activities would be retained for resource values. Native grass cover would be maintained to the extent possible during ground disturbing activities. Soil disturbance will be minimized by limiting the extent of the area traveled by vehicles and by avoiding areas with wet soils. Native species would be planted to stabilize erodible soils where needed.

24. In areas of ground disturbance on Forest Service or BLM lands, seeding will be considered to protect an area from erosion. If seeding is used for erosion control, then seed mix will be approved by the appropriate land management agency, and certified weed-free.

25. EPE will train personnel to identify noxious weeds and prevent spread. Training will discuss known noxious weed species, known locations, identification methods, and treatment protocols. EPE will monitor for noxious weeds during routine patrol and maintenance activities. Any findings will be reported to the Forest Service or BLM.

26. Prior to entering Forest Service or BLM lands, trucks and equipment arriving from other locations would undergo a controlled visual inspection and cleaning to ensure they are free of soil, weeds, vegetation matter, or other debris that could harbor seeds.

27. No vehicles or equipment will be parked or staged on or within 100 feet of the Jewett Airstrip. If damage or rutting to the airstrip surface occurs during EPE use, EPE will immediately repair any damage. The Forest Service Aviation Officer will be notified regarding repairs or if repairs cannot be completed immediately.

28. The preparation of the Project area for improvement activities would include identification of environmental avoidance areas as necessary to protect sensitive resources. Based on environmental resource studies, appropriate access would be flagged to avoid sensitive resources prior to improvements. Alternatives to field flagging could include GPS referencing and/or the provision of monitors during work.

The following measures would be modified as appropriate to reduce impacts to specific resource concerns (e.g., cultural, biological, visual) associated with access condition improvements and Project facility maintenance and included in the Final POD. EPE maintenance crews would adhere to the measures identified in this EA and further stipulated in the Final POD. To minimize impacts to sensitive resources, the following measures are proposed for select Project locations. These areas are generally identified in Chapter 4 of this EA and further specified in the Final POD.

Restricting Access

To minimize disturbance to sensitive habitats or resources, access roads or routes required for operations purposes would be gated or otherwise blocked if directed by the BLM, Forest Service, or other applicable agency/owner. Fences, gates, and cattle guards would meet BLM or other applicable agency/owner specifications. Limiting access to sensitive areas would reduce the potential for indirect effects associated with increased traffic.

Avoidance

No widening or improvements of existing access roads or routes would be undertaken where environmentally sensitive resources are present. Avoiding unnecessary access road upgrades would limit the amount of habitat disturbed or removed. In addition, the avoidance of road or route upgrades would minimize increases to vehicular traffic, thereby reducing the potential for indirect effects, such as damage or loss of vegetation, spread of noxious weeds, harassment of wildlife, vandalism of cultural resources, and disturbance to sensitive land uses.

Overland Drive and Crush

Overland drive and crush would be used to the greatest extent possible in areas where no grading would be needed to access work areas. Drive and crush is vehicular travel to access a site without significantly modifying the landscape. Vegetation is crushed, but not cropped. Soil is compacted, but no surface soil is removed. Overland drive and crush would avoid or minimize the removal of surface soil and vegetation, reducing the potential for erosion and loss of habitat. In addition, avoiding the construction of a new road would reduce the potential for increased traffic and the associated indirect effects.

Revegetation or Minor Restoration

In specially designated areas, (i.e., along the Continental Divide National Scenic Trail and specific locations within ACECs) or other sensitive areas where minor earth work is required, surface restoration would be implemented as required by the authorized officer. The method of restoration would normally consist of returning disturbed areas back to their natural contour, reseeding (where required), installing cross drains for erosion control, placing water bars in the road, and filling ditches.

2.6. Summary of Proposed Action

Table 2-2 provides a summary of the miles for each of the proposed access types within and outside of the existing transmission line ROW by land ownership (also see Figure 2-1, Figure 2-2, and Figure 2-3, and D-1 through D-3). Table 2-3 identifies the existing number and material type of transmission structures by land ownership. Table 2-3 identifies the number of acres associated with transmission structure maintenance use areas.

Table 2-2. AIP Access Route Summary

Project Components	Land Ownership				
	BLM	**Forest Service**	**State**	**Private**	**Totals**
Access Roads (miles)					
Within Existing Transmission ROW					
Cross-country Travel	0.0	45.5	0.0	1.0	**46.5**
Primitive Roads	20.8	0.0	4.3	10.6	**35.7**
Resource Roads	45.3	0.0	15.9	20.6	**81.8**
Outside Existing Transmission ROW					
Cross-country Travel	0.0	0.0	0.0	0.0	**0.0**
Primitive Roads	21.3	0.0	1.4	8.8	**31.5**
Resource Roads	48.7	0.0	19.8	26.6	**95.1**
Totals[1]	**136.1**	**45.5**	**41.4**	**67.6**	**290.6**

[1] Totals do not include CDNST Avoidance Alternatives and may not sum, due to rounding.

Table 2-3. Total Acres of Maintenance Use Areas and Number and Material Type of Existing Transmission Structures					
Project Components	Land Ownership				
	BLM	Forest Service	State	Private	Total
Transmission Structure Maintenance Use Areas in Acres					
Maintenance Use Areas	131.7	72.4	35.8	56.2	296.1
Number of Transmission Structures and Material Type					
Steel Structures (number)	44	158	18	98	**318**
Wooden Structures (number)	474	109	127	134	**844**
Total	**518**	**267**	**145**	**232**	**1162**

As described in Section 2.3, two alternatives have been identified to provide alternative access to structures 787-794. Table 2-4 provides a comparison of CDNST avoidance alternatives.

Table 2-4. Comparison of CDNST Avoidance Alternatives					
Alternatives	Land Ownership (Miles Crossed)				
	BLM	Forest Service	State	Private	Total
Alternative 1					
Primitive Road (BLM)	1.49	0.0	0.14	0.0	**1.63**
Alternative 2					
Resource Road (BLM)	1.08	0.0	1.75	0.0	**2.83**
Note: Total Proposed Project Access Summary as identified in Table 2-2 above does not include CDNST Avoidance Alternatives.					

CHAPTER 3. AFFECTED ENVIRONMENT

Chapter 3 describes the environment and resources that have the potential to be affected by the Proposed Action as described in Chapter 2. The description of the environment includes the current condition of each resource and the relevant characteristics that may be subject to impacts from the Project. Environmental resource baseline information is presented to allow the comparison of potential impacts that could result from the Proposed Action, the CDNST Avoidance Alternatives and the No Action alternative.

3.1. Project Resource Review

Table 3-1 summarizes the resources reviewed for this project. Resources not present within the Project study area, as well as those present and not affected, are not discussed in detail. The EA sections of those resources that are present and potentially affected are listed below.

Table 3-1. Project Resource Review

Resources Considered	Not Present	Present and Not Affected	Present and Potentially Affected
Air Quality and Climate Change*			3.12 and 4.12
Areas of Critical Environmental Concern*			3.8 and 4.8
Caves and Karst		✓	
Cultural and Historic*			3.11 and 4.11
Economic		✓	
Environmental Justice*/Socioeconomics		✓	
Fire and Fuels			3.6 and 4.6
Floodplains*		✓	
Forests and Woodlands			3.5,3.6 , 4.5 and 4.6
Geology and Minerals			3.2 and 4.2
Invasive and Non-native Species*			3.5 and 4.5
Inventoried Roadless Area			3.8 and 4.8
Land Use			3.7 and 4.7
Livestock Grazing			3.13 and 4.13
Eagles and Migratory Birds*			3.5 and 4.5
National Scenic and Historic Trails			3.8 and 4.8
Native American Religious Concerns*			1.6, 3.11 and 4.11
Paleontology			3.3 and 4.3

Table 3-1. Project Resource Review			
Resources Considered	**Not Present**	**Present and Not Affected**	**Present and Potentially Affected**
Recreation			3.9 and 4.9
Renewable Energy Production			3.7 and 4.7
Prime or Unique Farmland*	✓		
Soils/Watershed			3.2 and 4.2
Special Management Area			3.8 and 4.8
Special-status Species including Threatened and Endangered Species*			3.5 and 4.5
Vegetation			3.5 and 4.5
Visual Resources			3.10 and 4.10
Wastes, Hazardous or Solid*	✓		
Water Quality			3.4 and 4.4
Wetland or Riparian Zones*		✓ (riparian only, no wetlands)	3.4 and 4.4
Wild and Scenic Rivers*	✓		
Wilderness*	✓		
Wildlife			3.5 and 4.5
*Consideration required by law or executive order.			

The potentially affected resources associated with the natural, human, and cultural environment and identified in Table 3-1 were studied and included in the following resource sections:

- Earth Resources
- Paleontological Resources
- Water and Riparian Resources
- Biological Resources
- Land Uses
- Special Designation Areas
- Recreation
- Visual Resources
- Cultural Resources
- Air Quality and Climate
- Livestock Grazing

Unless otherwise noted in the resource sections below, the study area includes resources within one mile of proposed Project components (a two-mile-wide study corridor). The affected study area includes lands administered by the BLM, Forest Service, NMSLO, and privately owned land.

Table 3-2 below provides total acreage by land ownership within the 150' ROW and the 50' access road ROW outside of the 150' transmission line ROW.

Table 3-2. AIP Transmission Line 150' ROW Summary (Acres)					
Land Ownership					
Right-of-Way	**BLM**	**Forest Service**	**State**	**Private**	**Totals**
150' Transmission Line ROW	**1532**	**990**	**443**	**820**	**3785**
50' Access Roads ROW outside of the 150' Transmission Line	**578**	**0**	**167**	**375**	**1120**

3.2. Earth Resources

3.2.1. Introduction

This section presents an overview of Earth Resources present within the Project study area. The main purpose of this overview is to identify geological hazards, mineral, and soil resources that are present and could be affected by the Proposed Action.

3.2.2. Affected Environment

The Project is located in four physiographic provinces: the Colorado Plateau, Mogollon-Datil Volcanic Field, Rio Grande Rift, and the Basin and Range (New Mexico Bureau of Geology and Mineral Resources [NMBGMR] 2013). The Colorado Plateau is characterized by relatively flat-lying, red, white, gray, green, and yellow sedimentary rocks that have been sculpted into mesas, buttes, and badlands. The Mogollon-Datil Volcanic Field is part of a discontinuous belt of middle Cenozoic volcanism that runs from central Mexico to southwest Colorado and includes andesitic and silicic volcanoes, domes, and calderas. The Basin and Range is characterized by north-south trending valleys separated by mountain ranges (Fenneman, 1931). The Project ranges in elevation from 4,380 feet in the southern portions of the Project area near Deming to over 8,100 feet in the northern portions near the Tularosa Mountains.

3.2.2.1. Geological Hazards

Geological hazards include earthquakes, Quaternary faults, subsidence, and floodplains. Geological hazards were inventoried within a one-mile buffer around the Project components. Most earthquakes in New Mexico are in close proximity to, and associated with, the Rio Grande rift (Connell 2004; Mack 2004). No earthquakes have been reported from the Project area with magnitudes of 4.5 or greater (Pursley et al. 2013, Sanford et al. 2002, and Sanford et al. 2006). The closest, most recent, and significant earthquake occurred northeast of Pietown, and had a magnitude of 3.0 (Pursley et al. 2013).

Quaternary faults are the most recent and are still considered to be active. There is one Quaternary fault crossed by the centerline of the Project, and 86 that are intersected by roads associated with the Project (United States Geological Survey [USGS] 2013). There are 25 Quaternary faults on BLM lands, 42 on Forest Service lands, 4 on state owned lands, and 15 on privately owned lands. The Red Hills Fault is located in the northern portion of the Project area just south of Highway 60. Another Quaternary fault lies in close proximity to the Project area. This fault borders the Project area south of Punch Tucker Road and north of Highway 152.

An inventory of 100-year floodplains was conducted using data from the (FEMA 2013), and data from the New Mexico Department of Homeland Security and Emergency Management, and the Sierra County Flood Map. No data was available for Catron County, which is where most of the Project area on Forest Service lands is located. For Sierra County, most floodplain hazards are associated with areas in close proximity to the Rio Grande. The Project does cross several 100-year floodplains in the area west of Truth or Consequences. These floodplain areas are associated with several tributaries of the Rio Grande. In Luna County, there are three areas that the Project crosses within a 100-year floodplain. These were located northeast of Deming. These floodplains are on BLM, state, and private lands.

Subsidence is a gradual setting or sudden sinking of the Earth's surface owing to subsurface movement of earth materials. The principal causes are aquifer-system compaction, drainage of organic soils, underground mining, hydrocompaction, natural compaction, sinkholes, and thawing permafrost (National Resource Council [NRC] 1991; Galloway et al. 1999). There are no Geographic Information System (GIS) data for subsidence in New Mexico.

3.2.2.2. Mineral Resources

The study area for mineral resources includes a one-mile buffer around Project components. An inventory of federal mineral resources was reviewed to identify locatable, leasable, and salable mineral resources present in the study area. Locatable resources are typically metallic mineral deposits, such as copper and gold. Leasable resources include energy resources, such as geothermal, petroleum, natural gas, and coal. Salable resources include sand and gravel. Information for the inventory was obtained primarily from the LR2000 database maintained online by the BLM and U.S. Forest Service, the Mineral Resources Data System maintained by the United States Geological Survey (USGS), and the New Mexico Bureau of Geology and Minerals. Additional information was obtained by surveying aerial photos of the Project area.

After reviewing the above sources and databases, 31 mines (active and inactive) were found to be within the study area. Many of these are surface sand and gravel pits. There is a concentration of mines within the study area at Jaralosa Mountain, east of Highway 52.

Leasable resources include fluid resources, such as oil and gas deposits, as well as geothermal resources. There are multiple oil and gas leases on BLM lands within the study corridor located near Highway 60. Between the northern most Gila National Forest boundary within the Project study area and the northern extent of the project, Kinder Morgan CO_2 Company LP (KM CO_2) has leased BLM and New Mexico state lands for Oil and Gas Exploration (BLM 2014; NMSLO 2011). This leasing activity "specifically targets carbon dioxide exploration and development" (BLM 2010).

There is a materials pit located approximately one mile east of NM 32. The study area is located within the Zuni basin, which is the geologic area mostly north (and partially south) of US 60 near the crossing of AIP. The Zuni uplift extends to the south from the Zuni basin. Producible quantities of carbon dioxide (CO_2) and helium have been identified in the Zuni basin, resulting in it being considered "high potential" for CO_2 development. CO_2 is considered a non-renewable, non-energy fluid mineral, but given its association with fossil fuels, "leasing for carbon dioxide is conducted under standard oil & gas leasing procedures" (BLM 2010).

<u>BLM</u>

The Project crosses several leases on BLM lands in the northwest portion near the terminus of the Project, close to the New Mexico-Arizona Border. There are 15 mines on BLM lands within the study area.

Forest Service

The Project does not cross any leases on Forest Service lands. There are 3 mines on Forest Service land within the study area.

State

The Project crosses several leases on state lands within the same area as those for the BLM. There are 11 mines on state lands within the study area.

Private

The Project does not cross any leases on private lands within the study area. There are two mines on private lands within the study area.

3.2.2.3. Soil Resources

Soil data were obtained from the USDA's Natural Resources Conservation Service (NRCS) Soil Survey Geographic Database (SSURGO). Soil data were also derived from the following soil surveys: Luna County, Sierra County, Socorro County, and Catron County (NRCS Online Soil Survey Manuscripts). The study area for soil resources includes a one-mile buffer around Project components. Soil map units were assessed for their susceptibility to both water and wind erosion and for designated Prime or Unique Farmlands.

Susceptibility to water erosion was assessed based on the Kw values assigned to the soil units by the NRCS. The Kw factor applies to the whole soil, which includes rock fragments, as opposed to the Kf factor, which refers to soil free of rock fragments (Brewer 2012). Generally, soils that have been assigned higher Kw values are more susceptible to water erosion. Kw values less than 0.20 correspond to a low susceptibility, Kw values greater than or equal to 0.20 but less than 0.40 correspond to a moderate susceptibility, and Kw values greater than or equal to 0.40 correspond to a high susceptibility.

Susceptibility to wind erosion was assessed based on Wind Erodibility Groups (WEG) to which the individual soil units have been assigned. Soils that are largely pure sand or silt with no binding agents, such as clay or organic material, are most susceptible to wind erosion; whereas, rock outcrops or areas covered in a rock armature, or desert pavement, are not as susceptible to wind erosion. Soils with a WEG of 1 or 2 have a high susceptibility; WEGs of 3, 4, or 4L have a moderate susceptibility; WEGs of 5, 6, or 7 have a slight susceptibility; and WEGs of 8 are not susceptible.

Soils may be designated by the NRCS as capable of supporting Prime or Unique farmlands under a variety of conditions based on a number of characteristics. Soils in the southwestern United States typically are not capable of supporting Prime or Unique farmlands unless they are irrigated. There is no designated Prime Farmland within the Project study area.

A total of 74 soil map units are present within the Project study area. Soil map units with erosion susceptibility potential that are crossed by the Project are summarized in Table 3-3, and soil map units with a high susceptibility to wind or water erosion occurring within the Project study area are summarized below.

The Berino and Mohave soils are nearly level to gently undulating mapping unit found on valley-fill material that has been reworked by wind. Slopes are 0 to 3 percent (US Department of Agriculture 1985).

Bluepoint Series – consists of deep, somewhat excessively drained soils that formed in mixed material deposited on flood plains and alluvial fans by streams and washes. Slopes are 0 to 10 percent (US Department of Agriculture 1985).

Brazito Series – mixed, thermic Typic Torripsamments (Entisol). These deep, well drained, rapidly permeable soils formed in recent alluvium. They are in the Rio Grande floodplain. Slope is 0 to 1 percent. Typical pedon of Brazito fine sandy loam, 0 to 1 percent slopes (US Department of Agriculture 1985).

Cabezon-Thunderbird-Celosprings complex, 3 to 25 percent slopes – Soils in the Cabezon Series are classified as clayey, montmorillonitic, mesic Lithic Argiustolls. They are shallow, well drained soils forming in residium derived from basalt. They are on ridges, hills, and mesas. Typical pedon of a Cabezon cobbly clay loam in an area of Cabezon-Thunderbird-Celosprings complex, 3 to 25 percent slopes (US Department of Agriculture 1985).

Dona Ana-Tres Hermanos association, gently sloping – Soils in the Dona Ana Series are classified as Typic Haplargids, fine-loamy, mixed thermic. These deep, well drained soils formed in alluvium. They are on piedmonts. (US Department of Agriculture 1984).

Glendale Series – fine-silty, mixed (calcareous), thermic Typic Torrifluvents Entisols). These deep, well drained, moderately slowly permeable soils formed in recent alluvium. They are on flood plains and terraces. Slope is 0 to 1 percent. (US Department of Agriculture 1985).

Hondale Series – consists of deep, well-drained soils on the intermountain valley floor. These soils formed in valley-fill sediments derived from mixed igneous and sedimentary rocks. Slopes are 0 to 3 percent (US Department of Agriculture 1985).

Pintura Series – consists of deep, somewhat excessively drained soils. These soils formed as small hummocks in wind-deposited sandy sediments. Slopes are 0 to 5 percent. The soil is brown fine sand and generally noncalcareous (US Department of Agriculture 1985).

Thunderbird Series – fine, monmorillonitic, mesic Aridic Argiustolls. These moderately deep, well drained, slowly permeable soils formed in alluvium derived mainly from basalt. They are on plains of basalt-capped mesas. Slope is 1 to 10 percent (US Department of Agriculture 1985).

Also included, in the most common soil units, were areas mapped only as Typic Haplustalfs-Lithic Haplustalfs, Typic Haplustalfs-Mollic Eutroboralfs, and Typic Ustocchrepts-Fluventic Ustochrepts.

A majority of the soils in the study area (57 percent) belong to the groups Argiustolls, Calciargids, and Haplocalcids which have some layer of calcic (calcium carbonate accumulation) near the surface.

Table 3-3. Soil Units within the AIP Access Roads, Study Area by Ownership

Map Unit Name	Group	WEG	Kw	Prime Farmland	Mileage			
					BLM	USFS	State	Private
Abrazo-Motoqua, cool-Rock outcrop complex, 10 to 50 percent slopes	Argiustolls	4	0.28	No	1.6	0.0	0.4	0.0

Table 3-3. Soil Units within the AIP Access Roads, Study Area by Ownership								
Map Unit Name	**Group**	**WEG**	**Kw**	**Prime Farmland**	**Mileage**			
					BLM	**USFS**	**State**	**Private**
Abrazo-Rock outcrop, 15 to 30 percent slopes	Argiustolls	6	0.37	No	0.0	0.0	0.6	0.2
Albinas-Datil complex, 1 to 5 percent slopes	Argiustolls	3	0.43	No	0.0	0.0	0.0	0.3
Aridic-Argiustolls-Rock outcrop complex, 15 to 45 percent slopes	Argiustolls	6	0.28	No	2.1	0.0	0.0	0.0
Aridic Haplustalfs-Rock outcrop, extremely steep	Haplustalfs	7	0.2	No	0.9	0.0	1.2	0.1
Arizo and Canutio soils, gently sloping	Torriorthents	8	0.24	No	1.0	0.0	0.2	0.0
Badland-Nickel complex, extremely steep	Haplocalcids	4L	0.24	No	0.4	0.0	0.0	0.0
Bario sandy clay loam, 0 to 5 percent slopes	Paleustalfs	5	0.32	No	0	0.1	1.2	2.5
Berino and Mohave soils	Calciargids	2	0.32	No	0.0	0.0	0.0	0.1
Brazito loamy fine sand, gently sloping	Torripsamments	2	0.2	No	0.0	0.0	0.0	0.2
Bluepoint-Onite association	Torripsamments	2	0.28	No	0.3	0.0	0.0	0.0
Brycan loam, 0 to 3 percent slopes	Haplustolls	5	0.37	No	0.3	0.0	0.6	2.4
Cabezon-Thunderbird-Celosprings complex, 3 to 25 percent slopes	Argiustolls	6	0.43	No	15.4	0.0	3.0	1.5
Catman-Hickman complex, 1 to 5 percent slopes	Haplusterts	4	0.28	No	0.9	0.0	0.0	0.9
Celosprings loam, 1 to 8 percent slopes	Argiustolls	6	0.37	No	1.2	0.0	1.0	4.0
Coni-Tolman complex, 10 to 40 percent slopes	Argiustolls	4L	0.32	No	4.3	0.0	3.2	0.5
Datil-Dioxice complex, 1 to 5 percent slopes	Argiustolls	3	0.28	No	4.5	0.0	1.3	1.8
Datil gravelly fine sandy loam, 1 to 6 percent slopes	Argiustolls	4	0.37	No	0.0	0.0	0.4	0.0
Datil gravelly loam, 15 to 25 percent slopes	Argiustolls	6	0.32	No	0.8	0.0	1.7	7.0
Dona Ana-Tres Hermanos association, gently sloping	Calciargids	3	0.55	No	4.9	0.0	3.5	1.3
Eba very gravelly loam, gently sloping	Calciargids	7	0.37	No	1.2	0.0	0.0	0.5

Table 3-3. Soil Units within the AIP Access Roads, Study Area by Ownership								
Map Unit Name	**Group**	**WEG**	**Kw**	**Prime Farmland**	**Mileage**			
					BLM	**USFS**	**State**	**Private**
Fluventic-Haploborolls-Aquic Ustifluvents	Haploborolls	3	-	No data	0.0	1.90	0.0	0.0
Glenberg-Riverwash association, 0 to 5 percent slopes	Torrifluvents	3	0.24	If irrigated	0.3	0.0	0.5	0.9
Glendale-Gila complex, nearly level	Torrifluvents	3	0.55	No	0.0	0.0	0.0	0.1
Goldust gravelly sandy clay loam, 2 to 8 percent slopes	Argiustolls	6	0.32	No	0.1	0.0	0.0	1.7
Goldust gravelly sandy loam, 2 to 8 percent slopes	Argiustolls	5	0.37	No	0.0	0.0	0.4	0.2
Gustspring-Aridic Ustoschrepts complex, 5 to 40 percent slopes	Argiustolls	5	0.28	No	0.2	0	0	0
Hondale-Mimbres complex	Natrargids	4L	0.43	No	0.1	0.0	0.0	0.0
La Fonda loam, gently sloping	Haplocambids	4L	0.37	No	0.1	0.0	0.0	0.0
Lehmans extremely rocky loam, 10 25 percent slopes	Haplargids	8	0.24	No	1.9	0.0	0.0	0.0
Loarc-Guy-Dioxice-Datil	Argiustolls	3	0.37	No data	0.0	7.3	0.0	0.0
Luzena-Rock outcrop association, very steep	Argiustolls	7	0.37	No	1.6	0.0	0.2	5.8
Manzano-Hickman-Catman	Haplustolls	3	0.32	No data	0.0	5.9	0.0	0.0
Manzano clay loam, 0 to 2 percent slopes	Haplustolls	6	0.37	No	1.2	0.0	0.9	0.4
Mimbres and Verhalen soils	Haplocambids	4	0.32	No	3.1	0.0	0.3	1.5
Mimbres soils	Haplocambids	6	0.43	No	0.0	0.0	0.0	0.2
Mohave sandy clay loam, 0 to 3 percent slopes	Calciargids	4L	0.32	No	0.7	0.0	0.2	0.9
Nickel-Chamberino association, gently sloping	Haplocalcids	3	0.28	No	19.9	0.0	1.7	6.7
Nickel-Tencee-Delnorte complex, moderately sloping	Haplocalcids	6	0.28	No	1.3	0.0	0.0	0.0
Nickel-Tres Hermanos complex	Haplocalcids	5	0.37	No	0.3	0.0	0.1	0.0
Nickel very gravelly fine sandy loam, very steep	Haplocalcids	6	0.28	No	15.1	0.0	5.7	3.2
Nickel very gravelly sandy loam, 3 to 9 percent slopes	Haplocalcids	6	0.37	No	0.8	0.0	0.2	0.0

Table 3-3. Soil Units within the AIP Access Roads, Study Area by Ownership								
Map Unit Name	**Group**	**WEG**	**Kw**	**Prime Farmland**	**Mileage**			
					BLM	**USFS**	**State**	**Private**
Pinaleno-Nolam association, moderately sloping	Calciargids	6	0.3	No	0.0	0.0	0.0	0.3
Pintura-Berino complex, eroded	Torripsamments	1	0.2	No	0.0	0.0	0.0	0.8
Pleioville-Brycan-Bario	Haplustalfs	4	0.37	No data	0.0	1.8	0	0.1
Pleioville gravelly sandy loam, 3 to 15 percent slopes	Haplustalfs	4	0.2	No	0.0	0.0	0.0	6.9
Rock outcrop-Aridic Ustoschrepts complex, 10 to 25 percent slopes	Ustochrepts	5	0.24	No	3.7	0.0	0.4	1.6
Rock outcrop-Deama association, extremely steep	Calciustolls	6	0.37	No	0.0	0.0	0.0	0.5
Rock outcrop-Luzena association, extremely steep	Argiustolls	5	0.32	No	0.1	0.0	0.0	2.4
Rock outcrop-Rizozo association, extremely steep	Torriorthents	5	0.37	No	0.3	0.0	0.0	1.3
Rudd-Modyon complex, 3 to 15 percent slopes	Calciustolls	5	0.37	No	3.5	0.0	0.0	0.0
Scholle-Idelfonso association, moderately rolling	Calciargids	5	0.37	No	1.5	0.0	0.7	1.5
Smilo-Adman complex, 0 to 9 percent slopes	Argiustolls	5	0.37	No	20.1	0.0	2.4	2.0
Smilo-Adman complex, moist, 3 to 15 percent slopes	Argiustolls	6	0.2	No	0.3	0.0	0.0	0.0
Stellar-Continental association, gently sloping	Calciargids	3	0.32	No	4.3	0.0	3.1	0.0
Stellar silty clay loam	Calciargids	6	0.37	No	6.4	0.0	3.7	2.7
Thunderbird-Rudd-Hubbell-Cabezon	Argiustolls	2	0.2	No data	0.1	1.9	0.0	0.0
Tolman-Rock outcrop complex, 25 to 60 percent slopes	Argiustolls	8	-	No	0.9	0.0	0.7	0.0
Tolman-Smilo-Rock outcrop-Adman	Argiustolls	3	0.49	No data	0.0	1.8	0.0	0.0
Tres Hermanos-Hap association, gently sloping	Calciargids	5	0.37	No	6.7	0.0	2.4	1.0
Tres Hermanos gravelly fine sandy loam, gently sloping	Calciargids	3	0.37	No	2.0	0.0	1.6	0.0
Turney-Dona Ana association	Haplocalcids	3	0.37	No	0.0	0.0	0.0	0.1

Table 3-3. Soil Units within the AIP Access Roads, Study Area by Ownership								
Map Unit Name	**Group**	**WEG**	**Kw**	**Prime Farmland**	**Mileage**			
					BLM	**USFS**	**State**	**Private**
Typic Argiborolls	Argiborolls	6	-	No data	0.0	2.8	0.0	0.0
Typic Dystrochrepts-Rock outcrop-Lithic Ustoschrepts	Dystochrepts	4L	-	No data	0.0	0.2	0.0	0.0
Typic Haplustalfs-Lithic Haplustalfs	Haplustalfs	6	-	No data	0.0	1.8	0.0	0.6
Typic Haplustalfs-Rock outcrop-Eutric Glossoboralfs	Haplustalfs	6	-	No data	0.0	1.7	0.0	0.0
Typic Haplustalfs-Mollic Eutroboralfs	Haplustalfs	6	-	No data	0.0	8.3	0.0	0.4
Typic Ustochrepts-Fluventic Ustochrepts	Ustochrepts	3	-	No data	0.0	5.3	0.0	0.3
Typic Ustorthents-Typic Ustochrepts-Typic Udorthents-Rock outcrop	Ustorthents	3	-	No data	0.0	2.3	0.0	0.0
Udic Ustochrepts-Typic Ustochrepts	Ustochrepts	7	-	No data	0.0	2.4	0.0	0.0
Upton gravelly sandy loam, 3 to 10 percent slopes	Petrocalcids	8	0.28	No	0.4	0.0	0.0	0.0

Data derived from NRCS, SSURGO, and soil surveys of Luna, Sierra, Socorro, and Catron counties.
For WEG: 1-2 = high susceptibility, 3, 4, or 4L = moderate susceptibility, 5-7 = low susceptibility, 8 = no susceptibility
For Kw factor: < 0.20 = low susceptibility, 0.20 – 0.39 = moderate susceptibility, ≥0.40 = high susceptibility

The determination of total erodibility for a soil was weighed between both WEG and Kw.

Columns were rounded, but totals reflect total mileage for jurisdiction.

BLM

The proposed Resource Roads and Primitive Roads cross approximately 66 miles of BLM lands within the existing AIP transmission line right-of-way, and 70 miles outside of the existing AIP transmission line right-of-way (see Section 2.6 Table 2-2). Of this total 136 miles, approximately 21 miles are within soils having a high susceptibility to wind and water erosion, and 79 miles are within soils having a moderate susceptibility to wind and water erosion (see Table 3-3).

Forest Service

The proposed Cross-country Travel crosses approximately 46 miles of Forest Service lands within the existing AIP transmission line right-of-way. No proposed Project access on Forest Service lands is located outside of the existing AIP Transmission Line right-of-way (see Section 2.6 Table 2-2). Of this total, approximately 4 miles are within soils having a high susceptibility to wind and water erosion, and 21 miles are within soils having a moderate susceptibility to wind and water erosion (see Table 3-3).

State and Private

The proposed Resource Roads and Primitive Roads cross approximately 20 miles of State lands within the existing AIP transmission line right-of-way, and 21 miles outside of the existing AIP transmission line right-of-way (see Section 2.6 Table 2-2). Of this total 41 miles, approximately 6 miles are within soils having a high susceptibility to wind and water erosion, and approximately 20 miles are within soils having a moderate susceptibility to wind and water erosion (see Table 3-3).

The proposed Resource Roads and Primitive Roads cross approximately 31 miles of private lands within the existing AIP transmission line right-of-way, and 36 miles outside of the existing AIP transmission line right-of-way (see Section 2.6 Table 2-2). Of this total 67 miles, approximately 3 miles are within soils having a high susceptibility to wind and water erosion, and approximately 20 miles are within soils having a moderate susceptibility to wind and water erosion (see Table 3-3).

3.3. Paleontological Resources

3.3.1. Introduction

Paleontological resources are any fossilized remains, traces, or imprints of organisms that are preserved in the Earth's crust and provide information about the history of life on Earth. Fossil remains may include bones, teeth, shells, leaves, and wood that are typically considered to be older than 10,000 years B.P. Paleontological resources include not only the actual fossils, but also the collecting localities and the geological deposits that contain the fossils. Paleontological resources are recognized as non-renewable scientific resources and are protected by federal statutes and policies.

Information for the paleontological inventory was obtained from a review of the scientific literature, from the databases at the New Mexico Museum of Natural History and Science, from the BLM, and from a paleontological resources assessment performed in 2014. A search for paleontological localities was also conducted using records from the online Paleobiology Database (2011) maintained by the University of California, Berkeley Museum of Paleontology, and MioMap (Carrasco, et al. 2005). These record searches included a one-mile buffer (study area) around the Project components.

Information about the geological units and known fossil localities in the region were used to identify the paleontological resource potential of areas within the Project area. Paleontological potential levels were assigned to each geological unit using the Potential Fossil Yield Classification (PFYC) system that was adopted by the BLM in 2007 for assessing paleontological potential on federal land. The PFYC system is a five-tiered system that the BLM uses to classify geological units based on the relative abundance of vertebrate fossils or scientifically significant invertebrate and plant fossils and their potential to be adversely impacted, with a higher class number indicating a higher potential. This classification system is applied to the geological formation, member, or other distinguishable map unit, preferably at the most detailed mappable level. This approach was followed in recognition of the direct relationship that exists between paleontological resources and the geological units within which fossils are entombed.

- PFYC 5 – Very High Potential, monitoring required
- PFYC 4 – High Potential, monitoring required
- PFYC 3 – Moderate or Unknown Potential, monitoring may be required
- PFYC 2 – Low Potential, no monitoring required
- PFYC 1 – Very Low Potential, no monitoring

3.3.2. Affected Environment

The Project area study corridor contains 21 geological units ranging from the most recent Quaternary to the Permian (Scholle 2003). Table 3-4 shows these units within the AIP study area, with mileages calculated by land ownership beginning with the most recent.

Table 3-4. Geological Units within the AIP Study Area

Geological Name	Age	Rock Type	PFYC	Mileage			
				BLM	Forest Service	State	Private
Quaternary Alluvium (Qa)	Quaternary	Unconsolidated sand, silt, and gravel	1	14.5	9.0	1.6	4.9
Piedmont alluvial (Qp)	Quaternary	Alluvium	1	25.7	14.7	7.6	14.0
Older piedmont alluvial deposits (QTp)	Quaternary	Unconsolidated material	2	4.5	0.5	0.0	0.7
Pleistocene and Pliocene basaltic and andesitic volcanics interbedded with sedimentary units (QTb)	Quaternary/Tertiary	Basalt and andesite with sedimentary rocks	2	4.7	0.5	0.0	0.9
Upper Santa Fe Group (Camp Rice, Fort Hancock, Palomas, Sierra Ladrones, Ancha, Puye, and Alamosa Formations) (QTs, QTsf)	Middle Pleistocene to uppermost Miocene	Conglomerate and interbedded sand and clay beds, cobbles and boulders	4-5	60.1	0.4	22.8	28.4
Gila Group (QTg)	Quaternary to upper Oligocene	Conglomerate, sandstone and basalt	4 (case by case)	5.8	31.4	6.7	16.8
Basalt and andesite flows (Tmb)	Miocene	Volcanic rocks	1	11.3	0.0	0.3	0.0
Fence Lake Formation (Tfl)	Miocene	Conglomerate and conglomeratic sandstone, volcanoclastic sediments, minor eolian facies	4 (case by case)	1.4	0.0	1.0	0.0

Table 3-4. Geological Units within the AIP Study Area							
Geological Name	**Age**	**Rock Type**	**PFYC**	**Mileage**			
				BLM	**Forest Service**	**State**	**Private**
Basaltic andesites (Tuau)	Lower Miocene and uppermost Oligocene	Volcanic rocks	1	13.2	11.8	3.2	0.8
Sedimentary and volcanoclastic sedimentary rocks (Tos)	Oligocene and upper Eocene	Volcanic rocks	2	0.0	10.3	0.0	0.0
Silicic or felsic flows and masses (Turf)	Upper Oligocene	Volcanic rocks	1	1.5	7.7	0.0	0.7
Volcanic rocks, undifferentiated (Tlv)	Lower Oligocene and Eocene	Volcanic rocks	2	0.0	5.9	0.0	0.4
Quartz monzonites (Tli)	Eocene	Volcanic rocks	1	0.1	0.0	0.0	1.2
Rhyolitic pyroclastic rocks (Turp)	Upper Oligocene	Volcanic rocks	2	3.5	26.5	1.1	2.6
Andesites and basaltic andesites (Tual)	Upper Oligocene	Volcanic rocks	1	0.1	11.8	0.6	0.5
Silicic pyroclastic rocks (Tlrp)	Lower Oligocene	Volcanic rocks	2	0.1	2.4	0.0	1.4
Rubio Peak Formation and andesite of Dry Leggett Canyon (Tla)	Lower Tertiary	Andesite and basaltic andesite flows	2	1.7	0.0	0.0	4.4
Abo Formation (Pa)	Permian	Red beds, arkosic at base, finer above)	3 (locally 4 or 5)	2.8	0.0	0.8	3.1
Yeso, Glorieta, and San Andres formations (Pys)	Permian	Sandstone with some fine-grained mixed clastics	2	1.4	0.0	0.7	1.0
Madera Formation (Pm)	Pennsylvanian	Limestone, silt, shale, and sandstone	2	0.8	0.0	0.0	2.0
Mississippian through Cambrian rocks undivided (M)	Mississippian-Cambrian	Carbonate and clastic rocks	2	0.8	0.0	0.0	2.0

Table 3-4. Geological Units within the AIP Study Area							
Geological Name	Age	Rock Type	PFYC	Mileage			
				BLM	Forest Service	State	Private
Totals				153.73	132.80	46.27	83.72
PFYC 1= very low, PFYC 2=low, PFYC 3=moderate, PFYC 4=high, PFYC 5=very high							

No previously reported fossil localities are within the two-mile-wide study corridor (one mile on each side of the center line). However, fossils have been reported from several formations in New Mexico that are also found within the study area. A gomphothere was reported from the Fence Lake Formation (Lucas and Anderson 1994). Although the Rubio Peak Formation is classified as having a PFYC of 2, several vertebrate fossils have been found in this formation, including a rodent, brontothere, selenodont, and oromerycid (Lucas 1986; Morgan and Lucas 2012; New Mexico Museum of Natural History and Science [NMMNHS] 2014). Numerous fossils have been reported from the Palomas Formation (QTs) including fish, amphibians, reptiles, birds, glyptodonts, sloth, canids, cats, mustelids, rabbits, rodents, horses, tapirs, peccaries, camels, antilocaprids, and proboscideans (Morgan and Lucas 2003; Morgan et al. 2011; NMMNHS 2014). A mammoth and horse were found in Quaternary deposits near Deming (Morgan and Lucas 2005, NMMNHS 2014). The Abo Formation has produced plant fossils, amphibians, reptiles, and tracks (Vaughn 1969; Hunt 1983; Lucas et al. 2009; Lucas et al. 2013). The Dakota Sandstone has produced numerous invertebrate fossils.

For this Project, a paleontological resources assessment was performed on those geologic units having a PFYC of 3 and 4, and on the Rubio Peak Formation, which has a PFYC of 2. The survey revealed that although a large portion of the project crosses the QTsf, most of this is within a conglomerate section of the piedmont facies that are part of the Upper Santa Fe Group. The piedmont facies rarely produce fossils unlike the axial facies closer to the Rio Grande (Morgan et al. 2011). No significant paleontological resources were found during the paleontological survey.

BLM

There are 70.67 miles of geological units with a PFYC of 4, and 2.74 miles with a PFYC of 3.

Forest Service

There are 31.84 miles of geological units with a PFYC of 4, and 0 miles with a PFYC of 3.

State

There are 30.48 miles of geological units with a PFYC of 4, and 0.79 miles with a PFYC of 3.

Private

There are 45.14 miles of geological units with a PFYC of 4, and 3.14 miles with a PFYC of 3.

3.4. Water Resources

3.4.1. Introduction

This section describes the affected environment for water and groundwater resources. An inventory was conducted to identify perennial and intermittent streams, wetlands, and wells for the Project. Streams in the National Hydrography Dataset (NHD) of the USGS were buffered approximately 1/10 mile and access roads which either cross or parallel streams within this buffer were reported. Wetland and well data within a two-mile study area were gathered from National Wetlands Inventory of the USFWS and the New Mexico Office of State Engineer (well database), respectively. A preliminary jurisdictional delineation was conducted to assess potentially jurisdictional waters that are crossed by the Project. The results of the survey are presented in the Preliminary Jurisdictional Delineation report (2014).

3.4.2. Affected Environment

3.4.2.1. Watersheds

The surface hydrology within the Project area ultimately drains to several major regional waterways or river basins. Waters from the southernmost portions of the Project flow into the closed Guzmán Basin through the Mimbres River or smaller tributaries. Further north, waters on the east flank of the Mimbres Mountains and the Black Range drain to the Rio Grande. Waters on the western flank of these mountains drain to the Gila River, a major tributary of the Colorado River. The Project also crosses the watershed of the Plains of San Agustin. The northernmost portion of the Project crosses the watershed of the Little Colorado River, a tributary of the Colorado River.

The river basins can be further divided into subbasins, watersheds, and subwatersheds. For the purposes of this inventory, the Proposed Project is described by the miles of Project access roads within subwatersheds (6^{th} code) . The Forest Service has classified these subwatersheds into three functionality classifications for the Forest Service as of 2011.

- Class 1 – functioning properly
- Class 2 – functioning at risk
- Class 3 – impaired function

Miles of project access roads within each subwatershed are shown below in Table 3-5, by jurisdiction crossed. While all of the jurisdictions are shown, only the Forest Service lands include functionality classifications.

Table 3-5. Miles of Project Access Roads within 6th Code Subwatersheds

Name of Watershed	BLM	Forest Service			State	Private
		Classification				
		1	2	3		
Berrenda Creek-Rio Grande	4.2	-	-	-	3.4	
Canada de la Cruz-Alamosa Creek	0.4	-	-	-	0.2	6.5
Canada Honda	3.3	-	-	-	-	-

Table 3-5. Miles of Project Access Roads within 6th Code Subwatersheds						
Name of Watershed	BLM	Forest Service			State	Private
		Classification				
		1	2	3		
Canon del Buey	-	-	0.8	-	-	-
Canon del Molino Viejo-Palomas Creek	11.2	-	-	-	3.9	0.8
Coyote Canyon	16.6	-	-	-	-	2.7
Cuervo Arroyo	0.5	-	-	-	-	0.5
Dark Canyon	0.4	1.6	-	-	-	2.0
Fort Cummings Draw	4.0	-	-	-	0.1	-
Garcia Falls-Alamosa Creek	-	-	-	-	-	1.3
Gatlin Lake	1.7	4.8	-	-	-	0.4
Greenhorn Arroyo	5.8	-	-	-	1.1	2.5
Hadley Draw	1.4	-	-	-	0.5	0.7
Hadley Draw-Mimbres River	1.7	-	-	-	0.2	1.8
Hardcastle Canyon	-	-	6.7	-	-	0.4
Headwaters Berrenda Creek	0.1	-	-	-	0.8	-
Headwaters Red Hill Draw	4.2	-	-	-	-	1.5
Jaralosa Creek	-	-	-	-	0.6	-
Jug Canyon Creek	0.9	-	-	-	2.0	0.5
King Arroyo	-	-	-	-	-	4.5
Long Canyon	-	1.7	-	-	-	-
Lower Macho Creek	0.9	-	-	-	-	0.3
Lower Railroad Canyon	10.0	0.8	-	-	6.2	0.7
Mangitas Creek	10.2	-	-	-	-	1.5
Mayes Wash	4.4	-	-	-	1.2	-
Middle Corduroy Draw	-	-	-	-	1.0	3.7
Middle Macho Creek	3.2	-	-	-	-	1.3
Montoya Arroyo	1.5	-	-	-	-	0.1
Monument Creek-Cuchillo Negro Creek	0.2	-	-	-	-	1.7
Mud Springs Canyon	1.4	-	-	-	0.8	-
Negro Canyon-Tularosa River	2.5	-	-	-	-	-
O Bar O Canyon	0.1	-	-	-	-	-
Outlet Berrenda Creek	1.9	-	-	-	0.2	-

Table 3-5. Miles of Project Access Roads within 6th Code Subwatersheds						
Name of Watershed	**BLM**	**Forest Service**			**State**	**Private**
		Classification				
		1	**2**	**3**		
Outlet Los Animas Creek	1.8	-	-	-	-	0.2
Outlet Mule Creek	1.2	-	-	-	-	0.2
Outlet Red Hill Draw	1.0	-	-	-	0.1	-
Outlet Tierra Blanca Creek	1.7	-	-	-	1.4	0.7
Patterson Lake	2.5	1.9	-	-	0.9	2.4
Percha Creek	7.4	-	-	-	-	2.1
Percha Creek-Caballo Reservoir	0.2	-	-	-	-	-
Poverty Creek	1.0	-	-	-	-	0.1
Ricketson Draw	2.3	-	-	-	0.5	-
Round Mountain	1.2	-	-	-	4.3	-
Sand Flat Canyon	-	5.1	-	-	-	-
Salado Creek	0.2	-	-	-	0.1	-
Seco Creek	1.6	-	-	-	-	0.2
Seco Creek-Caballo Reservoir	-	-	-	-	-	1.2
Sim Yaten Canyon-Alamosa Creek	0.1	-	-	-	1.0	-
Starvation Draw	-	-	-	-	-	0.6
Starvation Draw-Mimbres River	-	-	-	-	-	0.7
T H Canyon	0.7	5.7	-	-	0.8	-
Trujillo Canyon Creek	6.4	-	-	-	-	-
Upper Corduroy Draw	-	2.5	-	-	-	6.4
Upper Railroad Canyon	-	0.8	-	-	0.7	1.6
Whiskey Creek	-	6.0	-	-	-	0.2
Wildhorse Canyon	2.7	1.8	-	-	4.1	10.7
Willow Spring Draw	6.4	-	-	-	2.8	1.8
Willow Spring Draw-Cuchillo Negro Creek	0.5	-	-	-	-	0.3
Y Canyon	7.2	-	-	-	4.0	2.1
USFS classifications: (1) functioning properly, (2) functioning, but at risk, (3) functioning, but impaired						

3.4.2.2. Streams, Wetlands, and Wells

The USGS NHD defines the following terms for streams. The term "perennial" is used to describe a stream that contains water throughout the year, except for infrequent periods of severe drought. The term "intermittent" refers to a stream that contains water for only part of the year, but more than just after rainstorms and at snowmelt. The term "ephemeral" describes a stream that contains water only in direct response to precipitation (synonymous with arroyo, gully, wash).

The NHD reported 1 perennial stream, 37 ephemeral streams, and 314 intermittent streams crossed by the Project. The perennial stream is located on Forest Service land in Headwater Canyon, between structures 966 and 967. The preliminary jurisdictional delineation (PJD) survey, completed for the Project in 2014, field checked and documented conditions at all Project access road stream crossings. The PJD documented all stream locations crossed by the Project access roads as ephemeral.

A total of approximately 2.6 miles of wetlands and one riparian crossing at Silver Creek were identified in the USFWS National Wetlands Inventory. Field verification through the PJD confirmed no riparian vegetation at the section of Silver Creek crossed by the Proposed Project. All wetlands crossed by Project access roads were associated with stream channels.

Well data included in the New Mexico Office of State Engineer well database were inventoried within the study area to assess the potential for Project access roads to interfere with well locations. There are a total of 19 water wells located within the Project study area (New Mexico Office of State Engineer 2013).

The number of ephemeral streams crossed by the Project access roads, and the wells located in the Project area are shown below in Table 3-6, by jurisdiction crossed.

Table 3-6. Streams and Wells

	BLM	Forest Service	State	Private
Streams Crossed by Project Access Roads	144	70	53	85
Wells Located in Project Area	3	0	1	15

3.4.2.3. Water Quality

To ensure compliance with the Clean Water Act, water quality standards are set by the New Mexico Water Quality Control Commission. New Mexico's Surface Water Quality Standards define water quality goals by designating uses for waterbodies, setting criteria to protect those uses, and establishing provisions to preserve water quality. These water quality standards are examined for changes on a 3-year rotating basis. Under Section 303(d)(1) of the Clean Water Act, states are required to develop a list of waters within a state that are not in compliance with water quality standards and to establish a total maximum daily load (TMDL) for each pollutant. Reaches of streams that are in some state of non-attainment are documented in "2014-2016 Integrated 303d)/305(b) List of Impaired Waters" (State of NM, 2014).

There are no waters in non-attainment of State Water Quality Standards within the Project.

There are no New Mexico State Designated Outstanding National Resource Waters crossed by the Project (New Mexico Environment Department 2016b).

3.5. Biological Resources

3.5.1. Introduction

This section provides a general description of the affected environment and environmental consequences for biological resources, particularly special-status species known to occur within the project area.

3.5.2. Affected Environment

This section provides a separate description of biological resources present on BLM and Forest Service lands. This description of the affected environment would be identical for private and State Trust lands that are adjacent to these federal lands, and a separate description for non-federal lands is not provided. Federal and state laws that protect biological resources would apply regardless of land ownership. However, policies specific to BLM and Forest Service land management actions (e.g., agency-specific sensitive species lists) would not apply on private and State Trust lands.

3.5.2.1. BLM

Vegetation

The AIP line and access roads pass through seven biomes (Table 3-7), as described by Dick-Peddie (2009). From the Luna Substation near Deming, the Project crosses Desert Grassland. Much of this area has been altered by conversion to shrubland, although the extensive Nutt Grasslands are relatively intact. Near Nutt, the Project turns to the north in the Chihuahuan Desertscrub-dominated Rio Grande Valley. Patchy, often shrub-invaded Desert Grassland is also present on mesas with low slopes in the Rio Grande Valley.

West of the Rio Grande Valley, the Project crosses a number of small mountain ranges and intervening valleys, with a resulting diversity of biomes. The Project crosses through Coniferous and Mixed Woodland and Montane Coniferous Forest in the Wahoo Mountains, then crosses Desert Grassland in valleys crossed by tributaries that form the headwaters of the Gila River. Juniper Savanna, Closed Basin Scrub, and Plains-Mesa Grassland are present near the interior-draining Plains of San Agustin. The Project then crosses extensive Montane Coniferous Forest and Coniferous and Mixed Woodland in the Gallo and San Francisco mountains north of the Tularosa River, before entering Plains-Mesa Grassland and reaching the Red Hill tie-in point. Riparian vegetation in the Project area is primarily "xeroriparian" habitat associated with ephemeral washes and streams. One stream, Las Animas Creek, is a permanent or intermittent stream that flows into the Rio Grande. Patchy riparian woodland dominated by cottonwoods (*Populus fremontii*) is present beneath the centerline of the transmission line on private lands, although the transmission line spans the entire floodplain from structures placed on elevated terrain on BLM lands. No access roads are a part of the Project in riparian habitat at Las Animas Creek, and no other riparian woodlands are present in the Project area.

Table 3-7. Miles Crossed by Transmission Centerline of Vegetation Types in the Project Area.

Vegetation type	BLM	Forest Service	State Trust	Private
Chihuahuan Desert Scrub	28.4	0.0	9.1	10.3
Closed Basin Scrub	0.2	0.0	1.0	0.0

Table 3-7. Miles Crossed by Transmission Centerline of Vegetation Types in the Project Area.				
Vegetation type	BLM	Forest Service	State Trust	Private
Coniferous And Mixed Woodland	4.1	10.1	1.0	6.8
Desert Grassland (Ecotone)	19.9	0.0	8.2	14.8
Juniper Savanna (Ecotone)	7.2	5	2.0	6.1
Montane Coniferous Forest	6.2	35.3	0.2	3.2
Plains-Mesa Grassland	18.1	4.1	3.0	3.9
Source: Dick-Peddie 2009.				

Wildlife

Wildlife species richness is high in the region, which is located near the convergence of several major biogeographical regions: the Chihuahuan Desert, Desert Grassland, and Rocky Mountains. Species richness is particularly high for small mammals (including bats) and reptiles. Within BLM lands in the Project area, the Pelona Mountain ACEC is specifically identified for special management to protect sensitive wildlife, including the Bald Eagle, Peregrine Falcon, and a large Elk herd. The remainder of this section provides notes particularly focused on special-status species that may be present in the Project area.

Migratory Birds

Nearly all birds that occur in the Project area are protected under the MBTA. Certain groups of birds, including upland game birds (quails, pheasants, and relatives) are not protected under the MBTA but are managed by the states. At least 542 bird species have been recorded in New Mexico (New Mexico Ornithological Society [NMOS] 2015). The Rio Grande supports a substantial segment of the Central Flyway, in particular supporting large numbers of migrating and wintering waterfowl.

The Memorandum of Understanding (MOU) between the BLM and USFWS identifies the need to consider bird species identified as declining in management decisions that affect bird habitat. The discussion below on special-status species provides additional information on declining or sensitive bird species that may occur in the Project area.

Special-status Species

The special-status species evaluated in the Biological Evaluation (see Appendix C) consist of all ESA-listed, proposed, and candidate species recorded from Catron, Luna, Sierra, and Socorro counties, as reported by the USFWS Information, Planning, and Conservation (IPaC) database (USFWS 2016). Additional species evaluated included state-listed species, USFWS Birds of Conservation Concern, USFWS plant species of concern, and BLM sensitive species. Additional special-status species were identified using the Biota Information System of New Mexico (BISON-M), and New Mexico Rare Plant Technical Council (NMRPTC 1999) (see Appendix C for complete Biological Evaluation). Table 3-8 also includes Forest Service Region 3 Management Indicator Species (MIS) and sensitive species, addressed separately in Section 3.5.2.2.

Reflecting the range of elevations and habitats traversed by the AIP line, a diverse array of animal species could potentially occur within the project area. One hundred seventy-eight special-status species were reviewed for potential occurrence within the Project area, 87 of which have the potential to occur along the AIP line (Table 3-8).

Table 3-8. Special-status Species that Were Evaluated for Potential Occurrence within the Study Area and Project Area of Influence

BCC: Bird Species of Conservation Concern
BGEPA: Bald and Golden Eagle Protection Act
BLMS: Bureau of Land Management Sensitive Species
C: Candidate for ESA listing
E: ESA Endangered Species
FSS: U.S. Forest Service Sensitive Species
MIS: Management Indicator Species
NEP: Nonessential Experimental Population
NME: New Mexico Endangered
NMT: New Mexico Threatened
P: Proposed for ESA listing
T: ESA Threatened Species

Common Name *Latin Name*	Status	Designated Critical Habitat	Habitat and Notes	Potential In or Near the Project Area
Mammals				
Allen's Big-eared Bat *Idionycteris phyllotis*	BLMS; FSS	NA	Montane forest and riparian woodlands in cliffs, rock outcroppings, and boulder piles.	Yes
Pale Townsend's Big-eared Bat *Corynorhinus townsendii*	BLMS; FSS	NA	Roosts in caves, mine tunnels, and buildings from desertscrub into montane coniferous forest.	Yes
Arizona Myotis *Myotis occultus*	BLMS	NA	Ponderosa pine, oak-pine woodland, or riparian habitats.	Yes
Western Red Bat *Lasiurus blossevillii*	BLMS; FSS	NA	Roosts in large trees, often in riparian woodlands.	Yes
Spotted Bat *Euderma maculatum*	BLMS; FSS; NMT	NA	Roosts in crevices and caves in rocky cliffs from below sea level to moderate elevations.	Yes
Mule Deer *Odocoileus hemionus*	MIS	NA	Variety of habitats ranging from xeric desertscrubland to montane mixed conifer forests.	Yes
Gunnison's Prairie Dog *Cynomys gunnisoni*	BLMS; FSS	NA	Grasslands, piñon-juniper savannas, and mountain meadows.	Yes
Oscura Mountains Colorado Chipmunk *Neotamias quadrivittatus oscuraensis*	BLMS; NMT	NA	Largely restricted to Ponderosa Pine woodlands in the Oscura Mountains.	Project area outside of known distribution.
New Mexico Meadow Jumping Mouse *Zapus hudsonius luteus*	E;; NME	Yes, outside Project area	Persistent emergent, herbaceous wetlands, open riparian areas, and wet meadows.	Project area outside of known distribution.
Pecos River Muskrat *Ondatra zibethicus ripensis*	BLMS	NA	Rivers, drainages, and marshes.	Yes
Desert Bighorn Sheep *Ovis canadensis mexicana*	FSS	NA	Low desert mountain ranges in steep, rocky terrain, often near a water source.	Project area outside of known distribution.
Arizona Montane Vole *Microtus montanus arizonensis*	NME	NA	Damp to wet montane grasslands in ponderosa pine or mixed coniferous forest.	Yes

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P: Proposed for ESA listing
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Common Name *Latin Name*	Status	Designated Critical Habitat	Habitat and Notes	Potential In or Near the Project Area
Mexican Gray Wolf *Canis lupus baileyi*	E (NEP); NME	NA	Chaparral, woodland, and forested areas.	Yes
Birds				
Lark Bunting *Calamospiza melanocorys*	BCC	NA	Dry plains and prairies, often associated with sagebrush.	Yes
Painted Bunting *Passerina ciris*	BCC; BLMS	NA	Partly open landscapes in riparian habitats and surrounding shrublands.	Yes
Varied Bunting *Passerina versicolor*	BCC; NMT	NA	Brushy desert canyons and along washes.	Project area outside of known distribution.
Neotropic Cormorant *Phalacrocorax brasilianus*	NMT	NA	Occurs in a variety of aquatic habitats that provide deep water for diving and structure for perches.	No suitable habitat within the Project area.
Yellow-billed Cuckoo, Western DPS *Coccyzus americanus*	T	Proposed, outside Project area	Cottonwood-willow and broadleaf riparian forest.	Yes
Long-billed Curlew *Numenius americanus*	BCC	NA	Short-grass and mixed-grass habitats.	Yes
Bald Eagle *Haliaeetus leucocephalus*	BGEPA; BCC; NMT	NA	Present in winter along large rivers and reservoirs.	Yes
Golden Eagle *Aquila chrysaetos*	BCC; BGEPA	NA	Mountain cliffs and canyons, but hunts in open grassland or shrubland habitat.	Yes
Northern Aplomado Falcon *Falco femoralis septentrionalis*	E (NEP)	NA	Chihuahuan desert grasslands with tall yuccas, mesquites, and existing raptor nests.	Yes
Peregrine Falcon *Falco peregrinus anatum*	BCC; FSS; NMT	NA	Mountain and canyon habitats.	Yes
Northern Goshawk *Accipiter gentilis*	FSS; MIS; BLMS	NA	Conifer-dominated mixed woodlands.	Yes

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NMT: New Mexico Threatened
P: Proposed for ESA listing
T: ESA Threatened Species

Common Name *Latin Name*	Status	Designated Critical Habitat	Habitat and Notes	Potential In or Near the Project Area
Ferruginous Hawk *Buteo regalis*	BLMS	NA	Occurs in broad expanses of prairie grassland.	Yes
Common Black-Hawk *Buteogallus anthracinus*	BCC; FSS; MIS; NMT	NA	Mature gallery forests dominated by cottonwood and sycamore.	Yes
Mexican Spotted Owl *Strix occidentalis lucida*	T; MIS	Yes, outside Project area	Mixed conifer forest dominated by Douglas-fir, pine, and pine-oak associations.	Yes
Burrowing Owl *Athene cunicularia*	BCC; BLMS	NA	Dry, open short grass habitats.	Yes
Elf Owl *Micrathene whitneyi*	BCC	NA	Desertscrub, wooded riparian canyons, and montane oak and mixed conifer woodlands.	Yes
Southwestern Willow Flycatcher *Empidonax traillii extimus*	E, NME	Yes, outside Project area	Dense riparian habitat of willow, salt cedar, and box elder.	No suitable habitat present.
Common Ground-dove *Columbina passerina*	NME	NA	Occurs in variety of habitats, including mesquite flats, riparian woodland, and washes in desertscrub.	Project area is outside of known distribution.
Piping Plover *Charadrius melodus*	T	Yes, outside Project area	Bare, dry sandy areas.	No suitable habitat present.
Mountain Plover *Charadrius montanus*	BCC	NA	Large, flat grasslands with sparse, short vegetation.	Yes
Snowy Plover *Charadrius nivosus*	BCC; FSS	NA	Barren or sparsely vegetated ground, usually alkali flats.	Project area is outside of known distribution.
Solitary Sandpiper *Tringa solitaria*	BCC	NA	Ponds, woodland streams, and marshes.	Yes
Montezuma Quail *Cyrtonyx montezumae*	MIS	NA	Understory of oak-pine and madrean evergreen woodlands with substantial herbaceous cover.	Yes
Costa's Hummingbird *Calypte costae*	NMT	NA	Desertscrub and xeric washes.	Yes

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T: ESA Threatened Species

Common Name *Latin Name*	Status	Designated Critical Habitat	Habitat and Notes	Potential In or Near the Project Area
Violet-crowned Hummingbird *Amazilia violiceps*	NMT	NA	Broadleaf riparian woodlands of sycamore, cottonwood, hackberry, and oak.	Yes
Broad-billed Hummingbird *Cynanthus latirostris*	BLMS	NA	Riparian zones of arid canyons.	Project area is outside of known distribution.
White-eared Hummingbird *Hylocharis leucotis*	NMT	NA	Desert canyons and low mountain woodlands.	Project area is outside of known distribution.
White-faced Ibis *Plegadis chihi*	BLMS	NA	Freshwater marshes.	Yes
Thick-billed Kingbird *Tyrannus crassirostris*	NME	NA	Riparian canyons with cottonwood and sycamore.	Project area is outside of known distribution.
Loggerhead Shrike *Lanius ludovicianus*	BCC; BLMS	NA	Occurs in a wide variety of habitats.	Yes
Chestnut-collared Longspur *Calcarius ornatus*	BLMS	NA	Open grasslands, occasionally desertscrub.	Yes
Grasshopper Sparrow *Ammodramus savannarum*	BLMS	NA	Open grasslands and prairies with patchy, bare ground.	Project area outside of known distribution.
Baird's Sparrow *Ammodramus bairdii*	BCC; BLMS; FSS; NMT	NA	Expansive grasslands with extensive litter and ground cover.	Project area is outside of known distribution.
Black-chinned Sparrow *Spizella atrogularis*	BCC	NA	Arid chaparral on rugged, rocky slopes, up to 8,000 feet elevation	Yes
Rufous-crowned Sparrow *Aimophila ruficeps*	FSS	NA	Open oak woodlands, treeless dry uplands, often near rocky outcrops.	Yes
Savannah Sparrow *Passerculus sandwichensis nevadensis*	FSS	NA	Prairies and fields.	Yes
Bendire's Thrasher *Toxostoma bendirei*	BCC; BLMS	NA	Sparse desert shrubland and open woodland with scattered shrubs.	Yes

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Common Name *Latin Name*	Status	Designated Critical Habitat	Habitat and Notes	Potential In or Near the Project Area
Juniper Titmouse *Baeolophus ridgwayi*	MIS	NA	Warm, dry habitats of open woodland. Primarily found in juniper dominated woodlands.	Yes
Elegant Trogon *Trogon elegans*	NME	NA	Lowland foothill and mountain habitats.	Project area is outside of known distribution.
Bell's Vireo *Vireo bellii*	BCC; BLMS; FSS; NMT	NA	Dense lowland shrub and understory vegetation.	Yes
Gray Vireo *Vireo vicinior*	BCC; FSS; NMT	NA	Associated with piñon-juniper, piñon savannah and oak habitats.	Yes
Grace's Warbler *Setophaga graciae*	BCC	NA	Prefers park-like stands of mature tall pines.	Yes
Lucy's Warbler *Oreothlypis luciae*	BCC	NA	Desert riparian habitats.	Yes
Olive Warbler *Peucedramus taeniatus*	BCC	NA	High elevation pine and pine-oak forests.	Yes
Red-faced Warbler *Cardellina rubrifrons*	BCC	NA	Moderate-to-high-elevation conifer forests, and riparian woodlands.	Yes
Yellow Warbler *Setophaga petechia*	BCC	NA	Found along streams and swampy areas.	Yes
Hairy Woodpecker *Picoides villosus*	MIS	NA	Mixed coniferous woodlands including piñon-juniper.	Yes
Lewis's Woodpecker *Melanerpes lewis*	BCC	NA	Open canopy riparian and montane forests.	Yes
Red-headed Woodpecker *Melanerpes erythrocephalus*	BCC	NA	Deciduous woodlands and adjacent open areas. Require large-diameter snags for nesting.	Project area is outside of known distribution.
Gila Woodpecker *Melanerpes uropygialis*	NMT	NA	Saguaro Desert and riparian woodland.	Yes

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Common Name *Latin Name*	Status	Designated Critical Habitat	Habitat and Notes	Potential In or Near the Project Area
Lesser Yellowlegs *Tringa flavipes*	BCC	NA	Frequents ponds, lakes, and river shores.	Yes
Black Tern *Chlidonias niger*	BLMS	NA	Freshwater marshes.	Yes
Least Tern *Sternula antillarum*	E	Yes, outside Project area	Bare or sparsely vegetated sand or dried mudflats. Recorded from Bitter Lake NWR in New Mexico.	Project area is outside of known distribution.
Brown Pelican *Pelecanus occidentalis*	NME	NA	Primarily coastal. Casual visitor to large inland bodies of water.	No suitable habitat present.
Reptiles				
Big Bend Slider *Trachemys gaigeae*	BLMS	NA	Ponds and streams along the Rio Grande.	No suitable habitat present.
Narrow-headed Gartersnake *Thamnophis rufipunctatus*	T; NMT	Yes, near Project area	Cool, clear rocky streams. May be present in the Tularosa River in Catron County.	Yes
Northern Mexican Gartersnake *Thamnophis eques megalops*	T; NMT	Yes, outside Project area	Riparian and wetland habitats.	Project area is outside of known distribution.
Reticulate Gila Monster *Heloderma suspectum suspectum*	NME	NA	Desertscrub associated with rocky regions of mountain foothills and canyons.	Project area is outside of known distribution.
Amphibians				
Chiricahua Leopard Frog *Lithobates chiricahuensis*	T	Yes, near Project area	Stock tanks, seeps, and permanent or near-permanent streams.	Yes
Lowland Leopard Frog *Lithobates yavapaiensis*	BLMS; FSS; NME	NA	Streams, rivers, lakes, marshes. Present in New Mexico in Guadalupe Canyon and tributaries of the Gila River.	Project area is outside of known distribution.
Northern Leopard Frog *Lithobates pipiens*	FSS	NA	Streams, rivers, lakes, marshes.	Yes

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Common Name *Latin Name*	Status	Designated Critical Habitat	Habitat and Notes	Potential In or Near the Project Area
Great Plains Narrowmouth Toad *Gastrophryne olivacea*	FSS; NME	NA	Desertscrub along flooded roadside ditches.	Project area is outside of known distribution.
Arizona Toad *Anaxyrus microscaphus*	BLMS	NA	Montane riparian corridors and low-elevation canyons from 460 to 7,930 feet elevation.	Yes
Fish				
Flathead Chub *Platygobio gracilis*	BLMS	NA	Sandy runs of rivers.	Project area is outside of known distribution.
Gila Chub *Gila intermedia*	E; NME	NA	Small headwater streams.	Project area is outside of known distribution.
Rio Grande Chub *Gila pandora*	FSS	NA	Pools of creeks and small rivers.	Project area is outside of known distribution.
Headwater Chub *Gila nigra*	C; FSS; NME	NA	Pools and runs in small streams near cover.	Project area is outside of known distribution.
Roundtail Chub *Gila robusta*	C; FSS	NA	Deep pools and eddies of rivers and streams.	Project area is outside of known distribution.
Longfin Dace *Agosia chrysogaster*	BLMS; FSS	NA	Shallow sandy and rocky runs of creeks and small rivers.	Project area is outside of known distribution.
Speckled Dace *Rhinichthys osculus*	BLMS	NA	Rocky riffles, runs, and pools of headwater streams and small rivers.	Project area is outside of known distribution.
Loach Minnow *Rhinichthys cobitis*	E; NME	Yes, outside Project area	In riffles with moderate-to-rapid velocity. Present in the Tularosa River south of Reserve, NM.	Project area is outside of known distribution.
Rio Grande Silvery Minnow *Hybognathus amarus*	E; NME	Yes, outside Project area	Shallow water in mainstream habitats.	Project area is outside of known distribution.
Rio Grande Shiner *Notropis jemezanus*	BLMS	NA	Sandy, rocky runs and pools.	Project area is outside of known distribution.

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Common Name *Latin Name*	Status	Designated Critical Habitat	Habitat and Notes	Potential In or Near the Project Area
Beautiful Shiner *Cyprinella formosa*	T	Yes, outside Project area	Small streams and ponds. Historical records in Mimbres River drainage, but now extirpated.	Project area is outside of known distribution.
Spikedace *Meda fulgida*	E; NME	Yes, outside Project area	Sand and gravel-bottomed runs and riffles.	Project area is outside of known distribution.
Desert Sucker *Catostomus clarkii*	BLMS; FSS	NA	Small-to-medium rivers.	Project area is outside of known distribution.
Rio Grande Sucker *Catostomus plebeius*	FSS	NA	Small-to-large, middle-elevation streams with gravel and cobble substrates.	Project area is outside of known distribution.
Sonora Sucker *Catostomus insignis*	BLMS; FSS	NA	Rocky pools of creeks and small-to-medium rivers.	Project area is outside of known distribution.
Rio Grande Cutthroat Trout *Oncorhynchus clarkia virginalis*	BLMS; FSS; MIS	NA	Clear, cool water streams and lakes.	Project area is outside of known distribution.
Gila Trout *Oncorhynchus gilae*	T; MIS	No	Small headwater streams.	Project area is outside of known distribution.
Invertebrates				
Silver Creek Woodlandsnail *Ashmunella binneyi*	FSS	NA	Endemic to the west side of the Black Range in canyons between 8,000 and 8,500 feet in elevation.	Project area outside of known distribution.
Woodlandsnail (no common name) *Ashmunella cockerelli argenticola*	FSS	NA	Higher elevation leaf litter amongst loose limestone rocks along Silver Creek Canyon.	Project area is outside of known distribution.
Black Range Woodlandsnail *Ashmunella cockerelli cockerelli*	FSS	NA	Southwestern Black Range in open woodland on limestone talus.	Project area is outside of known distribution area.
Woodlandsnail (no common name) *Ashmunella cockerelli perobtusa*	FSS	NA	Southeastern Black Range approximately 2 miles east of Sawyer Peak.	Project area is outside of known distribution area.
Whitewater Creek Woodlandsnail *Ashmunella danielsi*	FSS	NA	Wooded igneous rock in damp leaf litter.	Project area is outside of known distribution.

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Common Name *Latin Name*	Status	Designated Critical Habitat	Habitat and Notes	Potential In or Near the Project Area
Cooke's Peak Woodlandsnail *Ashmunella macromphala*	BLMS; NMT	NA	Igneous slopes on Cooke's Peak and surrounding canyons.	Project area is outside of known distribution.
Iron Creek Woodlandsnail *Ashmunella mendax*	FSS	NA	Canyons at mid-elevation, and forests at higher elevations in the southwestern Black Range.	Project area is outside of known distribution.
Woodlandsnail (no common name) *Ashmunella tetrodon animorum*	FSS	NA	High elevation forests on accumulations of talus of igneous rocks.	Project area is outside of known distribution.
Woodlandsnail (no common name) *Ashmunella tetrodon inermis*	FSS	NA	Deciduous forests along deep canyons in the southwestern Mogollon Mountains.	Project area is outside of known distribution.
Woodlandsnail (no common name) *Ashmunella tetrodon mutator*	FSS	NA	Deciduous forests along deep canyons in the southwestern Mogollon Mountains.	Project area is outside of known distribution.
Dry Creek Woodlandsnail *Ashmunella tetrodon tetrodon*	FSS	NA	Deciduous forests along deep canyons in the southwestern Mogollon Mountains.	Project area is outside of known distribution.
Alamosa Springsnail *Tryonia alamosae*	E; NME	No	Slow current on gravel and among vegetation near springheads.	Only known from one spring complex outside of the Project area.
Gila Springsnail *Pyrgulopsis gilae*	FSS; NMT	NA	Mud, debris and vegetation along springs in the Gila River Drainage.	Project area is outside of known distribution.
New Mexico Hot Springsnail *Pyrgulopsis thermalis*	NMT	NA	Thermal spring waters along the Gila River.	Project area is outside of known distribution.
Chupadera Springsnail *Pyrgulopsis chupaderae*	E; NME	Yes, outside Project area	Outflow of springs. Endemic to Willow Spring, Socorro County.	Project area is outside of known distribution.
Socorro Springsnail *Pyrgulopsis neomexicana*	E; NME	No	Slow current on gravel and among vegetation near springheads.	Project area is outside of known distribution.
Ovate Vertigo Snail *Vertigo ovata*	NMT	NA	Marshes at low elevations on organic litter or damp soil.	Project area is outside of known distribution
Mountainsnail (no common name) *Oreohelix metcalfei acutidiscus*	FSS	NA	High forests in limestone and igneous bedrock.	Project area is outside of known distribution.

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Common Name *Latin Name*	Status	Designated Critical Habitat	Habitat and Notes	Potential In or Near the Project Area
Mountainsnail (no common name) *Oreohelix metcalfei concentrica*	FSS	NA	Limestone bedrock in Silver Creek Canyon on the west side of Sawyer Peak.	Project area is outside of known distribution.
Mountainsnail (no common name) *Oreohelix metcalfei metcalfei*	FSS	NA	Limestone outcrops in the Percha Creek canyon system.	Project area is outside of known distribution.
Mountainsnail (no common name) *Oreohelix metcalfei radiata*	FSS	NA	Limestone bedrock in Iron Creek and Spring Creek Canyons just north of Silver Creek Canyon.	Project area is outside of known distribution.
Mineral Creek Mountainsnail *Oreohelix pilsbryi*	FSS; NMT	NA	Well-shaded, moist soils along streams. Endemic to the Black Range in Mineral Creek.	Project area is outside of known distribution.
Morgan Creek Mountainsnail *Oreohelix swopei*	FSS	NA	Northern Black Range in four canyons south of Diamond Peak.	Project area is outside of known distribution.
Bearded Mountainsnail *Oreohelix barbata*	FSS	NA	Along creeks in southwestern canyons.	Project area is outside of known distribution.
Gila Mayfly *Lachlania dencyanna*	FSS	NA	Habitat largely unknown, but the species occurs along the East Fork of the Gila River.	Project area is outside of known distribution.
A Caddisfly *Lepidostoma knulli*	FSS	NA	Found in New Mexico along streams in mesic habitats.	Project area is outside of known distribution.
A Stonefly *Capnia caryi*	FSS	NA	Clear, cool springs and brooks. Endemic to Iron Creek in Catron County.	Project area is outside of known distribution.
Dashed Ringtail *Erpetogomphus heterodon*	FSS	NA	Clear, rocky, mountain streams and rivers.	Yes
Bleached Skimmer Dragonfly *Libellula composita*	FSS	NA	Lakes, ponds, and still waters of river pools.	Yes
Arizona Snaketail *Ophiogomphus arizonicus*	FSS	NA	Lakes, ponds, and still waters of river pools.	Yes
Notodontid Moth *Euhyparpax rosea*	FSS	NA	Chaparral. Known only from Silver City, Grant County.	Project area is outside of known distribution.

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Common Name *Latin Name*	Status	Designated Critical Habitat	Habitat and Notes	Potential In or Near the Project Area
Moore's Fairy Shrimp *Streptocephalus moorei*	BLMS; FSS	NA	Chihuahuan Desert in alkali playas and stock tanks. Found in San Agustin Playa near the Project area.	Yes
Bowman's Fairy Shrimp *Streptocephalus thomasbowmani*	BLMS; FSS	NA	Temporary warm-water playas.	Project area is outside of known distribution.
Socorro Isopod *Thermosphaeroma thermophilus*	E	No	Outflow of springs. Only known from Sedillo Spring.	Project area is outside of known distribution.
Plants				
Wright's Dogweed *Adenophyllum wrightii* var. *wrightii*	FSS	NA	Sandy or silty soils in drainages in piñon-juniper woodland between 7,000-7,200 feet in elevation.	Yes
Goodding's Onion *Allium gooddingii*	FSS	NA	Moist, shaded canyon bottoms and montane meadows. Endemic to the Mogollon Mountains.	Project area is outside of known distribution.
Mogollon Death Camas *Anticlea mogollonensis*	FSS	NA	Understory of upper montane and subalpine forest on the highest peaks of the Mogollon Mountains.	Project area is outside of known distribution.
Greene Milkweed *Asclepias uncialis uncialis*	FSS	NA	Shortgrass prairie between approximately 3,900 and 7,650 feet in elevation.	Project area is outside of known distribution.
Villous Groundcover Milkvetch *Astragalus humistratus* var. *crispulus*	FSS	NA	Sandy soils of volcanic origins.	Yes
Gila Thistle *Cirsium gilense*	FSS	NA	Moist, montane meadows in coniferous forests at elevations of approximately 7,000-8,000 feet.	Yes
Wright's Marsh Thistle *Cirsium wrightii*	C; FSS; NME	NA	Alkaline soils in wetland margins. Present at Alamosa Spring, an off-channel spring near Alamosa Creek.	Project area is outside of known distribution.
Wooton's Hawthorn *Crategus wootoniana*	FSS	NA	Canyon bottoms and understory in coniferous forests in the Sacramento and Pinos Altos Mountains.	Project area is outside of known distribution.
Yellow Lady's-slipper *Cypripedium parviflorum* var. *pubescens*	FSS	NA	Mesic slopes and seeps in mixed conifer forests at elevations ranging from approximately 6,000-9,500 feet in elevation.	Project area is outside of known distribution.

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Metcalfe's Ticktrefoil *Desmodium metcalfei*	FSS	NA	Montane woodlands and canyons.	Yes
Hess' Fleabane *Erigeron hessii*	FSS; NME	NA	Bedrock exposures in high-elevation conifer forests. Endemic to the Gila Wilderness.	Project area is outside of known distribution.
Zuni Fleabane *Erigeron rhizomatus*	T	Yes, outside Project area	Barren clay soils of the Chinle or Baca formations. Present in the Datil and Sawtooth mountains.	Project area is outside of known distribution.
Duncan Pincushion Cactus *Escobaria duncanii*	NME	NA	Limestone and limy shale in Chihuahuan desertscrub.	Project area is outside of known distribution.
Todsen's Pennyroyal *Hedeoma todsenii*	E	Yes, outside Project area	Gypseous-limestone soils on north- or east-facing slopes in the Sacramento and San Andres mountains.	Project area is outside of known distribution.
Arizona Sunflower *Helianthus arizonensis*	FSS	NA	Dry, sandy soil between 4,000 and 7,000 feet in elevation.	Yes
Pecos Sunflower *Helianthus paradoxus*	T	Yes, outside Project area	Saturated, saline margins of wetlands in the Rio Grande and Pecos River watersheds.	Project area is outside of known distribution.
Chiricahua Mountain Alumroot *Heuchera glomerulata*	FSS	NA	Found in Hidalgo County on Animas Peak.	Project area is outside of known distribution.
Arizona Coralroot *Hexalectris arizonica*	FSS; NME	NA	Heavy leaf litter under the canopy of oaks, pines, and junipers between 3,480 and 6,950 feet in elevation.	Yes
Mogollon Hawkweed *Hieracium brevipilum*	FSS	NA	Grassy openings in ponderosa pine forests. Endemic to the Mogollon Mountains.	Project area is outside of known distribution.
Rusby Hawkweed *Hieracium abscissum* [*Hieracium rusbyi*]	FSS	NA	High-elevation mixed conifer forests. Restricted to the Mogollon Mountains and Black Range in New Mexico.	Project area is outside of known distribution.
Heartleaf Groundsel *Packera cardamine*	FSS	NA	Understory in higher elevation coniferous forests. Endemic to the Mogollon Mountains.	Project area is outside of known distribution.
Night-blooming Cereus *Peniocereus greggi* var. *greggi*	NME	NA	Sandy to gravelly soils in relatively level terrain in desert grassland and Chihuahuan desertscrub.	Yes

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Common Name *Latin Name*	Status	Designated Critical Habitat	Habitat and Notes	Potential In or Near the Project Area
Metcalfe's Penstemon *Penstemon metcalfei*	FSS	NA	Cliffs or steep slopes in coniferous forests near the crest of the Black Range.	Project area is outside of known distribution.
Davidson's Cliff Carrot *Pteryxia* [*Cymopterus*] *davidsonii*	FSS	NA	Moist, sheer cliffs in chaparral communities in the Mogollon and Pinos Altos Mountains.	Project area is outside of known distribution.
Parish's Alkali Grass *Puccinellia parishii*	BLMS; FSS; NME	NA	Alkaline springs and seeps between approximately 2,600 and 7,200 feet in elevation.	Yes
Arizona Willow *Salix arizonica*	FSS	NA	High elevation meadows associated with perennial water.	Project area is outside of known distribution.
Mimbres Figwort *Scrophularia macrantha*	BLMS; FSS	NA	Steep, rocky, cliffs in piñon-juniper and coniferous forests between 6,500 and 8,200 feet in elevation.	Project area is outside of known distribution.
Porsild's Starwort *Stellaria porsildii*	FSS	NA	Understory of mixed conifer forests. Restricted to the Pinos Altos Mountains in New Mexico.	Project area is outside of known distribution.
Mogollon Clover *Trifolium longipes* var. *neurophyllum*	FSS	NA	Wet meadows, springs, and along riparian corridors in montane coniferous forests.	Yes

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Mammals

Eleven special-status mammal species may occur within the Project area (Table 3-8).

The Mexican Gray Wolf is listed as endangered under the ESA, but the animals within the Project area are designated as a Nonessential Experimental Population (NEP). The entire Project area outside of the Forest Service land is within the Zone 2 management area in the Mexican Wolf Experimental Population Area (MWEPA), which includes areas where Mexican Gray Wolves can disperse naturally, and direct releases may take place on federal lands (USFWS 2015). The Gila National Forest is designated as Zone 1 of the MWEPA.

The Spotted Bat, a state threatened species, ranges throughout the more-arid regions of the western United States and central Mexico (Watkins 1977). This species generally roosts singly in crevices and cracks in rock faces (Watkins 1977; Arizona Game and Fish Department [AZGFD] 2003). They are capable of traveling long distances from roost sites during foraging bouts (Rabe et al. 1998). Habitat for the Spotted Bat is present along the entire length of the AIP line, and the species may forage at water crossings. Ten additional bat species listed as BLM sensitive occur throughout the Project area (5).

Three species of special-status small mammals could potentially occur within the Project area. Gunnison's Prairie Dogs are present in the northern portion of the Project area. Pecos River Muskrat occurs in a wide variety of aquatic habitats including rivers, marshes, and man-made ponds (Willner et al. 1980). In New Mexico, the Arizona Montane Vole is restricted to the upper San Francisco River drainage in Catron County (Frey 2004). It typically occupies dense damp-to-wet grass areas at high (alpine-like) elevations (AZGFD 2004).

Birds

Thirty-nine special-status bird species may be present within the Project area (Table 3-8). Three of these are listed as threatened or endangered under the ESA, or are candidates for ESA listing: Northern Aplomado Falcon, Mexican Spotted Owl, and Western Yellow-billed Cuckoo. The additional 36 species of birds known to occur within the Project area are listed as USFWS Birds of Conservation Concern, New Mexico threatened species, or BLM sensitive species.

The Northern Aplomado Falcon is listed as endangered under the ESA, and the individuals occurring within the Project area are designated as an NEP. Aplomado Falcons may nest along the southern portion of the AIP transmission line, particularly in grassland with tall yuccas and mesquite (New Mexico Partners in Flight 2007a). To support establishment of the NEP, the USFWS released up to about 100 Aplomado Falcons annually between sites in Texas and New Mexico (Peregrine Fund 2009), although new releases are not currently taking place.

The Western Yellow-billed Cuckoo is listed as threatened under the ESA, with proposed critical habitat outside the Project area. The species occurs within cottonwood-willow and broadleaf riparian forest. Although no nesting populations have been confirmed within 13 miles of the Project area (Johanson et al. 2006), anecdotal reports exist for Las Animas Creek near the Project area.

Reptiles

Two special-status reptile species may be present within the Project area (Table 3-8). These are the Narrow-headed Gartersnake and the Desert Massasauga. The Narrow-headed Gartersnake occurs in clear, rocky montane streams, where it preys on both native and non-native fish (Degenhardt, et al. 1996). Designated critical habitat for this species is present downstream from the Project in the Tularosa River. All streams and drainages crossed by the Project are ephemeral, and the species is not likely to occur in the Project area. The Desert Massasauga occurs along the southern end of the AIP transmission line in desert grassland habitat (Mackessy 2005).

Amphibians

Three special-status amphibian species may be present near the Project area (Table 3-8): Chiricahua Leopard Frog, Northern Leopard Frog, and Arizona Toad. Chiricahua Leopard Frogs may only be present on the Gila National Forest. The Northern Leopard Frog occurs in a wide variety of aquatic habitats throughout the northern portion of the Project area (Degenhardt et al. 1996), although many historical populations throughout New Mexico have been extirpated (Christman 2009). Arizona Toads range from 460 to 7,900 feet elevation in areas with large trees and cliffs near bodies of water (Degenhardt et al. 1996).

Invertebrates

Moore's Fairy Shrimp, a BLM sensitive species has been recorded from stock tanks near the Plains of San Agustin (Lang and Rogers 2002).

Plants

Twenty-nine special-status plant species were reviewed for their potential to occur in the Project area, and 9 of these may be present along the AIP line. None of these special-status plant species are ESA-listed. Refer to Table 3-8 for habitat requirements of these species.

3.5.2.2. Forest Service

The Project crosses the Gila National Forest in the Colorado Plateau and Mogollon-Datil Volcanic Field physiographic provinces, and is at elevations above 7000 feet on the Forest Service land.

Vegetation

The AIP line and access roads pass through seven biomes (Table 3-7), as described by Dick-Peddie (2009).

West of the Rio Grande Valley, the Project crosses a number of small mountain ranges and intervening valleys, with a resulting diversity of biomes. The Project enters the Forest Service land and crosses through Coniferous and Mixed Woodland and Montane Coniferous Forest in the Wahoo Mountains, then crosses Desert Grassland in valleys crossed by tributaries that form the headwaters of the Gila River. Juniper Savanna, Closed Basin Scrub, and Plains-Mesa Grassland are present near the interior-draining Plains of San Augustin. The Project then crosses extensive Montane Coniferous Forest and Coniferous

and Mixed Woodland in the Gallo and San Francisco mountains north of the Tularosa River, before leaving the Forest Service land, entering Plains-Mesa Grassland, and reaching the Red Hill tie-in point.

The limited availability of water leads to very little riparian vegetation within the project area on Forest Service lands. Scattered isolated patches of cottonwoods are present in intermittent and perennial drainages. Access roads cross drainages outside of these scattered riparian patches.

Invasive Species

There are currently no documented observations of invasive species within the project area. The presence of invasive species on Forest Service land is not extensive. However, the risk continues for the introduction and establishment of known invasive species through various pathways both from within and off the Forest Service lands.

Wildlife

Wildlife species richness is high in the region, which is located near the convergence of several major biogeographical regions: the Chihuahuan Desert, Desert Grassland, and Rocky Mountains. This section provides notes particularly focused on special-status species that may be present in the Project area.

Migratory Birds

Nearly all birds that occur in the Project area are protected under the MBTA. Certain groups of birds, including upland game birds (quails, pheasants, and relatives) are not protected under the MBTA but are managed by the states. Although at least 542 bird species have been recorded in New Mexico (New Mexico Ornithological Society [NMOS] 2015), the proximity of the border with Mexico allows subtropical bird species to occasionally disperse north of their typical range and occur in the United States; thus, bird diversity away from the border is typically lower. The Rio Grande supports a substantial segment of the Central Flyway, in particular supporting large numbers of migrating and wintering waterfowl.

The MOU between the USFS and USFWS identifies the need to consider bird species identified as declining in management decisions that affect bird habitat. The discussion below on special-status species provides additional information on declining or sensitive bird species that may occur in the Project area.

Special-status Species

The special-status species evaluated in the Biological Evaluation (see Appendix C) consist of all ESA-listed, proposed, and candidate species recorded from Catron, Luna, Sierra, and Socorro counties, as reported by the USFWS IPaC database (USFWS 2016). Additional species evaluated included state-listed species, USFWS Birds of Conservation Concern, USFWS plant species of concern, and Forest Service Region 3 MIS and sensitive species. Additional special-status species were identified using the BISON-M, and NMRPTC (NMRPTC 1999) (see Appendix C for complete Biological Evaluation). Table 3-8 also includes BLM sensitive species, addressed separately in Section 3.5.2.1.

Reflecting the range of elevations and habitats traversed by the AIP line, a diverse array of animal species could potentially occur within the project area. One hundred seventeen special-status species were

reviewed for potential occurrence within the Project area, 53 of which have the potential to occur along the AIP line (Table 3-8).

Mammals

Eleven special-status mammal species may occur within the Project area (Table 3-8).

The Mexican Gray Wolf is listed as endangered under the ESA, but the animals within the Project area are designated as an NEP. The Gila National Forest in New Mexico is designated as a portion of the Zone 1 management area in the MWEPA, which includes areas where direct releases may take place (USFWS 2015). The remainder of the Project area is within Zone 2 of the MWEPA, where Mexican Gray Wolves can disperse naturally, and may be translocated in coordination with landowners or land management agencies.

Desert Bighorn Sheep occur in desert mountain ranges along the Rio Grande in south-central New Mexico (NMDGF 2012). Any individuals occurring in the Project area are likely to be animals migrating or foraging. However, the Bighorn Sheep is only listed as sensitive in the Project area by the Forest Service, and the species does not occur in the Project area on Forest Service lands.

The Spotted Bat, a state threatened species, ranges throughout the more-arid regions of the western United States and central Mexico (Watkins 1977). This species generally roosts singly in crevices and cracks in rock faces (Watkins 1977; AZGFD 2003). They are capable of traveling long distances from roost sites during foraging bouts (Rabe et al. 1998). Habitat for the Spotted Bat is present along the entire length of the AIP line, and the species may forage at water crossings.

Three species of special-status small mammals could potentially occur within the Project area. Gunnison's Prairie Dogs are present in the northern portion of the Project area. Pecos River Muskrat occurs in a wide variety of aquatic habitats including rivers, marshes, and man-made ponds (Willner et al. 1980). In New Mexico, the Arizona Montane Vole is restricted to the upper San Francisco River drainage in Catron County (Frey 2004). It typically occupies dense damp-to-wet grass areas at high (alpine-like) elevations (AZGFD 2004).

Birds

Thirty-nine special-status bird species may be present within the Project area (Table 3-8). Two of these are listed as threatened under the ESA: Mexican Spotted Owl and Western Yellow-billed Cuckoo. The additional 37 species of birds known to occur within the Project area are listed as USFWS Birds of Conservation Concern, New Mexico threatened species, BLM sensitive species, or Forest Service sensitive species.

The Mexican Spotted Owl is listed as threatened under the ESA. Mexican Spotted Owl populations within the Gila National Forest are among the largest for this subspecies. In New Mexico, Mexican Spotted Owls occur primarily in mixed conifer forests, often associated with forested canyons with cliffs, perennial water, and riparian vegetation (New Mexico Partners in Flight 2007b).

The Western Yellow-billed Cuckoo is listed as threatened under the ESA, with proposed critical habitat outside the Project area. The species occurs within cottonwood-willow and broadleaf riparian forest. However, no riparian forests are present in the Project area on the Gila National Forest.

Reptiles

Two special-status reptile species may be present within the Project area (Table 3-8). These are the Narrow-headed Gartersnake and the Desert Massasauga. The Narrow-headed Gartersnake occurs in clear, rocky montane streams, where it preys on both native and non-native fish (Degenhardt, et al. 1996). Designated critical habitat for this species is present downstream from the Project in the Tularosa River. All streams and drainages crossed by the Project are ephemeral, and the species is not likely to occur in the Project area. The Desert Massasauga does not occur on the Forest Service land.

Amphibians

Three special-status amphibian species may be present near the Project area (Table 3-8): Chiricahua Leopard Frog, Northern Leopard Frog, and Arizona Toad. Chiricahua Leopard Frog uses a wide variety of natural and man-made aquatic habitats including rivers, pools in intermittent streams, wetlands, and earthen livestock tanks (Southwest Endangered Species Act Team 2008). The AIP line runs through the Gila-White Mountains and Mimbres-Alamosa Recovery Units for the Chiricahua Leopard Frog. The Forest Service land supports several populations of Chiricahua Leopard Frog (Degenhardt et al. 1996; USFWS 2007). The Northern Leopard Frog occurs in a wide variety of aquatic habitats throughout the northern portion of the Project area (Degenhardt et al. 1996), although many historical populations throughout New Mexico have been extirpated (Christman 2009). Arizona Toads range from 460 to 7,900 feet elevation in areas with large trees and cliffs near bodies of water (Degenhardt et al. 1996).

Invertebrates

Bleached Skimmer Dragonfly and Arizona Snaketail, both Forest Service sensitive species, occur within the Project area (USGS 2013b; 2013c). Both species inhabit lakes, ponds, and other still waters during all life stages. Moore's Fairy Shrimp has been recorded from stock tanks near the Plains of San Agustin (Lang and Rogers 2002).

Plants

Twenty-nine special-status plant species were reviewed for their potential to occur in the Project area, and 9 of these may be present along the AIP line. None of these special-status plant species are ESA-listed. Refer to Table 3-8 for habitat requirements of these species.

3.6. Wildland Fire

3.6.1. Introduction

Wildland fire management on public lands is typically planned to address the safety of the public and firefighters while attempting to meet resource management objectives for desired vegetation structure and condition, fuel loading, watershed protection, and protection of threatened and endangered species habitat. These objectives may be best met through fire suppression, prescribed fires, or management of natural or unplanned ignitions for resource benefit. Management of resources to address wildland fires may also include fuels thinning projects or other vegetation treatments.

Fire management is typically the responsibility of federal land management agencies on their respective lands. The New Mexico State Forestry Division is responsible for fire management on all non-federal, non-municipal, and non-tribal lands in NM, including private lands outside municipal boundaries. County or local fire departments have overlapping responsibilities for initial wildfire suppression inside established fire districts; however, the primary jurisdictional agency on most private lands is the State Forestry Division. Fire management on some other lands, including unincorporated private lands or at jurisdictional boundaries, may be conducted under cooperative agreements.

The following federal and local fire management plans were reviewed:

- Resource Management Plan Amendment for Fire and Fuels on Public Land in New Mexico and Texas (BLM 2004)
- Las Cruces District Office: Fire Management Plan (BLM 2010)
- Socorro Field Office: Fire Management Plan (BLM 2010)
- Gila National Forest Plan (1986) as amended
- Catron County Community Wildfire Protection Plan (Catron County 2006)
- Luna County Community Wildfire Protection Plan Final Draft (Luna County 2010)
- Sierra County Wildland Urban Interface Community Wildfire Protection Plan (Sierra County 2005)
- Socorro County Community Wildfire Protection Plan (Socorro County 2006)

3.6.2. Affected Environment

Vegetation in the Project area (Section 3.5.2) ranges from low-elevation grasslands and desertscrub to mixed-coniferous forests. Widespread fire suppression during much of the 20th century has contributed to landscape-scale changes in vegetation structure, in combination with other factors such as heavy livestock grazing and long-term drought. Grasslands may become invaded by shrubs or juniper trees in the absence of fire, while coniferous forests may accumulate high fuel loads and become dominated by dense, small-diameter trees with a closed canopy. Where fires may have historically been small and low-intensity, the high accumulated fuel loads can allow fires to become much larger and burn at higher intensities.

Current fire and vegetation management objectives recognize benefits that may be gained by returning a natural fire regime to the landscape, although human safety and other conflicts are not resolvable in many locations. The BLM's fire management planning identifies Fire Management Units that describes a desired fire regime as well as any conflicts with fire management for resource benefit.

The relatively low population density around the Gila National Forest has allowed fire management to incorporate fire use for the benefit of resources to a greater extent than many other areas with extensive Wildland-Urban Interfaces (WUI) (Boucher and Moody 1998). However, communities in Catron County and surrounding WUI are identified as high fire risk and are high priorities for fuels treatments (Catron County 2006).

3.7. Land Uses

3.7.1. Introduction

The land use inventory identified existing, planned, and officially designated uses within the study area based on the review and interpretation of existing maps, documents, and field reconnaissance. Federal, state, county, and local agencies were contacted to obtain or confirm specific land use data. Please see Appendix D for land use maps, D-1 through D-3.

3.7.2. Affected Environment

3.7.2.1. Ownership and Jurisdiction

The Project study area includes land managed by the BLM, Forest Service, and NMSLO, or privately owned and located in Catron, Sierra, Socorro, and Luna counties in New Mexico (see Table 2-2).

3.7.2.2. City, County, State

Existing Land Use

The existing City, County, and State land uses were identified and mapped based on information from aerial photography, existing maps, and the plans listed below.

Sierra, Luna, and Catron counties have comprehensive land use plans, though New Mexico does not have any state laws requiring comprehensive land use plans. As such, only a portion of Socorro County currently has a comprehensive land use plan; The Northern Socorro County Comprehensive Plan 2006. The Project is approximately 70 miles outside of the study area boundary for this plan.

- Catron County Capital Improvement Plan (CIP)/Comprehensive Land Plan (2007)
- Sierra County Comprehensive Plan (2006)
- Luna County Comprehensive Plan (1999 & 2012)

No city or incorporated towns lie within the study corridor, though the City of Deming has first right of refusal (before Luna County) for subdivision review within a three-mile buffer of the city boundary. Approximately 0.5 miles of the southernmost portion of the AIP transmission line fall within this buffered area.

Residential

The majority of the study area can either be categorized as rural residential (widely dispersed rural residences) or undeveloped vacant land (no residences). All residential areas within the study area are low density (zero to two dwelling units per acre). Small clusters of rural residences occur within a small subdivision south of SR 12 on the eastern edge of the Gila National Forest, on the west side of the San Agustin plains, along CO 13 (between Winston and Monticello), along Palomas Creek (South Las Palomas Road), and along Las Animas Creek (County Road No. 26).

Industrial/Office

Lyn Con Log Mill is a sawmill and lumber wholesaler located within the study corridor, approximately four miles north of the Town of Aragon. Agricultural and low-density residential uses occur in close proximity to the Lyn Con Log Mill.

Irrigated Agriculture

Irrigated agricultural lands occur within the study corridor at three locations. Two farming complexes containing flood-irrigated agricultural fields are located on the western end of the town of Cuchillo. A farm along Palomas Creek contains flood-irrigated fields within the study corridor. Flood-irrigated orchards associated with one or more residences/agricultural operations are located along Las Animas Creek.

Future Land Use

Future land use inventory is based on information contained in existing planning documents listed under the Existing Land Use section, as well as correspondence with staff and officials representing federal, state, and county agencies.

Luna, Sierra, and Catron counties' comprehensive plans do not include any regulations such as zoning or future land use designations.

Catron County CIP/Comprehensive Land Plan (2007) describes the County residents' vision and identifies goals, objectives and strategies to guide land use decisions. The plan responds to several key issues identified by the County residents that include land use (including interface with public lands), water, infrastructure and transportation, housing, public safety, and economic development. The plan calls for all future federal planning projects to be coordinated from their initiation with the Catron County Commission. Specifically, Ordinance 002-93 (An ordinance revising the Catron County Environmental Planning & Review Process & Repealing Ordinance No. 006-92) requires federal agencies "to conduct joint planning with Catron County for proposals on federal land and state lands within the County," describes "joint intergovernmental planning and coordination requirements," and calls for an "Initial Environmental Assessment Report" to be produced for all planning projects.

Socorro County future land use is regulated by a Land Use Commission. Similarly to Catron County, Socorro County requires that it be considered a joint planning agency in coordination with federal agencies conducting land use planning on federal and state lands (Ordinance 1993.002).

The Luna County Comprehensive Plan was originally drafted in 1999 and describes the county's historic and existing land use patterns and challenges. It furthermore references a county ordinance that requests consultation on federal land use changes within the county, as well as review of "adverse impact studies" of these changes, and objects to the use of federal designations including wilderness areas and ACECs, within the county. The plan was updated in 2012, with an expanded vision for the maintenance and enhancement of opportunities and qualities that attract people to the county.

The current Sierra County Comprehensive Plan, approved in 2006, provides a description of the current land use and development conditions within the county within a historical context, and provides community themes (values, goals, interests) toward which residents of Sierra County would like their county policy framework focused in the future. In addition to the Comprehensive Plan, land use in Sierra County is guided by an Interim Land Use Policy (No.91-001), developed in 1991. The Interim Land Use Policy directs that federal and state agencies inform and coordinate with local residents regarding pending federal and state actions affecting local communities and residents, supports an increase in the amount of nonfederal land within the Sierra County, and requires Sierra County concurrence on federal and state land adjustments within the county.

It is expected that the majority of existing land uses identified above would persist into the future. More detailed descriptions of specific future land uses follow.

Residential

Development applications for subdivision and/or new homes are currently rare in the areas of rural New Mexico crossed by the project. Although the majority of private lands within the study area do not possess a future land use designation, in most locations they are available for residential development. No specific residential development plans within the study area are known at this time.

Transportation

The study area encompasses a mix of federal, state, county, and private roadways. Highways under the jurisdiction of New Mexico Department of Transportation include US 60, and New Mexico State Highways 163, 52, 152, 27, and 26. Portions of SR 52 and SR 152 are categorized as National Scenic Byway and/or Backcountry Byway; these routes are discussed in greater detail in the visual resources inventory in Section 3.10.

A main line of the Burlington Northern Santa Fe railroad (formerly Atchison, Topeka, and Santa Fe) parallels the project for approximately 20 miles between Nutt and Deming. Aerial imagery and historic evidence suggests that there is an abandoned railroad grade, perhaps a former spur of the Atchison, Topeka, and Santa Fe, just northwest of Nutt.

Airstrips within the study corridor include the Rael Ranch Horse Pasture Airstrip, which is located on the western edge of the Plains of San Agustin. It is privately owned and contains two airstrips, one of which comes within 0.6 miles of the AIP transmission line.

Utilities

There are five existing transmission lines in various portions of the study corridor. The first of these is EPE's AIP 345kV line, for which this project would provide access. The second and third lines are 345kV lines managed by Tucson Electric Power (TEP) that enter the northern terminus of the study corridor from the north. Where they encounter AIP, these two 345kV lines turn to the west and are combined onto a single line of double-circuit towers. The fourth line is a 115kV line owned by Tri-State G & T Association, Inc. and perpendicularly crosses the AIP approximately 0.5 miles south of SR 152. The fifth line is also a 115kV line owned by Tri-State G & T Association, Inc., and parallels AIP for approximately 20 miles from a point approximately 3.7 miles southwest of the community of Nutt, to the southern terminus of the study corridor.

In addition to the aforementioned transmission lines, numerous distribution and communication lines cross throughout the study corridor.

West of the community of Nutt lies the Macho Springs (Element Power/TEP) wind farm, a 50-megawatt (MW) generating station, constructed in 2013, composed of 28 wind turbines on 1,900 acres. Future expansion of this site on 1,119 acres is planned. The wind farm became operational in May 2014.

Kinder Morgan CO_2 Company LP attained oil and gas exploration leases from BLM and New Mexico state lands in the Cottonwood Canyon Area of the Zuni Basin for the purpose of CO_2 extraction. While

these leases lie within the study corridor, the location of proposed wells, described in the Cottonwood Canyon Plan of Development, 2007, do not lie within the study corridor.

3.7.2.3. BLM

Land Use

The existing BLM land uses were identified and mapped based on information from aerial photography, existing maps, and the plans listed below.

- White Sands Resource Area RMP (1986)
- Mimbres Resource Area RMP (1993)
- Socorro RMP (2010)

Avoidance Areas

BLM right-of-way avoidance areas are defined as areas where future rights-of-way may be granted only when no feasible alternative route is available (BLM 2010). Within the Socorro FO, ROW applications for roads within avoidance areas with width equal to or lesser than 14 feet would not be rejected upon submittal, but would require site-specific environmental analysis and may be subject to best management practices related to the stabilization of soils and vegetation, and the mitigation of visual impacts. Portions of the project cross avoidance areas within the Socorro FO planning area; they are located within and near the Pelona Mountain ACEC, buffering SR 52 east of Wahoo Peak, and extending one mile south from US 60, which is correlated with BLM's Visual Management System (VRM)Class II lands.

The Project crosses two avoidance areas within the Mimbres planning area. The first is on the southeast corner of the Cooke's Range Foothills along SR 26, and is associated with VRM Class II lands. Within this avoidance area, new facilities are not allowed within riparian areas, and access routes would be limited and considered on a case-by-case basis. An avoidance area associated with the crossing of the Butterfield Trail is located between Deming and Nutt on SR 26. Within this avoidance area, the two restrictions related to riparian areas and access routes apply as well. In addition, facilities would not be located parallel to the Butterfield Trail or within 0.25 miles of any stage station on the Butterfield Trail. Cultural resources related to the Butterfield Trail are further discussed in Section 3.11.

Exclusion Areas

Right-of-way exclusion areas are defined as areas where rights-of-way may not be granted unless mandated by law. One exclusion area, defined by the boundaries of the Continental Divide Wilderness Study Area (WSA), is partially located within the study corridor.

This exclusion area/WSA overlaps portions of the Continental Divide Scenic Trail Special Management Area (SMA), and borders portions of the Pelona Mountain ACEC.

Utilities

Utility corridors are areas designated for the placement of linear utilities (transmission lines, pipelines, etc.) and are typically designed to minimize impacts to existing resources. The Department of Energy's

West-wide Energy Corridor Programmatic EIS (2008), The Mimbres RMP (1993), and the Socorro FO RMP (2010) identify utility corridors in the state of New Mexico, Mimbres Resource Area, and Socorro Planning Area, respectively. Neither the AIP 345kV transmission line nor the proposed action fall within these identified utility corridors.

Renewable Energy

The southern portion of this project lies within Luna County, which is in the Las Cruces District of the BLM. This district has high potential for solar energy and moderate potential for wind energy production. New Mexico enacted a mandatory Renewable Portfolio Standard in 2007, which outlines target levels of renewable energy production through 2020. However, there are currently no renewable energy project applications pending with the Las Cruces DO (BLM 2013).

Transportation

The study area encompasses a mix of BLM, state, county, and private roadways. Highways under the jurisdiction of New Mexico Department of Transportation include US 60, and New Mexico State Highways 163, 52, 152, 27, and 26. Portions of SR 52 and SR 152 are categorized as National Scenic Byway and/or Backcountry Byway; these routes are discussed in greater detail in the visual resources inventory in section 3.10.

A main line of the Burlington Northern Santa Fe railroad (formerly Atchison, Topeka, and Santa Fe) parallels the project for approximately 20 miles between Nutt and Deming. Aerial imagery and historic evidence suggests that there is an abandoned railroad grade, perhaps a former spur of the Atchison, Topeka, and Santa Fe, just northwest of Nutt.

3.7.2.4. FOREST SERVICE

Land Use

The existing Forest Service land uses were identified and mapped based on information from aerial photography, existing maps, and the Gila National Forest Plan (1986), as amended.

Ranger Districts within the study area are the Quemado, Reserve, and Black Range; wherein management emphasis is on a variety of renewable resources with emphasis on wildlife habitat improvements, livestock forage production, timber extraction, prevention of high severity wildfires, and dispersed recreation.

Timber

Areas tentatively suitable for timber production are periodically identified by timber staff of the Forest Service. Suitable timber lands identified by a Forest Service inventory associated with the Gila National Forest Plan (1986) are mapped in the AIP EIS (1986) and are crossed by the Project centerline and associated access roads approximately one to two miles east of NM 32, and directly east of Wagontongue Mountain. Aerial imagery of the area near Wagontongue Mountain suggests recent logging activity.

Additional suitable timber areas that are within the study corridor, but are not crossed by the Project centerline, can be found near where the AIP transmission line takes an abrupt turn west of NM 32, directly north of the Jewett Mesa Airstrip, northwest of Tularosa mountain, and on the north foothills of O Bar O Mountain (Dames and Moore 1986, AIP map volume).

Transportation

The study area encompasses a mix of Forest Service, state, county, and private roadways. The proposed Project crosses New Mexico State Highways 12, 32, on Forest Service land north of the community of Aragon, and New Mexico State Highway163, on Forest Service land between structures 697 and 698.

The Sand Flat airstrip is located north of the Lyn Con Log Mill on the south side of Sand Flats, is privately owned, and lies within 0.4 miles of the AIP transmission line. Jewett Mesa Airstrip is located along NM SR 32, is owned by the Forest Service, is used by the public and for firefighting activities, and includes a portion of proposed access for the Project.

Numerous multi-use, unpaved county and private roads are common throughout the study corridor. In addition, Forest Service Roads provide access to Forest Service lands. Use of many of these roads would be required by EPE to access transmission structures, and would be permitted by the Forest Service. The Forest Service holds an easement across BLM land for Silver Creek Road on the eastern side of the Wahoo Mountains.

3.8. Special Designation Areas

3.8.1. Introduction

Special designation areas refer to areas in federal land use planning that are unique for their special characteristics and the opportunities they offer, and are either administratively or congressionally designated. Examples of congressionally designated areas can include National Wilderness Areas, WSAs, National Wild and/or Scenic Rivers, National Conservation Areas, National Scenic Trails, National Historic Trails, National Recreation Trails, and National Byways. Examples of administrative designations can include ACECs and Wildlife Habitat Management Areas. Special designation areas are managed to protect their unique values and uses. These areas typically require a more intensive management emphasis than is applied to surrounding public land.

3.8.2. Affected Environment

The majority of the areas within the study corridor under federal ownership are characterized by dispersed use and do not fall under a special designation category. However, the following special designation areas fall within the Project area.

3.8.2.1. BLM

Special Management Areas

SMAs "are areas containing natural or cultural values that do not meet other regulatory or legislative criteria, but are areas that the BLM wishes to identify in order to protect or manage the resources associated with the area" (BLM 2010). Two SMAs are located within the study corridor.

Continental Divide Trail SMA

The Continental Divide Trail SMA is a special management area designated to protect values, resources, and the associated setting of the CDNST (BLM 2014b). The SMA provides opportunities for scenic and primitive hiking, biking, and equestrian experiences. The portion nearest to the Project is located approximately 22 miles southeast of Aragon, and extends along approximately 38 miles of the CDNST Route. Motor vehicle use is restricted to designated routes within this SMA, except for the portion inside the Continental Divide WSA, which would be closed to motorized vehicles. In addition, the BLM Socorro RMP prescribes an exclusion of right-of-way and lease authorizations within the Continental Divide WSA and an avoidance of the authorization of right-of-way and leases within the SMA and outside the WSA.

Butterfield Trail SMA

The Butterfield Trail SMA is managed to protect and interpret the historical values associated with the historic Butterfield Trail (BLM 1993). The Butterfield Trail was historically used to carry mail and passengers from St. Louis, Missouri to San Francisco, California. It runs in an east–west trajectory, and intersects the study corridor between Deming and Nutt. BLM guidelines within this SMA include a restriction on the authorizations for rights-of-way, designation as a Class II VRM, and management as a "semi-primitive motorized" area.

National Scenic and Historic Trails

National Scenic Trails are "extended trails that provide maximum outdoor recreation potential and for the conservation and enjoyment of the various qualities – scenic, historical, natural, and cultural – of the areas they pass through" (BLM 2014d). National Historic Trails are "extended trails that closely follow a historic trail or route of travel of national significance" (BLM 2014d).

One National Scenic Trail, the CDNST, and one trail under study to become a National Historic Trail, the Butterfield Trail, cross within the study corridor.

The CDNST corridor spans 3,100 miles between Mexico and Canada and crosses five states. About 1,900 miles of the corridor contain existing trails or primitive routes (NPS 2015). The trail exists within the study corridor in three separate locations, twice within Forest Service lands and once on BLM land, within the Pelona Mountain ACEC. Within the project vicinity, much of the CDNST is within the Continental Divide WSA. Restrictions associated with the CDNST are described above in the SMA section.

The Butterfield Trail, which is under study to become a National Historic Trail, runs in an east–west trajectory, and intersects the study corridor between Deming and Nutt. A portion of it is managed as an SMA. As described above, BLM guidelines within this SMA include a restriction on the authorizations for rights of way, designation as a Class II VRM, and management as a "semi-primitive motorized" area.

Areas of Critical Environmental Concern

ACECs are areas designated by the BLM where special management attention is needed to protect and prevent irreparable damage to important historic, cultural, and scenic values; fish and wildlife resources or other natural systems or processes; or to protect human life and safety from natural hazards (BLM 2010). One ACEC, the Pelona Mountain ACEC, is within the study corridor.

The Pelona Mountain ACEC, located in the southwest corner of the Plains of San Agustin, contains a variety of wildlife habitats and scenic, geologic, recreational, and cultural resources. This ACEC is managed "to protect diverse wildlife habitat, including a federally listed threatened species (the Bald Eagle), a federally listed species of concern (Peregrine Falcon), and one of New Mexico's largest elk herds (BLM 2010). Management restrictions within the Pelona Mountain ACEC include limiting motor vehicle use to designated routes and excluding authorization of right-of-way and leases (BLM 2010). The Pelona Mountain ACEC provides recreation opportunities centered on wildlife, scenery, geology, and cultural resources.

Wilderness Study Area

WSAs are areas under study for possible inclusion as a wilderness area in the National Wilderness Preservation System (BLM 2010). WSAs are managed by the BLM in accordance with the 1995 Interim Management Policy for Lands under Wilderness Review (Interim Management Policy).

The Continental Divide WSA is located approximately 30 miles south of Datil, New Mexico, and is characterized by rolling grassland, giving way to steep slopes of piñon pine woodland and ponderosa pine forest (BLM 2014c). It is managed for the maintenance and enhancement of primitive and semi-primitive recreation settings. This WSA overlaps portions of the Continental Divide Scenic Trail SMA, and borders portions of the Pelona Mountain ACEC.

Other Special Designation Areas

The Cuchillo Mountains Nut Gathering Area, identified in the White Sands RMP, is located in proximity of the study corridor north of Winston, New Mexico; however, the limits are not clearly known or defined. Per the White Sands RMP, the present stands of piñon pine in the Cuchillo Mountains are to be maintained as a piñon pine nut collection area.

Lands with Wilderness Character (LWC)

The BLM lands outside the EPE AIP right-of-way have been evaluated by BLM for LWC and determinations made that these areas lack LWC. The existing transmission line and associated roads bisect the BLM lands into parcels less than 5,000 acres in size west of Forest Road 551 (Coyote Canyon Road) and north and south of State Highway 60. Additionally, the BLM lands east of County Road 551

were inventoried for LWC (Coyote Canyon Unit NM-050-030) and a determination made that the unit lacked LWC (February 3, 2003). Therefore, no lands with LWC are located within the project area.

3.8.2.2. Forest Service

Inventoried Roadless Area

Two Inventoried Roadless Areas (IRA) of the Gila National Forest exist within the study corridor. IRAs are areas that include the following attributes: "Natural, being substantially free from the effect of modern civilization; undeveloped, having little or no permanent improvements or human habitation; outstanding opportunities for solitude or primitive and unconfined recreation; special features and values, or the potential to contribute to unique fish, wildlife and plant species and communities; outstanding landscape features; significant cultural resource sites; manageability, meaning the area is at least 5,000 acres in size" (Forest Service 2013a).

Access to the Wahoo Mountain IRA, which is contained within the study corridor and crossed by the project, would require approval by the Forest Authorized Officer on a case by case basis.

A portion of the Apache Mountain IRA is within the study corridor, though no improvements are proposed within the Apache Mountain IRA.

National Scenic Trails

Portions of the CDNST within Forest Service lands cross the study corridor between structures 634 and 635, and again between structures 890 and 891. Both of these portions of the CDNST do not allow motorized travel on the trail. The CDNST provides opportunities for scenic and primitive hiking, biking, and equestrian experiences.

3.9. Recreation

3.9.1. Introduction

The recreation inventory includes developed and dispersed recreation opportunities within the study area based on the review and interpretation of existing maps, documents, and field reconnaissance.

3.9.2. Affected Environment

Recreational uses within the study area are primarily dispersed, and include camping, hiking, wildlife viewing, bird-watching, OHV driving, rockhounding, and hunting. The BLM manages recreation on public lands with an objective to enhance opportunities for developed and undeveloped recreation on public land, and to enhance the public's knowledge and uses of those areas for recreational purposes. Within Gila National Forest, recreation management direction includes the maintenance of "a full spectrum of trail opportunities," and the provision of "a balanced level of developed and dispersed recreation experiences" (Gila National Forest 1986).

3.9.2.1. BLM Recreation

National Back Country Byways

BLM National Back Country Byways are designated roadways that provide opportunities for vehicular recreation in typically remote, scenic, or culturally rich landscapes, and are part of the larger U.S. Department of Transportation National Scenic Byways Program. BLM-designated Back Country Byways are divided into four category types (Type I-IV) based on their vehicular accessibility (presence of pavement, width, ground clearance, etc.) (BLM 2015).

The Lake Valley Backcountry Byway is a 48-mile stretch of paved roadways located between the Mimbres and Caballo Mountains and the Cooke's Range, where visitors can drive through scenic ranching and mining lands and past the historic mining town of Lake Valley (BLM 2013b). Approximately 5 miles of the Back Country Byway is located within the study corridor. The Lake Valley Backcountry Byway is managed as a Type I Back Country Byway, which comprises paved roads with an all-weather surface and has grades that are negotiable by a normal touring car (BLM 2004).

Recreation Management Areas

The BLM manages recreation on public lands with an objective to "enhance opportunities for developed and undeveloped recreation." Areas where concentrated or intensive recreational uses occur are often managed as a special recreation management area (SRMA), wherein the BLM focuses specific management, funding, and planning to provide for the recreation experience while protecting, sustaining, and enhancing the environmental resources of these areas. No SRMAs are located within or immediately adjacent to the Project area.

Areas outside of SRMAs are defined as extensive recreation management areas (ERMA), which emphasize traditional dispersed recreation use of public land. Except for areas of special designation, all areas of BLM-managed land that are not managed to maintain particular recreational values are, by default, part of the ERMA and are generally managed to limit use conflicts and resource damage. Excluding SMAs, the entirety of the Project area within BLM jurisdiction is located within an ERMA.

Forest Service Recreation

Numerous other facilities for dispersed and developed recreation are within Forest Service lands within Project vicinity, and provide opportunities for camping, hiking, backpacking, sightseeing, OHV use, horseback riding, hunting, fishing, and other activities. These facilities include established trails, trailheads, campgrounds, corrals and equestrian loading/unloading areas, lookout towers, and picnic areas.

3.10. Visual Resources

3.10.1. Introduction

The BLM and Forest Service are the primary federal agencies with established visual management systems that could be affected by the proposed project. Using methods derived from the BLM's VRM and the Forest Service's Visual Management System (VMS), this section addresses the potential visual impacts of the proposed project on landscape scenery (scenic quality) and viewing locations (viewers), as

well as determining conformance with agency visual management objectives. The visual resource study methodology is consistent with, and adheres to, the VRM Manual (VRM 8400 Series 1986) and the VMS Handbook (National Forest Landscape Management, Volume 2, Handbook Number 462 1974). This process provided the foundation for analysis and subsequent recommendations to all land equally, regardless of jurisdiction. The visual study included a data inventory and assessment of potentially affected visual resources associated with the proposed Project. The visual resource inventory was conducted on all land, including public, state, and private land that may be affected by the Project within the study area. Per discussions with agency resource specialists, the study area for visual resources is bound by a one mile buffer along the AIP right-of-way (corridor) and a 0.5-mile buffer on either side of Project access roads that reside outside the Project corridor. Data sources that were reviewed in context with the inventory includes existing land use plans, topographic maps, aerial photography, planning documents, the AIP Final EIS, consultation with participating agencies, and field investigations. The visual resource inventory includes consideration of scenery, viewing locations, and agency management objectives, as discussed below (Figure 3-1, Figure 3-2, and Figure 3-3).

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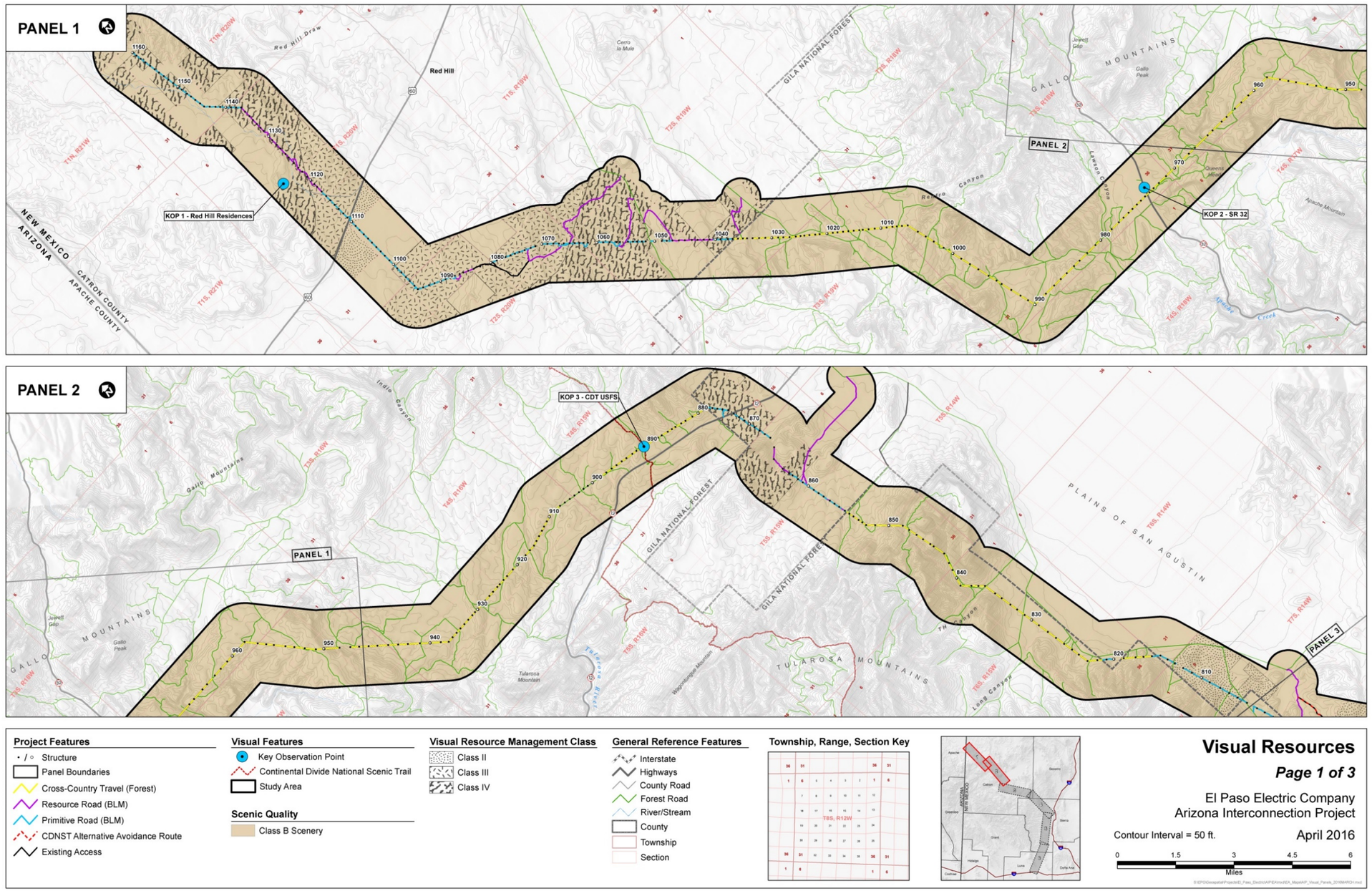

Figure 3-1. Visual Resources

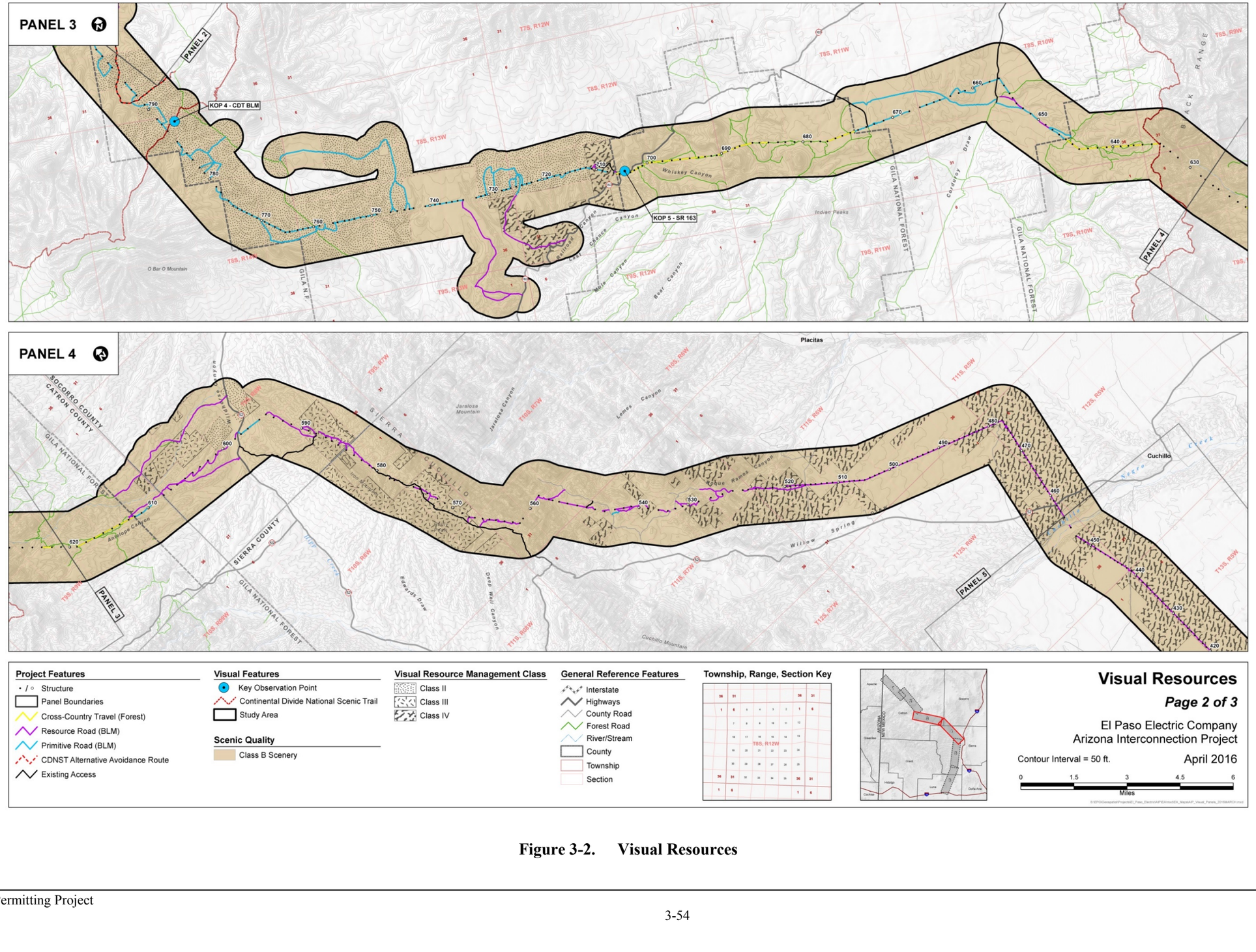

Figure 3-2. Visual Resources

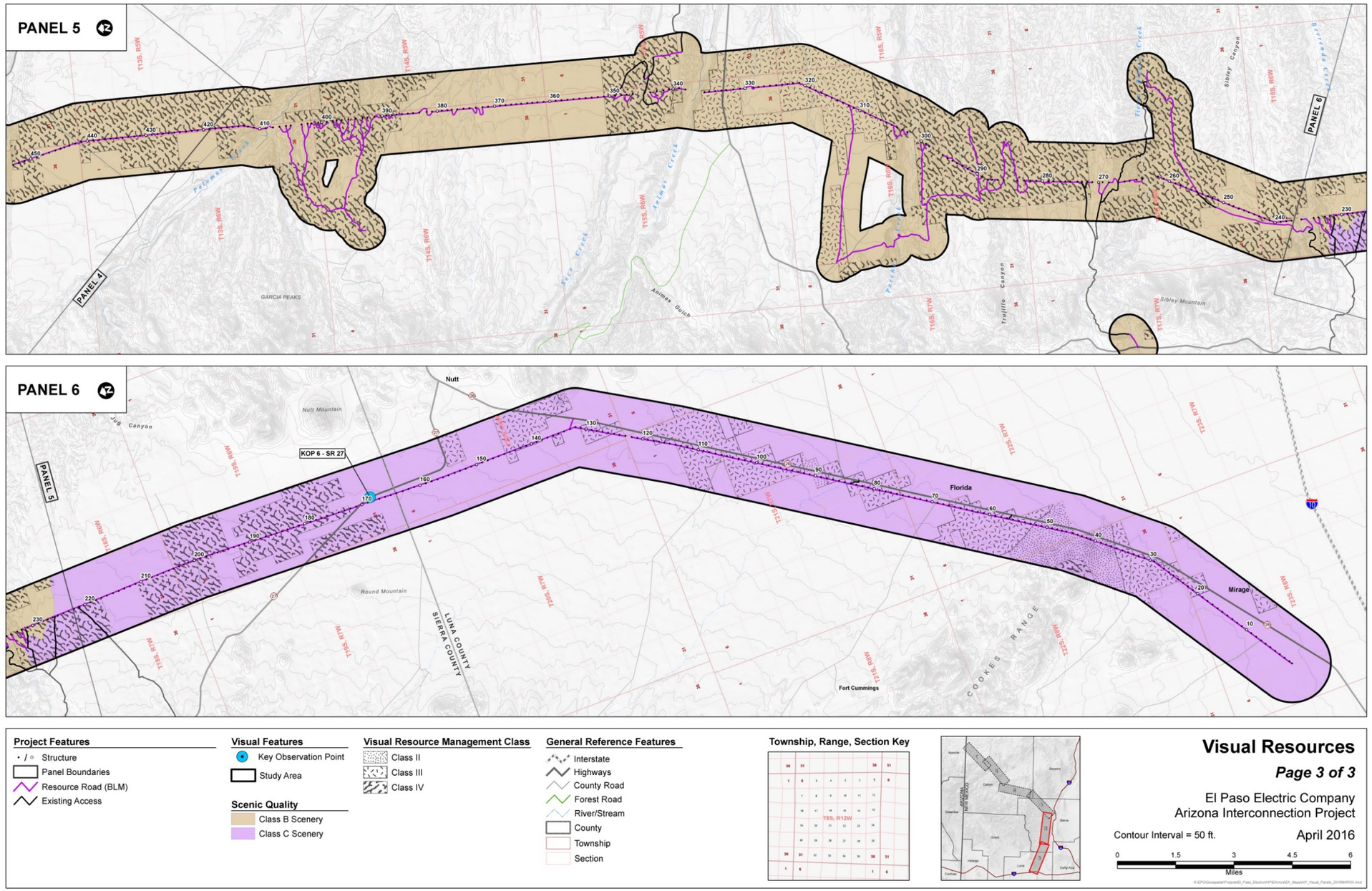

Figure 3-3. Visual Resources

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3.10.1.1. Scenery

Scenery reflects natural landscapes that would be affected by the Project. Typically, every landscape comprises varying levels of landform, vegetation, existence of water, scarcity, adjacent scenery, and cultural modifications; all of which combine to exhibit landscape character (BLM Manual H-8410-1). Inherent to landscape character is scenic quality, which is defined by the BLM as the aesthetic appeal of a tract of land and is expressed as Class A, B, or C (refer to figures 3-1 to 3-3). The Forest Service describes natural landscapes as a variety of classes with similar levels – A, B, and C. Class A scenery typically has a higher degree of landscape relief, diversity of water, and vegetation, which harmoniously combine and result in a high level of aesthetic appeal. Class B scenery has less variety in the elements that comprise the landscape, but still has some diversity and visual interest. Class C scenery typically does not have much diversity in terms of landscape features, and rates the lowest from an aesthetic perspective.

3.10.1.2. Viewing Locations and Key Observation Points (KOPs)

The term "viewing locations" pertains to public areas (including KOPs) within the landscape where the Project could be visible, and where concern for changes to the landscape exists. In this regard, viewing locations are typically associated with residences, travel routes, and recreation areas (e.g., trails). KOPs represent a critical or typical viewpoint within, or along, an identified viewing location, and are required by the BLM to assess and mitigate visual impacts of a proposed action and to demonstrate compliance with designated VRM classes. Factors considered when selecting KOPs were critical viewpoints from communities or road crossings, typical views encountered in representative landscapes, angle of observation, number of viewers, viewing duration, relative project size, season of use, and light conditions. Each viewing location was inventoried and level of concern was assessed based on the following five criteria: (1) volume of use, (2) viewing duration, (3) concern for aesthetics, (4) scenic or historic status, and (5) special status or designations. Concern levels relate to the importance of maintaining existing scenic quality and/or viewsheds associated with a specific viewing location, and are considered with assessing viewer impacts.

3.10.1.3. Agency Landscape Management Objectives

The BLM VRM system requires the inventory of scenic values, and the establishment of management objectives for those values, through a VRM planning process. The Visual Resources Inventory (VRI) process and its resulting information provide the information necessary to characterize the existing or affected environment, and are required for management- and project-level decisions. The BLM's Manual H-8410-1 defines the criteria that define the VRI classifications (i.e., Classes I and II represent lands with the highest value of visual resources, Class III represents moderate value, and Class IV represents lands with the lowest landscape value). VRI data was provided by the BLM FOs (Las Cruces and Socorro) and was incorporated into the inventory. BLM VRM classifications and associated objectives define levels of acceptable visual change (contrast) allowed on BLM-administered land, ranging from Class I to Class IV. These classifications are designated by the BLM, based in part on the VRI and other land use allocations during the resource management planning process. BLM VRM classifications were collected within the Project study area and are used to demonstrate project conformance with regards to established management plans.

The Forest Service Plan directs that the scenic qualities of forest landscapes be recognized and emphasized in all resource planning and management activities. Although agency-derived visual resource data is not available for the Forest Service, a project-level VRI was conducted (scenic quality and viewing locations previously described) in a manner consistent with methods of the Forest Service VMS and was

approved by the agencies for this EA. This process provides the baseline such that a visual assessment could be determined at the same level as all other lands, regardless of jurisdiction.

3.10.2. Affected Environment

3.10.2.1. Project Setting and Scenery

The Project is located within the Mexican Highland and Datil subdivisions of the Basin and Range and Colorado Plateau physiographic provinces, respectively (Fenneman 1931). The Basin and Range Province is characterized by its isolated, roughly parallel mountain ranges separated by closed (undrained) desert basins. The mountain ranges often run 50 to 70 miles in length and generally trend north–south. The Mexican Highland subdivision is also characterized by basin and ranges and intervening desert plains; however, most of the area has external drainage, as opposed to draining internally to basins or bolsons. The Plains of San Agustin is a prominent elongated bolson surrounded by high mountains located in the central portion of the Project study area. The Datil subdivision contains a greater number of domed, volcanic features than elsewhere in the province. Mountains within the Datil subdivision include the Black Range Mountains. The Colorado Plateau province is characterized by sparsely vegetated, horizontal plateaus, mesas, and canyons. Major ecosystems in the Project area include short-grass prairie, Chihuahua semidesert grassland, mixed-desert thorn scrublands, and piñon-juniper woodland hills, foothills, and mountains (Brown 1982). Near the Luna Substation tie-in, vegetation is primarily sagebrush, creosote, desert grasses, and succulents such as agave and yucca. Piñon-juniper woodlands and prairie grasslands dominate the lower elevations of the Black Range and surrounding mountains. At higher elevations, montane conifer forests dominate the landscape with occurrences of Ponderosa Pine and Aspen groves. Within the AIP study area, Class B scenery is associated with these higher-elevation areas where piñon-juniper woodland and savanna grasslands are dominant. Generally Class C scenery is associated with the lower elevation, flat valleys that are dominated by creosote and desert grasses.

The area of the Project is generally natural in appearance. Overall, the landscape setting has been minimally altered along the length of the ROW, with the exception of the existing 115kV transmission line near the Luna Substation tie-in point and the 345kV transmission line near the Red Hill tie-in point. Other modifications include the Macho Springs Wind Farm, dispersed rural residences, and the following paved and unpaved roads: SR 26, SR 52, SR 163, SR 12, SR 60, SR 32, SR 152, SR 27, FR 23, FR 19, FR 28, and County Road 16.

3.10.2.2. Viewing Locations

Recreation viewing locations and KOPs identified within the AIP study area are primarily associated with the CDNST. The CDNST extends from the Montana–Canada and New Mexico–Mexico borders, roughly following the mountains that form a watershed divide between the Mississippi River drainage and rivers flowing to the Pacific. Established in 1978, it was designated to provide a scenic, high-quality, and primitive experience along a continuous and appealing route through diverse terrain for travel by hikers and equestrians. The trail crosses Forest Service, BLM, state, and private lands through New Mexico. Within the AIP project area, the Project crosses the Gila National Forest Black Range, the Pelona Mountain ACEC area on BLM-administered lands, and Tularosa Mountains near SR 12. One of the primary purposes of the CDNST is to provide a "continuous, appealing" route designed for travel by hikers and equestrians, as well as other compatible land uses. While in some instances the trail is located along roads that would allow motor vehicle use, the intention for future development is to relocate the trail entirely off-road to limit use to non-motorized recreation. In 1997, a Forest Service Memorandum clarified this intent, stating that "It is the intent of the Forest Service that the CDNST would be for non-

motorized recreation…Allowing motorized use on these newly constructed trail segments would substantially interfere with the nature and purpose of the CDNST." In 2009, the amended CDNST Comprehensive Plan describes the nature and purposes of the CDNST as "…to provide high-quality scenic, primitive hiking and horseback riding opportunities and to conserve natural, historic, and cultural resources along the CDNST corridor." Dispersed recreation users not associated with the CDNST could occur on BLM or USFS lands within the project study area. Dispersed recreationists are typically moderately sensitive to changes in the landscape and recreate for short to moderate durations, depending on the activity. There are some rural dispersed residences generally located along all portions of the AIP study area. Overall, there are no large residential communities or populated areas near the AIP study area. KOP 1 was identified at a location near Red Hill where a cluster of eight to 10 residences occur immediately adjacent to the AIP ROW. These residences are associated with high sensitivity because of longer viewing duration and concern for maintaining existing scenery and/or viewsheds.

High sensitivity travel routes include those associated with scenic designations, including the Geronimo Trail National Scenic Byway (SR 152) and the Lake Valley Backcountry Byway (SR 27). Moderate sensitivity travel routes generally include state highways, Forest Roads, and other recreation/resource related roads (as identified by participating agencies). Specifically, moderate sensitivity roads include SR 60, SR 12, SR 52, and SR 26.

3.10.2.2.1 BLM

Recreation on BLM lands within the study area is primarily dispersed with formalized recreation areas being limited to the CDNST. Project-level information relating to recreation viewers was used, as well as information in the Continental Divide Trail Plan (CP) relating to desired visitor experiences and interpretive facilities. The CP states that on lands administered by the BLM, the CDNST is considered a high-sensitivity-level travel route. KOP 4 was identified on BLM land within the Pelona Mountain ACEC where the trail crosses the AIP ROW. Although this segment of the trail does not have a trailhead or other recreation facilities, the trail is well signed and is evident to trail users.

Portions of the Geronimo Trail National Scenic Byway (SR 152) and the Lake Valley Backcountry Byway (SR 27) cross BLM lands with KOP 6 representing viewers from the Lake Valley Backcounty Byway.

3.10.2.2.2 Forest Service

Recreation on Forest Service lands within the study area is primarily dispersed with the Continental Divide Trail being the primary recreation amenity. Consultation with the Forest Service confirmed that the CDNST is considered a high-sensitivity resource. KOP 3 was identified at a trailhead located off SR 12 on Forest Service land. This location has parking facilities as well as a corral for horseback riders.

While several travel routes cross Forest Service lands, consultation with the Forest Service identified two Forest Roads of concern: SR 32 (KOP 2) and SR 163 (KOP 5), which are crossed by the AIP. These non-scenic travel routes are associated with moderate sensitivity because viewers are traveling at a higher rate of speed in an area with a generally low volume of recreation use.

3.10.3. BLM VRI Classifications

The Project study area is primarily associated with VRI Class III land. No VRI Class I land would be crossed; however, VRI Class II land would be crossed near Cooke's Range, Percha Creek, and near the Cuchillo and Jaralosa Mountains.

3.10.4. Agency Management Objectives

3.10.4.1. BLM

The majority of BLM land crossed by the AIP study area is VRM Class III and Class IV. Isolated areas associated with VRM Class II lands include Cooke's Range, the Butterfield Trail, the Pelona Mountain ACEC area, and SR 60. The AIP study area does not cross VRM Class I lands.

3.10.4.2. Forest Service

Consultation with the Forest Service confirmed that Visual Quality Objective (VQO) data was not available.

3.11. Cultural Resources and Tribal Concerns

3.11.1. Introduction

The term "cultural resource" refers to a broad category of resources that includes prehistoric and historic archaeological sites, buildings, districts, structures, locations, or objects considered important to a culture or community for scientific, traditional, religious, or other reasons. Cultural resources deemed significant for their contribution to broad patterns of history/prehistory, architecture, engineering, culture and scientific information are eligible for listing on the National Register of Historic Places (NRHP) are known as historic properties. Historic Properties are afforded certain protections under the NHPA. Cultural resources that are insufficiently evaluated for the NRHP would require additional subsurface testing or archival research in order to evaluate their NRHP eligibility. For management purposes, these insufficiently evaluated sites are treated as historic properties. Because the Project is a federal undertaking, (i.e., a project, activity, or program permitted [or authorized by] or funded in whole or in part under the direct or indirect jurisdiction of a Federal agency, including those carried out by or on behalf of a Federal agency), it is subject to compliance with Section 106 of the NHPA of 1966, as amended (16 U.S.C. 470 et seq.). Section 106 (36 CFR Part 800, as amended August 5, 2004) requires federal agencies to consider the effects of their undertakings on historic properties, and consult with the State Historic Preservation Office and/or Tribal Historic Preservation Offices, as well as the Advisory Council on Historic Preservation.

In addition, Section 106 specifies that as lead federal agency, it is the responsibility of the BLM to consult with interested tribes to identify properties of special significance to them in the Project area. This responsibility is reinforced by the AIRFA enacted by Congress in 1978, directing federal agencies to minimize interference with the free exercise of Native religion, and accommodate access to and use of important religious sites. Properties identified through the tribal consultation process may include traditional cultural properties, sacred landscape or landscape elements, and traditional use areas important for Native American cultural and religious practices. Beyond Section 106 and the AIRFA, NEPA and Executive Order 13007 specify that Tribal concerns be taken into consideration. BLM consultation with 15 tribes (October 2013) resulted in three respondents expressing interest and claims of cultural affiliation. These tribes requested NAGPRA notification in the event of discoveries. The Hopi requested continued consultation beyond NAGPRA.

To be eligible for listing on the NRHP, a property must be significant under one or more of four evaluation criteria:

- Criterion A: Associated with events that have made a significant contribution to the broad patterns of our history
- Criterion B: Associated with the lives of persons significant in our past
- Criterion C: Embody the distinctive characteristics of a type, period, or method of construction, or represent the work of a master, or possess high artistic values, or represent a significant and distinguishable entity whose components may lack individual distinction
- Criterion D: Yielded, or may be likely to yield, information important in prehistory or history.

In addition, a property must be able to convey its significance through the retention of specific aspects of integrity, such as location, design, materials, setting, workmanship, feeling, and association. In general, properties less than 50 years of age, unless of exceptional importance, are not eligible for listing on the NRHP.

3.11.2. Culture History

3.11.2.1. Paleoindian Period (10,000 to 8000 BC)

The earliest human occupation of the Southwest occurred at the end of the Late Pleistocene, following the entrance of Paleoindian peoples into North America approximately 12,000 years ago (Haynes 1967; Waters 1985; Whittlesey et al. 1994). This early occupation in the greater region is known as the Paleoindian Period. Nomadic groups hunted large game animals, collected native plant food, and were highly mobile. The populations during this time remained small and dispersed. Physical remains of several Paleoindian cultural traditions, including Clovis, Folsom, and Cody, have been found in New Mexico (Cordell 1997).

Low population densities prevailed among these early inhabitants, who were organized as small-scale, residentially mobile, and socially fluid groups. Paleoindian site types may include kill sites, temporary hunting camps, base camps, processing sites, resource procurement sites, and quarries (Cordell 1984a, 1997; Frison 1993; Haury 1953; Hemmings 1970; Hemmings and Haynes 1969). These demographic patterns have resulted in a comparatively sparse occurrence and low visibility of Paleoindian archaeological sites. Two further factors may influence the discovery and recording of Paleoindian sites, including soil accumulation that may hide the sites (Cordell 1979) and the difficulty of identifying Paleoindian sites that contain no diagnostic lithic tools (Binford and Anderson 1992).

Environmentally, the Paleoindian Period corresponds to the Late Glacial, Pre-Boreal, and Boreal climatic episodes (Rowe 2002). Overall, this period is marked by warming and cooling trends associated with the movement of continental and mountain glaciers. Much of the paleoenvironment in the Southwest consisted of verdant grasslands and playas, which sustained numerous now-extinct herbivore populations such as mammoth, tapir, camel, horse, and bison (Haynes 1970; Mehringer and Haynes 1965). These episodes mark the end of the Pleistocene and the beginning of the Holocene. Pollen data suggests an abrupt change in climate, marked by declines in effective moisture and greater seasonal variability (Greiser 1980). This resulted in drastic alterations of vegetative patterns and the loss of browse vegetation. Extinction of the Pleistocene megafauna, which was well underway during the Late Glacial, was accelerated and species diversity was greatly reduced.

3.11.2.2. Archaic (8000 BC to AD 200)

The transition from the Paleoindian Period to the Archaic Period is marked by the extinction of the Pleistocene megafauna and the shift to small-scale hunting and plant processing. It remains unclear if these early Holocene extinctions were the result of climatic changes or overhunting; however, warmer and drier climates similar to present-day prevailed during this period. There was a change from Paleoindian lanceolate and stemmed points to Archaic side-notched types over time (Frison 1991), and Archaic peoples increasingly incorporated a reliance on wild plants into their subsistence strategies. These changes are apparent in stone tool assemblages, which became less specialized and distinctive than in the preceding period; and by artifacts, which increased in frequency throughout the period (Cordell 1997:101; Hayden 1982; Rogers 1966).

The Archaic Period corresponds to the Altithermal climatic episode (Antevs 1948, 1955; Rowe 2002). Spring dominant storms, declines in plant cover, and water tables resulted in increased erosion and arroyo cutting (Albanese 1980, 1982). By 7000 BC, the short-grass browsing areas appear to have reached their maximum, and lower effective moisture allowed for the invasion of the area by a xerophytic desert community dominated by juniper and mesquite. Faunal remains recovered from archaeological contexts in the area seem to indicate a general reduction in animal populations and the intrusion of desert-adapted species. By 2700 BC, during the Sub-Boreal phase, the dry conditions that prevailed during the earlier phases appear to have moderated. A southern shift in winter and summer frontal zones at approximately 1500 BC resulted in a general cooling trend in the region (Rowe 2002). This was followed by another warming trend that produced climatic conditions similar to those of the present (Greiser 1980). As a result, the areal distribution of grasslands and desert assumed their modern configuration.

Archaic sites are identified from surface remains by the presence of distinct projectile points (Elyea 2004:14). Different cultural traditions have been defined for Archaic peoples in New Mexico, including the Cochise tradition in southwest New Mexico and southeast Arizona (Beckett and MacNeish 1994; Rogers 1939, 1966; Sayles and Antevs 1941; Sayles et al. 1983), and the Oshara tradition in northwest New Mexico (Irwin-Williams 1973). Critics suggest that these subregional traditions, presumed to reflect prehistoric cultures, are in fact archaeological constructs that appear to be more troublesome than instructive (Berry and Berry 1986; Huckell 1984, 1988). Archaic Period chronology has been divided into three broad temporal divisions: Early (8000 BC to 4800 BC), Middle (4800 BC to 1500 BC), and Late (1500 BC to AD 200) (Huckell 1984).

Early Archaic (ca. 8000 to 4800 BC)

The Early Archaic Period is defined by the extinction of numerous megafauna species and the drastic reduction in population sizes of others. Human groups, in response to the extinctions, were forced to adopt a more varied hunting and gathering subsistence pattern in order to survive. Investigations reveal a subsistence system with an emphasis on plant processing and small game. Artifact assemblages during this time demonstrate a wider variety of chipped stone artifacts and an increasing dependence on groundstone artifacts. Point types and other aspects of cultural material differed markedly from those of the preceding Paleoindian Period. The dart and atlatl were used to hunt the smaller, swifter, and more elusive game of the time.

Middle Archaic (ca. 4800 to 1500 BC)

The Middle Archaic Period is marked by an increased reliance on wild plant foods, as evidenced by an increase in artifacts and the occurrence of rock-filled hearths or roasting pits that may have served to cook

either vegetable or animal materials. The use of larger animals increased during this time period, with the recovery of the larger prey animals, as the browsing areas recovered from the drought conditions of earlier periods.

Late Archaic (ca. 1500 BC to AD 200)

Experimentation and transition to new technologies characterizes the Late Archaic Period. During this period, there is a marked increase in settled village life and pottery manufacture, as well as the appearance of early farming activities as evidenced at Los Morteros (AZ AA:12:57[ASM]) (Hackbarth 1998). However, this is not a strict dichotomy, as the appearance of pottery and the transition to agriculture varies among cultural groups and geographic area. Moreover, numerous cultural groups continued with Archaic-like adaptations into the Protohistoric Period in southeast Arizona and southwest New Mexico (Lockhart 1997; Seymour 2009a; Stuart and Gauthier 1981).

3.11.2.3. The Early Pithouse period

Starting sometime around AD 200, early pithouse settlements consisting of one to a dozen or more roughly oval or circular pithouses were constructed in elevated locations along major drainages, and in upland areas far from major streams (Anyon et al. 2005; Lekson 2006). Early Pithouse settlements are distinguished from earlier Late Archaic settlements by the presence of pottery. In the Early Pithouse period, a plain, buff-colored pottery was produced, called Alma Plain, and it is thought that the rapid spread of this technology was critical for storage as well as cooking (Cordell 1984b). Ceramic vessels permit the storage of grains such as maize that can be easily protected from pests such as rodents. In addition, ceramic vessels can be placed over coals to permit long cooking times, an advantage over animal skin or basketry that was likely used in the Late Archaic Period. These pithouse dwellers likely practiced a combination of hunting-gathering and farming strategies, with cultivated plants supplementing wild resources (Wills 1988, 1995), and were mobile some part of the year (Gilman 1983, 1987, 1997).

3.11.2.4. The Late Pithouse Period

The Late Pithouse Period is subdivided on the basis of ceramic and architectural data into three phases: the Georgetown (AD 600-700), the San Francisco (AD 700-825), and the Three Circle phase (AD 825-975/1000). While archaeologists characterize Early Pithouse dwellers as seasonally mobile and only moderately dependent on agriculture (Gilman 1987; Wills 1991), it is believed that this changes over the course of the Late Pithouse Period, with people becoming more sedentary and more reliant on agriculture (Diehl 1996; Gilman 1997; Mauldin 1993; Minnis 1985; Wills 1988, 1995). Over the course of 800 years, archaeologists argue that maize-based agriculture became a dietary staple, and that there was a substantial decrease in mobility, with residents remaining at pithouse sites for greater lengths of time each year (Diehl and Gilman 1996; Gilman 1983, 1987).

Unlike the Early Pithouse Period, the Late Pithouse period is divided into three sequential phases; these temporal divisions are critical because there are important changes that occur during this period. These likely include changes in agricultural technology (Creel and Anyon 2003), increased intensification of maize agriculture (Diehl 1994), and drastic reduction of local, large game populations (Cannon, 2001). These important changes in subsistence and land use during the Late Pithouse Period are described for each of these phases in turn.

The Georgetown phase of the Late Pithouse Period was marked by the introduction of a new type of pottery, San Francisco Red, while Alma Plain continued to be produced. Pithouse layout apparently

changed from the earlier oval and circular shapes, with D-shaped or kidney bean shapes becoming more popular (Anyon et al. 1981). At this time, it appears that some of the earlier settlements on higher landforms were abandoned and residents moved downhill to streamside terraces in major drainages, and new sites were also established in these areas, reflecting a desire to reside closer to agricultural fields (Diehl and LeBlanc 2001; LeBlanc 1999). Settlement size may have increased along with population, and communal structures were constructed in some of these settlements, perhaps serving to integrate their community (Creel and Anyon 2003).

The subsequent San Francisco phase of the Late Pithouse Period was marked by the introduction of a new, painted type of pottery, known as Mogollon Red-on-brown, while Alma Plain and San Francisco Red continued to be produced. Pithouse layout changed from the oval or kidney shape of the Georgetown phase to D-shaped and semi-rectangular shaped pithouses with rounded corners in plan view (Anyon et al. 1981). Little research has been conducted on the transition from the Georgetown phase to the San Francisco phase, so there is not much to distinguish the latter from the former, except for the pottery and architecture. Recently, however, it has been suggested that during the San Francisco phase, connections with the Hohokam people to the west were strong, and items such as shell bracelets and stone palettes were traded into the area (Creel and Anyon 2003).

The subsequent Three Circle phase of the Late Pithouse Period is relatively long at 150 years, so it is convenient, when possible, to subdivide the phase into early and late intervals based on pottery styles (Shafer and Brewington 1995). Two new types of pottery were developed during the Three Circle phase (Anyon et al. 1981): Three Circle Red-on-white, followed by Mimbres Boldface (or Style I) Black-on-white. Alma Plain and San Francisco Red continued to be produced, albeit in lower frequencies. Pithouse layout changed to a rectangular shape, and entry ramps were shorter (Anyon et al. 1981). By the Three Circle phase a new and more productive form of maize, "maiz de ocho"[1] became widespread across the region (Diehl and LeBlanc 2001), and may have promoted increased maize dependence (Hard 1990).

Mogollon: Pueblo Periods (AD 1000 to 1450)

The Mogollon Pueblo Period was a time of intense cultural and social transformation. Major changes occurred in Mogollon subsistence, technology, architecture, settlement patterns, population size, and social interaction with outside groups. Mogollon subsistence strategies shifted from the use of a broad spectrum of plant and animal resources to a primary dependence upon cultivated plants, especially corn and beans. While hunting and gathering did not disappear completely during this period, increases in local population size and density appear to have reduced the availability of wild resources immediately around settlements (Reid 1989; Tuggle et al. 1984; Welch 1991). Changes in subsistence strategies also affected other aspects of Mogollon life; sites dating to this period typically lie in large alluvial valleys, in order to use large tracts of arable lands. Within the study area, two cultural groups have been identified, called *Mimbres* in the south and east, and *Cibola* in the north and west.

The most apparent change during this period is the appearance of surface architecture and larger settlements (Haury 1985; Reid and Whittlesey 1997; Rice 1980). Early pueblo communities consisted of small agricultural villages exemplified by small roomblocks with separate semisubterranean kivas; however, after AD 1200, these small sites were abandoned and populations aggregated into larger, more complex pueblos (Reid 1973). These large pueblos, often consisting of hundreds of rooms, were built around several kivas or a single, centrally located great kiva (Rice 1980), and may have been in response

[1] This is an eight-rowed, "flour" variety of maize with higher yields than earlier varieties.

to external or internal threats from groups searching for food or slaves (Bluhm 1960; Danson 1957; Reid and Whittlesey 1997). Alternatively, aggregation may have been a strategy to concentrate a large labor pool that could be used for agricultural or other pursuits in a small area (Rice 1980).

Dramatic increases in local population size and density were not solely the result of aggregations of local populations, but also a result of the immigration of large numbers of people from outside regions. By the mid-AD 1200s, a drought in the north forced large numbers of Anasazi south of the Colorado Plateau (Reid and Whittlesey 1997). At many sites, these immigrants resided alongside local Mogollon populations. Over time, as more and more immigrants moved into the Cibola area, population densities in some areas increased as much as tenfold over earlier population densities. This population explosion caused increased social tension between local populations and immigrants. These demographic changes also placed great stress on the subsistence base of most groups. Established agricultural techniques were unable to sustain such large populations and the available wild plant and animal resources were inadequate. By AD 1450, food and social stress may have increased to the point that the Mogollon abandoned most large communities (Ezzo 1990; Reid and Whittlesey 1982).

3.11.2.5. Classic Mimbres Period/Reserve Phase (AD 1000 to 1150

Around AD 1000, stone-masonry surface structures (called "*pueblos*") were constructed in new locations and over the top of many Late Pithouse villages as population exploded throughout the Mogollon region (Diehl and LeBlanc 2001; Hegmon 2002). Available farmland likely became scarcer, and farming expanded into upland side-drainages where runoff or dry-farming was practiced. This agricultural intensification was accompanied by increasing environmental degradation, with evident reduction in riparian vegetation (ibid.). This was sustained for a few generations, until climatic deterioration in the early 1100s resulted in abandonment of the Mimbres Valley, region, with some of the population relocating to areas outside the Mimbres Valley (Blake et al. 1986). Sporadic settlement occurred in subsequent periods, but never to the extent that characterized the Classic Mimbres settlement of the valley (Nelson and Anyon 1996; Nelson and LeBlanc 1986). Mimbres Black-on-white pottery, perhaps inspired by wares from neighboring areas but eventually having evolved a distinctive style of its own, was produced and traded throughout the Mogollon region (Hegmon and Nelson 2003; Stuart and Gauthier 1988).

Although less work has been conducted at Reserve phase sites in the southern Cibola region, they appear to share material culture patterns with Mimbres Classic Period sites. Reserve phase settlements are typically small hamlets or single-room field houses, and the ubiquitous ceramic ware, Reserve Black-on-white, reflects cultural and technological influence from Anasazi peoples to the north. As for the Mimbres region, settlement is characterized by the establishment of small communities in previously unoccupied areas (Berman 1979). Although sites area often found on benches and terraces overlooking major drainages, sites are also found on steep hillslopes, mesas, valley floors, and meadows.

Research conducted by Dr. Andrew Duff at the Cox Ranch Ruin, near Quemado, New Mexico, (Duff 2005; Stuart et al. 1988) suggests interaction of Chacoan peoples with other migrant cultures from the Mogollon region during AD 1050-1100s. Duff suggests that the great house community at Cox Ranch Ruin and the surrounding area incorporates other populations from migrant groups living in and around the Cox Ranch Pueblo (Duff 2005). The architecture reflects that of the Chaco style; however, the artifact assemblage consists of Cibola whitewares.

3.11.2.6. Postclassic Mimbres/Tularosa Phase (AD 1150 to 1350/1450)

Although the Mimbres Valley was largely abandoned around AD 1150, substantial settlements persisted in other parts of the region, including along the lower Mimbres River near Deming, along the creeks draining the eastern slopes of the Black Range, and along the Rio Grande. Recent and ongoing research along Palomas Creek and the Cañada Alamosa is beginning to show that this time period was one of population movement and shifting social connections across great distances (Hegmon and Nelson 2003). Many small settlements were abandoned by the 13th century, with populations aggregating into larger villages by the 14th century. Ceramic assemblages were diverse and include black-on-white types (e.g., Tularosa Black-on-white, Socorro Black-on-white) as well as glazed and unglazed polychrome types (e.g., St. John's Polychrome, El Paso Polychrome, Ramos Polychrome).

3.11.2.7. Protohistoric–Historic Era (AD 1540 to 1960)

The Protohistoric is designated as the interval between the first arrival of Europeans in the area around 1540, and the establishment of the Spanish province of Santa Fé de Nuevo México at the turn of the seventeenth century (Di Peso et al. 1953; Gilpin and Phillips 1998; Ravesloot and Whittlesey 1987; Riley 1987; Wilcox and Masse 1981).At the time of the Spanish *entrada* into New Mexico, there was a mix of both sedentary and mobile cultural groups. Sedentary groups included the Western Pueblos of the Zuni and Acoma-Laguna in the Cibola area, and a series of villages referred to as the Eastern pueblos along the Rio Grande from present day Socorro, northward. Nomadic groups included the Apache, ranging across northern Chihuahua and the central and southern portions of New Mexico; the Manso, Suma, Jano, and Jocome, around the Lower Rio Grande valley and into northern Chihuahua, and the Jumanos in the Salinas region and eastward into the Great Plains (Bolton 1949; Dozier 1983; Forbes 1959; Lockhart 1997; Seymour 2009a; Wells 2006).

3.11.2.8. Pueblos

The Pueblos of New Mexico represent the descendants of cultural groups referred to by archaeologists as the Anasazi and Mogollon cultural traditions. When the Spanish explorers arrived in the region, they referred to the nucleated, agrarian villages as "*pueblos*," which came to apply to the inhabitants of those settlements. Linguistically heterogeneous, present-day Puebloans speak a variety of languages and dialects grouped within the Uto-Aztecan, Tanoan, Keresan, and Zunian language families (Dozier 1983).

In 1598, the Pueblo villages unwillingly became incorporated into the Spanish colony of Santa Fé de Nuevo México, and for eight decades, the indigenous inhabitants of the region endured Hispanicization and missionary efforts lead by the Catholic Church and the secular government in Santa Fe. Dissatisfaction amongst the Pueblos reached a climax with the Revolt of 1680, resulting in the expulsion of the Spanish colonists and their native allies from the region. However, the Pueblo victory was short-lived, and in 1692, a military campaign of reconquest was undertaken, resulting in the submission of all of the Eastern Pueblos by 1696. The provincial authorities were unable to reassert control over the Hopi, Zuni, or Acoma-Laguna Pueblos due to the encroachment of Navajo and Ute raiders into the region. The Western Pueblos remained outside of the Spanish cultural sphere in the Rio Grande Valley for the remainder of the Spanish Colonial and subsequent Mexican periods (Dozier 1983; Kessell 2002).

Despite the negative aspects of colonization, the Spanish provincial government issued land grants to all of the existing New Mexico pueblos during the period 1598 to 1821 (Dory-Garduño 2010). Following the Mexican-American War of 1846–1848, the United States was bound by the Treaty of Guadalupe Hidalgo to recognize the rights and property of Mexican citizens. In a report to congress in 1858, the surveyor-general for New Mexico recommended 17 of 21 Pueblos as having legitimate claim to their lands.

Congress confirmed the Pueblo grants the same year, and the General Land Office (GLO) issued patents in 1864 (Brayer 1939). Presently, there are 19 Pueblos in New Mexico: Acoma, Cochiti, Isleta, Jemez, Kewa (Santo Domingo), Laguna, Nambe, Ohkay Owingeh, Picuris, Pojoaque, Sandia, San Felipe, San Ildefonso, Santa Ana, Santa Clara, Taos, Tesuque, Zia, and Zuni (Vlasich 2005).

3.11.2.9. Apache

Athabaskan-speaking Apache groups ranged across a significant portion of New Mexico during the Historic Period. This range extended from northern Mexico into eastern Arizona and western New Mexico, and across the southern Great Plains to southwest Texas (Gunnerson 1979). Linguistically, Athabaskan is a branch of the Na-Dene language family of northwestern North America. Geographically, Athabaskan speakers reside throughout the interior of Alaska and western Canada, with outliers along the Pacific Coast of Oregon and California, as well as in the Southwest, as represented by Navajo and Apache cultural groups (Ruhlen 1998).

Although Athabaskan-speaking cultural groups were relative latecomers to the Southwest, it remains unclear when the first migrations to the region occurred, particularly in regards to groups that would become the Apache of Arizona and New Mexico. Traditional views hold that following the abandonment of Mogollon settlements in eastern Arizona and western New Mexico in the late fourteenth century, the region remained depopulated, resulting in the *despoblado* (unsettled/uninhabited land) encountered by later Spanish explorers (Cordell 1984a; Haury 1985; Reid and Whittlesey 1997; Seymour 2008). This has led some scholars to suggest that Apache groups only arrived in the region in the mid-1600s (Schroeder 1974a; Seymour 2008). However, others suggest Athabaskan migrations occurred prior to the arrival of the Spanish to the area and that Apache, or proto-Apache groups, entered the southwest a century or more before Coronado's *entrada* in AD 1540 (Forbes 1960; Goodwin 1942; Oakes 1996; Seymour 2008, 2009b).

The various Apachean groups differed in dialect, social organization, and subsistence practices, resulting in distinct tribal groups. Major groups include the Western Apache, Chiricahua, Mescalero, and Jicarilla (Roberts and Roberts 2006). Two of these Apache tribal groups—the Chiricahua and Mescalero—ranged within the study area during the Protohistoric-Historic Period. The Chiricahua occupied parts of northwest Mexico, southeast Arizona, and southwest New Mexico. Schroeder (1974a, b, c) identifies five Chiricahua bands: Mogollon, Copper Mine, Mimbres, Warm Spring, and Chiricahua. The numerous bands of the Mescalero ranged from the Texas panhandle across the southern plains to the Rio Grande in New Mexico, and throughout parts of northern Mexico (Sonnichsen 1958).

The Apache occupied a large part of New Mexico and practiced a very different lifestyle from the agricultural groups already in the region. Living in temporary ranchería-type settlements, the Apache were mobile hunter gatherers skilled at exploiting seasonal and spatial variations in resource availability (Basso 1983; Sonnichsen 1958). Although the Apache adopted some small-scale agricultural practices from their sedentary neighbors, including maize cultivation (Goodwin 1935), raiding became a significant part of the culture following the adoption of the horse. Mountain camps provided a safe base from which to conduct raids for livestock and grain from agricultural groups in the valleys below (Basso 1971; Spicer 1962).

For nearly two centuries, the Apache successfully resisted Spanish efforts to settle in their lands. Moreover, with the collapse of the Spanish presidio system in the 1830s, Apache raiding resulted in a significant depopulation of northern Sonora as well as southern Arizona and New Mexico (Acuña 1974; Sweeney 1992). However, with the successful conclusion of the Mexican-American War (1846 to 1848), immigrants from the United States poured into the region. These circumstances led to inevitable conflicts with the military forces of the United States as well as with Mexican and Anglo ranchers, who for the first

time, began to successfully encroach on Apache lands in part due to the protections afforded by the U.S. Army (Trimble 1989).

Following their release as prisoners of war from Fort Sill, Oklahoma in 1913, the majority of the remaining Chiricahua, along with a number of Lipan, relocated to the Mescalero Reservation (1873) in southeastern New Mexico (Sheridan 1995; Sonnichsen 1958). Those Chiricahua that remained at Fort Sill were given allotment land, and formed the Fort Sill Apache Tribe of Oklahoma (Griffin-Pierce 2010).

Spanish Colonial Period (AD 1539 to 1821)

Although the Spanish first entered the present-day American Southwest in 1539, maintaining a permanent presence in the region was elusive until the establishment of a New Mexico colony at the start of the seventeenth century. Six decades of sporadic exploration, culminating in several unsuccessful attempts to gain a foothold in the region, preceded the foundation of the colony. The following section provides a context and background for these early explorations and the foundation of the New Mexico colony.

The de Niza and Coronado Expeditions (AD 1539 to 1542)

The first historic reference to the lands encompassing present-day New Mexico occurred during Nuño Beltrán de Guzmán's conquest of western Mexico (1529 to 1531), as tales of seven great cities lying to the north in the land of Cíbola were brought back to the Spanish. In 1536, Alvar Nuñez Cabeza de Vaca and three other survivors of a failed expedition to conquer Florida may have crossed into present-day New Mexico on their return to Mexico City, returning to Spanish territory across the northern frontier of Nueva Galicia. Although the survivors' tales were not particularly embellished, they did speak of great cities north of the frontier, with houses four and five stories tall. These accounts served to further exaggerate a growing legend of "Seven Cities of Cíbola". Influenced by these events, the viceroy of Nueva España, Antonio de Mendoza, selected a Franciscan friar, Fray Marcos de Niza, to lead a reconnaissance expedition into the north to find, and establish relations with, the inhabitants of Cíbola in 1539 (Farish 1915; Kessell 2002).

Consisting of de Niza, Estéban de Dorantes, and a contingent of natives that had travelled with Cabeza de Vaca across the northern frontier, the expedition departed northward from San Miguel de Culiacán, Nueva Galicia in March of 1539. Estéban, a Moor, served as the expedition party's guide. Skirting the Sierra Madre Occidental to the east, the party followed the coastline along the Gulf of California coast through the present-day states of Sinaloa and Sonora, Mexico before turning northeast towards the San Pedro Valley (Farish 1915; Kessell 2002). Estéban, leading a forward party several days ahead of Fray Niza, continued beyond the Gila River northeast to the settlements at Zuni (Bolton 1949; Farish 1915). Shortly upon arrival at what he believed to be Cíbola, Estéban and most of the native contingent were apparently dispatched by the town's inhabitants. Fearing a similar fate, Fray de Niza approached the town at a distance where he erected a cross, claiming the land in the name of Spain, and hastily returned to Nueva Galicia (Farish 1915; Kessell 2002).

Encouraged by de Niza's claims of abundant gold and silver, and by the vision of the great city he had observed from a distance, Viceroy Mendoza and his newly appointed governor of Nueva Galicia, Francisco Vásquez de Coronado, immediately organized a military expedition to take Cíbola. Departing from Nueva Galicia in the spring of 1540, Coronado rode at the head of an army consisting of approximately 300 Spanish soldiers and 1,000 native allies, including Mexica, Tlaxcalan, and Tarascan warriors; de Niza led a religious contingent of five Franciscans. In support of the army were hundreds of

servants and followers leading spare horses, driving the pack mules, and herding 5,000 cattle, sheep, and pigs (Flint 2003; Kessell 2002).

Traversing a *despoblado*, Coronado's army crossed into present-day New Mexico. Upon reaching Cíbola, the army found a modest-sized Zuni town (Háwikuh) defended by some 200 warriors. Seizing the village after less than an hour of fighting, Coronado promptly established a headquarters to send out further expeditions in search of the wealthy civilization described by de Niza. Captains Don Pedro de Tovar and Garcia López de Cárdenas were sent to the west, while Hernando de Alvarado explored to the east. Tovar made contact with the Hopi as Cárdenas followed the Colorado River to the Grand Canyon. In the east, de Alvarado passed through the Acoma, Tiguex, and Cicuyé pueblos. In each case, de Niza's claims of great riches in the land of Cíbola proved to be greatly exaggerated. Conscious of the army's resentment and feelings of betrayal, de Niza promptly returned to Mexico City (Kessell 2002; Prince 1883). Coronado eventually realized that the tales of gold and silver were inaccurate, and he led his group back into Nueva Galicia in 1542 (Kessell 2002; Prince 1883). The failure of the Coronado expedition dispelled any further notions of great cities beyond the northern frontier, and several years would pass before Spain returned to the region (Dozier 1983).

The Chamuscado and Espejo Expeditions (AD 1581 to 1583)

Spain's reentry into the region began in 1581, when Francisco "el Chamuscado" Sánchez and Fray Antonio Rodríguez led an expedition from Santa Bárbara, Nueva Vizcaya (present-day southern Chihuahua) across the northern frontier into the region known by the Spanish of the time as "Nuevo México." With natives as guides, the party crossed the frontier along the Rio Grande near present-day Ciudad Juárez, Mexico. Following the Rio Grande upstream, the party encountered lightly clothed, non-metal-working cultural groups, and supposedly met natives who had seen Cabeza de Vaca and his companions. They eventually arrived at the Tiwa pueblos from where they continued to explore east to the plains, and west to Acoma and Zuni pueblos (Flint and Flint 2005).

A second expedition occurred in late 1582, under the command of Antonio de Espejo, who was interested in finding exploitable mineral resources and identifying possible sites for establishing a permanent Spanish settlement. During the course of their explorations, the Espejo party travelled to the Zia, Jemez, Acoma, Zuni, Hopi, Tiwa, and Keresan pueblos, and to the Tanos at Galisteo Basin (Dozier 1983). On his return to Nueva Vizcaya, Espejo petitioned the Crown to establish a colony in Nuevo México; however, lacking the necessary credentials—primarily money and lineage—Spanish authorities ultimately considered Espejo unsuitable for the task (Kessell 2002).

Nuevo México (AD 1595 to 1848)

In 1595, Don Juan de Oñate Salazar, a wealthy and influential citizen of Zacatecas, was awarded the colonization contract for Nuevo México. The organization of the colonial expeditionary force took three years to recruit the necessary settlers, soldiers, and servants (Dozier 1983). In total, the colonial force consisted of approximately 700 soldiers, 130 families, 80 wagons, and thousands of head of livestock (Kessell 2002; Prince 1883). In January of 1598, the colonists followed the Rio Grande through the lands of the Sumas and Mansos and upon reaching Pueblo country, Oñate established the first provincial capital at the Tewa pueblo of Ohkay Owingehm, which was moved in 1600 to San Gabriel (Yunge Owingeh). In 1610, Don Pedro de Peralta, the third governor of the province, moved the capital to Santa Fé (NMOSH 2010).

The establishment of Nuevo México marked the beginning of a period of forced religious conversions and exploitation of its indigenous inhabitants (Dozier 1983; Kessell 2002). The Franciscans vigorously pursued a mission building program throughout the western and eastern Pueblo worlds; by 1630, ninety chapels had been constructed in as many Pueblo villages (Dozier 1983:49), although many Puebloans continued to practice their own rites and ceremonies in secret.

Although there is no inventory of individually owned herds and flocks, a barter system between the missionaries and the colonists emerged by which baptism, marriage, and funerary services were provided in exchange for livestock (Baxter 1987). In addition to amassing large herds of livestock, the larger mission centers established workshops employing native labor in such fields as leatherworking and blacksmithing. Many Pueblo missions became centers of intraregional trade and commerce (Bancroft 1889).

Competing with the missionaries was the civil administration, which implemented the *encomienda* system; an exploitative labor policy entitling Spanish *encomenderos* to services provided by natives in the form of direct labor and tribute. Successive members of the civil administration throughout the period exploited native labor in numerous government-sanctioned commercial enterprises for self-enrichment. Fragmentary evidence suggests that both civil and religious authorities engaged in illegal livestock trading with the northern mining districts of Nueva Vizcaya from 1620 until 1670; a practice that enriched individuals, but depleted inventories and proved detrimental to the overall provincial economy (Baxter 1987).

Puebloan social unrest was exacerbated by continuing religious suppression and the exploitative labor practices of the encomienda system, and finally emerged into open rebellion in 1680. Popé, a Tewa religious leader from San Juan Pueblo, led a revolt from his headquarters at Taos Pueblo issuing clear and simple instructions: kill all of the friars and settlers (Dozier 1983). The revolt started in Taos on August 10. Alerted to the uprising, many colonists in the north escaped south to Santa Fé, where Governor Antonio de Ortemín and more than 1,000 refugees erected a defense of the city against besieging Pueblo forces that consisted of Tanos, Tewas, Tiwas, and Picuris. However, realizing that the city would not be able to remain defended indefinitely, Governor Ortemín ordered an evacuation to Isleta Pueblo. From Isleta, the refugees fled south along the Camino Real rallying at La Salineta, approximately 15 miles north of El Paso del Norte. In total, 21 missionaries and 380 settlers out of a population of 2,500 colonists were killed in the revolt; and approximately 350 Puebloans lost their lives, most killed during the fighting at Santa Fé (Dozier 1983).

Eventually resettling in El Paso del Norte, the Nuevo Mexicanos planned for the *reconquista* of the Pueblo country. Three different governors, including Antonio de Ortemín, attempted to subdue the Pueblos throughout the 1680s; however, none of these campaigns was successful. Despite failure, these campaigns did succeed in two areas, further unbalancing an already tenuous Pueblo political unity and contributing to the attrition of Pueblo forces. Newly appointed Governor Don Diego de Vargas' military campaign in 1692 took place amidst a backdrop of fracturing Pueblo alliances and increasing raids by nomadic tribes. Quick to establish peace with the Spaniards, 23 pueblos submitted to Vargas within the first year. In 1693, Vargas laid siege to Santa Fé and took the city the following spring. The final clashes of the *reconquista* occurred in 1694, during the nine-month siege of Tano and Tewa forces at Black Mesa near San Ildefonso. Although additional uprisings and occasional outbreaks of violence occurred over the next 2 years, by the end of 1696 all Eastern Pueblos were once again under Spanish rule; however, the more distant and isolated Western Pueblos remained out of the reach of Spanish authorities, due to increasing raids by Navajos and Utes along the western frontier (Dozier 1983).

Ultimately, Vargas had succeeded in reinstituting Spanish rule in the Eastern Pueblos by including native leaders in the process. Although many negative aspects of Spanish rule continued in the eighteenth

century, civil and religious authorities did alter their most extreme policies (e.g., eliminating the *encomienda* system and ending the suppression of native ceremonies and rituals (Dozier 1983)). However, these new policies of tolerance did not stem from Spanish altruism, but a growing need for native allies in a region surrounded by increasingly mobile and hostile nomadic tribes. At the turn of the eighteenth century, Shoshonean-speaking Utes and Comanches migrated into the Southwest from the Great Basin region in search of horses, adding to the danger already posed by the extant Apaches and Navajos (Kessell 2002). Threatened by the Comanche and Jicarilla Apache in the north and east, the Ute and Navajo to the northwest, and various Apache groups throughout the southern regions, no part of the province remained safe from native raiding parties. Due to these circumstances, the government in Santa Fé entered into numerous treaty agreements and alliances with all nomadic tribes throughout the period in an effort to bring an end to instability in the region (Dozier 1983; Torrez 2010).

Assuming the governorship of Nuevo México in 1778, Juan Bautista de Anza immediately focused on subduing the hostile nomadic tribes of the region. Although Anza's advisors insisted on alliance with the Comanche to combat the Apache, the governor chose to actively campaign against the Comanches led by "the cruelest scourge of the colony," Cuerno Verde, as a show of force (Kessell 2002). Campaigning in the fall of 1779, Anza's army consisted of approximately 400 soldiers, Hispanic militia, and Pueblo auxiliaries that were augmented en route by some 200 Ute and Jicarilla Apache. The army located and destroyed Cuerno Verde's main encampment near present-day Colorado Springs. Returning from a raid in Nuevo México, Cuerno Verde's light cavalry was intercepted by Anza's army. All of the Comanche, including Cuerno Verde and his second-in-command, Jumping Eagle, were killed. Although not immediate, Anza's campaign against Cuerno Verde eventually brought Comanche leaders to the peace table, and in 1786 Comanche representatives signed a formalized treaty granting trade rights and alliance with the Spanish Province. Within a month of signing the treaty with the Comanche, similar terms were accepted by the Navajo (Kessell 2002).

In 1780, the Commandant General of the Internal Provinces, Teodoro De Croix, tasked Anza with opening a trade route from Santa Fé to Arizpe in the province of Sonora y Sinaloa. In November of that year, Anza and approximately 150 soldiers, natives, and settlers departed Santa Fé for Arizpe. At the same time, Croix dispatched two separate armies to intercept and join with the Anza expedition, which followed the Rio Grande south, turned southwest to the Mimbres River where the party crossed over south to the Sierra de la Hacha, and eventually east to the San Bernardino Valley before arriving in Arizpe in December. The first of Croix's detachments, deployed from Las Nutrias, Sonora y Sinaloa, consisted of 116 soldiers and 80 Opata auxiliaries under the command of Captain Joseph Antonio Vildosola. En route, Vildosola sent several parties into the Chiricahua Mountains, while the main body traversed the San Simon Valley and Burro mountains before returning south to the Animas Valley. The second detachment, deployed from Carrizal, Nueva Vizcaya, consisted of 474 soldiers and 120 Opata auxiliaries under the command of Don Franco Martinez; this detachment explored north to the San Francisco Mountains. Both armies failed to join with Anza; however, their orders to attack and destroy Apache *rancherías* further provoked the Mimbreños and Chiricahua bands of the region (Kessell 2002; Thomas 1932).

Throughout much of the eighteenth century, expansion of the province remained confined to the Rio Grande Valley at settlements such as San Felipe de Albuquerque (present-day Albuquerque), established in 1706. Ranching and small-scale farming remained the foundation of the provincial economy. The first significant mining operation in the region occurred in the Pinos Altos, where Lieutenant Colonel José Manuel Carrasco and Don Manuel Francisco Elguea obtained a land grant for a copper mine called Criadero de Cobre (Copper Nursery) in 1800. Under contract with the government to provide copper for coinage, the Spanish authorities established a penal colony at the mine to provide labor. By 1805, 600 workers and their families lived near the mine at the settlement of Santa Rita del Cobre. Mule and ox

teams transported copper from the mine 400 miles south to Chihuahua City (Couchman 1990; Sinclair 1985).

Mexican Period (AD 1821 to 1848)

Following independence from Spain in 1821, economic instability and periodic civil war greatly affected the newly established Mexican government's ability to maintain control in the far northern reaches of the country. In Nuevo México, these circumstances fostered an atmosphere of semiautonomy characterized by settlement expansion and increasing interaction with the United States. During this period there were significant numbers of American trappers and businessmen entering into the region (Bancroft 1889; Lavender 1980; Trimble 1989).

Throughout the 1830s and 1840s, Governor Manuel Armijo awarded approximately five million acres in land grants. Many of these were communal grants in response to a growing Hispanic population, which had increased from approximately 25,000 in 1821 to 60,000 by 1846 (Merlan 2010; Sheck 1990). Free of previous restrictions that forbade foreign trade, the rancher-merchants of Nuevo México sought out new markets in California along the Old Spanish Trail and with the United States along the Santa Fe Trail (Kessell 2002; Sánchez 1997). Mining at Santa Rita del Cobre came to an abrupt end in 1837, following the massacre by Mimbreños Apaches of all but six of the approximately 400 settlers (Sinclair 1985).

In 1836, the Republic of Texas declared its independence from Mexico, claiming all New Mexican territory east of the Rio Grande (Prince 1883). In 1841, an expedition consisting of civilian merchants and a military contingent of approximately 300 soldiers set out for New Mexico in an attempt to seize control of the Santa Fe Trail, and possibly bring New Mexico into the Republic of Texas. Upon reaching New Mexico, this Texan Santa Fe Expedition party was confronted by approximately 1,500 troops of the Mexican army dispatched by Governor Armijo, and subsequently taken prisoner. Marched to Mexico City, the prisoners were released the following year by American diplomatic efforts (Kendall 1847; Prince 1883). Following the annexation of Texas in 1846, the United States continued to exert pressure on Mexico to cede the New Mexico territory east of the Rio Grande. However, Mexico refused to recognize any of the United States' claims west of the Nueces River in Texas, and war quickly followed (Prince 1883). On August 18, 1846, American forces under the command of Brigadier General Stephen W. Kearny entered Santa Fé, and secured the city without firing a shot. In December of the same year, an American cavalry regiment engaged and defeated a Mexican force at the Battle of El Brazito just south of Mesilla (Lavender 1980; Simmons 1977).

In October, prior to the Battle of El Brazito, approximately 340 soldiers of the Mormon Battalion led by Lieutenant Colonel Philip St. George Cooke departed from Santa Fe for San Diego, California. Tasked with blazing a wagon trail to the Pacific, the battalion crossed into the Pimería Alta where they seized the Presidio San Agustín de Tucsón from provisional Mexican forces who had retreated to Tubac prior to the army's arrival. The Cooke Wagon Road became the first American wagon route extending from New Mexico to the Pacific Coast. In the ensuing years, thousands of immigrants would travel this road (known as the Gila Trail) during the California Gold Rush of 1848 to 1849 (Pike 2004; Trimble 1989).

American Period (Post AD 1848)

New Territories (AD 1848 to 1861)

The Mexican-American War ended with the signing of the Treaty of Guadalupe Hidalgo in 1848. Under terms of the treaty, Mexico ceded most of its northern territories to the United States, including disputed lands in Texas, California, and New Mexico, as well as all land north of the Gila River in present-day Arizona. The United States acquired the rest of the land south of the Gila River to the present-day international boundary with Mexico, with the Gadsden Purchase of 1854. Consolidation, exploration, and mineral prospecting characterize the American Period in the Southwest prior to the Civil War (1861 to 1865). Following annexation, the United States government quickly established a series of military forts, and began the first surveys of the region through the U.S. Army Corps of Topographical Engineers. Throughout the 1850s, survey parties mapped waterways and springs, noted soils and climate, and searched for potential wagon and railroad routes. Forts were constructed at intervals along the Santa Fe Trail and down the Rio Grande Valley in order to secure the established trade routes.

In 1857, Congress appropriated funds for the construction of two federal wagon roads through the New Mexico Territory. Construction of the northern road followed a route established by U.S. Army surveyor Lt. Edward Beale. This route, which became known as the Beale Wagon Road, extended across the Colorado Plateau, linking Ft. Smith, Arkansas to the Colorado River. The southern El Paso & Fort Yuma Wagon Road followed a route devised during Lt. John G. Parke's survey a few years earlier, which defined a corridor extending west from the Rio Grande River to the San Pedro River, north along the San Pedro to the Gila River, and west along the Gila to the Colorado River (Jackson 1952). Construction and improvements along the proposed El Paso & Fort Yuma Wagon Road route began in 1858. That same year, the Butterfield Overland Mail Company won a government contract for twice-a-week stage and mail service. The El Paso & Yuma Wagon Road served as the principal transportation corridor for Butterfield stagecoaches; however, service to Tucson required alternative routes which diverged from the main wagon road (Sayre 2004). These alternative routes, as well as the El Paso & Yuma Wagon Road, collectively, became known as the Butterfield Trail.

On June 25, 1861, Confederate forces under Colonel John Baylor occupied Mesilla, New Mexico. Upon defeating nearby Union forces under the command of Major Isaac Lynde from Fort Fillmore, Baylor declared himself military governor of the Confederate Territory of Arizona. In February 1862, a Confederate force led by General Henry Sibley departed Texas for New Mexico. Sibley occupied Albuquerque and Santa Fe for a brief period; however, his ultimate goal was the stores at Fort Union, and an eventual push on Denver to threaten the Oregon Trail. Defeated by Union forces at the Battle of Glorieta Pass in March of 1862, Sibley's forces retreated down the Rio Grande to El Paso. Called the Gettysburg of the West, the Battle of Glorieta Pass ended any further Confederate ambitions in New Mexico (Lavender 1980; Trimble 1989).

In June, an advanced column of 122 soldiers and 22 wagons of the California Volunteers entered Apache Pass en route to Santa Fe, where they were ambushed by approximately 700 Chiricahua and Mimbreños Apaches under the leadership of Cochise and his father-in-law, Mangas Coloradas. A total of 66 Apaches and 2 Anglos were killed in the short-lived engagement. The battle prompted Carleton to order the construction of Fort Bowie at the pass, and sent orders for Colonel West in Tucson to move up and take command of the post. The following July, General Carleton arrived in Santa Fe to take over as commander of the Department of New Mexico. With the defeat of the Confederacy in the West, the California Volunteers became an occupational force tasked with restoring civil order and subduing the Apache (Lavender 1980; Sweeney 1992).

Native American Resettlement, Rural Development, and Industrialization (AD 1862 to 1912)

The defeat of Confederate forces at the Battle of Glorieta Pass and the subsequent federal reoccupation of Tucson officially brought an end to the Civil War in the West in 1862. In New Mexico, immediate concerns focused on removing the "Indian menace", particularly the nomadic tribes of the Apache, Navajo, and Comanche. Believing in centralization, General Carleton convinced Congress to authorize one million acres for a reservation named Bosque Redondo on the Pecos River in eastern New Mexico. Carleton's extreme policy called for the extermination of all Native males, or amnesty to those who willingly relocated to the reservation; by January of 1865, approximately 8,577 Navajos, 465 Mescalero Apaches, and 20 Mimbreños Apaches had been relocated (Lavender 1980). In short, Bosque Redondo proved to be a failure, representing the eventual undoing of Carleton's tenure as the military commander of New Mexico. Following crop failures in 1865, the Mescalero left the reservation, and the Navajo began petitioning the government for a reservation in their former homeland. Following Carleton's departure in 1867, the Navajo were awarded 3.5 million acres in their former homeland in northeastern Arizona and northwestern New Mexico (Lavender 1980).

In the winter of 1872–1873, Crook mounted a successful campaign against the Tonto Apache that prompted approximately 5,000 Apache to move to the reservations. The system appeared successful; however, in 1877 the bureaucracy in Washington decided that all the Apache should be confined to a single reservation at San Carlos. These circumstances eventually led to discontent among the various bands, most especially among the Mimbreños and Chiricahua. No longer willing to endure the indignities of reservation life, several hundred Apache escaped from the reservation, sparking a new period of violence throughout southern Arizona and northern Mexico. Final peace with Apache came with the surrender of Geronimo and the last of his band of some two dozen followers in 1886 (Lavender 1980; Trimble 1989). The United States recognized titles derived from land grants given by the Spanish government to the Eastern Pueblos. Hence, the Pueblos remained secure in their villages, and were not affected by the government's resettlement policies (Lavender 1980).

With the end of the Civil War and native resettlement relatively complete, rural development and industrialization increased unimpeded throughout the western territories in the 1870s. Moreover, the introduction of the telegraph and railroad significantly improved conditions for Anglo settlement and growth. During this period, cattle ranching expanded across the territory. In New Mexico, demand for beef prompted Texas cattlemen Charles Goodnight and Oliver Loving to combine their herds in 1866 for a drive to Fort Sumner. The trail blazed became the Goodnight-Loving Trail. The success of these drives encouraged other cattlemen, and in short time a network of trails emerged as large drives from Texas crossed the territory to the northern ranges in Colorado and Wyoming, and west to Arizona (Roberts and Roberts 2006; Williams 1986). However, the era of the open range and the large ranches was short-lived due to competition from sheep ranchers and the increasing numbers of homesteaders entering the territory. Moreover, with the arrival of the railroad, herds could be transported safely and efficiently without the risks presented by the overland drives. By the turn of the century, most of the big outfits were replaced by smaller, fenced-in ranches employing windmills for water (Lavin 2001; Roberts and Roberts 2006; Williams 1986).

Mining continued unabated throughout the territory in the 1870s. Gold and silver initially attracted the prospectors; however, copper (needed for emerging technologies such as electrical cable and telephone wire) became the most important mineral resource in the region. In general, the successful individual claimants sold out their mines to large mining outfits once the easily obtainable surface deposits were exhausted. Tent communities situated around the successful mining claims gave way to boom towns attracting merchants and additional settlement. Some of these mining settlements became towns, and a few others evolved into cities; however, most faded away with the exhaustion of the mineral deposits. In southwestern New Mexico, Silver City represents the exception to the rule as the present-day counties of

Grant, Catron, and Sierra are dotted with ghost towns of the era (GTNM 2010; Lavin 2001; Roberts and Roberts 2006).

Taking advantage of the Homestead Act of 1862, numerous Anglo homesteaders appeared in the New Mexico territory in the mid-1860s. Homesteaders settled throughout the Pecos River and Rio Hondo valleys. Although homesteads were broadly spaced based on GLO quarter sections, several towns emerged as trading centers (Merlan 2010). Following the arrival of the railroad in the 1880s, settlement and agricultural and industrial development increased exponentially. Building east from California, the Southern Pacific Railroad reached Yuma in 1877, Tucson in 1880, and El Paso in 1881. Similarly, the west-building Atchison, Topeka, and Santa Fe Railroad entered New Mexico along the east side of the Rocky Mountains reaching Las Vegas in 1879, Albuquerque in 1880, and continuing west through northern Arizona to California (Myrick 1990; Trimble 1989). Throughout this period, thousands of miles of additional small spur lines were constructed across the region, connecting the territory's emerging agricultural and mining centers with outside markets. Hundreds of new settlements emerged alongside the various railroad stations, depots, and sidings (Myrick 1990; Roberts and Roberts 2006).

Beginning in the 1890s, the first of numerous reclamation projects were undertaken by the federal government; these projects involved the construction of dams, reservoirs, and canals throughout the region's river valleys. Although the guiding policy was the reclamation of arid land in the west, the construction of dams decreased the threats posed by seasonal floods to irrigation agriculture, provided a stable delivery of water for the regions farms, and most importantly, generated hydroelectric power (Clark 1987; Trimble 1989). Presently, the region's reclamation projects provide agricultural, municipal, and industrial water to approximately one third of the population (BOR 2000).

Statehood and the Modern Era (Post AD 1912)

On January 6, 1912, the New Mexico territory became the 47th of the contiguous states admitted to the United States (Lavin 2001; Roberts and Roberts 2006). Populations continued to increase during this period, but the region remained rural in character and economically dependent on mining and agriculture. These conditions peaked following the United States' entry into the war in Europe in 1917, resulting in high demand for resources such as copper, cattle, and agricultural products. Although the war boosted the regional markets, the postwar years proved detrimental for the traditional economies, sparking repeated economic restructuring that continued throughout the twentieth century (Nash 1987; Roberts and Roberts 2006; Trimble 1989).

Tourism provided the needed boost to the region throughout the 1920s. Railroads and cities advertised themselves, and dude ranches and resorts became popular. However, the largest boost in tourism stems from the transportation revolution brought about by the automobile. New Mexico constructed additional and improved highways during this period, which resulted in the emergence of a host of uniquely American twentieth century cultural roadside icons such as gas stations, auto lodges (motels), campgrounds, cafes, curio shops, and other recreational facilities (Nash 1987; Roberts and Roberts 2006; Trimble 1989). Like the rest of the nation during the 1930s, New Mexico was hit hard by the Great Depression as agricultural prices fell, mines closed, and populations declined. In 1933, congress created the Civilian Conservation Corps (CCC), which put approximately three million young men to work on park, soil, and water conservation projects throughout the country (Cornebise 2004). That same year, New Mexico instituted the State Park System in order to provide the jobs needed for the CCC program (Laine and Laine 1988). Throughout the late 1930s, CCC workers built roads, bridges, trails, wells, reservoirs, and recreational facilities. By the end of the program in 1942, 43 CCC camps had been established in New Mexico (Clark 1987; Trimble 1989). During this period, congress passed the Taylor Grazing Act (1934) in response to the drought conditions responsible for the Dust Bowl on the Great Plains. Intended

to limit overgrazing and restrict ranchers from federal lands, the Act provided the means to return abandoned lands back into the public domain. Moreover, the Act effectively reversed 50 years of public policy that encouraged settlement in the West by ending homesteading (Clark 1987).

Following the United States' entry into World War II, southwestern natural resources were once again in high demand for the war effort. Production in the raw materials industry increased; however, the biggest changes occurred in the expansion of manufacturing and service industries. With the expanding manufacturing sector, a significant portion of the rural population migrated to the major center of Albuquerque, contributing to the loss of its small-town character (Nash 1987; Sheridan 1995). This change in trajectory of the regional economy grew and strengthened in the postwar years, and produced the diverse and complex economy that exists today (Nash 1987).

In addition to the expansion of the manufacturing and service industries was the government's introduction of the scientific research complex across the West. Particularly affected, New Mexico was the choice for the construction of Los Alamos, a top secret city and research facility charged with implementing the Manhattan Project. The culmination of the project occurred in the summer of 1945 with the detonation of the first atomic bomb at the White Sands Proving Ground (present-day White Sands Missile Range). In the postwar years, hundreds of thousands of acres of land were either withdrawn from the public domain or condemned for various military programs deemed crucial for national defense. The Los Alamos and Sandia laboratories, White Sands Missile Range, and Holloman and Kirtland Air Force Bases support New Mexico's economy to this day (Chávez 2002; Simmons 1977).

3.11.3. Affected Environment

A Class I records review inventory was conducted to identify previous cultural resource field inventories and previously recorded cultural resources, including historic properties (resources that are eligible for, or listed on the National Register of Historic Places) in the Project study area. This inventory involved a review of the records maintained by the following institutions:

- National Register of Historic Places (NRHP)
- U.S. Bureau of Land Management (BLM)
- General Land Office (GLO) maps
- New Mexico State Historic Preservation Division
- Archaeological Records Management Section (ARMS)
- New Mexico Cultural Resources Information System (NMCRIS) database
- State Register of Cultural Properties
- U.S. Forest Service (Forest Service), Gila National Forest

3.11.3.1. Class I Records Review

A detailed Class I records review in support of the proposed Project was conducted to identify prior inventories, research, and previously recorded sites within the study corridor, which was one mile from each edge of the 150-foot-wide transmission line corridor ROW. This review resulted in an enormous amount of data, so results for an area within 0.5 kilometers (or approximately 0.3 miles) of the Project centerline were analyzed and are presented in the resulting report (Swanson and Rayle 2016).

The records review relied primarily on the NMCRIS database. The NMCRIS database allows researchers to access the cultural site and project records of the ARMS of the New Mexico State Historic Preservation Division. Additional site records were obtained directly from the BLM and Forest Service. Also, reports of selected prior studies, particularly the original survey conducted in support of the AIP line construction

(Obrien et al. 1988), were reviewed to supplement the information obtained from the electronic database. GLO plats on file at the BLM, as well as other historical maps, were reviewed for indications of potential unrecorded historic resources.

The Class I records review identified 193 prior cultural resource surveys and 198 previously recorded cultural resource sites (144 prehistoric, 30 historic, 12 multicomponent, and 12 unknown). Primarily associated with the Mogollon cultural tradition, the majority of the previously recorded prehistoric sites consist of artifact scatters, many with associated structures (pueblos, pithouses, and fieldhouses). The 30 identified historic sites included the Atchison, Topeka, and Santa Fe Railway, the Butterfield Trail (listed on the New Mexico State Register of Cultural Properties), and a telephone line, though the majority consisted of structures and artifacts associated with ranching and homesteading. The 12 multicomponent sites comprise prehistoric and historic structures, features (immovable archaeological objects such as a hearth or roasting pit) and artifacts (an object that has been created or modified by people). Additionally, review of GLO survey plat maps revealed 183 possible historic roads and 47 historic features within the review area, consisting of railroad lines, trails, telephone/telegraph lines, unnamed road segments, ranches, and property fence lines. No NRHP-listed properties were identified within the review area.

3.11.4. Inventoried Cultural Resource Sites

To support the NEPA analysis and to comply with Section 106 of the NHPA for this undertaking, Environmental Planning Group (EPG) archaeologists conducted a cultural resources studies consisting of a detailed Class I records review as well as intensive Class III pedestrian survey of a 100-foot- (access roads) to-150-foot-wide corridor (transmission line). (Swanson and Rayle 2015; Swanson et al. 2016).

The Class III pedestrian surveys identified a total of 169 sites (77 previously recorded and 92 newly recorded) (Table 3-9 to Table 3-11). Of these, 77 sites are recommended or have been determined eligible for listing in the NRHP, while for eight sites NRHP eligibility remains insufficiently evaluated. Insufficiently evaluated sites would require additional subsurface testing or archival research in order to evaluate their NRHP eligibility. A total of 84 sites have been recommended not eligible for listing on the NRHP, and for these sites EPG recommends that no further work be required. This investigation also identified 257 isolated occurrences within the Class III survey area, which were recommended not eligible for listing in the NRHP.

3.11.5. Cultural Resource Sites on BLM Land

Class III pedestrian survey identified a total of 59 sites on lands under the jurisdiction of the BLM (Table 3-9). Of these, 23 sites are recommended or have been determined eligible for listing in the NRHP, while for three sites, NRHP eligibility remains insufficiently evaluated. Insufficiently evaluated sites would require additional subsurface testing or archival research in order to evaluate their NRHP eligibility. A total of 33 sites have been recommended not eligible for listing on the NRHP, and for these sites EPG recommends that no further work be required.

Table 3-9. Cultural Resources within AIP Survey Area on BLM Land				
Resource Type	**NRHP-Eligible**	**Insufficiently Evaluated**	**Not NRHP-Eligible**	**Quantity**
Prehistoric				
Habitation	1	-	-	1
Prehistoric features and artifacts	1	2	3	6
Prehistoric artifacts	11	-	1	12
Subtotal	**13**	**2**	**4**	**19**
Historic				
Homestead	1	-	-	1
Historic features and trash	-	-	1	1
Ranching features	-	-	2	2
Trail[1]	1	-	-	1
Roads and railroads	6	1	24	31
Trash scatter	-	-	2	2
Subtotal	**8**	**1**	**29**	**38**
Multicomponent				
Prehistoric quarry and hunting blinds; Historic petroglyphs/graffiti	1	-	-	1
Prehistoric lithic scatter; Historic homestead	1	-	-	1
Subtotal	**2**	**-**	**-**	**2**
Grand Total	**23**	**3**	**33**	**59**

*Recommendations of NRHP eligibility to be followed by agency determinations. Eligibility could change pending consultation
[1]Contributing segment of the Butterfield Trail, which is currently under evaluation as a National Historic Trail.

3.11.6. Cultural Resource Sites on Forest Service Land

Class III pedestrian survey identified a total of 55 sites on lands under the jurisdiction of the Forest Service (Table 3-10). Of these, 31 sites are recommended or have been determined eligible for listing in the NRHP. A total of 24 sites have been recommended not eligible for listing on the NRHP, and for these sites EPG recommends that no further work be required.

Table 3-10. Cultural Resources within AIP Survey Area on Forest Service Land				
Resource Type	**NRHP-Eligible**	**Insufficiently Evaluated**	**Not NRHP-Eligible**	**Quantity**
Prehistoric				
Habitation	12	-	-	12

Table 3-10. Cultural Resources within AIP Survey Area on Forest Service Land				
Resource Type	**NRHP-Eligible**	**Insufficiently Evaluated**	**Not NRHP-Eligible**	**Quantity**
Prehistoric features and artifacts	6	-	-	6
Prehistoric artifacts	8	-	11	19
Subtotal	**26**	**-**	**11**	**37**
Historic				
Historic features and trash	-	-	2	2
Ranching features	-	-	1	1
Roads	2	-	7	9
Informal airstrip	-	-	1	1
Subtotal	**2**	**-**	**11**	**13**
Multicomponent				
Prehistoric artifacts; Historic ranch	1	-	-	1
Prehistoric artifacts; Historic trash scatter	2	-	1	3
Historic cistern/well	-	-	1	1
Subtotal	**3**	**-**	**2**	**5**
Grand Total	**31**	**-**	**24**	**55**

*Recommendations of NRHP eligibility to be followed by agency determinations. Eligibility could change pending consultation.

3.11.7. Cultural Resource Sites on NMSLO and Private Land

Class III pedestrian survey identified a total of 55 sites on lands under the jurisdiction of the NMSLO, as well as those located on private lands (Table 3-11). Of these, 23 sites are recommended or have been determined eligible for listing in the NRHP, while for five sites NRHP eligibility remains insufficiently evaluated. Insufficiently evaluated sites would require additional subsurface testing or archival research in order to evaluate their NRHP eligibility. A total of 27 sites have been recommended not eligible for listing on the NRHP, and for these sites EPG recommends that no further work be required.

Table 3-11. Cultural Resources within AIP Survey Area on State/Private Land				
Resource Type	**NRHP-Eligible**	**Insufficiently Evaluated**	**Not NRHP-Eligible**	**Quantity**
Prehistoric				
Habitation	8	-	-	8
Prehistoric features and artifacts	5	-	3	8

Table 3-11. Cultural Resources within AIP Survey Area on State/Private Land				
Resource Type	**NRHP-Eligible**	**Insufficiently Evaluated**	**Not NRHP-Eligible**	**Quantity**
Prehistoric artifacts	4	1	9	14
Subtotal	**17**	**1**	**12**	**30**
Historic				
Homestead	3	-	-	3
Historic features and trash	1	-	-	1
Ranching features	-	-	2	2
Canal/ditch	-	1	-	1
Roads	-	2	12	14
Trash scatter	-	-	1	1
Subtotal	**4**	**3**	**15**	**23**
Multicomponent				
Prehistoric artifacts; Historic ranch	1	-	-	1
Prehistoric habitation and petroglyphs; Historic features and trash	1	-	-	1
Prehistoric artifacts; Historic trash	-	1	-	1
Subtotal	**2**	**1**	**-**	**3**
Grand Total	**23**	**5**	**27**	**55**

*Recommendations of NRHP eligibility to be followed by agency determinations. Eligibility could change pending consultation.

3.11.8. Definition of the Area of Potential Effects

As defined in Section 106 (36 CFR Part 800.16[d]), the area of potential effect (APE) refers to the "geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties," is "influenced by the scale and nature of an undertaking," and "may be different for different kinds of effects caused by the undertaking." The APE for the Project bounded by a 50-foot buffer includes the footprint of the substation, transmission lines connecting to the substation, and access roads used to convey machinery and equipment to the substation and transmission lines during construction, and for subsequent maintenance. In addition, cross-country travel will be permitted on Forest Service Lands within the existing 150-foot-wide AIP transmission line right-of-way.

In compliance with the NHPA Section 106, EPG archaeologists conducted a cultural resources study consisting of a detailed Class I records review, as well as an intensive Class III pedestrian survey in support of the NEPA analysis and the BLM's and Forest Service's compliance with the NHPA (Swanson and Rayle 2016).

3.12. Air Quality and Climate

3.12.1. Introduction

Air quality in the Project area is generally good to excellent. The existing air quality condition is a result of the relatively low population density and lack of pollution sources in the area. Air pollution in the local area is typically a result of airborne particulate matter (i.e., dust).

3.12.2. Affected Environment

3.12.2.1. Air Quality

The Project crosses federal, State, and private land within four of New Mexico's 11 designated airsheds identified as the South-Western Closed, Lower Rio Grande, Lower Colorado River, and Western Closed.

Most areas within New Mexico are designated as Class II, wherein standard pollution control requirements apply. Certain areas are given special protection from air quality degradation through the use of more stringent requirements. These areas are designated as Class I areas, which are provided the highest level of protection from additional air pollution, and include some (but not necessarily all) national parks, monuments, wilderness areas, and certain tribal land (EPA 2014).

Within New Mexico most areas have been designated as either in attainment or unclassifiable with respect to the National Ambient Air Quality Standards (NAAQS). Unclassifiable means that the area lacks sufficient air quality monitoring data to determine whether the ambient standards have been attained. From a regulatory standpoint, unclassifiable areas are treated as attainment areas.

Particulate matter refers to particles in the air that are 10 micrometers or less in size (PM-10) and are of concern because they are small enough to enter the lungs through the nose and throat, and have the potential to cause major health problems (EPA 2013b). The closest and only PM-10 non-attainment area currently in the State of New Mexico, as determined by the EPA, is an area along Interstate 10, from the town of Anthony in Doña Ana County to the Texas state line southeast of the study area, approximately 67 miles (EPA 2013b). The Project area is rural without any major point or area sources of air pollutants. Thus, air pollutant concentrations in the study area are likely to be in attainment with the levels established by the EPA.

<u>BLM</u>

The BLM is required to comply with the New Mexico State Implementation Plan on air quality as well as meet the requirements of the Clean Air Act as amended, and the FLPMA (BLM 1993).

The Project crosses BLM land within four of New Mexico's 11 designated airsheds identified as the South-Western Closed, Lower Rio Grande, Lower Colorado River, and Western Closed (see Table 3-12 below). All land involved with the Project is designated as Class II, pursuant to the provisions of the federal Prevention of Significant Deterioration program, codified at 40 CFR 51.166 and 40 CFR 52.21, along with corresponding New Mexico regulation, codified at New Mexico Administrative Code 20.2.74.

Table 3-12. Airsheds Crossed by Project on BLM, State, and Private Land	
Airshed	**Miles Crossed***
Lower Colorado River (3)**	47
Lower Rio Grande (4)	73
South-Western Closed (8)	29
Western Closed (11)	6
Total	155
*Mileages approximate due to rounding **( ) Number assigned to the Airshed Source: State of New Mexico, Water Quality Control Commission: Water Quality and Water Pollution Control in New Mexico 2002	

Forest Service

The Project crosses Forest Service land within three of New Mexico's 11 designated airsheds identified as the Lower Rio Grande, Lower Colorado River, and Western Closed see Table 3-13 below.

Table 3-13. Airsheds Crossed by Project on Forest Service Land	
Airshed	**Miles Crossed***
Lower Colorado River (3)**	41
Lower Rio Grande (4)	6
South-Western Closed (8)	0
Western Closed (11)	11
Total	58
*Mileages approximate due to rounding **( ) Number assigned to the Airshed Source: State of New Mexico, Water Quality Control Commission: Water Quality and Water Pollution Control in New Mexico 2002	

Due to its existence at the time of the passage of the Clean Air Act Amendments of 1977, the Gila Wilderness Area is the only Class I wilderness area in the Gila National Forest, all others within the Gila National Forest are designated as Class II, which are less protected than Class I areas (Forest Service 2013b). The Gila Wilderness Area is the closest Class I area to the Project located approximately 13 miles west of the study area at its closest point.

The closest Class II wilderness areas within the Gila National Forest include:

- Aldo Leopold Wilderness Area (approximately 13 miles west of the study area at its closest point)
- Blue Wilderness Area (approximately 30 miles west of the study area at its closest point)

3.12.2.2. Climate

New Mexico has a mild, arid, or semiarid continental climate characterized by light precipitation totals, abundant sunshine, low relative humidity, and a relatively large annual and diurnal temperature range. Its climate is varied due to the state's diverse topographic features, including high plateaus, mountain ranges, canyons, valleys, and normally dry arroyos. The principal sources of moisture for the scant rains and snows that fall on the state are the Pacific Ocean 500 miles to the west and the Gulf of Mexico 500 miles to the southeast. The highest mountains have climate characteristics common to the Rocky Mountains (Western Regional Climate Control [WRCC] 2014).

During the summer, daytime temperatures often exceed 100 degrees Fahrenheit at elevations below 5,000 feet, while the average monthly maximum temperatures during July (the warmest month) range from slightly above 90 degrees Fahrenheit at the lower elevations to the upper 70s at higher elevations. The warmest days often occur in June, before the thunderstorm season sets in. During July and August, afternoon convective storms tend to decrease solar insolation, lowering temperatures before they reach their potential daily high. A preponderance of clear skies and low relative humidity permits rapid cooling after sundown (WRCC 2014).

January is the coldest month, with average daytime temperatures that range from the mid-50s in the southern and central valleys to the mid-30s at higher elevations. Temperatures below freezing are common in all sections of the state during the winter. The freeze-free season ranges from more than 200 days in the southern valleys to less than 80 days in the northern mountains (WRCC 2014).

Average annual precipitation ranges from less than 10 inches over much of the southern desert and the Rio Grande and San Juan valleys to more than 20 inches at higher elevations; and varies widely from year to year. Summer rains fall almost entirely during brief, often intense thunderstorms (WRCC 2014).

3.12.2.3. Climate Change

The EPA agrees with scientific research that human activity is indeed changing the composition of the Earth's atmosphere as greenhouse gases, including CO_2, methane (CH4), nitrous oxide (N2O), and hydrofluorocarbons, are on the rise (EPA 2013). Pertinent to the study area, the "Southwestern Region Climate Change-Trends and Forest Planning" states that the Southwestern regional climate over the next several decades would experience:

- A decrease in overall moisture
- An overall rise in air temperature
- Increased wildfire occurrence
- An increase in the intensity of storms, resulting in more severe flooding, especially in the Southwest

As the Southwest is the hottest and driest region in the U.S., water availability would continue to remain a vital concern in relation to climate change, and its subsequent effects on the natural as well as human environment (EPA 2013).

3.13. Livestock Grazing

3.13.1. Introduction

This section presents an overview of livestock grazing present within the Project study area. Federal, state, and private land within the Project study corridor is largely undeveloped. Undeveloped federal and state lands can be leased to ranchers to graze livestock. An overview of livestock grazing on federal lands that occur within the Project study corridor is presented below. For the purposes of this analysis, it is assumed that all New Mexico State trust land that occurs within the Project study corridor can be leased for livestock grazing purposes.

3.13.2. Affected Environment

Numerous private ranches, pastures, and range improvements lie on private, state, and federal land within the study corridor. Ranch headquarters and infrastructure are largely concentrated along major drainages and within grasslands

3.13.2.1. BLM

Livestock Grazing

There are 347 allotments within the BLM Mimbres Planning Area, 267 allotments within the White Sands Planning Area, and 252 allotments (12 of which are directly affected by the proposed action) within the Socorro FO Planning Area (BLM 1986; BLM 1993; BLM 2010). All state land parcels, with the exception of one small parcel on the farthest southern portion of the study area, are leased for grazing.

A variety of improvements exist on these allotments, including: vegetation treatments, fences, dirt tanks, livestock water pipelines and associated water troughs and storage tanks, water wells, management facilities such as corrals, as well as roads that access these improvements.

3.13.2.2. Forest Service

Livestock Grazing

Forest Service lands are primarily open rangeland available for use for livestock grazing through grazing permits. There are 14 active grazing allotments on Forest Service land, and one not actively grazed by cattle at this time (Forest Service 2014) within the Project area.

CHAPTER 4. ENVIRONMENTAL EFFECTS

4.1. Introduction

This chapter describes the effects or impacts, including the potential cumulative effects of the Project, to the affected environment that potentially could result from the Project as described in Chapter 2. Specifically considered are improvements to existing linear disturbances or original access roads used during the original construction of the existing AIP 345kV transmission line, and the clearance of previously disturbed work areas around each existing transmission structure.

Baseline information regarding the existing condition of the environment, as described in Chapter 3, was used to identify potential impacts resulting from the Project. The EA considered Design Features and measures, where appropriate, before arriving at the impacts described in this chapter (see Section 2.5.7 Design Features).

An impact, or effect, results from the modification of an existing condition (or conditions) of the environment brought about by an outside action. Impacts vary in degree from no change, or only slightly discernible change, to a full modification or elimination of an inventoried environmental resource. Impacts can be beneficial (positive) or adverse (negative), and short-term, long-term, or permanent. According to the BLM NEPA Handbook, section 6.8.1.1 (2008) "…effects analysis predicts the degree to which the resource would be affected upon implementation of an action. Effects can be ecological, aesthetic, historic, cultural, economic, social, or health. Effects may also include those resulting from actions that may have both beneficial and detrimental effects."

Short-term or temporary impacts typically are associated with maintenance activities, where the environment generally would revert to preconstruction conditions at or within a few years of the end of maintenance activity. For the Project, short-term or temporary impacts are those that would occur from the time that ground-disturbing activities begin to when site stabilization occurs, which is when vegetation has been re-established in Primitive Road conditions and maintenance work areas. Long-term or permanent impacts are those that would occur through the life of the Project or beyond, and include road construction activities such as blading or grading travelways, which would be associated with Resource Road conditions. The life of the proposed Project is estimated to be through the remainder of the existing permit, September 16, 2018, for the southern half and October 11, 2018, for the northern half. At that time, it is expected that EPE would file for renewal of the existing authorized right-of-way permit, which would include the Project improvements proposed in this EA.

An action can have direct or indirect effects and can contribute to cumulative effects. Direct effects occur at the same time and place that an action is being performed. Indirect effects occur later in time or farther from the initial action, but are still reasonably foreseeable. Cumulative effects result from a proposed action's incremental impacts, when these impacts are added to the impacts of other past, present, and reasonably foreseeable future actions (RFFAs), regardless of the agency or landowner.

4.1.1. Impact Assessment Methodology

The impact assessment is based on the Project's effects to sensitive resources within the study corridors for each of the affected resources (see Section 3.1). Based on the Project description and baseline resource data as described in Chapter 3, each resource specialist identified the context and intensity related to the types of impacts that could occur.

The potential sensitivity of each resource as affected by the Project was evaluated against the relative intensity of Project-related improvement activities (see Section 2.5). Intensity of proposed Project-related activities was evaluated based on existing access conditions and terrain features (e.g., slope characteristics). Specific areas were identified where project components crossed slope and existing access conditions that would potentially require greater amounts of ground disturbance. These areas were then assessed within the context of each affected resource to identify potential impacts resulting from the proposed Project. For resources that are difficult to quantify, analyses were based on best available information and professional judgment.

A slope model was used to categorize slope conditions across the Project. Using a 30m digital elevation model, slope was analyzed into three categories (0-8 percent, 8-15 percent and greater than 15 percent). See Appendix D for slope intensity rating maps. Existing access conditions were categorized into the following three classifications:

Class A – Visually Evident Roads: Explicitly defined travel surface that is unencumbered by vegetation, boulders or erosion;

Class B - Moderately Evident and Typical two-Track Roads: Moderately evident travel surface with signs of rutting, mild erosion, and occurrence of some boulders and vegetation; and

Class C – Not Evident/Reclaimed/Visually Eroded: Little evidence of travel surface that is encumbered by vegetation, boulders, or erosion.

Although improvement and maintenance activities would occur intermittently as necessitated by maintenance requirements over the life of the Project, the assessment identified the likely impacts that could result from full implementation of the Project (i.e., if all improvements and maintenance activities were completed).

The assessment of impacts included an evaluation of the potential ground disturbing activities that could occur based on the design and typical specifications of the proposed improvements. Characteristic of the proposed Project improvements include construction techniques, equipment used, and extent and duration of the improvement activities. For a complete description of the proposed Project improvements, see sections 2.1 and 2.5.

Potential impacts primarily would result from the following construction activities:

- Improving existing access conditions or constructing new access routes where needed
- Preparing maintenance work areas around existing structures

4.1.2. Cumulative Impacts

For the cumulative effects analysis, the impacts of the Project, when added to other past, present, and RFFAs, were evaluated in context with inventoried resources within the study corridors.

Table 4-1 displays a general list of past and present activities within the vicinity of the Project. Table 4-2 displays a general list of reasonably foreseeable activities within the vicinity of the Project.

Table 4-1. List of Past and Present Actions within the Vicinity of the Project	
Project Name or Action	**Type of Activity**
Residential development	Ongoing development of homes and other buildings on private land
Grazing	Ongoing permitting and management of livestock grazing
Dispersed recreation	Dispersed recreation (i.e., camping, hiking, hunting)
Forest Service Travel Management Planning	Use of Forest Service roads and trails designated for motor vehicle use
Off-highway vehicle (OHV) use	General OHV activity
Fire	Natural and prescribed fires
Macho Springs Solar Project	Installation and maintenance of solar facility

Table 4-2. List of Reasonably Foreseeable Future Actions within the Vicinity of the Project	
Project Name or Action	**Type of Activity**
Residential development	Development of homes and other buildings on private land
Grazing	Permitting and management of livestock grazing
Dispersed recreation	Dispersed recreation (i.e., camping, hiking, hunting)
Forest Service roads	Use and maintenance of Forest Service roads
OHV use	General OHV activity
Fire and fuels management	Natural and prescribed fires; hazardous fuels reduction
SunZia Southwest Transmission Project	500 kV transmission line

4.2. Earth Resources

4.2.1. Environmental Consequences

4.2.1.1. Geological Hazards

The potential for geological hazards, such as earthquakes or Quaternary faults, to impact the Project is low. Damage to vehicles and construction crews from ground shaking is unlikely given the lack of recorded seismic activity. Several ephemeral and perennial washes that have mappable 100 year flood plains are crossed by the project, however design features identified in Section 2.5.7 would maintain natural waterflow patterns, and therefore impacts to floodplains would be minimal.

There are no GIS data or published reports regarding subsidence for the Project area. The only published reports for subsidence are in the areas around the City of Albuquerque and the City of El Paso, Texas. Areas of subsidence in the Albuquerque area and Mimbres Basin have settled as much as 1-2 feet (Leake 2013). A majority of areas with subsidence in New Mexico result from the lowering of the water table due to ground water pumping. The monitoring of ground water levels has been used as one method to predict areas where subsidence may occur. Subsidence can also impact the local topography, drainage patterns, and floodplains (Schumann 1995).

BLM

No known documented instances of subsidence have occurred within the Project study corridor; however, areas of the Project study corridor most likely to experience instances of subsidence due to groundwater withdraw would be located west of Interstate 25. Potential impacts to existing or proposed Project components resulting from subsidence would be temporary, localized, and minimal.

Continental Divide National Scenic Trail Avoidance Alternatives

Alternative 1

Damage to equipment and vehicles from geologic hazards is unlikely due to the lack of seismic activity and lack of documented subsidence.

Alternative 2

Damage to equipment and vehicles from geologic hazards is unlikely due to the lack of seismic activity and lack of documented subsidence.

Forest Service

Impacts to Project facilities resulting from geologic hazards are anticipated to be minimal.

No Action Alternative

Similar to the proposed action, impacts to Project facilities resulting from geologic hazards are anticipated to be minimal. Under the No Action alternative, the right-of-way application would not be approved and would not meet El Paso Electric's objectives for this project. Maintenance activities on the existing 345kV transmission line would continue to be done under the existing conditions, requiring specific and individual access requests when issues arise. Ground disturbance at structure work areas may not be to the same extent as the proposed action, but would be allowed to the amount needed to provide for safe equipment placement and operations.

4.2.1.2. Mineral Resources

The Project area includes multiple leases associated with oil and gas, and numerous mines that occur on federal, state, and private lands. The potential impact to leases and mines would be low due to proposed Project improvements occurring within the existing transmission line ROW and previously disturbed areas associated with the original transmission line construction access roads. The proposed improvement of existing access conditions, or the construction of new roads, would not further restrict potential development of oil and gas resources on existing leases and avoid existing mines.

BLM

The Project crosses multiple oil and gas leases between structures 1096 and 1160 on BLM lands. The proposed Project improvements of existing access conditions occur mostly within the existing transmission line ROW in this area and would not further restrict potential development of oil and gas resources on these existing leases.

Several unidentified mineral resources were identified near structure 576; however, these are not crossed by the existing transmission line ROW or proposed access improvements, and therefore will not be impacted. Several surface mines are located within several hundred feet of the existing transmission line ROW near Highway 26 between structures 36 and 64 and 102 and 110. The status of theses surface mines is unknown, but from aerial maps they appear to be sand and gravel pits. Proposed Project improvements in this area are not anticipated to further restrict potential development of these mines.

Continental Divide National Scenic Trail Avoidance Alternatives

Alternative 1

Alternative 1 does not cross any known mineral resources and therefore no impacts are expected.

Alternative 2

Alternative 2 does not cross any known mineral resources and therefore no impacts are expected.

Forest Service

There are no mineral leases within the Project area on Forest Service lands, and therefore no impacts to mineral leases are expected. The three identified mines are not impacted by the access or maintenance activities due to not being close to or crossed by existing routes or utility corridor.

No Action Alternative

Under the No Action alternative, the right-of-way application would not be approved and would not meet El Paso Electric's objectives for this project. Maintenance activities on the existing 345kV transmission line would continue to be done under the existing conditions, requiring specific and individual access requests when issues arise. Ground disturbance at structure work areas may not be to the extent as the proposed action, but would be allowed to the amount needed to provide for safe equipment placement and operations. Impacts to mineral resources under the No Action alternative would be similar to the Proposed Action.

4.2.1.3. Soil Resources

Erosion is the natural process by which water or wind removes soil from its natural location. Project improvements as identified in Section 2.5 could adversely affect soil resources by increasing the exposure of soil that is susceptible to water or wind erosion at the land surface. This could result in a degradation of

the land surface, reduced long-term soil productivity through loss of topsoil material, and non-point pollution as eroded soil material is washed into nearby streams or water bodies.

Table 4-3. summarizes the acres of potential ground disturbance by land ownership associated with the Project improvements and activities as described in Section 2.5. Using the impact assessment method described in Section 4.1.1, it was estimated there would be approximately 510 acres of total potential ground disturbance (temporary and permanent) that could result from Project improvements associated with access routes and maintenance use areas.

Table 4-3. Ground Disturbance Summary for Access and Maintenance Use Areas by Land Ownership

Project Components	Ground Disturbance by Land Ownership (Acres)				
	BLM	**Forest Service[1]**	**State**	**Private**	**Totals**
Access Routes					
Within Existing Transmission Corridor ROW					
Cross-country Roads[1]	N/A	N/A	N/A	N/A	**N/A**
Primitive Roads[2]	9.8	N/A	2.1	5.0	**16.9**
Resource Roads	52.9	N/A	18.2	22.6	**93.7**
Outside Existing Transmission Corridor ROW					
Cross-country Roads[1]	N/A	N/A	N/A	N/A	**N/A**
Primitive Roads[2]	7.8	N/A	0.2	2.1	**10.1**
Resource Roads	45.8	N/A	18.5	28.6	**92.9**
Transmission Structure Maintenance Use Area					
Transmission Structure Maintenance Use Areas[2]	131.7	72.4	35.8	56.2	**296.1**
Totals	**248**	**72.4**	**74.8**	**114.5**	**509.7**

[1] Cross-country Travel on Forest Service land has no specific route identified within existing transmission line corridors, and therefore temporary impacts are described below in Tables 4-7 and 4-8.
[2] Primitive Roads and Transmission Structure Maintenance Use Areas are considered temporary disturbance associated with route improvements.

Soil resources would be directly affected by ground-disturbing activities associated with access road improvements and structure work areas as described in Section 2.5. These activities would likely crush or clear vegetative cover, compact soils, possibly result in rutting, and could indirectly increase local soil susceptibility to water or wind erosion. In areas of frequent travel, soil compaction could increase bulk density and inhibit water infiltration and vegetative root growth decreasing overall vegetative cover and soil productivity. These proposed Project improvements that are located within or cross areas with high and moderate soil erosion factors, could adversely affect soil material and productivity.

It is anticipated that travel along all portions of the line would be infrequent. As described in Section 2.5.1, routine patrols along the length of the transmission line occur once in the spring and once in the fall of each year. Routine patrols are usually conducted by foot, all-terrain vehicles, or standard size

pick-up trucks. As a result of routine patrols, standard maintenance and operations activities are identified and occur as needed. Although emergency situations such as fires or storm damage could increase the frequency of intensive maintenance activities, it is not anticipated. Intensive maintenance, such as structure replacement would require larger work crews and vehicles as described in Section 2.5.4, and would occur very infrequently and only as needed. General soil design features such as placement of water bars to reduce erosion, maintenance of vegetation where grading is not required, and use of existing roads as much as possible would effectively minimize impacts to soil resources (see Section 2.5.7, design features 2-5 and 25-28).

BLM

Table 4-4 identifies acres and miles crossed of soils with high and moderate erosion susceptibility that could be affected by the proposed Project improvements. Table 4-5 identifies general locations of high and moderate erosion susceptible soils on BLM lands. Temporary effects resulting from proposed improvements of Primitive Road access and structure maintenance use areas combined with permanent Resource Road improvements in areas of high and moderate erosion susceptibility are anticipated to be minimal. Approximately 192 acres of ground disturbance is estimated to be within these areas of high and moderate erosion susceptibility. That is approximately 9 percent of the total of 2,110 acres that would be within the ROW on BLM lands. In addition to the general design features listed above, overland drive and crush and minor restoration and revegetation would be used in areas of sensitive environmental resources such as the Pelona Mountain ACEC (see Section 2.5.7). Therefore effects to soil resources on BLM lands are expected to be minimal.

Table 4-4. High and Moderate Erosion Susceptibility Ground Disturbance by Project Component on BLM Lands

Project Component	Miles	Acres
High Erosion Susceptibility Ground Disturbance Areas		
Primitive Roads	6	3
Resource Roads	12	16
Transmission Structure Maintenance Use Areas[1]	-	15
Moderate Erosion Susceptibility Ground Disturbance Areas		
Primitive Roads	32	13
Resource Roads	47	81
Transmission Structure Maintenance Use Areas[1]	-	64
Totals[2]	**97**	**192**

[1] Maintenance use areas include structure maintenance areas and pulling and tensioning sites and are considered temporary disturbance.

[2] Totals may not sum, due to rounding.

Table 4-5. Project Access with High and Moderate Erosion Factors on BLM Lands		
Access Type	**Structures**	**Soil Unit**
High		
Primitive Roads	787-797, 1038-1039, 1044, 1056-1057, 1061-1070	Cabezon-Thunderbird-Celsosprings complex, 3-25% slopes
Resource Roads	799, 1065, 1067, 1055, 1041-1047, 1120-1123,	Cabezon-Thunderbird-Celsosprings complex, 3-25% slopes
	31-32	Mimbres soils
	28	Hondale-Mimbres complex
	88-89, 98-99	Bluepoint-Onite association
	462-474, 479-486	Dona Ana-Tres Hermanos association, gently sloping
	409	Brazito loamy fine sand, gently sloping
	454	Glendale-Gila complex, nearly level
Moderate		
Primitive Roads	706-710, 719-720, 722-723, 730	Coni-Tolman complex, 10 to 40 percent slopes
	711-721, 725, 729, 730-732, 786, 1037-1040, 1051-1054,	Smilo-Adman complex, 0 to 9 percent slopes
	809-812	Rock outcrop-Aridic Ustochrepts complex, 10 to 25 percent slopes
	1093-1099, 1110-1116, 1140-1141, 1148-1152, 1155-1159	Datil-Dioxice complex, 1 to 5 percent slopes
	1071-1080, 1137-1139,	Rudd-Modyon complex, 3 to 15 percent slopes
	1087-1092	Catman-Hickman complex, 1 to 5 percent slopes
	1139-1140	Gustspring-Aridic Ustochrepts complex, 5 to 40 percent slopes
Resource Roads	279-284, 387-396,	Nickel-Chamberino association, gently sloping
	20, 23-24, 48-49, 53-54, 58-63, 76-77, 84-88, 102, 104-105, 108, 112, 125-126, 127-128, 140-141	Mimbres and Verhalen soils
	20-23, 24-25, 57-58, 113-114	Mohave sandy clay loam, 0 to 3 percent slopes
	33, 63, 64, 66,	Nickel-Tres Hermanos complex
	172-190, 194-204	Stellar-Continental association, gently sloping
	241-243, 298-299	Tres Hermanos gravelly fine sandy loam, gently sloping
	303-312, 420-427, 433-440, 441-442, 449-453	Tres Hermanos-Hap association, gently sloping
	252-262, 275-277, 289-292, 312-317, 319-329, 330-337, 344, 347-351, 387-389, 394-398, 427-433	Nickel-Chamberino association, gently sloping

Table 4-5. Project Access with High and Moderate Erosion Factors on BLM Lands		
Access Type	**Structures**	**Soil Unit**
High		
	516	Scholle-Ildefonso association, moderately rolling
	517-518	La Fonda loam, gently sloping
	573	Rock outcrop-Rizozo association, extremely steep
	584-588	Abrazo-Motoqua, cool-Rock outcrop complex, 10 to 50 percent slopes
	588-589	Datil gravelly loam, 1 to 6 percent slopes
	1084-1087, 1132-1137,	Rudd-Modyon complex, 3 to 15 percent slopes
	1125	Datil-Dioxice complex, 1 to 5 percent slopes

Continental Divide National Scenic Trail Avoidance Alternatives

Alternative 1

Alternative 1 would utilize overland drive and crush to cross 1.63 miles of the Cabezon-Thunderbird-Celosprings complex, 3 to 25 percent slopes. This could be effective in minimizing impacts to soils when compared to more intensive road construction techniques. This soil type has a high susceptibility to water erosion, but a low susceptibility to wind erosion.

Alternative 2

Alternative 2 would utilize a Resource Road construction to cross 2.38 miles of the Cabezon-Thunderbird-Celosprings complex, 3 to 25 percent slopes. This soil type has a high susceptibility to water erosion, but a low susceptibility to wind erosion. Alternative 2 also crosses 0.44 miles of Celosprings loam, 1 to 8 percent slopes. This soil type has a moderate susceptibility to water erosion and a low susceptibility to wind erosion. There would be greater impacts to soils resulting from the selection of Alternative 2 when compared to alternative 1 due to permanent ground disturbance associated with Resource Road construction.

Forest Service

Table 4-6 identifies miles crossed of soils with high and moderate erosion susceptibility that could be affected by the proposed Project improvements. Table 4-7 identifies general locations of high and moderate erosion susceptible soils on Forest Service lands. Cross-country Travel is proposed through the existing AIP transmission line ROW through Forest Service lands. Cross-country Travel does not have a specific route identified, and therefore temporary impacts are estimated using an estimated 10’ linear disturbance through the exiting transmission line ROW on Forest Service lands. Temporary effects resulting from proposed improvements of Cross-country Travel, structure maintenance use areas or any

use of the existing Forest Road system that may require maintenance in areas of high and moderate erosion susceptibility are anticipated to be minimal.

Approximately 77 acres of potential ground disturbance is estimated to be within these areas of high and moderate erosion susceptibility (see Table 4-6). That is approximately 8 percent of the total of 990 acres that would be within the ROW on Forest Service lands. In addition to the general design features listed above, minor restoration and revegetation would be implemented in areas of sensitive environmental resources (see Section 2.5.7). Therefore, effects to soil resources on Forest Service lands are expected to be minimal.

Table 4-6. High and Moderate Erosion Susceptibility Ground Disturbance Areas by Project Component on Forest Service Lands

Project Component	Miles	Acres
High Erosion Susceptibility Ground Disturbance Areas		
Cross-country Travel[1]	4	12
Transmission Structure Maintenance Use Areas[2]	-	6
Moderate Erosion Susceptibility Ground Disturbance Areas		
Cross-country Travel[1]	21	25
Transmission Structure Maintenance Use Areas[2]	-	34
Totals[3]	**25**	**77**

[1]Cross-country roads have no specific route identified within Cross-country Travel access corridor, and therefore temporary impacts are reported using a notional 10' linear disturbance area through the ROW.
[2] Maintenance use areas include structure maintenance areas and pulling and tensioning sites and are considered temporary disturbance.
[3] Totals may not sum, due to rounding.

Table 4-7. Project Access with High and Moderate Erosion Factors on Forest Service Lands

Access Type	Structures	Soil Unit
High		
Cross-country Travel	1019-1030	Thunderbird-Rudd-Hubbell-Cabezon
	691-698, 703-706	Tolman-Smilo-Rock outcrop-Adman
Moderate		
Cross-country Travel	954-967	Typic Ustochrepts-Fluventic Ustochrepts
	936-941, 949-953	Typic Ustorthents-Typic Ustochrepts-Typic Udorthents-Rock outcrop
	641-646, 674A-677	Pleioville-Brycan-Bario
	815-819, 822-839, 847-850,	Manzano-Hickman-Catman
	879-898, 998-1019, 1031-1032,	Loarc-Guy-Dioxice-Datil

State and Private

Table 4-8 identifies acres and miles crossed of soils with high and moderate erosion susceptibility that could be affected by the proposed Project improvements on private and state lands. Table 4-9 identifies general locations of high and moderate erosion susceptible soils on private and state lands. Temporary effects resulting from proposed improvements of Primitive Road access and structure maintenance use areas combined with permanent Resource Road improvements in areas of high and moderate erosion susceptibility are anticipated to be minimal. Approximately 92 acres of potential ground disturbance is estimated to be within these areas of high and moderate erosion susceptibility. That is approximately 5 percent of the total of 1,805 acres that would be within the ROW on state and private lands. The general design features listed above would be used in areas of sensitive environmental resources (see Section 2.5.7). Therefore effects to soil resources on State and Private lands are expected to be minimal.

Table 4-8. High and Moderate Erosion Susceptibility Ground Disturbance Areas by Project Component on State and Private Lands

Project Component	Miles	Acres
High Erosion Susceptibility Ground Disturbance Areas		
Primitive Roads	2	1
Resource Roads	8	8
Transmission Structure Maintenance Use Areas	-	9
Moderate Erosion Susceptibility Ground Disturbance Areas		
Primitive Roads	18	6
Resource Roads	36	34
Transmission Structure Maintenance Use Areas	-	34
Totals[5]	**64**	**92**

[1]Cross-country roads have no specific route identified within Cross-country Travel access corridors, and therefore temporary impacts are reported using miles of cross-country access from Table 2-2.
[2] Primitive Roads are considered temporary disturbance associated with route improvements.
[3] Resource Roads are considered permanent disturbance associated with road improvements.
[4] Maintenance use areas include structure maintenance areas and pulling and tensioning sites and are considered temporary disturbance.
[5] Totals may not sum, due to rounding.

Table 4-9. Project Access with High and Moderate Erosion Factors on State and Private Lands		
Access Type	**Structures**	**Soil Unit**
High		
Primitive Roads	797-801	Cabezon-Thunderbird-Celsosprings complex, 3-25% slopes
Resource Roads	1044-1047	Cabezon-Thunderbird-Celsosprings complex, 3-25% slopes
	598-600	Glenberg-Riverwash association, 0 to 5 % slopes
	2-6,	Pintura-Berino Complex
	9-10	Berino and Mojave soils
	18	Mimbres soils
	28	Hondale-Mimbres complex
	88-89, 98-99	Bluepoint-Onite association
	461, 487-500	Dona Ana-Tres Hermanos association, gently sloping
	409	Brazito loamy fine sand, gently sloping
	454	Glendale-Gila complex, nearly level
Moderate		
Primitive Roads	595-597	Datil gravelly loam, 15 to 25 percent slopes
	609-612	Goldust gravelly sandy loam, 2 to 8 percent slopes
	646-648, 655-665	Pleiovlle gravelly sandy loam, 3 to 15 percent slopes
	665-674A	Bario sandy clay loam, 0 to 5 percent slopes
	732-744	Smilo-Adman complex, 0 to 9 percent slopes
	802-804	Rock outcrop-Aridic Ustochrepts complex, 10 to 25 percent slopes
	860-861A, 1099-1101, 1105-1106, 1109, 1142-1147, 1153-1154, 1160	Datil-Dioxice complex, 1 to 5 percent slopes
	1102-1109	Catman-Hickman complex, 1 to 5 percent slopes
Resource Roads	351-373, 376, 380-386	Nickel-Chamberino association, gently sloping
	1-2, 7-8, 10-11, 14, 15-16, 71-72, 118-119, 132, 163-164	Mimbres and Verhalen soils
	12-14, 15, 16-18	Mohave sandy clay loam, 0 to 3 percent slopes
	23	Turney-Dona Ana association
	164-172, 191-193, 204-213	Stellar-Continental association, gently sloping

Table 4-9. Project Access with High and Moderate Erosion Factors on State and Private Lands		
Access Type	**Structures**	**Soil Unit**
	239-244, 243-246	Tres Hermanos gravelly fine sandy loam, gently sloping
	246-251, 443-448	Tres Hermanos-Hap association, gently sloping
	325-329, 330-331	Nickel-Chamberino association, gently sloping
	455-456	Dona Ana Tres Hermanos association, gently sloping
	500-505	Scholle-Ildefonso association, moderately rolling
	526-528, 530	Rock outcrop-Luzena association, extremely steep
	562-568	Rock outcrop-Rizozo association, extremely steep
	589-594	Datil gravelly loam, 1 to 6 percent slopes
	598-600	Glenberg-Riverwash association, 0 to percent slopes
	608-612	Goldust gravelly sandy loam, 2 to 8 percent slopes
	649-650, 654	Pleiovlle gravelly sandy loam, 3 to 15 percent slopes

4.2.1.4. No Action Alternative

Under the No Action alternative, the right-of-way application would not be approved and would not meet El Paso Electric's objectives for this project. Maintenance activities on the existing 345kV transmission line would continue to be done under the existing conditions, requiring specific and individual access requests when issues arise. Ground disturbance at structure work sites may not be to the extent as the proposed action, but would be allowed to the amount needed to provide for safe equipment placement and operations. Similar to the proposed action, impacts to soils under the No Action alternative would minimal.

4.2.2. Cumulative Impacts

4.2.2.1. Geological Hazards

This project would not have any cumulative effects related to geologic hazards. Other projects would not have cumulative effects from geologic hazards. No large earthquakes have been reported in the Project area, and only one recent fault is present. It is possible that other projects could be impacted by 100-year floods.

4.2.2.2. Mineral Resources

This project, in addition to reasonably foreseeable projects listed in Table 4-2 are not anticipated to have cumulative impacts to mineral resources. Therefore, no construction-related activities would have cumulative effects to mineral resources. It is possible that future projects within the study area could impact mineral resources and thus add to the cumulative effects on mineral resources.

4.2.2.3. Soil Resources

Soil conditions vary significantly over short distances, limiting the geographic range of the impacts to a particular soil type. Therefore, potential impacts of the proposed Project to soil resources would be localized within the Project area. Ground-disturbing activities associated with the proposed Project would impact a total of 313 acres of soils with high wind and water erosion susceptibility, which is less than 0.1 percent of soils in the study area. This project, in conjunction with reasonably foreseeable actions (Table 4-2), would result in minimal negative cumulative impacts.

4.3. Paleontological Resources

4.3.1. Environmental Consequences

The Proposed Action may impact paleontological resources present in the proposed Project area on federal, state, and private lands. The paleontological inventory described in Section 3.3.2 demonstrates that four geological units, with PFYC 3, 4 or 5, present within the Project study corridors that may contain paleontological resources. The primary impact issue for paleontological resources is the loss of scientifically significant fossils and their contextual data. Two types of impacts could potentially affect paleontological resources:

- Direct impacts resulting from ground disturbance during construction
- Indirect impacts due to increased public accessibility to remote areas or erosion

It is possible that ground disturbance resulting from access road improvements could expose important paleontological resources. In addition, adverse impacts indirectly associated with ground disturbance are a concern. For example, fossils could be subject to damage or destruction by erosion that is accelerated by ground disturbance. Further, improved access and increased visibility could result in unauthorized collection or vandalism. However, not all impacts of construction are adverse to paleontology. Excavation can and often does reveal significant fossils that would otherwise remain buried and unavailable for scientific study. In this manner, ground disturbance can result in beneficial impacts. Such fossils can be collected properly and catalogued into the collection of a museum repository so that they can be available for scientific study.

<u>BLM</u>

The Project crosses 2.75 miles of geological units having a PFYC of 3 and 68 miles of geological units having a PFYC of 4, and therefore could impact paleontological resources.

Continental Divide National Scenic Trail Avoidance Alternatives

Alternative 1

Alternative 1 crosses 1.63 miles of geological units with a PFYC of 1.

Alternative 2

Alternative 2 crosses 2.44 miles of geological units with a PFYC of 1, and 0.38 miles of geological units with a PFYC of 2.

Forest Service

The Project crosses 31.8 miles of geological units with a PFYC of 4, which therefore has the potential risk of having direct or indirect impacts to paleontological impacts as described above.

State

The Project crosses 0.79 miles of geological units with a PFYC of 3 and 30.5 miles of geological units with a PFYC of 4.

Private

The Project crosses 3.14 miles of geological units with a PFYC of 3 and 45.1 miles of geological units with a PFYC of 4.

4.3.1.1. No Action Alternative

Under the No Action alternative, the right-of-way application would not be approved and would not meet El Paso Electric's objectives for this project. Maintenance activities on the existing 345kV transmission line would continue to be done under the existing conditions, requiring specific and individual access requests when issues arise. Ground disturbance at structure work areas may not be to the same extent as the proposed action, but would be allowed to the amount needed to provide for safe equipment placement and operations. As a result, the direct and indirect impacts to paleontological resources would be similar to the no action.

4.3.2. Cumulative Impacts

The area of cumulative analysis for paleontological resources includes the geological units associated with the Proposed Action. The sensitivity of the geological units range from low to high. Other projects within the study area could add to the cumulative effects to paleontological resources. Any construction or ground-disturbing activities associated with other projects, such as transmission lines, pipelines, or new roads, could have incremental effects on paleontological resources similar to those presented by the Proposed Action. RFFAs within the study area for paleontological resources could include the SunZia Southwest Transmission Line, dispersed recreation, and general OHV activities.

4.4. Water Resources

4.4.1. Environmental Consequences

Impacts to water resources from the Proposed Action are associated with contamination of a water resource from an accidental spillage of fuel or other hazardous substance, increased sedimentation due to loss of vegetation or changes to existing drainage and erosional patterns, increased turbidity from stream crossings, and direct impacts to wells from Project activities.

EPE proposes to use the footprint of the original construction roads, to the greatest extent practicable, for Project access routes. Access improvements would typically be made using a D-6 or D-8 bulldozer and backhoe, and would be conducted where terrain or vegetation restricts operational vehicle access. Improvements could consist of removal of obstacles, including vegetation, boulders, or earthen berms, and minor earthwork, such as smoothing rough patches or reduction of ruts or holes for cross-country access and Primitive Roads. Resource Road improvements could include blading or grading travelways up to 14 feet wide.

Design features of the Project in Section 2.5.7 and POD elements assist in minimizing impacts to water resources. These include such things as management of hazardous materials near waterways, the placement of water bars in disturbed areas in such a way to divert the water flow into vegetated or rocky areas to dissipate the flow, maintaining as much vegetation as possible, improving access roads as near as possible to right angles to streams, and minimizing disturbance to drainage channels.

The proposed access roads cross approximately 352 streams. Approximately 140.2 miles of access roads are located within $1/10^{th}$ mile of streams. The PJD survey, completed for the Project in 2014, field checked and documented conditions at all Project access road stream crossings as ephemeral. Table 4-10 shows the relationship between access roads, streams, and wetlands by ownership.

Table 4-10. Project Access and Water Resources

Ownership	Number Streams Crossed	Miles of Access Within 1/10th Mile of Stream	Miles of Wetlands Crossed
BLM	144	61.5	1.0
Forest Service	70	20.8	0.0
State Land	53	21.6	0.6
Private	85	36.3	1.0

EPE proposes to travel along Project access roads for routine inspections twice a year, once in the fall and once in the spring. Access roads would be maintained to a condition sufficient for the passage of four-wheel-drive patrol vehicles or ATVs. If maintenance is required on specific structures or a section of transmission line, access may be upgraded to allow maintenance equipment along those roads necessary to reach the work area. Therefore, only a portion of the total number of streams would be crossed by maintenance equipment identified in Table 2-1.

Impacts to floodplains can occur when channels for floodwaters are obstructed or changed, increasing downstream flows or upstream flooding, or when vegetation is removed and soils are compacted enough

to lessen the ability for floodplain to store excess water. Upgrades proposed for project access roads are only enough to allow infrequent travel by inspection crews and maintenance activities, when required, and are not expected to change flows in floodplains, or affect the ability of the floodplains to store excess water.

No wells are directly impacted by the proposed Project facilities.

4.4.1.1. BLM

The proposed access roads cross approximately 144 streams, and approximately 1.0 miles of wetlands associated with stream channels on BLM managed lands. Approximately 61.5 miles of access roads on BLM managed lands are located within 1/10th mile of streams. EPE proposes to travel along Project access roads for routine inspections twice a year, once in the fall and once in the spring. Access roads would be maintained to a condition sufficient for the passage of four-wheel-drive patrol vehicles or ATVs. If maintenance is required on specific structures or a section of transmission line, access may be upgraded to allow maintenance equipment along those roads necessary to reach the work area. Therefore, only a portion of the total number of streams would be crossed by maintenance equipment identified in Table 2-1. Implementation of design features in Section 2.5.7, such as installation of water bars, crossing streams at right angles, leaving vegetation in place where possible, and reseeding in sensitive areas as directed by the authorized officer would reduce potential sedimentation in streams.

No wells are directly impacted by the proposed Project facilities.

Continental Divide National Scenic Trail Avoidance Alternatives

Alternative 1

Alternative 1 follows an approximately 1.6-mile existing two-track linear disturbance through the Pelona Mountain ACEC, and is proposed as a BLM Primitive Road. The terrain is relatively flat and would not require blading or construction, and access along this alternative would include driving over existing vegetation. Potential ground disturbance would be minimized, reducing the potential for sedimentation and impacts to water quality.

Alternative 2

Alternative 2 follows an existing two track road through a small canyon for approximately 2.8 miles and would require blading to maintain the travelway through the canyon bottom as it traverses the wash. Approximately 1.1 miles of the access road would be located within 1/10th mile of the stream and access roads would cross approximately 0.2 miles of wetlands associated with this stream channel. While access would be improved to a standard no higher than necessary to accommodate transmission line maintenance vehicles and equipment, the potential for sedimentation and erosion would be higher than Alternative 1.

4.4.1.2. Forest Service

Travel on Forest Service lands would be cross-country and could consist of removal of obstacles, including vegetation, boulders, or earthen berms, and minor earthwork, such as smoothing rough patches or reduction of ruts or holes. Removal of vegetation would use above-ground cutting methods that leave

the root crown intact, and woody vegetation would be cropped to 6" or less. EPE proposes to travel along Project access roads for routine inspections twice a year, once in the fall and once in the spring. Access roads would be maintained to a condition sufficient for the passage of four-wheel-drive patrol vehicles or ATVs. If maintenance is required on specific structures or a section of transmission line, maintenance equipment would travel along the cross-country access necessary to reach the work area. Therefore, only a portion of the total number of streams would be crossed by maintenance equipment identified in Table 2-1. Implementation of design features in Section 2.5.7, such as installation of water bars, crossing streams at right angles, leaving vegetation in place where possible, and reseeding would reduce potential sedimentation in streams.

Impacts to water resources from Cross-country Travel would be short term, and the implementation of design features should minimize long-term erosion potential to streams.

The proposed Cross-country Travel routes cross approximately 70 streams, and no wetlands associated with stream channels on Forest Service managed lands. Approximately 20.8 miles of these travel routes fall within $1/10^{th}$ mile of streams. The PJD survey, completed for the Project in 2014, field checked and documented conditions at all Project access road stream crossings as ephemeral. No riparian vegetation was identified at Project crossing locations, therefore no direct impacts to riparian conditions are expected from Project activities.

Of the approximately 45.5 miles of Cross-country Travel on Forest Service lands, approximately 38 miles cross sub-watersheds that are functioning properly and 7.5 miles cross sub-watersheds that are functioning at risk.

No wells are directly impacted by the proposed Project facilities due to no wells existing in the Project area.

The Project is expected to have minimal impacts to water resources, based on the low frequency of travel combined with the lack of intermittent or perennial stream crossings, the absence of riparian vegetation, and the amount of properly functioning watersheds.

4.4.1.3. No Action Alternative

Under the No Action alternative, the right-of-way application would not be approved and El Paso Electric's objectives would not be met for this project. Maintenance activities on the existing 345kV transmission line would continue to be done under the existing conditions, requiring specific and individual access requests when issues arise. Ground disturbance at structure work areas may not be to the same extent as the proposed action, but would be allowed to the amount needed to provide for safe equipment placement and operations. Similar to the Proposed Action, impacts to water resources are expected to be minimal.

4.4.2. Cumulative Impacts

Potential ground disturbance activities associated with the Project are anticipated to have minimal negative cumulative effects to water resources, including water quality, riparian condition, and overall watershed functionality. The maintenance of access roads could allow additional travel from other users, which is expected to be very light.

4.5. Biological Resources

4.5.1. Environmental Consequences

Potential impacts to biological resources from the Proposed Action may include (1) disturbance to wildlife and their habitat during construction and maintenance; (2) loss of individual animals; (3) loss of vegetation during construction; and (4) introduction of non-native invasive plant species. Impacts related to BLM and Forest Service management are discussed following the general discussion of impacts.

4.5.1.1. Potential Effects to Vegetation

As described in Section 2.2, the Project would result in the removal of vegetation. Clearing of vegetation for roads (estimated miles of roads shown in Table 2-2) or work areas (estimated acres of work areas shown in Table 2-3) would occur, although temporary disturbance would be stabilized. Soil disturbance from construction and inadvertent transport of seeds from all vehicles used to access work sites increases the susceptibility of an area to invasion of noxious weeds and other invasive plants. However, Project design features (Section 2.5.7) and elements within the POD identify actions to reduce the risk of introduction, establishment, and/or spread of invasive species from vehicles and ground disturbing activities.

4.5.1.2. Potential Effects to Wildlife

Although construction of new roads would occur and closed roads would be opened, impacts of the Proposed Action should be minimal as the majority of activities would involve the use and improvement of existing roads and travelways. Clearing of vegetation for new roads and other construction areas could have both direct and indirect effects on wildlife and plant species that depend on habitats in the Project area. Direct impacts on special-status wildlife species, including migratory birds, resulting from construction of new roads and improvement of existing roads include increased noise and human activity during construction and downstream effects of erosion and chemical contamination of water. The nesting seasons for migratory birds vary with species and across the range of elevations in the Project area. Raptors may begin nest construction or repair as early as January, and some late-spring migratory songbirds may not arrive and begin nesting until July or August. Indirect impacts to wildlife special-status species due to increased road access may include increased predation on or illegal hunting of these species.

Noise and emissions from construction and vehicular traffic can lead to avoidance of the area by wildlife species for several hundred meters from the construction site (Fahrig and Rytwinski 2009). Some species would alter activity patterns in relation to the disturbance (Kaartinen et al. 2005) and the density of breeding bird territories may be reduced near the Project area (Reijnen et al. 1995). Since work would be temporary and the roads are not heavily traveled, noise-related impacts should be minimal. There is evidence that Bighorn Sheep and Mexican Spotted Owl recover quickly and do not alter behavior or movements when exposed to short-term noise disturbance (Krausman et al. 1998; Delaney et al. 1999).

While no permanent streams are crossed by the Project, any activity at ephemeral stream and wash crossings could result in degradation of water quality through erosion and contamination of the waterway from chemical spills and fluids leaking from vehicles (Forman and Alexander 1998), which may have the potential to affect aquatic species downstream from road crossings. Erosion and chemical contamination can have downstream effects beyond the location of the impact. The type of vehicle crossing a stream affects the quantity of downstream sedimentation, with heavier vehicles being likely to cause proportionally greater sedimentation (Taylor et al. 1999; Lane and Sheridan 2002). Quantities of rainfall

and runoff during a given time period also impact the quantity of downstream sedimentation and chemical transport. Ephemeral streams only receive flows in response to heavy rain events and do not typically contain surface water or support species dependent on permanent water.

Potential impacts on biological resources related to water quality would be minimized or avoided in Project activities. All proposed road crossings would occur over ephemeral streams, and some of the larger ephemeral streams are spanned by the transmission line but not crossed by roads. All road crossings will be constructed and maintained at a level that minimizes the risk of erosion, and thus reduces the risk that the Project may affect aquatic species by reducing water quality. Section 2.5.4 (Industrial Wastes and Toxic Substances) provides detail on the management of petroleum products and other materials that could affect water quality, and states that EPE's Emergency Spill Response Procedures would be followed in the event of any accidental release of harmful materials.

Indirect effects from low-use roads may occur, independent of traffic levels. There is some evidence that predators preferentially hunt near linear corridors. Prey species have been observed to decrease use of linear corridors in response to observed higher predation rates from Gray Wolves (James and Stuart-Smith 2000). Increased hunter and OHV access via road improvements and clearing of work areas may cause disturbance not directly related to the Project (Thiel 1985; McLellan and Shackleton 1988).

Clearing of vegetation for roads or work areas removes habitat for species and could reduce the capacity of these areas to function as cover from predator species, thereby increasing mortality. Vegetation clearing may also remove bird nests. Soil disturbance from construction and inadvertent transport of seeds increases the susceptibility of an area to invasion of noxious weeds and other invasive plants, which could alter habitat quality for plant and wildlife species in construction areas and surrounding areas.

Several Project Design Features would reduce or eliminate direct and indirect effects of the Project on special-status species and other biological resources. Design Feature 1 requires the development of a detailed POD prior to construction that would address biological considerations, including noxious weed management. Under Design Feature 5, wherever possible, vegetation would be left in place and original land contours would be maintained to avoid damage to roots and allow for vegetation regrowth. Design Feature 16 requires that surveys for special-status plants and wildlife species would occur in areas of known occurrences or suitable habitat, and that surveys for active migratory bird nests would take place prior to construction during the nesting season. Timing and extent of the surveys would be determined on a species-by-species basis, coordinated with agency wildlife biologists, and completed prior to construction. Monitoring of construction activities may be required in some areas to ensure that effects to these species are avoided during construction. Other avoidance measures may be required for certain species as determined necessary by agency wildlife biologists.

The general impacts previously described may occur anywhere in the Project area that ground disturbance and other Project activities take place, and would affect any species that are present and sensitive to those activities regardless of land ownership.

Special-status Wildlife

As described in Section 3.5.2 and Table 3-8, several ESA-listed species are present near the Project area. However, the Mexican Spotted Owl, Yellow-billed Cuckoo, Chiricahua Leopard Frog, and Narrow-headed Gartersnake are not anticipated to be present where Project activities would occur, and are not anticipated to be adversely affected by the Project. The Mexican Gray Wolf and Northern Aplomado Falcon, both managed as NEPs, may be present where Project activities would occur. The types of potential effects described in Section 4.5.1.2 related to the disturbance of wildlife (e.g. human presence

during Project activities, particularly during sensitive seasons) could affect the Mexican Gray Wolf and Northern Aplomado Falcon. However, these potential impacts would be avoided or minimized by the applications of Design Features for the protection of biological resources, including the preservation of existing raptor nests and seasonal avoidance of active nests or any known Mexican Gray Wolf dens and rendezvous sites. Additional information on the potential presence of these species is presented in Appendix C.

Table 4-11 provides a summary of determinations that were made by the BLM and Forest Service for potential effects of the Project to ESA-listed species. These determinations are analyzed in detail in a Biological Assessment prepared for the Project, to support Section 7 consultation with the USFWS.

Table 4-11. Summary of determinations for ESA-listed species and critical habitat.

DPS: Distinct Population Segment **E:** Endangered **T:** Threatened	**NEP:** Nonessential Experimental Population **NA:** Critical habitat is not designated for candidate species and NEPs

Common Name *Latin Name*	Status	Critical Habitat	Effects Determination (Species)	Effects Determination (Critical Habitat)
Mammals				
Mexican Gray Wolf *Canis lupus baileyi*	E (NEP)	NA	▪ Not likely to jeopardize.	NA
Birds				
Northern Aplomado Falcon *Falco femoralis septentrionalis*	E (NEP)	NA	▪ Not likely to jeopardize.	NA
Mexican Spotted Owl *Strix occidentalis lucida*	T	Yes	▪ No effect.	▪ No effect.
Yellow-billed Cuckoo, Western DPS *Coccyzus americanus*	T	Yes	▪ No effect.	▪ No effect ▪ Not likely to adversely modify
Reptiles				
Narrow-headed Gartersnake *Thamnophis rufipunctatus*	T	Proposed	▪ May affect, not likely to adversely affect.	▪ May affect, not likely to adversely affect ▪ Not likely to adversely modify.
Amphibians				
Chiricahua Leopard Frog *Lithobates chiricahuensis*	T	Yes	▪ May affect, not likely to adversely affect.	▪ May affect, not likely to adversely affect.

4.5.1.3. BLM

On BLM lands, impacts to BLM sensitive species could result in conflicts with BLM special-status species policies if the effects were substantial enough to contribute to downward population trends that may result in the need to consider those species for listing under the ESA. Because the actions associated with the Project on BLM lands are primarily associated with either maintenance of existing routes, travel along existing linear disturbances, or short-term maintenance work on an existing transmission line, the Project will not result in a measurable reduction of the amount of habitat currently available for these species in the Project area. No BLM sensitive species are anticipated to be affected by the Project in ways that would result in a measurable effect at the population level or would contribute to a need to consider the species for listing under the ESA (Appendix C).

A portion of the Project crosses the Pelona Mountain ACEC (refer also to Section 4.8.1.1, Special Designations). This ACEC was designated in part to provide protections to the Bald Eagle, Peregrine Falcon, a large Elk herd, and other wildlife. Protections are provided through restrictions on certain types of land uses. Within the ACEC, Primitive Road access and the application of design measure overland drive and crush would be utilized in this area to minimize disturbance and avoidance of sensitive resources within this area, and would be stipulated in the POD.

Continental Divide National Scenic Trail Avoidance Alternatives

The Pelona Mountain ACEC is managed in part to protect sensitive wildlife resources. Potential impacts to wildlife would occur regardless of the location of each alternative, as the habitat types are similar among all alternatives. Potential impacts would be as described in Section 4.5.1.2, and would include disturbance of wildlife, risk of erosion, and risk of transporting seeds of invasive plants. These impacts would be in proportion to the length of each alternative. The alternatives were developed to make use of existing linear disturbances where possible.

Alternative 1

The selection of Alternative 1 would cross BLM and state land within the Pelona Mountain ACEC for approximately 1.48 and 0.14 miles, respectively. Primitive Road access and the application of design measure overland drive and crush would be utilized in this area to minimize disturbance and avoidance of sensitive resources within this area, and would be stipulated in the POD.

Alternative 2

The selection of Alternative 2 would cross BLM and state land through the Pelona Mountain ACEC for approximately 1.08 and 1.72 miles, respectively. Resource Road access would be utilized in this area.

4.5.1.4. Forest Service

Invasive Species

There is a risk of introduction, establishment, and/or spread of invasive species on Forest Service lands from vehicles and ground disturbing activities. Project design features (Section 2.5.7) and elements within the POD reduce risk.

Wildlife

On Forest Service lands, impacts to Forest Service-sensitive species could result in conflicts with Forest Service special-status species policies if the effects were substantial enough to contribute to downward population trends that may result in the need to consider those species for listing under the ESA. Additionally, impacts to MIS that resulted in a downward trend Gila National Forest-wide could be considered to be in conflict with Forest Service management objectives.

Table 3-8 lists all special-status species analyzed in this EA, including MIS and FSS. Of those MIS that may be present in or near the Project area, the Northern Goshawk, Common Black-hawk, and Mexican

Spotted Owl use habitat (riparian vegetation or old-growth woodlands with large trees) that would not be altered by the Project. The Mule Deer, Montezuma Quail, Juniper Titmouse, and Hairy Woodpecker may use habitat types crossed by the Project. Because the actions associated with the Project on Forest Service land are associated with either maintenance of existing routes identified in the TMP or travel within the right-of-way of the existing AIP transmission line, the Project will not result in a measurable reduction of the amount of habitat available for these species in the Forest Service land. The Project will not result in a downward trend Forest Service-wide for MIS. Appendix C provides a summary of the current status of each MIS on the Forest Service land.

The Northern Goshawk, Common Black-Hawk, Northern Leopard Frog, Dashed Ringtail, Bleached Skimmer Dragonfly, Arizona Snaketail, Moore's Fairy Shrimp, Wright's Dogweed, Gila Thistle, Arizona Sunflower, Arizona Coralroot, Parish's Alkali Grass, and Mogollon Clover are FSS that may be present in the vicinity of the Project area, but use habitat types that are not crossed by the Project. The Project would have no effect on those FSS. The Allen's Big-eared Bat, Pale Townsend's Big-eared Bat, Western Red Bat, Spotted Bat, Gunnison's Prairie Dog, Rufous-crowned Sparrow, Savannah Sparrow, Bell's Vireo, Villous Groundcover Milkvetch, and Metcalfe's Ticktrefoil are FSS that may be present in the vicinity of the Project area and may use habitat crossed by the Project. Because the actions associated with the Project on Forest Service land are associated with either maintenance of existing routes identified in the TMP, or travel within the right-of-way of the existing AIP transmission line, the Project may affect, but is not likely to result in a trend toward listing or a loss of viability for any of these species.

4.5.1.5. No Action Alternative

Under the No Action alternative, the right-of-way application would not be approved and EPE's objectives for this Project would not be met. Maintenance activities on the existing 345kV transmission line would continue to be done under the existing conditions, requiring specific and individual access requests when issues arise. As a result, impacts to vegetation under the No Action alternative would be similar to the Proposed Action. Impacts to wildlife under the No Action alternative would also be similar to the Proposed Action.

4.5.2. Cumulative Impacts

The Project could contribute to the cumulative impacts of many of the past, present, and reasonably foreseeable future actions identified in Section 4.1.2, particularly those actions that involve ground disturbance or human activities. The Project represents the reopening of existing roads that require maintenance or have been reclaimed. A portion of this Project would represent an incremental loss of vegetation and increase in disturbance associated with access road improvements and transmission structure maintenance, while the remainder of the roads are identified as travel routes in the Forest Service system of roads. Over time, improved access may incrementally increase access to recreational opportunities in areas that would otherwise be inaccessible on BLM, State and private lands, which may cause additional disturbance to sensitive wildlife species; however, the increase in access associated with the Proposed Action would be minimal when incrementally added to the existing network of authorized roads and trails.

Ground disturbances associated with the Project in conjunction with natural pathways such as wind, water, and animal movement will continue to some degree into the future and cumulatively affect the introduction and/or spread of invasive species. In addition, untreated invasive species located on private, federal, and state lands adjacent to the project area will continue to contribute to the introduction, establishment and spread if not properly managed.

4.6. Wildland Fire

4.6.1. Environmental Consequences

The Project may affect fire management by increasing the risk of unplanned wildfires in the Project area. Many human activities carry some risk of fire ignition. The use of heavy equipment can cause sparks during ground-clearing activities, exhaust from small engines may also cause sparks, and contact between dry vegetation and vehicle exhaust systems can ignite fires.

To minimize or prevent the risk of the accidental ignition or spread of fires, a Fire Protection Plan will be developed for the Final POD. The following are standard procedures that would be stipulated in the Final POD for all Project activities:

- All engines would be required to have an approved spark arrestor.
- All vehicles would carry a fire extinguisher.
- Welding and similar activities would require the use of a spotter, equipped with water and tools to quickly extinguish any ignitions.
- All contractors would receive training in basic fire suppression to attempt to prevent the spread of any accidental ignitions beyond the work area.
- Smoking would be restricted to vehicles or bare ground.
- Emergency contacts and evacuation routes would be carried in vehicles during all Project activities.
- Notification would be made to the appropriate jurisdictional agency of any wildfires caused by project activities.

Additionally, the applicant would perform annual inspections and Light Detection and Ranging data collection for clearance between vegetation and power lines in an ongoing effort to maintain vegetation within the right-of-way to reduce fire hazard.

4.6.1.1. BLM

Impacts related to fire management would be similar across the Project area regardless of land ownership. The Fire Protection Plan and standard safety procedures would be followed Project-wide.

<u>Continental Divide National Scenic Trail Avoidance Alternatives</u>

Alternative 1

Impacts related to fire management would be similar across the Project area regardless of land ownership. The Fire Protection Plan and standard safety procedures would be followed Project-wide.

Alternative 2

Impacts related to fire management would be similar across the Project area regardless of land ownership. The Fire Protection Plan and standard safety procedures would be followed Project-wide.

4.6.1.2. Forest Service

Impacts related to fire management would be similar across the Project area regardless of land ownership. The Fire Protection Plan and standard safety procedures would be followed Project-wide.

4.6.1.3. No Action Alternative

Similar to the proposed action, impacts to fire management are expected to be minimal. Under the No Action alternative, the right-of-way application would not be authorized, and would not meet El Paso Electric's objectives for this project. Maintenance activities on the existing 345kV transmission line would continue to be done under the existing conditions, requiring specific and individual access requests when issues arise.

4.6.2. Cumulative Impacts

Nearly all ongoing and future activities in the Project area have the potential to cause unplanned fire ignitions, and the Project may contribute incrementally to that risk. As an example, the Luna County Community Wildfire Protection Plan (Luna County 2010) reported that approximately 75 percent of fires between 1980 and 2010 were human-caused, from the following activities: campfires, children playing, debris burning, equipment use, fireworks and incendiaries, hot ashes, power lines, railroads, smoking, and unknown or miscellaneous causes. In addition to directly increasing the level of human activity and fire risk, the Project may also increase access into some areas, allowing increased recreational and other activities that may cause fire ignitions. The increase in access roads and improvement of existing access roads could improve response time for fire personal to fire ignitions, for both human and natural caused fires.

4.7. Land Uses

4.7.1. Environmental Consequences

4.7.1.1. Existing Land Use

Direct adverse impacts to existing land uses associated with the Proposed Action common to all land jurisdictions include potential temporary interruption of access to residences, agriculture operations, livestock grazing operations, utilities, and to existing and available timber stands and mining sites. These impacts would be short term and limited to localized construction activities associated with improvements to access roads and transmission structure work areas, and therefore anticipated to be minimal.

The Proposed Action could indirectly effect land-uses in the Project area by providing access points to remote areas that did not previously exist, or are not currently in use. However, implementation of Design Features—Restricting Access (see Section 2.5.7) would limit access to sensitive areas, and would reduce the potential for indirect effects associated with increased traffic.

To minimize potential impacts to existing transmission facilities adjacent to AIP transmission structures 1094-1160, AIP structure work areas would be placed on the east side of AIP structures, and construction activities would be coordinated when possible between EPE and TEP. Design Feature 6 (see Section 2.5.7) would further minimize potential impacts from additional access construction by utilizing existing access where possible. Whenever performing routine inspections, EPE would utilize the existing access road primarily within the adjacent TEP transmission line ROW from structures 1094-1160 where it

crosses BLM lands; however, EPE can access the existing AIP transmission line ROW where an existing road intersects. From the intersection point, EPE can travel within the existing transmission line ROW and improve access conditions up to the level of a Primitive Road only when necessary for transmission line maintenance purposes.

4.7.1.2. Future Land Use

The Proposed Action is consistent with county plans, and would not adversely impact any planned utility projects as currently proposed, and therefore under the Proposed Action, minimal impacts to future land uses are anticipated.

4.7.1.3. BLM

Avoidance Areas

Road and transmission structure work area improvements within the avoidance area associated with VRM Class II lands near the Cooke's Range Foothills are proposed (between transmission structures 35 and 56). In addition, road and transmission structure work area improvements are proposed within the avoidance area associated with VRM Class II lands near the US 60 (between transmission structures 1109 and 1111). Further description of impacts associated with these improvements, related to VRM Class II lands, are described in Section 4.10.

Road and transmission structure work area improvements within the Right-of-Way Avoidance area associated with the Pelona Mountain ACEC would begin at its boundary approximately 0.10 miles northwest of structure 711 to approximately 0.06 miles east of structure 733, and again 0.04 miles west of structure 744, and 0.25 miles southeast of structure 798. To minimize impacts to sensitive resources in the ACEC, Primitive Roads that only utilize overland drive and crush (see Section 2.5.7) are proposed to access the existing right-of-way, and for travel within the existing right-of-way to structure work areas. Locations of existing linear disturbances that spur off of existing designated local roads were identified as the Primitive Road alignments of these overland drive and crush travelways. To further minimize impacts to resources within the Right-of-Way Avoidance Area, revegetation or minor restoration as identified in Section 2.5.7 would occur after any improvements to structure work areas within the Right-of-Way Avoidance area. A summary of proposed improvements occurring within the Right-of-Way avoidance area is presented in Table 4-12.

Table 4-12. Access Route and Transmission Structure Work Area Summary for Right-of-Way Avoidance Area/Pelona Mountain ACEC (BLM Land Ownership)

Proposed Improvements (Between Structure Numbers 711-733, 744-798)	Temporary Disturbance (Acres)	Miles Crossed
Within Existing Transmission ROW		
Primitive Roads with Overland Drive and Crush Design Measure[1]	0.0	7.7
Structure Maintenance Use Areas	18.6	-

Table 4-12. Access Route and Transmission Structure Work Area Summary for Right-of-Way Avoidance Area/Pelona Mountain ACEC (BLM Land Ownership)		
Proposed Improvements (Between Structure Numbers 711-733, 744-798)	**Temporary Disturbance (Acres)**	**Miles Crossed**
Outside Existing Transmission ROW		
Primitive Roads with Overland Drive and Crush Design Measure[1]	0.0	19.8
Totals[2]	18.6	27.5
[1]Primitive Roads are considered temporary disturbance associated with route improvements.		

While a portion of the Project study corridor passes through it, no road improvements are proposed within the avoidance area associated with the Butterfield Trail. Transmission structure work area improvements are proposed between transmission structures 87 and 95.

No improvements are proposed within the avoidance area buffering SR 52, which is in proximity to transmission structures 595–601.

Exclusion Areas

No Project components are located within exclusion areas, and therefore no impacts to exclusion areas are anticipated.

Continental Divide National Scenic Trail Avoidance Alternatives

Alternative 1

The selection of Alternative 1 would cross BLM Land within the Right-of-Way Avoidance Areas for approximately 1.6 miles. This alternative utilizes an existing linear disturbance that spurs off of an existing designated local road. The access is proposed as a Primitive Road that utilizes overland drive and crush (see Section 2.5.7) to minimize impacts to sensitive resources.

Alternative 2

The selection of Alternative 2 would cross BLM and state land through the Pelona Mountain ACEC for approximately 1.1 and 1.7 miles, respectively. Proposed improvements for Alternative 2 would require Resource Road access due to existing ground and steep slope conditions. To minimize impacts to sensitive resources that could result from potential ground disturbance associated with Resource Road construction, minor restoration and revegetation (as described in in Section 2.5.7) could occur in flat areas that would not impede future overland drive and crush travel for transmission line maintenance needs.

4.7.1.4. Forest Service

Jewett Mesa Airstrip is located along NM SR 32 and is used by the public and for firefighting activities. The airstrip is proposed to be used for access to the Project facilities. Impacts to the airstrip operations could occur if maintenance equipment or trucks interrupted aircraft or damaged the airstrip due to rutting or other ground disturbing activities. Design feature 30 (Section 2.5.7) specifically addresses the Jewett Mesa Airstrip and prohibits vehicles and equipment from being parked or staged on or within 100 feet of the Jewett Airstrip. In addition, EPE will immediately repair any damage or rutting to the airstrip surface identified during EPE use. The Forest Service Aviation Officer will be notified regarding repairs or if repairs cannot be completed immediately. These design features are expected to effectively prevent impacts to the airstrip. No Action Alternative

Similar to the proposed action, impacts to Land Uses are expected to be minimal. Under the No Action alternative, the right-of-way application would not be authorized and would not meet El Paso Electric's objectives for this project. Maintenance activities on the existing 345kV transmission line would continue to be done under the existing conditions, requiring specific and individual access requests when issues arise.

4.7.2. Cumulative Impacts

Cumulative impacts to land use could occur through changes in the designation and development of land resources and access to the land. Improvements to existing access could result in an increase in visitation of the areas within and in the vicinity of the study area. Over time, continued visitation in this area would contribute to greater use of the land within the Project area; however, the improvement of access along the existing transmission line is expected to contribute minimally to cumulative impacts to land use.

4.8. Special Designations

4.8.1. Environmental Consequences

Special Designations only apply to federal lands, and are described below by affected agency.

4.8.1.1. BLM

Areas of Critical Environmental Concern

Road and transmission structure work area improvements within the Pelona Mountain ACEC would conflict with management objectives for protection of sensitive resources within the ACEC such as wildlife habitats and scenic, geologic, recreational, and cultural resources. Proposed improvements would begin at its boundary approximately 0.10 miles northwest of structure 711 to approximately 0.06 miles east of structure 733, and again 0.04 miles west of structure 744, and 0.25 miles southeast of structure 798. To minimize impacts to sensitive resources in the Right-of-Way avoidance area, Primitive Roads that only utilize overland drive and crush (see Section 2.5.7) are proposed to access the existing right-of-way, and for travel within the existing right-of-way to structure work areas. Locations of existing linear disturbances that spur off of existing designated local roads were identified as the Primitive Road alignments of these overland drive and crush travelways. To further minimize impacts to resources within the Pelona Mountain ACEC, revegetation or minor restoration as identified in Section 2.5.7 would occur

after any improvements to structure work areas within the ACEC. A summary of proposed improvements occurring within the Pelona Mountain ACEC is presented in Table 4-12.

Special Management Areas

No road improvements are proposed within the Butterfield Trail SMA; however, work area improvements around transmission structures 87–95 are proposed within this SMA and would occur in previously disturbed areas associated with the original construction of the transmission line.

Improvements to access conditions and transmission structure work areas are proposed within the Continental Divide Trail SMA between transmission structures 784 and 790, and would occur in previously disturbed areas associated with the original construction of the transmission line. Primitive Roads that utilize overland drive and crush (as described in Section 2.5.7) are proposed to access the structures within the SMA. Impacts to the trail may occur near Structure 787 as a result of work area improvements. Minor restoration and revegetation (as described in Section 2.5.7) would minimize impacts to the SMA. Additionally, as indicated in Section 3.8.2.1, motorized vehicle access along this section of the CDNST is prohibited; however, unauthorized recreational OHV access occurs. Installation of proposed gates would minimize and deter ongoing non-authorized recreational OHV access, and further assist BLM with management objectives for the trail (see Section 2.5.7).

National Scenic and Historic Trails

Under the Proposed Action, minimal impacts to existing and proposed National Scenic and Historic Trails are anticipated. Work area improvements for transmission structures 87–95, portions of which cross the historic Butterfield Trail (proposed National Historic Trail), are not expected to compromise the consideration of the trail for National Historic Trail designation. Project improvements would minimally affect the context and setting for the historic trail due to the proposed structure work areas being previously disturbed, and multiple exiting adjacent linear features (two transmission lines and SR 26) crossing the historic trail in the same local vicinity.

Impacts to the section of the CDNST within the Continental Divide Trail SMA, between transmission structures 784 and 790, are not anticipated due to the access roads to the structures being proposed approximately 1 mile or greater from the trail alignment, and the Project will not cause substantial interference or be incompatible with the purposes for which the trail was designated. BLM implementation of the requirements established by the National Trails System Act can be found in BLM manuals 6250, 6280, and 8353 (see Section 3.8.2.1 for a further description of these manuals). Additionally, as indicated above, installation of proposed gates at these access locations would minimize and deter ongoing non-authorized recreational OHV access in these locations, and further assist BLM with management objectives for the trail. See Section 2.5.7 for locations of proposed gated access.

Wilderness Study Areas

No impacts to WSAs are expected. While a portion of the Project study corridor passes through the Continental Divide Trail WSA, no improvements are proposed within it.

Other Special Designation Areas

Approximately 6 miles of existing access roads and approximately 7 miles of Resource Roads within the Cuchillo Mountains would be utilized under the Proposed Action. As the limits of the Cuchillo Mountains Nut Gathering Area are not clearly known or defined, and impacts to the piñon pine stand in the Cuchillo Mountains are expected to be minimal, under the Proposed Action, minimal impacts to the Cuchillo Mountains Nut Gathering Area are anticipated.

Continental Divide National Scenic Trail Avoidance Alternatives

Alternative 1

The selection of Alternative 1 would cross BLM land within the Pelona Mountain ACEC for approximately 1.6 miles. This alternative utilizes an existing linear disturbance that spurs off of an existing designated local road. The access is proposed as a Primitive Road that utilizes overland drive and crush (see Section 2.5.7) to minimize impacts to sensitive resources.

Alternative 2

The selection of Alternative 2 would cross BLM and state land through the Pelona Mountain ACEC for approximately 1.1 and 1.7 miles, respectively. Proposed improvements for Alternative 2 would require Resource Road access due to existing ground and steep slope conditions. To minimize impacts to sensitive resources that could result from potential ground disturbance associated with Resource Road construction, minor restoration and revegetation (as described in in Section 2.5.7) could occur in flat areas that would not impede future overland drive and crush travel for transmission line maintenance needs.

4.8.1.2. Forest Service

Inventoried Roadless Areas

While a portion of the Project study corridor passes through it, no construction is proposed within the Apache Mountain IRA.

Access and transmission structure work area improvements may be necessary within the Wahoo Mountain IRA between transmission structures 619 and 634. Operations and maintenance activities that would require motorized access to these structures would be coordinated and authorized on a case by case basis with the Forest Service Authorized Officer or other necessary Forest Service personnel, and therefore no change is proposed to the IRA for this project.

National Scenic and Historic Trails

Under the Proposed Action, minimal impacts to National Scenic and Historic Trails are anticipated. Impacts could occur on sections of the CDNST, between structures 890 and 891 where it crosses north of SR12, and between structures 634-635 where Project access crosses or utilizes portions of the CDNST; however, Project access would cross previously disturbed areas associated with the original construction of the transmission line. Impacts from access improvements or structure work areas are not expected to substantially compromise recreational uses of the trail. Access interruption would be short term and limited to localized construction activities. Cross-country Travel would provide access in these areas

across the CDNST on Forest Service lands and would minimize impacts to the trail. Furthermore, gates and signs and/or barriers will be installed at structure 642 and between structures 890 and 891 to restrict motor vehicles from accessing the CDNST, and deter unauthorized recreational OHV access along the trail. Only authorized motorized uses would be allowed beyond the gates. See Section 2.5.7 for other locations of proposed gated access.

4.8.1.3. No Action Alternative

Under the No Action alternative, the right-of-way application would not be authorized and the access roads and structure work areas would not be improved as proposed. Maintenance activities on the existing 345kV transmission line would continue to be done under the existing conditions, requiring specific and individual access requests when issues arise. The potential impacts to special designations would be similar to the Proposed Action, but may take place without the same level of environmental review.

4.8.2. Cumulative Impacts

Cumulative impacts to special designations could result from incremental contributions from the proposed Project in conjunction with past, present, and reasonably foreseeable future projects or activities.

Cumulative impacts to SMAs could occur through changes in their accessibility. The Proposed Action could improve access to SMAs, which could foster additional use of these resources. Over time, improved access to SMAs could contribute to greater use of the land within the Project area. SMAs within the Project area are managed largely for their recreational and scenic values. It is expected that the implementation of the Proposed Action, along with other past, present, and reasonably foreseeable future projects, could result in alterations to the scenic landscape, but cumulative impacts to SMAs are expected to be minimal because of the avoidance of the CDNST and the overland drive and crush prescriptions within the Pelona Mountains ACEC.

4.9. Recreation

4.9.1. Environmental Consequences

4.9.1.1. BLM

Access to developed and dispersed recreation opportunities may be temporarily interrupted during improvements to existing roads and transmission structure work areas. Access interruption to other developed and dispersed recreation opportunities would be short-term and limited to localized construction activities. In addition, increased accessibility to developed and dispersed recreation opportunities may result from implementation of the proposed Project. Furthermore the application of the design measure of overland drive and crush (see Section 2.5.7) within the existing right-of-way where it crosses the Pelona Mountain ACEC would result in no permanent ground disturbance and could effectively curtail the establishment of two-track conditions that may lead to further unauthorized OHV use in the area.

Improvements to access conditions and transmission structure work areas are proposed within the Continental Divide Trail SMA between transmission structures 784 and 790, and would occur in previously disturbed areas associated with the original construction of the transmission line (see Section 4.8.1). Minor restoration and revegetation (as described in Section 2.5.7) would rehabilitate

transmission structure work areas located within the SMA and effectively minimize impacts associated with the Proposed Action. Therefore, impacts associated with proposed Project improvements are not expected to substantially compromise recreational uses of the trail.

Continental Divide National Scenic Trail Avoidance Alternatives

Alternative 1

The selection of Alternative 1 may provide minimal additional local access to dispersed recreation opportunities isolated to areas near and adjacent to the existing transmission structures 787–794. Alternative 1 proposes access through a 1.6 mile-long non-constructed Primitive Road across BLM land to the existing transmission right-of-way. Furthermore, design measures of overland drive and crush (as described in Section 2.5.7) would be applied that would result in no ground disturbance associated with access road improvements, and could effectively curtail the establishment of a two-track, thereby diminishing the likelihood of its use to access unauthorized areas.

Alternative 2

The selection of Alternative 2 may provide minimal additional local access to dispersed recreation opportunities isolated to areas near and adjacent to the existing transmission structures 787–794. Alternative 2 proposes access through a 2.8 mile-long Resource Road across BLM and State land to the existing transmission right-of-way. Access would require improvements that would improve the road to more than a two-track, which may increase dispersed use. However, access would be controlled by the private landowner.

4.9.1.2. Forest Service

Access to developed and dispersed recreation opportunities may be temporarily interrupted during improvements to existing roads and transmission structure work areas. Impacts from access improvements or structure work areas are not expected to substantially compromise recreational uses that may take place in the area. Access interruption to other developed and dispersed recreation opportunities would be short term and limited to localized construction activities. In addition, increased accessibility to developed and dispersed recreation opportunities may result from implementation of the proposed Project.

As a result of detailed resource surveys conducted for the AIP Transmission Line Project, previously unknown sensitive resources were located in the vicinity of Structures 948 to 949. Consequently, 1.6 miles of NFSR 4034 O will be closed for public access. To provide public access to this area of the Gila National Forest, previously closed NFRS 4034 R will be reopened and gates installed at the intersections NFSR 4034 O and 4034 N, and NFSR 4034R and 4034Q. No impacts are anticipated to access and dispersed recreational activities in this area as a result.

4.9.1.3. No Action Alternative

Under the No Action alternative, the right-of-way application would not be authorized. Potential non-authorized OHV use on the CDNST may persist without the implementation of Project Design Features and measures (i.e., gating access to the CDNST). Maintenance activities on the existing 345kV transmission line would continue to be done under the existing conditions, requiring specific and individual access requests when issues arise. As a result, impacts to recreation under the No Action alternative would be similar to the Proposed Action.

4.9.2. Cumulative Impacts

Cumulative impacts to recreation could occur through changes in accessibility to recreation opportunities. Throughout the project area numerous existing authorized roads and trails, and unauthorized linear ground disturbance features provide OHV access to public state and private lands. The Proposed Action in consideration with these other past, present and reasonably foreseeable actions could improve access to authorized recreation opportunities, as well as unauthorized access to non-motorized recreation areas. Over time, improved access to recreation opportunities could contribute to greater use of the land within the project area; however, the increase in access associated with the Proposed Action would be minimal when incrementally added to the existing network of authorized roads and trails, and unauthorized linear ground disturbance features. The application of design measure Restricting Access would utilize fencing and barriers to further discourage unauthorized OHV access to sensitive areas. Additionally, Cross-country Travel within the right-of-way on Forest Service lands and design measure overland drive and crush within the Pelona Mountain ACEC could effectively curtail the establishment of two-track access conditions that otherwise could provide unauthorized OHV access to sensitive recreation areas.

The Proposed Action, when considered with past, present, and reasonably foreseeable future actions throughout the Project area could result in alterations to recreation opportunities, but would not appreciably increase authorized or unauthorized motorized access to recreation areas. Therefore, cumulative impacts to recreation are expected to be minimal.

4.10. Visual Resources

4.10.1. Environmental Consequences

The primary purpose of the impact assessment is to evaluate and characterize the level of visual modification, or visual contrast, to the landscape that would result from the Proposed Action. Visual contrast is defined as the degree of perceived change that occurs in the landscape due to modifications necessary for the Proposed Action. Visual contrast for the Proposed Action would primarily result from the improvement of access roads and work areas around towers that require replacement and/or maintenance. The assessment for visual contrast is performed by comparing visual elements (form, line, color, and texture) of the existing landscape with the visual elements associated with the implementation of the Proposed Action. In this regard, existing vegetation conditions within the Project area were evaluated in conjunction with EPE's Proposed Action to establish permanent access roads. The existing structures and modifications to vegetation within the rights-of-way and Project area have altered the integrity of the landscape.

Portions of the Project area (e.g., existing contrast resulting from transmission line construction) are currently visible to viewing locations and identified KOPs. Construction actions (e.g., access roads and vegetation clearing) are evident within the Project study area; however, regrowth of vegetation over time has reduced visual contrast since construction and/or maintenance of the facilities. Regrowth of vegetation varies along the right-of-way; however, the existing transmission line structures generally dominate the setting. Visual contrast as a result of vegetation clearing associated with the Proposed Action would be strongest on steep-to-rolling topography occupied by dense woodland vegetation, and weakest on flat, sparsely vegetated topography. However, in areas of steep terrain where the Project crosses canyons, washes, and/or depressions, Project facilities may span many of these features at such a height that vegetation would not interfere with safe and reliable transmission line operation, thus not requiring removal.

4.10.1.1. Scenery

Visual impacts to scenery would be low to low-moderate for the majority of the Project study area, which crosses Class B and C landscapes where existing access roads (and vegetation removal near towers) are evident. Resulting contrast would be weak for the majority of the Project area that traverses flat-to-rolling terrain occupied by creosote-bursage grassland. Improvements to access roads and/or work areas while in steep-to-moderate terrain occupied by juniper woodland would result in moderate contrast. Impacts would be minimized through the implementation of a mitigation measure such as overland construction that would permit maintenance activities through "drive and crush" methods where feasible. Vegetation would be crushed but not removed and grading would not be necessary for maintenance vehicles that are able to access tower locations on flat-to-rolling topography.

4.10.1.2. Viewing Locations and KOPs

Residential impacts associated with KOP 1 are anticipated to be low based on the proposed access road improvement. Existing transmission lines and associated access roads are visible from residences near Red Hill and the Proposed Action would be visible while crossing moderate (rolling) terrain. Landform modification and vegetation removal also may be visible; however, it would be viewed in the context of existing access roads within a utility corridor. This condition would result in weak visual contrast.

Low–moderate visual contrast would be visible for moderate-sensitivity travel routes including SR 60, SR 12, SR 32 (KOP 2), SR 163 (KOP 5), SR 52, where vegetation clearing would be evident. However, impacts are anticipated to be low for moderate-sensitivity viewers associated with SR 60, SR 12, SR 32, SR 163, and SR 52 because the Project would be viewed perpendicularly, which would reduce viewing duration for travel routes associated with a high rate of speed. In addition, existing vegetation and topography would primarily screen contrast associated with access road improvement. Per consultation with the Forest Service, larger vegetation near the crossing of SR 32 should be preserved where feasible, which would reduce impacts. Preserving larger vegetation would not be as effective for SR 163, primarily due to the absence of larger dense vegetation. Low impacts are anticipated for high-sensitivity travel routes including SR 152 because the Project, if visible, would be viewed perpendicularly, which would reduce viewing duration. SR 27 would be crossed and roughly paralleled by the proposed Project; however, in flat terrain with dense grassland vegetation coverage, visibility would be limited and viewed for a short duration resulting in low impacts.

Low impacts are anticipated for dispersed recreation users (independent of the CDNST) in areas where the Project would be seen in context with the existing transmission line structures and where views would be partially to fully screened by vegetation and topography.

4.10.1.3. BLM

The Proposed Action would result in low to moderate impacts to the CDNST resources, qualities, values, and associated settings of the scenic trail. It is anticipated that primitive hiking or horseback riding recreation settings would not be substantially degraded as a result of the Project due to the presence of the existing AIP structures, existing access, and vegetation clearing within the ROW at these trail crossings. Project activities including operation and maintenance of the Proposed Action would not substantially interfere with the use and enjoyment of the CDNST because design features and measures would be implemented (see Section 2.5.7), as further specified in the final POD, to reduce impacts where feasible. In addition, the Proposed Action would not limit the agency's ability to manage the trail for the protection and conservation of natural, historic, and cultural resources because these resources would not be substantially impacted.

Impacts to moderate-sensitivity travel route viewers on BLM lands would be similar to travel route viewers as described above.

Continental Divide National Scenic Trail Avoidance Alternatives

Between structures 790 and 801, where access road improvements would potentially be visible from the CDNST, visual impacts would range from negligible to low impacts as described below.

Alternative 1

Alternative 1 would result in negligible impacts as the proposed access road would not be seen from the CDNST. Topography would effectively screen this alternative from users of the CDNST.

Alternative 2

Limited portions of the Alternative 2 action would be intermittently visible from the CDNST in locations where trail users would have superior views of the route. The resulting impacts are anticipated to be low primarily because the alternative is located at over a mile away from the CDNST and in the context of existing transmission line structures. Using overland travel in locations where feasible would further reduce these impacts.

4.10.1.4. Forest Service

Impacts to moderate-sensitivity travel route viewers and to the CDNST on Forest Service lands would be low due to Project access being along existing access roads in addition to the access road being seen in the context of the existing transmission line structures. Where maintenance of structures is within visual distance of routes, there is the potential for short-term visual impacts associated with ground disturbing activities from maintenance around structures.

4.10.1.5. Agency Visual Management Classifications

4.10.1.6. BLM

Conformance with BLM VRM Class III and IV lands is anticipated where the Proposed Action would introduce weak to moderate visual contrast. In areas with Class II lands, conformance is anticipated due to the Proposed Action introducing weak visual contrast into the landscape, therefore compliance with all BLM VRM Classes is anticipated. In Class II lands crossed by the Butterfield trail, VRM compliance is anticipated as existing access roads will be used and will not be improved as part of this project. In Class II lands crossed by the CDNST (Alternatives 1 and 2), VRM compliance is anticipated because views from the CNDST of the alternatives on BLM administered lands would be completely screened by intervening topography. Therefore, contrast would be none, which meets the objective of VRM Class II.

4.10.1.7. Forest Service

Currently, visual resource data (VQOs) within the Gila National Forest are not available as described in the Gila National Forest Plan; thus, conformance with management classifications cannot be determined for the Gila National Forest. However, the Recreation Specialist Report for the Travel Management DEIS states that "concern for visual quality impacts of the Forest Service transportation system and trail features is generally low since such features are small in scale and when aspects of roads are seen, they generally do not visually dominate." Therefore, compliance with the Gila National Forest Plan is anticipated.

4.10.1.8. No Action Alternative

Under the No Action alternative, the right-of-way application would not be authorized. Maintenance activities on the existing 345kV transmission line would continue to be done under the existing conditions, requiring specific and individual access requests when issues arise. Visual impacts resulting from structure maintenance would be similar to those of the Proposed Action.

4.10.2. Cumulative Impacts

The continuation of grazing throughout the study area could over the long term result in modified vegetation patterns. Potential increases in recreation and OHV use created by improved access may result in additional disturbance. Nearby communities could require additional electrical distribution lines and access roads associated with potential future growth and development. The application of prescribed fire management could gradually alter the landscapes where treatments are conducted. Smoke from prescribed fires used for the same purpose could temporarilly affect the quality of viewsheds and interfere with the public's viewing of scenery. The Proposed Action would contribute to the cumulative impacts that are occurring in the area. Design features would effectively reduce, but not eliminate, the degree of cumulative effects.

4.11. Cultural Resources and Tribal Concerns

Historic Properties are adversely affected when potential effects would result in the loss of integrity for the property, thereby, potentially destroying aspects of sites that allow them to be listed on or eligible to the NRHP. Generally, four types of impacts could adversely affect historic properties during and after construction of the proposed Project include:

- Direct and permanent ground disturbance
- Direct and permanent visual and auditory intrusions
- Indirect and temporary visual intrusions
- Indirect and permanent disturbances due to changes in public accessibility and visual intrusions
- Indirect and permanent and/or temporary erosion due to route construction, maintenance, or use and vegetation removal within work areas

4.11.1. Environmental Consequences

EPG archaeologists conducted a Class III pedestrian survey and identified a total of 169 sites (77 previously recorded and 92 newly recorded). Of these, 77 sites are recommended or have been determined eligible for listing in the NRHP, while for eight sites NRHP eligibility remains insufficiently evaluated. Insufficiently evaluated sites would require additional subsurface testing or archival research in

order to evaluate their NRHP eligibility. For management purposes, these insufficiently evaluated sites are treated as historic properties. A total of 84 sites have been recommended not eligible for listing on the NRHP, for which EPG recommends no further action be required.

Historic properties that lie more than 10 meters from the proposed work areas would be avoided by the proposed project activities. Monitoring of ground-disturbing activities (e.g., grading and leveling associated with structure or hardware replacement [see Section 2.5]) is recommended for 25 historic properties located within 10 meters of proposed work areas. Data recovery involving surface and/or subsurface investigation followed by monitoring is recommended to mitigate adverse effects at 21 historic properties. There are 39 historic properties that will be avoided by project activities and for which monitoring is not recommended (Table 4-4). Finally, there are 84 sites that are recommended or determined not eligible for which no further action is required.

In terms of Section 106, the Proposed Action would have an adverse effect on historic properties. Adverse effects would be caused by direct impacts related to use of mechanized equipment and ground disturbance of the Proposed Action. A memorandum of agreement (MOA) would be prepared and executed prior to the decision record. The MOA would outline how the adverse effects would be resolved. A Historic Properties Treatment Plan (HPTP) would be developed and implemented to resolve adverse effects. The HPTP would provide specific treatments for each affected site. Data recovery could occur within transmission line structure workspaces (up to 150ft x 150ft) or within proximity of access roads requiring improvement (i.e., areas which would be disturbed). The exact methods would vary depending on the resource type and location, but would result in the proposed work having no adverse effect for sites being avoided and/or monitored, and would mitigate adverse effects to historic properties recommended for data recovery.

4.11.1.1. BLM

Impacts to NRHP-eligible sites located on lands under the jurisdiction of the BLM would be similar to those described above for all jurisdictions. A total of nine sites have been recommended to be flagged for avoidance, and also require the presence of a monitor, while eight would not require monitoring. A total of nine NRHP-eligible sites are recommended for data recovery (Table 4-13).

Table 4-13. BLM NRHP-eligible Site Summary and Recommendations*

NRHP-eligible Resource Types	Recommend Avoidance/No Monitoring	Recommend Avoidance with Monitoring	Recommend Data Recovery	Quantity
Prehistoric				
Habitation	-	1	-	1
Prehistoric features and artifacts	-	3	-	3
Prehistoric artifacts	1	4	6	11
Subtotal	**1**	**8**	**6**	**15**
Historic				
Homestead	1	-	-	1
Butterfield Trail	-	-	1	1
Roads and railroads	6	-	1	7
Subtotal	**7**	**-**	**2**	**9**
Multicomponent				

Table 4-13. BLM NRHP-eligible Site Summary and Recommendations*				
NRHP-eligible Resource Types	**Recommend Avoidance/No Monitoring**	**Recommend Avoidance with Monitoring**	**Recommend Data Recovery**	**Quantity**
Prehistoric quarry and hunting blinds; Historic petroglyphs/graffiti	-	1	-	1
Prehistoric lithic scatter; Historic homestead	-	-	1	1
Subtotal	**-**	**1**	**1**	**2**
Grand Total	**8**	**9**	**9**	**26**
***Recommendations of NRHP eligibility to be followed by agency determinations. Eligibility could change pending consultation.**				

Continental Divide National Scenic Trail Avoidance Alternatives

Alternative 1

In order to assess potential adverse effects to cultural resources for Alternative 1, a Class III cultural survey would need to be conducted. A Class III cultural survey and data recovery, if necessary, will be completed prior to authorization of construction activities.

Alternative 2

In order to assess potential adverse effects to cultural resources for Alternative 2, a Class III cultural survey would need to be conducted. A Class III cultural survey and data recovery, if necessary, will be completed prior to authorization of construction activities.

4.11.1.2. **Forest Service**

Impacts to historic properties located on lands under the jurisdiction of the Forest Service would be similar to those described above for all jurisdictions. With one exception, the Forest Service does not anticipate indirect or permanent disturbances to Historic Properties due to public accessibility. The Proposed Action includes obtaining special use permits for both administrative use roads and cross-country travel within the 150 foot wide AIP transmission line right-of-way. These actions will not increase public use of Forest Service lands, as they are designated by special use permit.

There are 31 historic properties located within the 150 foot wide AIP transmission line right-of-way on Forest Service-administrated lands. Cross-country travel is proposed for the entire right-of-way. However, non-travel areas have been identified, as have any cross-country travel-historic property conflicts. Any affects related to cross-country travel are included in this assessment. The Historic Properties Treatment Plan (HPTP) will address any sites that may be affected by this action.

A total of 16 sites , require avoidance and monitoring,, while 13 would not require monitoring. A total of two NRHP-eligible sites would be adversely affected by the Proposed Action and are recommended for data recovery (Table 4-14).

Table 4-14. Gila National Forest NRHP-eligible Site Summary and Recommendations*				
NRHP-eligible Resource Types	**Recommend Avoidance/No Monitoring**	**Recommend Avoidance with Monitoring**	**Recommend Data Recovery**	**Quantity**
Prehistoric				
Habitation	6	5	1	12
Prehistoric features and artifacts	2	4	-	6
Prehistoric artifacts	3	5	-	8
Subtotal	**11**	**14**	**1**	**26**
Historic				
Roads	2	-	-	2
Subtotal	**2**	**-**	**-**	**2**
Multicomponent				
Prehistoric artifacts; Historic ranch	-	-	1	1
Prehistoric artifacts; Historic trash scatter	-	2	-	2
Subtotal	**-**	**2**	**1**	**3**
Grand Total	**13**	**16**	**2**	**31**
***Recommendations of NRHP eligibility to be followed by agency determinations. Eligibility could change pending consultation.**				

4.11.1.3. NMSLO and Private Land

Impacts to historic properties located on lands under the jurisdiction of the NMSLO, including private lands, would be similar to those described above for all jurisdictions. A total of two sites have been recommended for flagging and avoidance requiring the presence of a monitor, while 17 would not require monitoring. A total of 10 NRHP-eligible sites are recommended for data recovery (Table 4-15).

Table 4-15. NMSLO/Private NRHP-eligible Site Summary and Recommendations*				
NRHP-eligible Resource Types	**Recommend Avoidance/No Monitoring**	**Recommend Avoidance with Monitoring**	**Recommend Data Recovery**	**Quantity**
Prehistoric				
Habitation	4	1	3	8
Prehistoric features and artifacts	4	-	1	5
Prehistoric artifacts	2	1	3	5
Subtotal	**10**	**2**	**7**	**18**
Historic				
Homestead	2	-	1	3
Historic features and trash	-	-	1	1
Canal/ditch	1	-	-	1

Table 4-15. NMSLO/Private NRHP-eligible Site Summary and Recommendations*				
NRHP-eligible Resource Types	**Recommend Avoidance/No Monitoring**	**Recommend Avoidance with Monitoring**	**Recommend Data Recovery**	**Quantity**
Roads	2	-	-	2
Subtotal	**5**	**-**	**2**	**7**
Multicomponent				
Prehistoric habitation and petroglyphs; Historic features and trash	-	-	1	1
Prehistoric artifacts; Historic ranch	1	-	-	1
Prehistoric artifacts; Historic trash	1	-	-	1
Subtotal	**2**	**-**	**1**	**3**
Grand Total	**17**	**2**	**10**	**28**
***Recommendations of NRHP eligibility to be followed by agency determinations. Eligibility could change pending consultation.**				

4.11.1.4. No Action Alternative

Under the No Action alternative, the right-of-way application would not be approved and EPE's objectives for this Project would not be met. Maintenance activities on the existing 345kV transmission line would continue to be done under the existing conditions, requiring specific and individual access requests when issues arise. Impacts to cultural resources under the No Action alternative would be similar to the Proposed Action.

4.11.2. Cumulative Impacts

Cumulative impacts to cultural resources could occur through the development of reasonably foreseeable future projects, such as mineral exploration, energy development including renewable resources and oil and gas exploration, and the resulting increased access to the land. Improvements to existing access could result in more visitations to areas within and in the vicinity of the study area, potentially increasing the likelihood of vandalism or unintentional damage to sites from off-highway vehicles. Over time, continued visitation in this area could contribute to greater use of the land within the Project area, which could result in the incremental loss of cultural artifacts, features, and sites that could yield important information about the past. Gating of access and officially designated roads would aid in the reduction of anticipated visitation. Additionally, future actions undertaken by, or on lands managed by, federal agencies would help reduce the potential of effects to cultural resource sites. Specifically, future projects in the area would likely initiate the Section 106 process, requiring the identification of historic properties (i.e., records reviews and pedestrian surveys), as well as the assessment of, and resolution for, adverse effects (e.g., programmatic agreements/memoranda of agreements) to said properties.

4.12. Air Quality and Climate Change

4.12.1. Environmental Consequences

Effects to air quality that could result from the Proposed Action and activities as described in Sections 2.1 and 2.5 would be similar in all areas crossed by the Project. Emissions of air pollutants as well as an increase in levels of particulate matter (PM-10) could occur as a result of the routine inspection and maintenance, access improvements and emergency activities associated with the existing transmission line facilities. Increases in particulate matter would be generated by vehicular travel on roaded and unroaded surfaces producing dust, emissions from vehicles, and construction and maintenance activities.

Emission of air pollutants and increased PM-10 resulting from project improvements of the Proposed Action would be confined to daytime hours and occur only intermittently as needed for maintenance (except under emergency circumstances that require activities to take place to ensure quality, safety, and reliability of transmission). The nearest Class I airshed is approximately 13 miles away from the nearest Project component, and is not anticipated to be affected by Project activities. The Project crosses Class II airsheds, and due to small maintenance crew sizes required for proposed Project improvement activities (see Section 2.5.4) and proposed Project improvements and activities occurring intermittently, small localized short-term increases in emissions of air pollutants or PM-10 would be negligible.

Routine patrols of existing facilities occur once in the spring and once in the fall of each year. During routine patrols, emissions would be limited primarily to vehicular use for routine maintenance and emergency repair activities. The sources would be similar to those from improvement activities, but pollutants would be emitted in much smaller amounts on an annual basis; therefore, the majority of emissions and impacts would be associated with improvement activities.

Proposed Project improvement activities and maintenance may also occur during unforeseen emergency situations (e.g., longer portions of transmission line structures damaged by extreme weather conditions) when the safety and reliability of the line is compromised and repairs are immediate. Emergency situations could require larger crews and maintenance activities to be more concentrated in localized areas, which may result temporarily in greater localized increases in emission of air pollutants and particulate matter; however, these increases are still anticipated to be negligible and short in duration.

4.12.1.1. BLM

Air Quality

Impacts to air quality would be associated with emissions of air pollutants as well as an increase in levels of particulate matter (PM-10) resulting from the routine inspection and maintenance, access improvements and emergency activities associated with the existing transmission line facilities. On BLM lands, these impacts are associated with BLM primitive and Resource Roads. As described in Section 2.5.2, improvements for Primitive Roads could include minor earthwork, such as smoothing rough patches or reduction of ruts or holes, and removal of above-grade irregularities such as boulders or earthen berms. Improvements for Resource Roads could include any improvements associated with Cross-country Travel or Primitive Roads, as well as ground disturbing actions such as blading or grading up to 14-foot travelways.

Continental Divide National Scenic Trail Avoidance Alternatives

Alternative 1

The selection of Alternative 1, in conjunction with the proposed action would likely not increase emissions of pollutants and PM 10 in the localized area near structures 787–794 beyond the impacts described above for the Proposed Action. Alternative 1 proposes access through a 1.62 miles long non-constructed Primitive Road across BLM land to the existing transmission right-of-way. Furthermore, design measures of overland drive and crush would be applied that would result in no ground disturbance associated with access road improvements.

Alternative 2

The selection of Alternative 2 in conjunction with the proposed action could increase emissions of pollutants and PM 10 in the localized area near structures 787–794 due to the construction of access to the right-of-way. Alternative 2 proposes access through a 2.8 mile-long Resource Road across BLM and State land to the existing transmission right-of-way. Improvements associated with the Resource Road will result in an increase in emissions of pollutants including PM 10 when compared to Alternative 1.

Climate Change

An increase of greenhouse gas emissions would exacerbate the effects of climate change; however, the increase of PM-10 emissions during improvement activities as described in Section 2.5 would be temporary and are not expected to impact climatic conditions in the study area. It is further expected that there would be no significant contribution to climate change in this region as a result of Project activities.

4.12.1.2. Forest Service

No roads would be constructed on Forest Service lands within the Gila National Forest. As described in Section 2.5.2, access to the existing transmission line facilities would be through existing Forest Roads. Cross-country Travel is unrestricted travel, and would be utilized within the existing 150-foot wide AIP transmission line right-of-way, where the right-of-way crosses Forest Service administered lands.

Specific improvements for Cross-country Travel could consist of removal of obstacles, including vegetation, boulders, or earthen berms, and minor earthwork, such as smoothing rough patches or reduction of ruts or holes, to provide suitable access for equipment to structure work areas. Removal of vegetation would use above-ground cutting methods that leave the root crown intact. Woody vegetation would be cropped to 6" or less. Due to small maintenance crew sizes required for proposed Project improvement activities (see Section 2.5.4), and proposed Project improvements and activities occurring intermittently on an as needed basis, small localized short term increases in emissions of air pollutants or PM-10 would be negligible.

Climate Change

An increase of greenhouse gas emissions would exacerbate the effects of climate change; however, the increase of PM-10 emissions during improvement activities as described in Section 2.5 would be

temporary and are not expected to impact climatic conditions in the study area. It is further expected that there would be no significant contribution to climate change in this region as a result of Project activities.

4.12.1.3. No Action Alternative

Under the No Action alternative, the right-of-way application would not be authorized. Maintenance activities on the existing 345kV transmission line would continue to be done under the existing conditions, requiring specific and individual access requests when issues arise. The potential impacts to air quality and climate change would be similar to the Proposed Action.

4.12.2. Cumulative Impacts

Cumulative impacts to air quality that could result from incremental contributions from the proposed Project in conjunction with past, present, and reasonably foreseeable future projects or activities would be regional in effect and similar in all areas crossed by the Project, as described below.

Air Quality and Climate Change

The Project could contribute incremental air quality and climate impacts to past, present, and reasonably foreseeable future actions. However, these cumulative effects would not appreciably increase the baseline emission of pollutants including PM-10 in the area.

Potential increases of emissions including PM-10 during improvement activities and maintenance phases of the Project would be temporary and are not expected to pose a threat to the climatic conditions of the surrounding region when considered in conjunction with any reasonably foreseeable future actions. Therefore, it is expected that there would be no incremental contribution to the cumulative baseline conditions of climate change within the region as a result of proposed Project activities.

4.13. Livestock Grazing

4.13.1. Environmental Consequences

Direct adverse impacts to livestock grazing is associated with the Proposed Action common to all land jurisdictions that could include potential temporary interruption of access to facilities associated with ranching and range improvements. These impacts would be short term and limited to localized construction activities associated with improvements to access roads and transmission structure work areas, and are therefore anticipated to be minimal.

Access improvements or maintenance activities may cause short-term reduction in vegetation from ground disturbing activities, but may be minimal due to implementation of design features. The extent of this effect will be dependent upon the number, location, and type of maintenance activities occurring within the maintenance corridor. In addition, any range improvements impacted by activities would be minimized with implementation of design features.

4.13.1.1. BLM

Impacts to livestock grazing or ranching operations on BLM lands would be similar to those common to all land jurisdictions described above.

Continental Divide National Scenic Trail Avoidance Alternatives

Alternative 1

The selection of Alternative 1 would result in impacts to livestock grazing or ranching operations on BLM lands that would be similar to those common to all land jurisdictions described above.

Alternative 2

The selection of Alternative 2 would result in impacts to livestock grazing or ranching operations on BLM lands that would be similar to those common to all land jurisdictions described above.

4.13.1.2. Forest Service

Impacts to livestock grazing or ranching operations on Forest Service lands would be similar to those common to all land jurisdictions described above.

4.13.1.3. No Action Alternative

Similar to the proposed action, impacts to Livestock Grazing are expected to be minimal. Under the No Action alternative, the right-of-way application would not be authorized and would not meet El Paso Electric's objectives for this project. Maintenance activities on the existing 345kV transmission line would continue to be done under the existing conditions, requiring specific and individual access requests when issues arise.

4.13.2. Cumulative Impacts

Cumulative impacts to livestock grazing operations could occur through changes in the designation and development of land resources and access to the land. Over time, continued development of rural land and undeveloped land within the study area would incrementally contribute to loss of available land for livestock grazing; however, the improvement of access along the existing AIP transmission line is expected to contribute minimally to cumulative impacts to livestock grazing operations.

CHAPTER 5. INDIVIDUALS, ORGANIZATIONS, TRIBES, OR AGENCIES CONSULTED

5.1. Agency Coordination

Monthly Project conference calls were initiated in November 2013, and included agency staff from the BLM Socorro FO and the BLM Las Cruces DO, Forest Service, EPE, and third-party contractors tasked with the preparation of the EA. These meetings were used to update agency staff on the progress of the Project and to assist in the identification of resource-specific issues.

5.2. Stakeholder and Public Involvement

The public had the opportunity to contact the Las Cruces DO and provide input on this Project. The Project was listed on the New Mexico BLM Website NEPA Log: http://www.blm.gov/nm/st/en/prog/planning/nepa_logs.html.

Additionally, a 30-day scoping period was initiated on March 4, 2014, and ended on April 15, 2014. Mailing lists of land owners within the study area were compiled from contact lists provided by BLM Socorro FO, BLM Las Cruces DO, and the Forest Service. A scoping packet (see Appendix A, Scoping Summary Report), which included the scoping letter, map of the proposed Project, and a self-addressed postage-paid comment form, were direct mailed to a total of 428 private land owners, local and county governments, and New Mexico State Agencies that included the NMSLO and NMDGF.

5.2.1. Issues Identified during the Scoping Process

The following issues were raised during the public comment period, and have been summarized in Table 5-1, which includes a brief response and the section of the EA where a more in-depth discussion of the issue can be found.

Table 5-1. Summary of Issues Raised during Scoping

Issue	Resolution	Section of the EA*
Permanent Access/Private Property	Permanent access refers to the ability of EPE to access transmission line components and structures for replacement or maintenance on an as needed basis to ensure the safe, reliable, transmission of electricity. No private property will be accessed without permission of the land owner.	2.1.1. Permanent Access to Project Facilities 2.5.1. Expected Operations and Maintenance Activities 2.5.2. Access Roads 2.5.7. Design Features; No.1,and 6
100x100ft work areas	Clearing of pads would occur on an as needed basis, and is not intended to be completed across the project as a single action. Note: In areas where steep slopes (>8%) pose a threat to maintenance feasibility and worker safety, pad size may be increased (up to the entire width of the right-of-way; 150ft x150ft).	2.1.2. Work Areas at Transmission Structures 2.5.3. Structure Work Areas 2.5.7. Design Features; No.1,and 6

Table 5-1. Summary of Issues Raised during Scoping		
Issue	**Resolution**	**Section of the EA***
Grazing Lands	EPE intends to use former AIP construction access roads to create passable routes that allow EPE's vehicles access to AIP transmission facilities for maintenance and operational activities.	2.5.2. Access Roads 2.5.7. Design Features; No.8, 12 3.7.2. Affected Environment; Livestock Grazing
Soil Erosion	Soils have been evaluated and are considered for both wind and water erosion (Section 3.2.2). Design features will be implemented to minimize water erosion. In areas with more susceptible soils, water bars would be placed along access roads or routes and maintenance use areas. They should approximate the contour of the slope. Runoff would be diverted to vegetated or rocky areas to dissipate the erosive forces of the concentrated flows.	2.5.7. Design Features; No.4, 5, 10, 26 3.2.2. Affected Environment; Soil Resources
Reseeding/Revegetation	Native vegetation that does not pose a hazard to the transmission line, vehicle access, or maintenance activities would be retained for resource values. Native grass cover would be maintained to the extent possible during ground disturbing activities. Soil disturbance will be minimized by limiting the extent of the area traveled by vehicles and by avoiding areas with wet soils. Native species would be planted to stabilize erodible soils where needed.	2.5.7. Design Features; No.5, 26
Noxious Weeds	EPE will train personnel to identify noxious weeds and prevent spread. Training will discuss known noxious weed species, known locations, identification methods, and treatment protocols. EPE will monitor for noxious weeds during routine patrol and maintenance activities. Any findings will be reported to the Forest Service or BLM.	2.5.7. Design Features; No.26, 27, 28, 29

Table 5-1. Summary of Issues Raised during Scoping		
Issue	**Resolution**	**Section of the EA***
Nutt Grasslands	Native grass cover would be maintained to the extent possible during ground disturbing activities. Native species would be planted to stabilize erodible soils where needed. Project activities within the Nutt Grasslands would comply with the Carson Foley Act, and EO 13112 as described in Section 1.5.1.	Section 2.1.1. Permanent Access to Project Facilities Section 2.1.2. Work Areas at Transmission Structures 2.5. Project Improvements and Activities 2.5.7. Design Features; No.26, 27 1.5.1. Applicable Laws and Executive Orders
Discovery of Cultural Sites	In compliance with the NHPA Section 106, EPG archaeologists conducted a cultural resources study consisting of a detailed Class I records review, as well as an intensive Class III pedestrian survey in support of the NEPA analysis and the BLM's and Forest Service's compliance with the NHPA. If unknown cultural resources are discovered, activities would cease at that location and the Forest Service or BLM Archaeologist would be notified.	3.11 and 4.11 Cultural Resources and Tribal Concerns 2.5.7. Design Features; No.9, 19, 20, 21, 22
Habitat Fragmentation	Project improvements are proposed that use previously disturbed areas, and utilize design features to minimize impacts to vegetation.	2.5.7. Design Features; No.16, 17, 18, Avoidance
Air Quality	Fugitive dust would occur during project activities; improvements to access roads, structure repair/replacement, operation and intermittent maintenance. All activities would be performed on an as needed basis during temporary timeframes, not as a single action.	2.5.7. Design Features; No.11 3.12 and 4.12 Air Quality and Climate
*Design features included but not limited to.		

5.3. Tribes

In October 2013, the BLM contacted the following federally recognized tribes to notify them of the Project, initiated formal consultation, and invited them to participate as cooperating agencies in preparation of the EA.

- Hopi Tribe
- San Carlos Apache Tribe
- White Mountain Apache
- Comanche Indian Tribe

- Fort Sill Apache Tribe of Oklahoma
- Kiowa Tribe of Oklahoma
- Ysleta del Sur Pueblo
- Mescalero Apache Tribe
- Pueblo of Isleta
- Navajo Nation (including Alamo and Ramah Chapters)
- Pueblo of Acoma
- Pueblo of Laguna
- Zuni Pueblo

As expressed in a consultation letter dated November 12, 2013, the Hopi Tribe claims cultural affiliation to prehistoric cultural groups in New Mexico. The Hopi Cultural Preservation Office (HCPO) supports the identification and avoidance of prehistoric archaeological sites, and considers the prehistoric archaeological sites to be Traditional Cultural Properties. Moreover, the HCPO is interested in consulting on any proposal that has the potential to adversely affect Ancestral Puebloan prehistoric sites in the project area. If prehistoric sites are identified that may be adversely affected by project activities, the Hopi Tribe requests continuing consultation.

As expressed in a consultation letter dated November 21, 2013, the Navajo Nation Historic Preservation Department-Traditional Cultural Program (NNHPD-TCP) concludes that the proposed undertaking will not impact Navajo traditional cultural resources. However, the NNHPD-TCP remains concerned about the potential for inadvertent discoveries of Navajo-affiliated cultural sites (e.g., habitations, plant gathering areas, human remains, and objects of cultural patrimony), and expresses a desire to engage in consultation regarding cultural resources.

5.4. List of Preparers

Table 5-2. BLM AIP EA Interdisciplinary Team

Name	Title
New Mexico State Office	
Jane Childress	Archaeologist, Member of the National Transmission Support Team
Las Cruces DO	
Corey Durr	Hydrologist
David Legare	Archaeologist
Frances Martinez	Lands and Realty
Jennifer Montoya	Planning and Environmental Specialist
Lizeth Ochoa	Associate NRS
Thomas Phillips	Supervisory Recreation & Cultural Resource Specialist
Philip Smith	Rangeland Management Specialist
Steven Torrez	Wildlife Biologist
Socorro FO	
Virginia Alguire	Lands and Realty
Denny Apachito	Wildlife Biologist
Kevin Carson	Recreation Planner
Nathan Combs	Range Specialist
Carlos Coontz	Planning and Environmental Specialist
Brenda Wilkinson	Archaeologist

Table 5-2. BLM AIP EA Interdisciplinary Team	
Name	**Title**
Carlos Madril	Wildlife Management Biologist
Management Oversight	
Mark Matthews	Field Manager
Forest Service	
Erin Knolles	Asst. Forest Archeologist
Lisa Mizuno	Environmental Coordinator
Wendy Sutton	Archeologist
John Baumberger	Lands and Minerals Specialist
Jerry Monzingo	Wildlife Biologist
EPE	
Jessica Christianson	Environmental Manager
Kenton Martin	Environmental Scientist
David Gamon	Transmission Engineer
Martha Velasco	Operations Permitting

Table 5-3. Consultant Preparers and Contributors		
Name	**Education**	**Involvement**
EPG		
Jennifer Burns	BA, English	Technical Editor
Newton DeBardeleben	BS, Environmental Science	Project Advisor
Anthony DeLuca	MUEP, Urban and Environmental Planning BS, Geography/Urban Studies	Project Coordinator
Caree Griffin	AAS, Drafting	Graphics, Visual Simulations
David Kahrs	MS, Wildlife Conservation and Management BA, Biology	Wildlife Biology and Vegetation Resources
Don Kelly	MUEP, Urban and Environmental Planning BA, Anthropology BA, Philosophy	Project Manager
Conrad Langley	MLA, Landscape Architecture	Visual Resources
Cara Lonardo	BA, Archeology	Cultural and Historical Resources
Tyffany Nidey	BS, Applied Biological Sciences	Wildlife Biology and Vegetation Resources
Michael Pasenko	MS, Paleontology BA, Anthropology	Earth and Paleontological Resources
Devin Petry	BA, Geography	Land Use, Special Designations, Recreation Resources
Christopher E. Rayle	MA, Anthropology BA, Anthropology	Cultural and Historical Resources
Daren Riedle	PhD, Wildlife and Fisheries Science MS, Zoology BS, Biology	Wildlife Biology and Vegetation Resources

Table 5-3. Consultant Preparers and Contributors		
Name	**Education**	**Involvement**
Marc Schwartz	MLA, Landscape Architecture (pending) BS, Forestry	Visual Resources
Mike Skoko	BS, Geography	Geographical Information Systems
Dustin Sunderman	BA, Anthropology	Cultural and Historical Resources
Steve Swanson	PhD, Anthropology MA, Anthropology BA, Anthropology	Cultural and Historical Resources
Victor Vizcaino	MS, Community Resources and Development BS, Parks and Recreation Management Certificate, Geographic Information Systems	Geographical Information Systems

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Appendix A Scoping Summary Report

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Appendix B Resource Data

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Appendix C Biological Evaluation

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Appendix D Maps

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