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Kit Carson Electric Cooperative Fiber-to-the-Home Project

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BLM

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TABLE OF CONTENTS

1.0	Purpose and Need for Action	1
1.1	Background	1
1.2	Purpose and Need for Action	2
1.3	Conformance with Applicable Land Use Plan(s).....	2
1.4	Relationship to Statutes, Regulations or Other Plans.....	2
1.5	Scoping, Public Involvement, and Issues	5
1.5.1	Air Resources.....	5
1.5.2	Water Resources.....	5
1.5.3	Biological Resources.....	5
1.5.4	Cultural Resources.....	5
1.5.5	Lands with Wilderness Characteristics	5
1.5.6	Other Special Designations.....	5
1.5.7	Visual Resources	6
2	Proposed Action and Alternative(s).....	7
2.1	Proposed Action.....	7
2.1.1	Fiber Installation	7
2.1.2	Reconductoring (El Rito Line Only).....	9
2.1.3	Future Maintenance	9
2.1.4	Design Features	9
2.2	No Action.....	11
3	Affected Environment and Environmental Consequences.....	12
3.1	Air Resources.....	12
3.1.1	Affected Environment.....	12
3.1.2	Impacts from the Proposed Action	12
3.2	Water Resources	13
3.2.1	Affected Environment.....	13
3.2.2	Impacts from the Proposed Action	13
3.3	Biological Resources.....	13
3.3.1	Affected Environment.....	14
3.3.2	Impacts from the Proposed Action	17
3.4	Cultural Resources.....	20
3.4.1	Affected Environment.....	21
3.4.2	Impacts from the Proposed Action	21
3.5	Lands with Wilderness Characteristics	21
3.5.1	Affected Environment.....	21
3.5.2	Impacts from the Proposed Action	22
3.6	Other Special Designations.....	22
3.6.1	Affected Environment.....	23
3.6.2	Impacts from the Proposed Action	25
3.7	Visual Resources	27
3.7.1	Affected Environment.....	27
3.7.2	Impacts from the Proposed Action	28
4	Supporting Information	29
4.1	Tribes, Individuals, Organizations, or Agencies Consulted	29
4.2	List of Preparers.....	29
5	References	30

List of Figures

Figure 1. Northern project area overview.....	3
Figure 2. Southern project area overview.....	4

List of Tables

Table 1. Project Lines on BLM Land.....	7
Table 2. BLM-listed Sensitive Species with Potential to be Found in the Project Area.....	14
Table 3. Bird Conservation Region 16 List (2008).....	15
Table 4. Weed Species in the Project Area.....	17
Table 5. Summary of BLM-listed Special Status Species Impacts.....	18
Table 6. Special Designations in the Proposed Action Area.....	23
Table 7. BLM VRM Classifications for the Vicinity of the Project Lines.....	28

List of Appendices

Appendix A. TRS Line Locations	A.1
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1.0 PURPOSE AND NEED FOR ACTION

1.1 Background

Kit Carson Electric Cooperative (KCEC) received an award through the U.S. Department of Agriculture (USDA) Rural Utility Service's (RUS) Broadband Investment Program (BIP) to provide funding assistance for the construction of a new fiber-to-the-home (FTTH) network to augment and support telecommunications services within their service territory. FTTH networks allow end users to connect to main fiber-optic routes directly and are much faster than copper-based networks. The new KCEC FTTH network will be capable of meeting and exceeding the Federal Communications Commission's (FCC) goal of delivering affordable high-speed broadband service in excess of 100 mbps to residential consumers and 1 gbps to anchor institutions such as educational and medical facilities and government and public safety agencies. The new network will also allow KCEC to initiate a "smart" grid for their electrical system using "smart" electrical meters that will be installed using funds provided by a separate electrical program. Once initiated, the "smart" grid will allow KCEC to detect power outages and faults in real-time and will also provide the ability for remote meter reading.

KCEC is headquartered in Taos, New Mexico, and was organized and incorporated in 1944 to provide electric utility service to rural areas in Taos, Colfax, and Rio Arriba Counties in north-central New Mexico. KCEC provides electric service by means of their existing distribution system, which is located within existing road rights-of-way (ROWs) and easements across private, public, and Tribal lands, including land administered by the Bureau of Land Management (BLM) Taos Field Office (TFO) and the U.S. Forest Service (USFS) Carson National Forest (CNF).

Approximately 1,650 km (1,025 miles) of aerial fiber-optic cable and 909 km (565 miles) of buried fiber-optic cable are to be installed, along with approximately 821 km (510 miles) of final customer connections, or fiber drops, which will complete the system. Of these totals, approximately 98.6 km (61.3 miles) of the fiber installations would occur on BLM-administered land (Figures 1 and 2). Although environmental reviews have been completed and authorizations granted by the other agencies (RUS, USFS, and Bureau of Indian Affairs), the BLM must also complete its environmental review process in compliance with the National Environmental Policy Act (NEPA).

During the permitting process initiated with the BLM for fiber-optic line installations on TFO lands as part of the FTTH network, KCEC was informed that approximately 14.9 km (9.3 miles) of their existing lines on BLM land were installed outside of designated ROWs and were therefore in trespass. (This length of lines in trespass differs slightly from the 20.6 km [12.8 miles] mentioned in the Biological Survey Report [BSR] and cultural resource reports for the project because further review of permit documentation in February of 2014 indicated that additional line segments were actually within permitted ROWs.) The locations and total length of the lines in trespass was determined using a three-step geographic information systems (GIS) process. First, the permitted areas were digitized based on legal descriptions provided by BLM TFO serial registers. Second, an intersection analysis was run between the serial register dataset and KCEC's line dataset. Third, any resulting line segments outside the permitted areas were determined to be in trespass.

Because the normal permitting process was not implemented for the portions of the KCEC lines in trespass, and the BLM considers these portions of the system as requiring new ROWs, environmental and cultural resource compliance must be demonstrated prior to any fiber-optic installations or future maintenance of the lines. Subsequently, KCEC requested that Tierra personnel perform surveys of these lines and develop this Environmental Assessment (EA) in addition to a BSR and cultural resource reports.

The scope of the analysis presented in this EA includes all KCEC project lines occurring on BLM land that have at least one line segment in trespass. Approximately 12.7 km (7.9 miles) of fiber line were previously approved by the BLM under categorical exclusions because they are independent lines within existing ROWs. Therefore, of the total 98.6 km (61.3 miles) of lines originally proposed to be installed on BLM

lands, the remaining approximately 85.9 km (53.4 miles) are included in the Proposed Action considered in this EA (See Section 2.1 below.)

1.2 Purpose and Need for Action

The purposes of BLM action are to provide KCEC with legal use and access for existing facilities across public land managed by the BLM TFO and to accommodate the new fiber-optic infrastructure under right-of-way (ROW) grants. The need for BLM action is established by the BLM's responsibility under the Federal Land Policy and Management Act (FLPMA) of 1976 to respond to requests for ROW grants across BLM lands in compliance with the provisions of the applicable land use plan.

1.3 Conformance with Applicable Land Use Plan(s)

The Proposed Action is in conformance with the Taos Resource Management Plan (RMP), which was approved in May of 2012 (BLM 2012). Management goals identified under Section 2.2.3 of the RMP include the establishment of an efficient utility corridor system that will meet the telecommunications needs of the public with a minimum of adverse impacts to visual, biological, cultural, and physical resources. In addition, none of the proposed ROW alignments would occur in areas excluded for such use by the Taos RMP.

1.4 Relationship to Statutes, Regulations or Other Plans

The Proposed Action is subject to the NEPA of 1969; the Clean Water Act (CWA) 33 USC sec. 1251, et. seq., and 33 USC sec. 404; the Clean Air Act (CAA) Title 40 Code of Federal Regulations (CFR) parts 50 and 51; the Endangered Species Act (ESA) of 1973 16 USC sec. 1531, et. seq., as amended; the Archaeological Resources Protection Act (ARPA) of 1979 16 USC 470aa-mm, as amended; and the National Historic Preservation Act (NHPA) of 1966 16 USC sec. 470. The Proposed Action is also subject to the FLPMA of 1976. The proposal is consistent with these laws.

In addition, this analysis must demonstrate the consistency of this project with the terms of the Presidential Proclamation that established the Rio Grande del Norte National Monument on March 25, 2013.

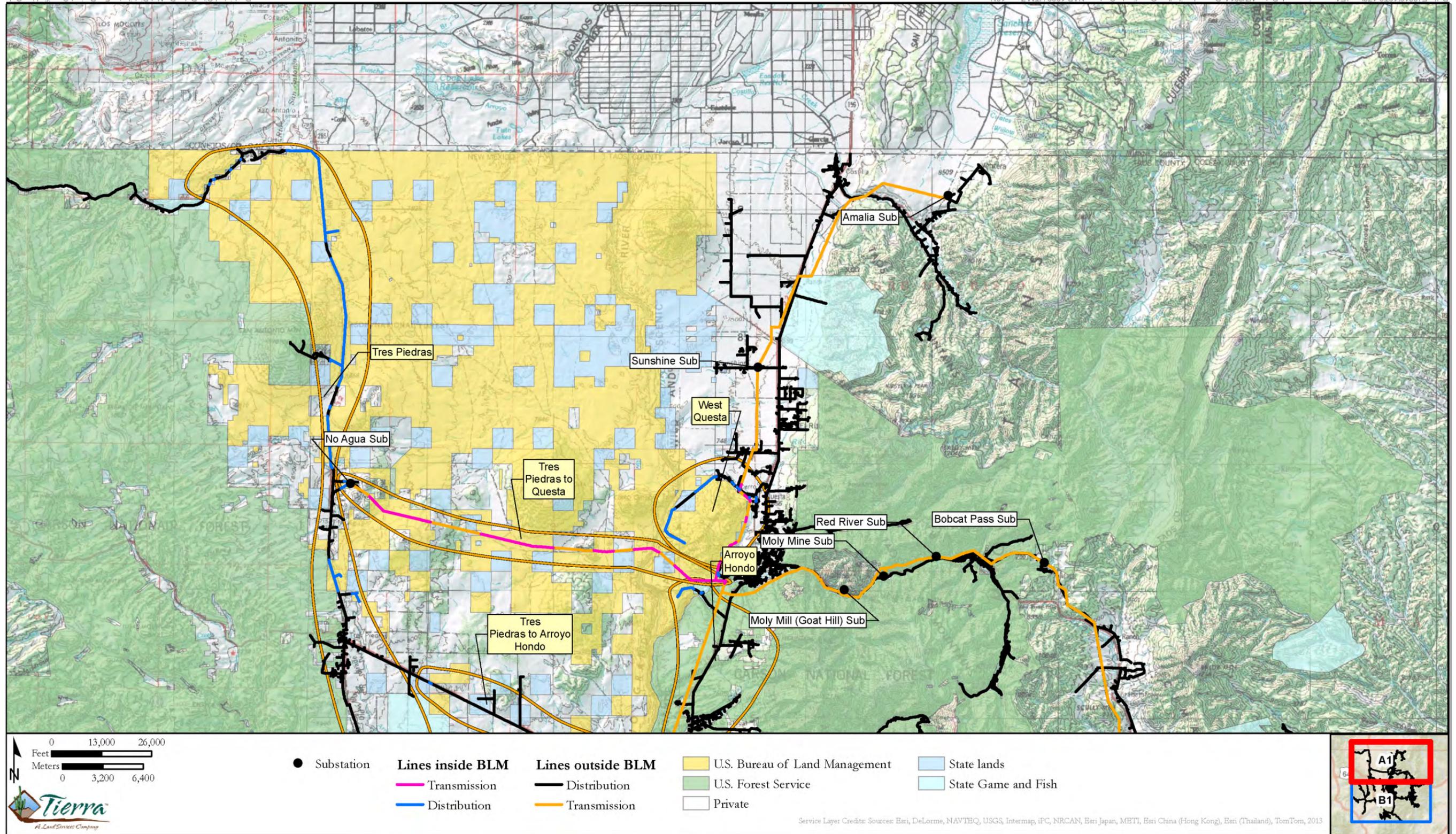


Figure 1. Northern project area overview.

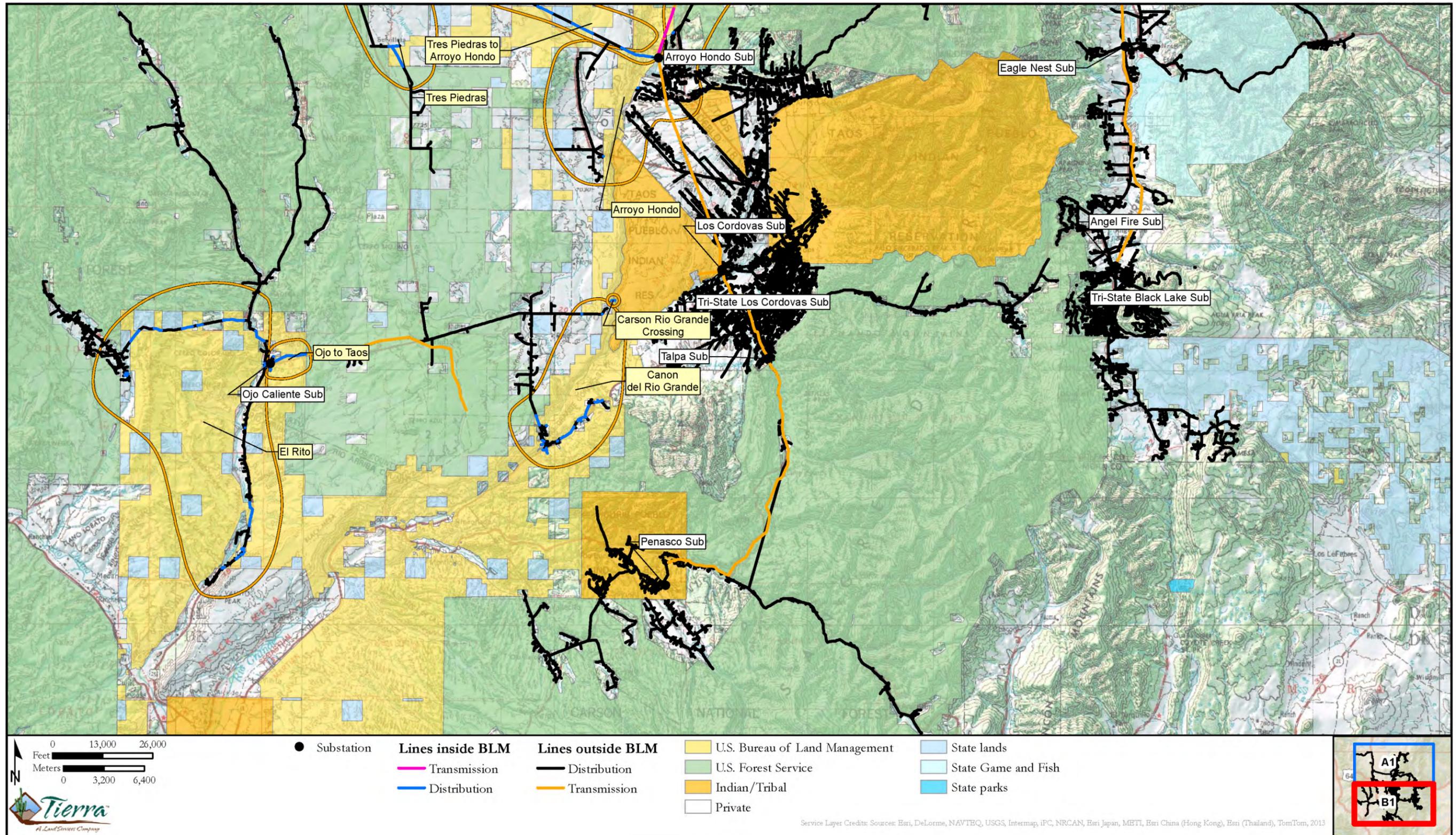


Figure 2. Southern project area overview.

1.5 Scoping, Public Involvement, and Issues

Scoping is a public process designed to determine the scope of issues surrounding a project and develop alternatives to be addressed in a NEPA document. Scoping helps ensure that potentially significant issues are identified early and that they are properly studied, that issues of no concern do not consume time and effort, and that the proposed action and alternatives are adequately considered and evaluated.

Public involvement is a vital component of NEPA and Council on Environmental Quality regulations. In addition to facilitating the dissemination of information, effective public involvement vests the public in the decision-making process and provides a means for full environmental disclosure. Guidance for implementing public involvement is codified in 40 CFR 1506.6, thereby ensuring that Federal agencies make a diligent effort to involve the public in preparing NEPA documents.

Internal scoping for the proposed project was performed by the BLM TFO Interdisciplinary Team (IDT) on April 7, 2014, and during subsequent IDT meetings. Also, in January 2015, this project was listed on BLM TFO's online NEPA log to disclose to the public that this action is under consideration by the BLM and that an environmental review—the preparation of this EA—is underway. The following issues were identified by the IDT:

1.5.1 Air Resources

- How would fugitive dust and equipment exhaust produced during the implementation of the proposed action affect air quality in the vicinity of the project area?

1.5.2 Water Resources

- Would the proposed action affect surface waters?

1.5.3 Biological Resources

- Would the proposed action affect BLM-listed Sensitive species?
- Would the proposed action affect migratory birds, including Mountain Plover (*Charadrius montanus*)?
- Would the proposed action affect wintering habitat and migration corridors utilized by big-game species?
- Would the proposed action affect raptor species, including those known to nest in the Rio Grande Gorge?
- Following the implementation of the proposed action, would the risk of noxious and invasive species establishing along the project corridors increase?

1.5.4 Cultural Resources

- How might the proposed action affect cultural resources present in the project area?

1.5.5 Lands with Wilderness Characteristics

- Would the proposed action alter the size criteria of lands inventoried by the BLM with wilderness characteristics?
- How might the proposed action affect the natural qualities of lands with wilderness characteristics and their ability to provide outstanding opportunities for solitude and primitive and unconfined recreation?

1.5.6 Other Special Designations

1.5.6.1 Rio Grande del Norte National Monument

The presidential proclamation that designated the Rio Grande del Norte National Monument (the Monument) specifically identified cultural and historic resources, ecological diversity, geologic resources, and wildlife resources as objects and values to be protected and enhanced. The IDT identified no issues

with the Proposed Action as it relates to geologic resources on the Monument; however, the following issues were identified concerning the remaining Monument objects and values:

- How might the proposed action affect cultural and historic resources, and would it change the cultural landscape?
- How might the proposed action affect ecological sites that contribute to the Monument's ecological diversity?
- Does the proposed action have the potential to introduce or spread noxious and invasive species, and would this compromise the ecological integrity of the monument?
- How might the proposed action affect wildlife resources including special status species, migratory birds, raptor species, and wintering habitat and migration corridors utilized by big-game species?

1.5.6.2 Areas of Critical Environmental Concern (ACECs)

- How might the proposed action affect the relevant and important values within the Lower Gorge, Ojo Caliente, and Taos Plateau ACECs?

1.5.6.3 Wilderness Study Areas (WSAs)

- How might the proposed action affect the San Antonio WSA's natural qualities, scenic and riparian values, and ability to provide outstanding opportunities for solitude and primitive and unconfined recreation?

1.5.6.4 Wild and Scenic Rivers (WSRs)

- How might the proposed action affect the remarkable values of the Rio Grande and Red River WSRs?
- Would the proposed action be consistent with the WSR classification of the Rio Grande and Red River WSRs?

1.5.7 Visual Resources

- Would the proposed action be consistent with the BLM's visual resource management (VRM) prescriptions for the vicinity of the project area?

2 PROPOSED ACTION AND ALTERNATIVE(S)

2.1 Proposed Action

The Proposed Action is to issue ROWs for the KCEC project lines currently in trespass on BLM land and to accommodate approximately 85.9 km (53.4 miles) of new fiber-optic communications lines. More specifically, the new ROWs would authorize KCEC to perform 85,237 m (279,648 feet) of aerial installations and 658 m (2,159 feet) of buried installations, as well as an upgrade of the electrical conductors (or reconductoring) of a portion of the El Rito distribution line. Authorization would also allow for future maintenance activities on both the electrical and fiber-optic lines. The new ROWs would be located within Taos and eastern Rio Arriba Counties, New Mexico (see Figures 1 and 2), and implementation would commence in 2015.

A summary of the project lines assessed, arranged by line name, installation type, approximate length, and general location, can be found in Table 1, and the Township, Range, and Section (TRS) locations of all proposed installations on BLM land can be found in Appendix A.

Table 1. Project Lines on BLM Land

Line Name	Line Type	County	BLM Planning Unit	Installation Length*	Installation Type
Arroyo Hondo	distribution	Taos	Taos Plateau	1,724 m (5,656 feet)	aerial
				303 m (994 feet)	buried
	transmission			3,625 m (11,893 feet)	aerial
Canon del Rio Grande	distribution		Lower Gorge / Copperhill	5,866 m (19,245 feet)	aerial
				201 m (659 feet)	buried
El Rito	distribution		Rio Arriba, Taos	Ojo Caliente	9,540 m (31,299 feet)
Tres Piedras	distribution	Taos Plateau		143 m (469 feet)	buried
			33,388 m (109,540 feet)	aerial	
Tres Piedras to Questa	distribution	Taos	Taos Plateau	3 m (10 feet)	buried
				1,468 m (4,816 feet)	aerial
transmission	20,164 m (66,155 feet)			aerial	
West Questa	distribution			6,466 m (21,214 feet)	aerial
				9 m (30 feet)	buried
West Questa	transmission			2,996 m (9,829 feet)	aerial

*Individual line lengths indicated in Table 1 differ from those identified in the BSR and cultural resource reports because the line limits have been modified to better reflect the functional topology of the KCEC system. The overall length of the proposed installations on BLM land indicated in the cultural resource reports and the overall length indicated in this report differ only because of the addition of the 268-m-long (879-foot-long) Carson Rio Grande Crossing project segment, as indicated in Figure 2 above, and the omission of a 119-m-long (390-foot-long) buried segment on the Arroyo Hondo line from the revised BSR. The segment on the Arroyo Hondo line was left out of the revised BSR because at the time it appeared not to be located on BLM land. The segment is now considered to be on BLM land; therefore, it is included in this EA.

2.1.1 Fiber Installation

Fiber would be installed on electrical distribution lines and, in some cases, transmission lines within the existing KCEC electrical system using standard aerial and buried construction techniques.

Portions of several aerial project lines are located in remote areas that do not have existing access roads. Areas observed during Tierra's surveys that do not have existing access along the lines include line segments on the Canon del Rio Grande line, located in the Rio Grande Gorge near Pilar; line segments on the Tres Piedras line, located along the Rio de los Pinos; and a portion of the El Rito line, located along NM 554 west of NM 111. No new roads would be constructed to gain access to these line segments or any other segments that do not have existing access; instead, the fiber would be walked in by work crews and installed manually (see Section 2.1.4 below).

The estimated start date for the fiber-optic installations is in the third quarter of 2015; the installations would take approximately four months to complete.

2.1.1.1 Aerial

Approximately 99 percent of the proposed fiber-optic cable installations on BLM land covered in this EA will be installed aurally. Aerial fiber would be installed using equipment including utility bucket trucks, cable reel trailers, and cable lashers. First, a worker using a bucket truck would attach a 0.60-cm (0.25-inch) steel support wire along the electric line. Next, the fiber-optic cable would be anchored to one of the utility poles on the line and spooled out along the line from a reel trailer towed by either a second bucket truck or a crew pickup. As the fiber-optic cable is spooled out, it would be lashed to the previously installed support wire using a rotary lasher pulled by a crew member walking beneath the line. The rotary lasher is a manually operated machine that clamps around the support wire and fiber-optic cable. It contains a rotor that spins around the support wire and fiber-optic cable and lashes them together with a small diameter steel wire. At the end of each segment, a slack loop would be installed by doubling the line back on itself; this extra length of fiber-optic cable would allow for future repairs along the line, if necessary. The next length of fiber would then be connected to the first inside a weatherproof splice box, and the installation would continue down the line.

The aerial fiber installations would not involve ground disturbance and would be similar to the maintenance operations KCEC routinely performs on their electrical system, which are described below in Section 2.1.3.

2.1.1.2 Buried

Buried fiber-optic cable installation would account for approximately 1 percent of the proposed installations on BLM land covered in this EA. Unlike aerial fiber installations, buried fiber installation requires the use of a protective conduit, which is installed first. The buried conduit would be installed using either plowing or trenching construction techniques. The plowing construction technique, the preferred method to be used to the extent feasible, involves using a bulldozer equipped with a single ripper blade to install the conduit. As the bulldozer progresses, the conduit is fed into the resulting trench behind the ripper blade. The trench is then filled and compacted by a second tractor following the plow. The trenching construction technique involves using either a backhoe or trackhoe to excavate a trench for the conduit installation.

After the conduit is installed, fiber-optic cable is "blown" through the conduit using compressed air. The cable is then spliced to the next length of cable within a pedestal, which is an approximately 1-m-tall (3-foot-tall), 25-cm-square (10-inch-square) metal box. All buried installations would be marked with 10-cm-wide (4-inch-wide) fiberglass markers spaced at approximately 300-m (1,000-foot) intervals.

Ground disturbance associated with the buried portions of the proposed project would occur in a corridor with a nominal width of 2.4 m (8.0 feet), and the estimated total ground disturbance for the buried installations on BLM land would be approximately 0.16 ha (0.40 acres).

2.1.2 Reconductoring (El Rito Line Only)

In addition to the proposed fiber-optic installations on the El Rito project line, KCEC would replace the existing conductors on approximately 12.6 km (7.8 miles) of the line. Of this total, approximately 4.2 km (2.6 miles) of the line crosses BLM land in Section 1, Township 24 North, Range 7 East, and Sections 31, 33, and 35, Township 25 North, Range 8 East, New Mexico Principal Baseline and Meridian (NMPB&M) (see Figure 2).

The conductor replacement would be performed in compliance with requirements specified in the U.S. Fish and Wildlife Service (FWS) Avian Protection Plan Guidelines (FWS 2005), including the Avian Power Line Interaction Committee's *Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 2006* and *Mitigating Bird Collisions with Power Lines: The State of the Art in 2012*.

Reconductoring would begin with the removal of existing conductors. After the line is de-energized, workers would remove the hardware attaching the conductors to each pole using a bucket truck. In areas where access by vehicle is restricted, workers would climb each pole to remove the attaching hardware. Pulley blocks would be installed at each pole, and the existing conductors would be placed in the blocks. The new conductor, spooled on a reel carried by a reel trailer and set up on one end of the line, would then be attached to the old conductor and pulled through the blocks on the poles using a winch trailer, which would be set up on the opposite end of the line that is being reconducted. Once the new conductors are in place on the poles, workers would attach the conductors to the poles and remove the blocks.

As with the aerial fiber installations described in Section 2.1.1 above, the El Rito reconductoring would not involve ground disturbance.

The estimated start date for the El Rito reconductoring is in the third quarter of 2015, and it would take approximately four weeks to complete.

2.1.3 Future Maintenance

Normal maintenance operations of both the electrical and fiber-optic facilities would include work crews driving along the lines that have existing access roads during inspections and using bucket trucks to replace damaged line equipment. Future inspection and maintenance of lines located in areas without vehicular access would be performed by work crews walking the lines during inspections and performing maintenance activities manually.

2.1.4 Design Features

The following project design features have been developed to minimize or eliminate potential impacts to resources from the Proposed Action. These features would be included as stipulations or conditions of approval in the BLM ROW grant.

- Existing roads would be used to access the project lines for the fiber-optic installations, and no new roads may be constructed. If an area is inaccessible by vehicles, the new fiber-optic cable and all required equipment must be hand-carried to the installation location.
- Driving off-road in sagebrush and mixed sagebrush/pinyon-juniper vegetation communities would be precluded for the months of May through mid-July to protect ground nesting birds.
- Driving off-road during wet conditions would be precluded.
- All equipment would be inspected for the presence of noxious weeds and cleaned prior to entering public land. All equipment traveling in or out of weed-infested areas shall be cleaned after use on public land.
- A professional archaeologist listed on a BLM Cultural Resource Use Permit shall monitor all activities associated with the Proposed Action occurring on BLM land. The construction monitor would provide, at a minimum, bi-weekly monitoring updates to the BLM TFO archaeologist. In addition, all vehicular and heavy equipment traffic shall be restricted to existing corridors and two-track access roads. All archaeological features and artifact concentrations shall be avoided. If

necessary to avoid archaeological features, fiber-optic line shall be hand-carried through site boundaries during the installations. No grading by heavy equipment or vegetation removal may occur within site boundaries.

- All BLM lands will be subject to Class III survey prior to the initiation of the proposed action, including any areas where BLM ownership is currently in dispute. An addendum to the existing cultural resource document will be prepared and forwarded to the BLM and the State Historic Preservation Office (SHPO) for review prior to the initiation of any ground-disturbing activities in those areas. All previously recorded sites located on BLM land will have updated site forms completed. These updates may be completed concurrent with the cultural resource monitoring that is also stipulated for implementation of the proposed action.
- The plowing construction technique to bury a section of line will be employed to the extent feasible. If trenching is necessary, all topsoil will be removed and stored separately from subsoil materials.
- Soils will be returned to their respective positions in the pre-disturbance soil profile, thereby ensuring that topsoil is replaced at the soil surface and maintaining the seedbed. Recontoured surfaces will be stabilized and have adequate surface roughness to reduce surface run-off.
- Structural soil stabilization (e.g., weed-free wattles, etc) would be implemented in areas where slope or other factors indicate the potential for increased soil erosion.
- Following construction, all disturbed surfaces, including cut-and-fill slopes and drainage ditches along roads, will be seeded with a BLM-approved seed mix. On roads, topsoil will be spread where successful revegetation is likely (e.g., along appropriate cut and fill slopes or at the top edge of the borrow ditches) and where it will not be disturbed during regular road maintenance activities.
 - Seeding will occur between the beginning of October and the end of February (depending on location) or as otherwise approved by BLM. BLM will be contacted for site-specific seed mix recommendations. Only native species will be permitted unless a special circumstance is indicated and approved by BLM.
 - If the initial seeding effort is not successful, KCEC will be required to seed again, as approved by BLM.
- KCEC will monitor areas undergoing soil disturbance twice annually (once in June and again in August) to ensure that weed infestations do not establish in these areas for a period of at least 3 years following construction.
- If State of New Mexico-listed Class A, B, or C noxious weeds are found within the ROW, weed treatments would be conducted in an effective manner compatible with approved seed mixes. To reduce the need for repeated bare-ground herbicide treatments around facilities, alternative methods such as gravel, weed-barrier fabric, or low-growing, disturbance-tolerant herbaceous vegetation may be used as authorized for a specific site by the BLM.
 - If herbicide treatments are required, KCEC or their contractor must first obtain a Pesticide Use Permit from the BLM.
- Although none of the proposed buried project segments contain riparian habitat (Jordan 2013), several of the aerial project segments cross ephemeral drainages, and the Tres Piedras and West Questa project lines cross the perennial Rio de los Pinos and the Red River, respectively. In addition, the Tres-Piedras-to-Questa and Arroyo Hondo project lines cross the Rio Grande. It is anticipated that all streams would be avoided during the project construction. None of the proposed aerial or buried fiber-optic installations would occur within waterways. Therefore, there would be no impacts to riparian habitat from the Proposed Action. To eliminate any potential adverse impacts to surface waters from sediment transport, the use of Best Management Practices (BMPs), such as straw wattles, silt fencing, and straw bales, would be implemented during the Proposed Action in areas where ground disturbance is to occur (Jordan 2013).
- To avoid impacts to nesting raptors along the Rio de los Pinos and at the two Rio Grande crossings, fiber installations would occur outside of the raptor breeding season of January through August (Jordan 2013).
- To avoid potential impacts to Mountain Plover and Ferruginous Hawk (*Buteo regalis*), installations on the Tres Piedras line between San Antonio Mountain and the New Mexico/Colorado border shall occur outside of March 1 through July 31.

- To avoid potential impacts to eagles during installations in the vicinity of the Rio de los Pinos and the Rio Grande Gorge, the following procedure will be implemented:
 - If an eagle is present within 0.40 km (0.25 miles) of the work zone in the morning before project activity starts or following any breaks in project activity, project activity must be suspended until the bird leaves of its own volition.
 - If eagles might be in the area at a perch or roosting site, a presence/absence survey must be performed within a 0.40-km (0.25-mile) radius of a project site before work activity initially starts for the day and again before work resumes following a break. If an eagle enters the construction zone *during* work activity, the work activity can continue.

2.2 No Action

The No-Action Alternative is required by NEPA and provides a baseline with which to compare any proposed activities. Under the No-Action Alternative, the BLM would not approve ROW grants for the KCEC electrical lines having at least one segment in trespass on BLM land. Fiber-optic cable would not be installed; future maintenance of the lines, if needed, would occur without legal access; and reconductoring would not occur on the El Rito distribution line. Because of the resulting gaps in the fiber-optic installations, each line with at least one segment in trespass would become a non-functional link in the KCEC FTTH network, and telecommunications services in the surrounding areas would be limited. In addition, the electrical capacity of the El Rito distribution line would continue to be limited to that currently provided by the line's existing conductors.

3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

The No-Action Alternative reflects the current situation within the project area and will serve as the baseline for comparing the environmental impacts of the Proposed Action.

3.1 Air Resources

Air Quality

The Federal government has enacted, and the State of New Mexico has adopted, National Ambient Air Quality Standards (NAAQS) (40 CFR Part 50) as the region's air quality criteria. Primary standards were established to protect public health, and secondary standards provide protection for the public's welfare, including wildlife, climate, recreation, transportation, and economic values. Regulations under the CAA Prevention of Significant Deterioration (PSD) provisions (40 CFR Part 52-PSD of Air Quality) were enacted to maintain or improve the existing air quality in all Intrastate Air Quality Control Regions (IAQCRs) and national rural and wilderness areas by creating various classifications using the existing NAAQS pollutants. These classifications relate to the allowable increment above an established baseline concentration of a pollutant within which some increase would be allowed. Class 1 is the most restrictive (smallest allowable increment), and Class 3 is the least restrictive (largest allowable increment).

Greenhouse Gases

Gases that have the ability to trap heat in the atmosphere are called greenhouse gases (GHGs). The carbon dioxide (CO₂) produced from the burning of fossil fuels is a greenhouse gas and one of five principal greenhouse gases entering the atmosphere as a result of human activities identified by the Environmental Protection Agency (EPA) and other Federal agencies. The remaining gases are methane (CH₄), nitrous oxide (N₂O), and fluorinated gases. Since the time of the Industrial Revolution, the concentrations of greenhouse gases in the Earth's atmosphere have risen and have been correlated with rising average temperatures. Increased atmospheric temperature, often called global warming, is only one aspect of climate change; other influences on climate include human causes such as deforestation and land development and natural causes such as changes in ocean and atmospheric circulation, the Earth's orbit, solar intensity, and volcanic activity.

3.1.1 Affected Environment

According to the EPA's "Green Book Nonattainment Areas for Criteria Pollutants," as published on the EPA's website and reviewed on October 28, 2014, the Proposed Action is located within an area that is in attainment for all criteria pollutants.

3.1.2 Impacts from the Proposed Action

3.1.2.1 Direct and Indirect Impacts

Air quality would be impacted with pollution from exhaust emissions and dust during implementation of the Proposed Action but not to a measurable degree. The significance threshold for particulate matter of 35 ug/m³ daily PM_{2.5} is not expected to be exceeded, and air pollution from the motorized equipment and dust dissemination would discontinue at the completion of the project. Other factors that currently affect air quality in the area include dust from livestock herding activities, dust from recreational use, and dust from the use of roads for vehicular traffic. Impacts to air quality attributable to this project would be temporary and would not measurably contribute to compromising attainment standards.

3.1.2.2 Cumulative Impacts

The very small increase in GHG emissions that could result from implementing the Proposed Action would not produce climate change impacts that differ from the No-Action Alternative. This is because

climate change is a global process that is impacted by the sum total of GHGs in the earth's atmosphere. The incremental contribution to global GHGs from the Proposed Action cannot be translated into effects on climate change globally or in the area of this site-specific action. It is currently not feasible to predict with certainty the net impacts from the Proposed Action on global or regional climate.

3.2 Water Resources

The Clean Water Act (CWA) is the fundamental means of surface water quality protection in the United States. The CWA employs a variety of regulatory and non-regulatory tools to sharply reduce direct pollutant discharges into waterways, finance municipal wastewater treatment facilities, and manage polluted runoff. These tools are employed to achieve the broader goal of restoring and maintaining the chemical, physical, and biological integrity of the nation's waters so that they can support "the protection and propagation of fish, shellfish, and wildlife and recreation in and on the water" (33 U.S.C. §§ 1251 a.2).

3.2.1 Affected Environment

None of the proposed buried project segments cross waterways; however, several of the aerial project lines cross ephemeral drainages. In addition, the Tres-Piedras-to-Questa line crosses the Rio Grande, the Tres Piedras line crosses the Rio de los Pinos, and the West Questa line crosses the Red River; all three of these waterways are perennial. All of these ephemeral and perennial waterways are likely to be potential Waters of the United States (WUS) under the jurisdiction of the U.S. Army Corps of Engineers (USACE). It is anticipated that all waterways would be avoided during project construction. Therefore, coordination with USACE would not be required prior to project implementation.

3.2.2 Impacts from the Proposed Action

3.2.2.1 Direct and Indirect Impacts

None of the proposed aerial or buried fiber-optic installations would occur within waterways; therefore, no direct impacts to water resources would occur as a result of the Proposed Action. The Proposed Action has the potential to indirectly impact waterways, because the temporary ground disturbance associated with the buried installations may increase the likelihood for sediment transport.

3.2.2.2 Cumulative Impacts

The Proposed Action would have no cumulative impacts on water resources, because all waterways would be avoided during construction. Any stormwater runoff from areas disturbed by the buried installations that aren't successfully mitigated could contribute to sediment loads in waterways, but due to the minimal scale of the proposed disturbance and application of the standard measures, the proposed project only has the potential to contribute a very small increment, if any.

3.2.2.3 Mitigation Measures and Residual Impacts

To eliminate any potential adverse indirect impacts to surface waters from sediment transport, the use of BMPs such as straw wattles, silt fencing, and straw bales would be implemented during the Proposed Action in areas where ground disturbance is to occur.

3.3 Biological Resources

Biological resource surveys of the project area were conducted from May 21–24 and May 31–June 3, 2013, by Tierra Senior Biologist Tim Jordan. Special status species (listed in Sections 3.3.1) were assessed for their potential to occur in the project area based on the existing characteristics of the area. Selected project area photographs can be found in Appendix B of the BSR (under separate cover) (Jordan 2013).

3.3.1 Affected Environment

The project area is located in north-central New Mexico at elevations ranging from approximately 1,830–2,560 m (6,000–8,400 feet) above mean sea level (AMSL). Lower-elevation portions of the project area are located in the Great Basin Desertscrub and the Plains and Great Basin Grassland biotic communities, and intermediate elevations of the project area are located in the Great Basin Conifer Woodland biotic community (Brown 1994). See the BSR for detailed accounts of these biotic communities.

3.3.1.1 Threatened, Endangered, and BLM-listed Sensitive Species

To determine presence or absence of special status species in the project area, information was obtained from the FWS *New Mexico Ecological Services Field Office Listed and Sensitive Species in Taos County and Rio Arriba County*; BLM-listed Sensitive species were determined through a review of Special Status Species lists maintained in the TFO. See the BSR (Jordan 2013) for a detailed account of these species and determinations considered in this analysis.

BLM-listed Sensitive species with the potential to occur in the project area, as determined in the BSR, can be found in Table 2. One species in the table, Yuma Skipper (*Ochlodes yuma Anasazi*), was not evaluated in the BSR because it was not considered Sensitive by the BLM in 2013. An impact assessment for this species is presented below in Section 3.3.2.

Table 2. BLM-listed Sensitive Species with Potential to be Found in the Project Area

Scientific Name	Common Name
Birds	
<i>Athene cunicularia hypugaea</i>	Western Burrowing Owl
<i>Gymnorhinus cyanocephalus</i>	Pinyon Jay
<i>Haliaeetus leucocephalus</i>	Bald Eagle
Mammals	
<i>Corynorhinus townsendii pallescens</i>	Pale Townsend's Big-eared Bat
<i>Cynomys gunnisoni</i>	Gunnison's Prairie Dog
<i>Euderma maculatum</i>	Spotted Bat
Invertebrates	
<i>Ochlodes yuma anasazi</i>	Yuma Skipper
Plants	
<i>Astragalus ripleyi</i>	Ripley's Milkvetch
<i>Sclerocactus papyracanthus</i>	Grama Grass Cactus

3.3.1.2. Wildlife, Migratory Birds including Mountain Plover, and Raptors

3.3.1.2.1 Wildlife

Wildlife species known to occur in the project area include Rocky Mountain Elk (*Cervus elaphus*), Mule Deer (*Odocoileus hemionus*), Coyote (*Canis latrans*), Pronghorn Antelope (*Antilocapra americana*), Gunnison's Prairie Dog (*Cynomys gunnisoni*), Swift Fox (*Vulpes velox*), Black-tailed Jackrabbit (*Lepus californicus*), Bullsake (*Pituophis melanoleucus*), and Prairie Rattlesnake (*Crotalus viridis viridis*). Bird species include Sage Sparrow (*Amphispiza belli*), Mountain Plover, Western Meadowlark (*Sturnella neglecta*), Prairie Falcon (*Falco mexicanus*), Pinyon Jay (*Gymnorhinus cyanocephalus*), Black-throated Gray Warbler (*Dendroica nigrescens*), Western Burrowing Owl (*Athene cunicularia*), and Sage Thrasher (*Oreoscoptes montanus*).

The most common wildlife species observed during Tierra's surveys of the Proposed Action area was Common Raven (*Corvus corax*). Other wildlife species observed include Cliff Swallow (*Petrochelidon pyrrhonata*), Redtail Hawk (*Buteo jamaicensis*), Pinyon Jay, Stellar's Jay (*Cyanocitta stelleri*), Turkey Vulture (*Cathartes aura*), Horned Lark (*Eremophila alpestris*), and Black-billed Magpie (*Pica hudsonia*). A Mountain Plover was observed on the Tres Piedras line (see Section 4.3 below). The most common sign of wildlife observed during the surveys was Rocky Mountain Elk and Mule Deer scat. Tracks of both of these species were also observed on the Tres Piedras and Tres-Piedras-to-Questa project lines. Other wildlife sign observed includes gopher (*Thomomys* sp.) mounds and the scat of Coyote, Black-tailed Jackrabbit, and Desert Cottontail (*Sylvilagus audubonii*). Calls from Gunnison's Prairie Dog were heard on the Tres Piedras line (see Table 2). Complete lists of all wildlife species and wildlife sign observed on the project lines can be found in Appendix D of the BSR.

3.3.1.2.2. Migratory Birds

The Migratory Bird Treaty Act (MBTA) of 1918 (United States Code, Title 16, Chapter 7, Subchapter II) prohibits the "pursuit, hunt, take, capture, kill, attempt to take, capture, or kill, possess, offer for sale, sell, offer to barter, barter, offer to purchase, purchase, deliver for shipment, ship, export, import, cause to be shipped, exported, or imported, deliver for transportation, transport or cause to be transported, carry or cause to be carried, or receive for shipment, transportation, carriage, or export, any migratory bird, any part, nest, or eggs of any such bird, or any product, whether or not manufactured, which consists, or is composed in whole or part, of any such bird or any part, nest, or egg thereof." The ensuing Executive Order 13186, signed January 10, 2001, by President Clinton, "directs executive departments and agencies to take certain actions to further implement the [MBTA]."

The project area is located within Bird Conservation Region 16, Southern Rockies/Colorado Plateau. A list of Birds of Conservation Concern identified in this region can be found in Table 3.

Table 3. Bird Conservation Region 16 List (2008)

Gunnison Sage Grouse	Willow Flycatcher
American Bittern	Gray Vireo
Bald Eagle	Pinyon Jay
Ferruginous Hawk	Juniper Titmouse
Golden Eagle	Veery
Peregrine Falcon	Bendire's Thrasher
Prairie Falcon	Grace's Warbler
Snowy Plover	Brewer's Sparrow
Mountain Plover	Grasshopper Sparrow
Long-billed Curlew	Chestnut-collared Longspur
Yellow-billed Cuckoo	Black Rosy-Finch
Flammulated Owl	Brown-capped Rosy-Finch
Burrowing Owl	Cassin's Finch
Lewis's Woodpecker	

Mountain Plover

At the request of the BLM, surveys for Mountain Plover were conducted by Tierra on May 21, 2013, along a portion of the Tres Piedras aerial distribution line paralleling the New Mexico/Colorado border, just west of New Mexico Highway 285 (NM 285). A single female Mountain Plover in breeding plumage was observed during Tierra's Mountain Plover survey. This observation confirms that Mountain Plover uses the northern portions of the Tres Piedras project line and that the grassland habitat present is suitable for the species. Additional observations made during the segment surveys along NM 285 south of the border indicate that suitable habitat extends south along the highway to the vicinity of San Antonio Mountain.

3.3.1.2.3. Raptors

Raptors not otherwise afforded protection by the ESA are protected by the MBTA and, in the case of eagles, the Bald and Golden Eagle Protection Act (BGEPA). The BGEPA (16 U.S.C. 668-668c), enacted in 1940 and amended several times since then, prohibits anyone without a permit issued by the Secretary of the Interior from "taking" bald eagles, including their parts, nests, or eggs. The Act provides criminal penalties for persons who "take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle ... [or any golden eagle], alive or dead, or any part, nest, or egg thereof." The Act defines "take" as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb." "Disturb" means "to agitate or bother a Bald or Golden Eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior." In addition to immediate impacts, this definition also covers impacts that result from human-induced alterations initiated around a previously used nest site during a time when eagles are not present if, upon the eagle's return, such alterations agitate or bother an eagle to a degree that interferes with or interrupts normal breeding, feeding, or sheltering habits, and causes injury, death, or nest abandonment.

At the request of the BLM, raptor surveys were conducted on the Arroyo Hondo line crossing of the Rio Grande Gorge on May 22, 2013, and on the Tres-Piedras-to-Questa aerial transmission line crossing of the gorge from May 23–24, 2013. These surveys were conducted on both sides of the Rio Grande Gorge using binoculars to scan the opposite cliff face and the gorge itself for the presence of raptor nests, whitewash, and individual raptors.

No raptor individuals were observed during the raptor surveys of the Tres-Piedras-to-Questa and Arroyo Hondo crossings of the Rio Grande; however, cliff habitat present in the vicinity of both crossings represents suitable nesting habitat for raptors, including Golden Eagle (*Aquila chrysaetos*), Peregrine Falcon (*Falco peregrinus*), Prairie Falcon (*Falco mexicanus*), Great-Horned Owl (*Bubo virginianus*), and Red-tailed Hawk (*Buteo jamaicensis*). Cliff habitat is also present along the portion of the Tres Piedras line in the vicinity of the Rio de los Pinos; however, raptor surveys were not conducted in this area because design features have been added to the Proposed Action that would serve to protect raptor species at this location. Other habitat types exist within the project area that could contain nesting habitat for Ferruginous Hawk, Sharp-shinned Hawk (*Accipiter striatus*), Swainson's Hawk (*Buteo swainsonii*), Cooper's hawk (*Accipiter cooperii*), Northern Harrier (*Circus cyaneus*), and American Kestrel (*Falco sparverius*).

3.3.1.2.4. Big-game Habitat and Migration Corridors

Big-game species found on lands managed by the BLM TFO include Rocky Mountain Elk, Pronghorn Antelope, Bighorn Sheep (*Ovis canadensis*), Mountain Lion (*Puma concolor*), Black Bear (*Ursus americanus*), and Mule Deer.

Wintering habitat for big-game species is usually located at lower elevations than habitat used at other times of the year and consists of south-facing slopes with good thermal cover. During winter, less forage is available for big-game species, and its nutritional value and digestibility is low; therefore, forage availability is a key factor for big-game species (USFS 2011).

All of the project lines, except the Arroyo Hondo line, are located within wintering habitat for big-game species. In addition to wintering habitat, the Tres-Piedras-to-Questa line roughly parallels a migration corridor, and the Tres Piedras line crosses the same corridor. Big-game sign observed during the surveys included Rocky Mountain Elk and Mule Deer scat on all project lines, except the Arroyo Hondo and Arroyo-Hondo-to-Questa lines; Mule Deer tracks on the Tres Piedras line; and Rocky Mountain Elk tracks on the Tres-Piedras-to-Questa line.

3.3.1.2.5. Vegetation including Noxious and Invasive Species

The most common tree species observed during the surveys include Pinyon Pine (*Pinus edulis*), One-seed Juniper (*Juniperus monosperma*), Rocky Mountain Juniper (*Juniperus scopulorum*), and Ponderosa Pine (*Pinus ponderosa*). Common shrub and sub-shrub species observed include Big Sagebrush (*Artemisia tridentata*), Rabbitbrush (*Chrysothamnus nauseosus*), Broom Snakeweed (*Gutierrezia sarothrae*), Turpentine Bush (*Ericameria laricifolia*), and Fringed Sage (*Artemisia frigida*). Common grass species observed include Blue Grama (*Bouteloua gracilis*), Ring Muhly (*Muhlenbergia torreyi*), Indian Ricegrass (*Oryzopsis hymenoides*), Sideoats Grama (*Bouteloua curtipendula*), and Sand Dropseed (*Sporobolus cryptandrus*). Cacti species observed include Plains Prickly Pear (*Opuntia polyacantha*), Common Cholla (*Cylindropuntia imbricata*), and Claret Cup Cactus (*Echinocereus triglochidiatus*). Complete lists of vegetation observed during the surveys can be found in Appendix C of the BSR.

Two weed species, Cheatgrass (*Bromus tectorum*) and Siberian Elm (*Ulmus pumila*), were observed during Tierra’s surveys on three of the project lines. Both of these species appear on the *BLM National List of Invasive Weed Species of Concern* list. A summary of the specific locations of these weeds is presented in Table 4.

Line Name	Weed Species	Location
Canon del Rio Grande	Cheatgrass	Segment 868 at entrance to Rio Grande Gorge Recreation Area on NM 570
El Rito	Siberian Elm	Segment 342 south of Ojo Caliente at U.S. 285 MP 351.5
West Questa	Cheatgrass	Segments 719–724 at the Red River Fish Hatchery
	Siberian Elm	

3.3.2 Impacts from the Proposed Action

3.3.2.1 Direct and Indirect Impacts

3.3.2.1.1 Threatened and Endangered Species

None of the project lines are located within designated critical habitat or riparian habitat potentially suitable for the Southwestern Willow Flycatcher (*Empidonax traillii extimus*); therefore, the proposed project would have no effect on the Southwestern Willow Flycatcher or its designated critical habitat (Jordan 2013).

None of the project lines are located within riparian habitat potentially suitable for the New Mexico Meadow Jumping Mouse (*Zapus hudsonius luteus*); therefore, the proposed project would have no effect on the New Mexico Meadow Jumping Mouse (Jordan 2013).

No Federally listed species are likely to occur in the project area because suitable habitat for these species is not present. Therefore, the Proposed Action would have no effect on Federally listed Threatened and/or Endangered species.

3.3.2.1.2 BLM-listed Sensitive Species

A summary of the determinations made for BLM-listed Sensitive species that may occur in the project area is presented in Table 5.

Table 5. Summary of BLM-listed Special Status Species Impacts

Species	Status	Determination
Ripley's Milkvetch (<i>Astragalus ripleyi</i>)	S	may impact, not likely to result in a trend towards Federal listing or loss of viability
Western Burrowing Owl (<i>Athene cunicularia hypugaea</i>)	S	may impact, not likely to result in a trend towards Federal listing or loss of viability
Pale Townsend's Big-eared Bat (<i>Corynorhinus townsendii pallescens</i>)	S	may impact, not likely to result in a trend towards Federal listing or loss of viability
Gunnison's Prairie Dog (<i>Cynomys gunnisoni</i>)	S	may impact, not likely to result in a trend towards Federal listing or loss of viability
Spotted Bat (<i>Euderma maculatum</i>)	S	may impact, not likely to result in a trend towards Federal listing or loss of viability
Pinyon Jay (<i>Gymnorhinus cyanocephalus</i>)	S	may impact, not likely to result in a trend towards Federal listing or loss of viability
Bald Eagle (<i>Haliaeetus leucocephalus</i>)	S	no impact
Yuma Skipper (<i>Ochloides yuma anasazi</i>)	S	may impact, not likely to result in a trend towards Federal listing or loss of viability
Grama Grass Cactus (<i>Sclerocactus papyracanthus</i>)	S	no impact

Key: S = Sensitive.

BLM-listed Sensitive Species Evaluated in the BSR

Several portions of the project area contain suitable habitat that could support Western Burrowing Owl, Gunnison's Prairie Dog, Pinyon Jay, Townsend's Big-eared Bat, and Spotted Bat. Disturbance to habitat during the proposed installations would be minimal, and the vegetation would recover quickly. In addition, timing restrictions for construction on the Tres Piedras project line north of San Antonio Mountain put into place for the benefit of Mountain Plover would also benefit any Western Burrowing Owls in the vicinity (Jordan 2013). Therefore, the proposed project may impact these species, but it is not likely to result in a trend towards Federal listing or loss of viability for any of these species.

Portions of the Tres-Piedras-to-Questa, Arroyo Hondo, and Canon del Rio Grande project lines in the vicinity of the Rio Grande are located in areas used by Bald Eagle as wintering habitat. In addition, Bald Eagles may be present in these areas during spring and fall migration (Jordan 2013). Because design features for eagle protection have been incorporated into the Proposed Action (see Section 2.1.4), the proposed project would have no impact on Bald Eagle.

It was determined that the proposed project would have no impact on the BLM-listed Sensitive Grama Grass Cactus. The project may impact Ripley's Milkvetch but is not likely to result in a trend towards Federal listing or loss of viability because vegetation disturbance during the proposed installations would be minimal, no access roads would be constructed prior to the installations, and, because the vegetation along the lines would simply be driven over rather than impacted more heavily, any impacted Ripley's Milkvetch may be able to recover (Jordan 2013).

Yuma Skipper (*Ochloides yuma anasazi*), Not Evaluated in the BSR

Yuma Skipper is a butterfly that is found in two areas, or activity nodes, along the Upper Rio Grande. The first activity node is a larval host stand of Common Reed (*Phragmites australis*) along the banks of the Rio Grande, and the second node is a concentration of nectar sites consisting of milkweed, thistles, and rabbitbrush found along the roads within the Wild Rivers Recreation Area where somewhat regular mowing of the shoulders of the roads has allowed these forbs to proliferate (Valerie Williams, personal communication, March 18, 2015).

All waterways and their associated vegetation would be avoided during the proposed installations; therefore, the proposed project would have no impacts on the first Yuma Skipper activity node. Portions of the West Questa project line installations either cross or would be parallel to the roadsides of the second Yuma Skipper activity node within the Wild Rivers Recreation Area. However, the installations

would involve a relatively minimal amount of disturbance, and other areas would be available to Yuma Skipper for foraging during construction. Therefore, the proposed project may impact Yuma Skipper but is not likely to result in a trend towards Federal listing or loss of viability.

3.3.2.1.3 Wildlife, Migratory Birds (including Mountain Plover), and Raptors

Wildlife

There would be short-term impacts to wildlife species during the proposed installations; however, the impacts would not be adverse to populations as a whole. Mobile species, such as birds and larger mammals, would be expected to move to adjacent areas in response to equipment noise and the presence of workers during the installations; their chances of mortality would be lower than smaller, less-mobile species such as rodents, amphibians, and reptiles.

Migratory Birds

Migratory bird species will occur in the project area. The proposed project has the potential to have an adverse impact on individual birds, eggs, young, and the nesting habitat of ground-nesting birds. However, there would be no noticeable impact to migratory bird populations or to species as a whole, because the proposed project involves only minimal ground disturbance, and construction activities would be similar to KCEC's normal maintenance operations. KCEC and their contractor(s) would comply fully with the stipulations outlined in the MBTA during the construction of this project.

Mountain Plover

Nesting Mountain Plovers would not be adversely impacted, given seasonal restrictions for installation of the project segments in potential Mountain Plover habitat.

Raptors

The proposed aerial installations on the Arroyo Hondo and Tres-Piedras-to-Questa lines that cross the Rio Grande Gorge and the Tres Piedras line in the vicinity of the Rio de los Pinos would be conducted outside the raptor breeding and nesting season; therefore, there will be no adverse impacts on these species.

3.3.2.1.4 Big-game Habitat and Migration Corridors

The proposed installations are anticipated to have negligible impacts on winter range and migration corridors for big-game species. No new access roads would be constructed, and vegetation that could be used as forage would not be removed. Impacts to big-game species from noise produced by the equipment used for the fiber-optic installations are expected to be minimal, because the noise produced would be similar to that produced by the occasional recreational traffic that would be present in the vicinity of the installations.

3.3.2.1.5 Vegetation including Noxious and Invasive Species

The Proposed Action is anticipated to have only minimal impacts on vegetation, because disturbance would be minimal during the proposed installations, and the vegetation that is adversely and temporarily impacted is expected to fully recover.

The ground disturbance associated with the buried portions of the project may create conditions that encourage the establishment and spread of noxious weeds. Vehicles, people, and other natural vectors such as wind and water can transport seeds and deposit them in disturbed soils, and existing seeds may be encouraged to germinate in disturbed soils. Noxious weeds that spread can degrade habitat quality and decrease the productivity of native forage. Implementation of the design features listed in Section 2.1.5 would reduce the likelihood of introducing or spreading noxious and invasive species. The proposed activities would have a low-to-moderate long-term impact on the introduction and spread of invasive and non-native species to the Proposed Action area.

3.3.2.2 Cumulative Impacts

The Proposed Action is not anticipated to have any cumulative impacts on biological resources because all impacts to biological resources would occur at such a small scale that they would be incrementally immeasurable.

3.3.2.3 Mitigation Measures and Residual Impacts

Because design features have been incorporated into the Proposed Action to avoid potential adverse impacts to biological resources, no additional mitigation measures are necessary.

3.4 Cultural Resources

The BLM TFO requested that cultural resource surveys be performed for the portions of the KCEC network on BLM land that had either not been previously surveyed or had not been recently surveyed. In January of 2013, prior to the field survey, Tierra archaeologists and Geographic Information System (GIS) specialists, with the assistance of Archeological Resource Management Section (ARMS) staff, compiled existing data for all cultural resource sites and surveys within 500 m (1,640 feet) of the APE. Also in January of 2013, with the assistance of BLM TFO archaeologist Merrill Dicks, Jesse Murrell conducted a records review at the BLM TFO. The methods and results of the Class I inventory are reported separately (Murrell 2013).

Certified archaeologists performed cultural resource surveys of the project area between June 11 and October 9, 2013. The surveyed areas include a 15-m (50-foot) cultural buffer zone surrounding the project's area of potential effect. The survey areas measured approximately 46 m (150 feet) wide and, in total, were approximately 247 ha (610 acres) in size. All isolated occurrences, archaeological sites, historic buildings, and historic structures encountered within the survey areas were recorded.

During archaeological site recording, a rebar datum with an aluminum tag labeled with the field site number, date, Tierra's name, and the initials of the recorders was established. Detailed site plans with the location of the datum, point-located artifacts, artifact concentrations, archaeological features, photo points, disturbances, and land development features, such as fence lines and utility poles, were prepared using a Trimble GeoXH global positioning system (GPS) unit with sub-meter accuracy. Site overviews and details of point-located artifacts and archaeological features were documented with digital photographs. Artifacts and archaeological features were inventoried by site. In general, all observed flaked stone tools (formal and informal), ground stone artifacts, and prehistoric ceramic artifacts were tabulated. Flaked stone debitage was fully tabulated unless it numbered more than an estimated 50 pieces in a site assemblage, in which case only a sample of the observed debitage was recorded. In general, all observed historic metal, glass, and ceramic artifacts were tabulated. All rock art was documented on a BLM Rock Art Attachment. A Laboratory of Anthropology (LA) Site Record was completed for each archaeological site encountered during the survey. Shovel tests were completed at each site for which geomorphological conditions or the nature of the site did not preclude the possibility of buried archaeological deposits. Isolated occurrence documentation involved recording a description of the finding and its GPS location.

Historic buildings, structures, and objects encountered during field survey were documented on Historic Cultural Property Inventory (HCPI) forms. Each resource was photographed, and its location was recorded with the Trimble GeoXH GPS unit. Information was gathered according to the requirements of HCPI Form 1, which provides basic information and is required for all historic resources. HCPI Form 2, requiring more detailed information, was completed for historic resources that were judged to be eligible for the National Register of Historic Places (NRHP). Historic irrigation ditches or acequias were documented on a Historic Water Delivery System Inventory Form.

Tierra's cultural resource surveys and the subsequently produced reports address the potential impacts of all of the proposed KCEC installations that would occur on BLM land. This includes the portions of the project that would occur outside of existing ROWs (the subject of this EA), as well as those proposed installations that would occur within existing ROWs, which will be included in categorical exclusion

documentation. The Affected Environment and Impacts discussions below consider all of the proposed installations that would occur on BLM land.

3.4.1 Affected Environment

A total of 81 isolated occurrences, 54 archaeological sites, 3 historic buildings, and 2 acequia segments were documented during Tierra's cultural resource field surveys. A total of six properties with historic buildings was documented. These included three archaeological sites (LA 177151, LA 177152, and LA 177153). LA and HCPI form documentation was completed for these sites. The three in-use historic buildings were documented with HCPI forms. Documented sites, buildings, and acequias are described in detail in the Class III report (under separate cover) (Murrell 2014).

3.4.2 Impacts from the Proposed Action

3.4.2.1 Direct and Indirect Impacts

Direct impacts to archaeological sites normally include alterations to the physical integrity of a cultural site. If a cultural site is significant for reasons other than the scientific information it has the potential to provide, direct impacts may also include the introduction of audible, atmospheric, or visual elements that are out of character for the cultural site. In order to avoid direct impacts to cultural resources during implementation of the Proposed Action, all sites would either be avoided or monitored during construction.

The SHPO concurred with the BLM's No Adverse Effect finding for the Proposed Action on January 22, 2015, contingent upon the adherence of the proponents to all stipulations and conditions contained in this document.

3.4.2.2 Cumulative Impacts

The Proposed Action would have no cumulative impacts on cultural resources because no adverse effects are anticipated that could contribute to cumulative impacts.

3.4.2.3 Mitigation Measures and Residual Impacts

Because design features have been incorporated into the Proposed Action to avoid potential adverse impacts to cultural resources, no additional mitigation measures are necessary.

3.5 Lands with Wilderness Characteristics

The FLPMA of 1976 directed the BLM to inventory and study its roadless areas for wilderness characteristics. Wilderness characteristics include the area's size, its apparent naturalness, and its ability to provide outstanding opportunities for solitude or primitive and unconfined recreation. These characteristics may also include supplemental values such as ecological, geological, educational, historical, scientific, and scenic values.

Once BLM's inventory of roadless areas was complete, certain areas were set aside as wilderness study areas (WSAs) to be preserved until Congress considers their designation as wilderness under the Wilderness Act of 1964 (see Section 3.6 below). Though the BLM's authority to establish new WSAs under FLPMA has lapsed, the BLM must continue to maintain a current inventory of lands having wilderness characteristics, as these characteristics are recognized as public resources. The BLM exercised its discretion under the Taos RMP to manage certain areas having wilderness characteristics for the protection of these resources. These areas include those described below under Section 3.5.1

3.5.1 Affected Environment

Portions of the Tres Piedras line near the New Mexico/Colorado border are located in the San Antonio East area that is approximately 9,859 acres in size and managed by the BLM for wilderness characteristics. A small portion of the El Rito line east of El Rito and north of NM 554 is located in the

Cerro Colorado area, which is approximately 31,221 acres in size and also managed for wilderness characteristics; however, this portion of the line is also located within a BLM-designated ROW corridor.

3.5.2 Impacts from the Proposed Action

3.5.2.1 Direct and Indirect Impacts

As mentioned above, one of the wilderness characteristics is the size of the area subject to inventory. The Wilderness Act specifies that an area under consideration for wilderness designation must be at least 5,000 acres in size, and the BLM has adopted this criterion for areas inventoried and managed for wilderness characteristics. The proposed installations in areas managed for wilderness characteristics would be located along the areas' borders and would not result in a reduction in size of the areas or cause a portion of the areas to be detached from their remainder, because the installations would be aerial and would not involve ground disturbance. Therefore, the Proposed Action would have no impact on the size criterion for lands managed for wilderness characteristics. The Proposed Action may have a temporary impact on the other wilderness characteristics due to the presence of equipment and work crews on existing roads during the fiber-optic installations. The naturalness and opportunity for solitude would be interrupted and diminished while work crews are present.

3.5.2.2 Cumulative Impacts

The Proposed Action would have no cumulative impacts on lands managed for wilderness characteristics.

3.5.2.3 Mitigation Measures and Residual Impacts

Because design features have been incorporated into the Proposed Action to avoid potential adverse impacts to lands with wilderness characteristics, no additional mitigation measures are necessary.

3.6 Other Special Designations

Special landscapes and resources in the TFO planning area have been delineated for additional management attention. Some have been Congressionally authorized and include national scenic or historic trails, cultural protection areas, and national heritage areas. Other designations are made administratively by the BLM or the U.S. Department of the Interior and include ACECs, WSAs, and backcountry or scenic byways. Other designations can also include National Monuments, WSRs, national recreation trails, and watchable wildlife-viewing sites. All of these landscapes and resources are protected and preserved through limitations on surface disturbance and careful implementation of any uses such that each area's special resource values are retained.

As part of the BLM's implementation of FLPMA, Manual 1613 and 43 CFR 1610.7-2 require that areas meeting the relevance and importance criteria for ACECs be considered during the planning process, with special consideration for (1) the protection of the area and prevention of irreparable damage to the resources or natural systems identified during the inventory and (2) the protection of life and the promotion of safety in areas where natural hazards exist. Areas qualifying for consideration as ACECs must have substantial significance and value, including qualities of more than local significance and special worth, consequence, meaning, distinctiveness, or cause for concern. The values for which ACECs are designated are considered the highest and best use for those lands, and protection of those values will take precedence over multiple uses.

Wilderness study areas identified during BLM's required inventory of roadless areas (see Section 3.5 above) are managed to preserve their suitability for designation as wilderness and will continue to be managed as such until Congress makes final determinations on the WSAs. Congress has reviewed some of these areas and has designated some as wilderness and released others for non-wilderness uses.

The Rio Grande and Red Rivers were among the first group of eight rivers that inaugurated the nation's WSR System in 1968. The designation included 109.75 km (68.2 miles) of the Rio Grande, beginning at the New Mexico/Colorado border and extending south to Rinconada, and the lower 6.4 km (4.0 miles) of

the Red River, starting at the Red River Fish Hatchery and continuing southeast to the river's confluence with the Rio Grande. The designated river corridor for the two rivers is approximately 17,330 acres in size.

3.6.1 Affected Environment

The majority of the proposed installations are located in areas having one or more special designations. A summary of special designations and how they relate to the proposed installations is presented in Table 6.

Line	BLM Special Designation	Line Portion in Special Designation
Canon del Rio Grande	Lower Gorge ACEC ^a	all
El Rito	Ojo Caliente ACEC	all ^b
Tres Piedras	Taos Plateau ACEC ^a	partial
	San Antonio WSA	none ^c
Tres Piedras to Questa	Taos Plateau ACEC ^a	all
West Questa		

^a The entire Taos Plateau ACEC and a portion of the Lower Gorge ACEC are now designated as the Rio Grande del Norte National Monument, effective March 25, 2013 (see below).

^b All portions of the line are located in a designated ROW corridor within the ACEC.

^c A short, approximately 62-m-long (204-foot-long) portion of the Tres Piedras line ROW is located on the boundary of the San Antonio WSA. However, TFO indicates that no portion of this ROW is actually located within the WSA itself (Brad Higdon, BLM TFO personal communication, November 10, 2014).

3.6.1.1 Rio Grande del Norte National Monument

The Rio Grande del Norte National Monument (the Monument) was designated by a proclamation made by President Obama on March 25, 2013. The Monument is approximately 242,255 acres in size and consists of the entire Taos Plateau ACEC and a portion of the Lower Gorge ACEC. The designation only affects BLM-managed lands and does not affect non-BLM holdings within the Taos Plateau. BLM TFO administers the Monument as a unit of the National Landscape Conservation System. Stipulations in the designating proclamation applicable to the proposed installations in the Monument include:

- Motorized vehicle use in the Monument shall be permitted only on designated roads, and non-motorized use shall be permitted only on designated roads and trails.
- Nothing in this proclamation shall be construed to preclude the Secretary of the Interior from renewing or authorizing the upgrade of existing utility line ROWs within the physical scope of each such ROW that exists on the date of proclamation. Additional utility line ROWs or upgrades outside the existing utility ROWs may only be authorized if consistent with the care and management of the Monument's values.

The BLM TFO is currently preparing a management plan for the Monument. The Monument Plan will amend the current Taos RMP through the preparation of an EA and will provide management direction to ensure the protection and restoration of cultural, ecological, geological, and wildlife values and their associated landscapes for which the Monument was designated. The Monument Plan will also consider opportunities for continued uses of Monument lands and resources, including wood gathering, livestock grazing, and recreation, as well as the potential for new land use authorizations.

The landscape of the Monument comprises rugged, wide-open plains at an average elevation of 2,134 m (7,000 feet) AMSL. It is dotted by volcanic cones and cut by steep canyons with rivers tucked away in their depths. The Río Grande carves a gorge through layers of volcanic basalt flows and ash that is up to 244 m (800 feet) deep. Among the volcanic cones in the Monument, Ute Mountain is the highest, reaching 3,076 m (10,093 feet) AMSL.

This part of the Río Grande has attracted human activity since prehistoric times. Evidence of ancient use is found throughout the area in the form of petroglyphs, prehistoric dwelling sites, and many other types of

archaeological sites. Evidence of more recent activity includes abandoned homesteads dating to the 1930s.

Lying between the San Juan Mountains to the west and the Sangre de Cristo Mountains to the east, the Monument straddles the northern end of the Rio Grande Rift, a 966-km-long (600-mile-long) tear in the North American continent that resulted in most of the geological features seen in the Monument.

The Monument is an important area for wintering animals and provides a corridor by which wildlife moves between the two mountain ranges. The varied landscape creates habitat for a wide variety of species. Cottonwoods and willows grow along the rivers. Pinyon and juniper woodlands at middle elevations include 500-year-old trees. Mountaintops are forested by Ponderosa Pine, Douglas Fir (*Pseudotsuga menziesii*), aspen, and spruce. Wildlife, including raptors, songbirds, waterfowl, Beaver, River Otter (*Lontra canadensis*), Ringtail (*Bassariscus astutus*), Prairie Dog, Cougar (*Puma concolor*), Black Bear (*Ursus americanus*), Bighorn Sheep, Mule Deer, Rocky Mountain Elk, and many more species call the Monument home.

The unique setting of the Monument also provides a wealth of recreational opportunities; recreational activities include whitewater rafting, hunting, fishing, hiking, and mountain biking. The Wild Rivers Recreation Area at the confluence of the Río Grande and Red River includes campgrounds, scenic viewpoints, and hiking trails. La Junta Point, at Wild Rivers Recreation Area, provides a dramatic vista of the confluence of the two rivers and is wheelchair-accessible. The Orilla Verde Recreation Area includes campgrounds near the river's edge as well as boat launches; the Taos Valley Overlook provides stunning views and trails for hiking and mountain biking.

A major part of the Monument's acreage lies west of the Río Grande. Here, seclusion is easy to find, with access consisting solely of rough dirt tracks or gravel roads. This is where a visitor is most likely to see the vast herds of Rocky Mountain Elk that bring hunters to the region. The many volcanic cones also provide an opportunity for peak climbing, with nine peaks higher than 2,438 m (8,000 feet) AMSL.

The Monument includes the Río Grande and Red River WSRs, which were designated by Congress in 1968 to provide present and future visitors the opportunity to experience the beauty of rivers in a natural free-flowing state (BLM 2013).

3.6.1.2 Taos Plateau ACEC

The Taos Plateau ACEC is approximately 222,500 acres in size and is managed to protect its scenery, water quality and quantity, wetlands, and wildlife habitat, including habitat for special status species resource values. Four management zones are present in the ACEC: the North Unit, Ute Mountain, Wild Rivers, and San Antonio. The San Antonio WSA and the San Antonio East area managed for wilderness characteristics are located within the San Antonio zone, north of San Antonio Mountain and south of the Rio de los Pinos Recreation Area. Management prescriptions applicable to the proposed installations in the Taos Plateau ACEC include:

- **Land Use Authorizations**—The San Antonio zone is excluded from new ROWs. ROWs would be considered on a case-by-case basis in the North Unit.
- **Transportation and Access**—The San Antonio and Ute Mountain zones are closed. Access to the remainder of the ACEC, including the San Antonio East wilderness characteristics, is limited to designated routes and/or season of use.
- **Lands with Wilderness Characteristics**—The San Antonio WSA and the San Antonio East area are managed to preserve wilderness characteristics.

3.6.1.3 Lower Gorge ACEC

The Lower Gorge ACEC is approximately 21,190 acres in size and is managed to protect its cultural resources, riparian areas, and wildlife habitat, including wildlife habitat for special status species resource values. Management prescriptions applicable to the proposed installations in the Lower Gorge ACEC include:

- **Land Use Authorizations**—New ROWs are excluded, except for road improvements to improve safety or to provide access or utility service to non-Federal land where no practicable alternative exists.
- **Transportation and Access**—Access to the ACEC is limited to designated routes.
- **Special Status Species**—Protection of Southwestern Willow Flycatcher habitat; critical habitat was designated in the ACEC in 2005.

3.6.1.4 Ojo Caliente ACEC

The Ojo Caliente ACEC is approximately 66,150 acres in size and is managed to protect its cultural resources, ecological processes (soils), riparian areas, and wildlife habitat, including wildlife habitat for special status species resource values. Management prescriptions applicable to the proposed installations in the Ojo Caliente ACEC include:

- **Land Use Authorizations**—New ROWs are excluded from areas managed for wilderness characteristics, such as the Cerro Colorado area.
- **Transportation and Access**—Access to the ACEC is limited to designated routes.
- **Lands with Wilderness Characteristics**—Manage the Cerro Colorado area to preserve wilderness characteristics.

3.6.1.5 San Antonio Wilderness Study Area

The San Antonio WSA is approximately 7,050 acres in size and managed under direction provided in BLM Manual 6330: Management of BLM Wilderness Study Areas. The BLM TFO has recommended to Congress that the WSA is non-suitable for wilderness designation; however, if it is designated as a wilderness, it will be managed under guidelines outlined in the Wilderness Act of 1964 and its enabling legislation and under a wilderness management plan that will be prepared by the BLM. If the San Antonio WSA is released from further consideration as wilderness, it will be managed as part of the Taos Plateau ACEC/Rio Grande del Norte National Monument and would be protected by restrictive land use prescriptions.

3.6.1.6 Wild and Scenic Rivers

The West Questa project line includes an aerial crossing of the Red River WSR at the Red River Fish Hatchery, and the Tres-Piedras-to-Questa project line crosses the Rio Grande in the Upper Gorge (Wild Rivers) Recreation Area. BLM management prescriptions applicable to the proposed installation across the Red River include:

- **Land Use Authorizations**—New ROWs may be considered for installations on existing structures if such additions would not impact the designation's outstandingly remarkable values.
- **Transportation and Access**—Access is limited to designated routes.

3.6.2 Impacts from the Proposed Action

3.6.2.1 Direct and Indirect Impacts

The Proposed Action may impact specially designated areas if the proposed installations are contrary to BLM management direction for these areas and/or the installations have the potential to adversely affect the qualities of the areas that led to their designation.

3.6.2.1.1 Rio Grande del Norte National Monument

The potential impacts of the Proposed Action on the Rio Grande del Norte National Monument as a resource will be considered here on an ecological scale. This differs from the narrower impact discussion presented for specific resources in other sections of this EA, such as biological resources and cultural and historic resources, because of the holistic nature of ecology.

The Proposed Action would have the potential to impact the Rio Grande del Norte National Monument if it resulted in a change to the cultural landscape; if it had an effect on ecological sites that contribute to the

Monument's ecological diversity; if it had the potential to introduce or spread noxious and invasive species, leading to a compromise to the Monument's ecological integrity; or if it had the potential to affect wildlife resources found on the Monument, such as special status species, migratory birds, raptors, and wintering habitat and migration corridors used by big-game species. All of these resources and values are interconnected and together make up the ecological context of the Monument.

Ecology is the study of living organisms and their interactions with their environment. This includes very small organisms, such as bacteria, up to larger, more complex organisms such as wildlife, plants, and humans. Temporal connections, such as the relation between humans and their environment and the cultural and historic resources that develop over time, can also be considered in an ecological context. The environment with which living organisms interact includes other organisms of the same and different species and other physical constituents such as soil, water, air, weather patterns, climate, and disturbance regimes.

Ecological diversity is a term used to describe the number of different species and habitats present in a given area, often at a community scale. The term "ecologic site" is synonymous with habitat. An example of an ecological site found on the Monument would be the Rio Grande Gorge, which provides both nesting and winter habitat for raptor species. Other types of ecological sites found on the Monument include the grasslands, desertscrub, and pinyon-juniper habitats of the Taos Plateau that are used by big-game species as both wintering habitat and migration corridors as herds of big game move seasonally between the Taos Plateau and the Guadalupe Mountains and the San Juan Mountains to the west.

In most cases, an impact would have to occur at a large scale in order to be considered ecologically adverse. An example of a relatively recent adverse impact occurring on an ecological scale would be the Deepwater Horizon oil spill in the Gulf of Mexico. This oil spill began with the explosion and sinking of an offshore oil rig on April 20, 2010, and continued for 87 days, until the undersea well was capped on July 15, 2010. An estimated 210 million gallons of oil was released into the Gulf, which had devastating impacts on marine fisheries, estuaries, and beaches on the southern coast of the United States. In this example, the oil spill constitutes an ecological impact because it affected several resources simultaneously, including water, shellfish, marine mammals, fish, birds, and aquatic plants. Connections between resources such as nutrient cycling between aquatic plants and marine animal species and breeding areas used by fish and avian species were impacted as well. Ecological impacts can also occur at smaller scales, such as by removing a food plant from the environment that an animal needs. In response, the animal can either move to another area where the food item can still be found or it can try to find a substitute. If the animal can't find the food item within its range, and no substitute can be found, the animal may perish. In this example, there are only two major ecological components: the animal species and its food plant, although there are several ecological connections in play. For example, the animal may infringe on the territory of another of its species in the search for food. This could have either beneficial or adverse consequences.

The Proposed Action would have no impacts on ecological diversity because of the relatively small scale of the proposed fiber-optic installations. All of the proposed fiber-optic installations are to occur on existing KCEC electric lines, access to the project lines would be from designated routes, and no new roads would be constructed. The Proposed Action may have temporary and negligible impacts on ecological sites such as the raptor habitat provided by the Rio Grande Gorge and big-game habitat on the Taos Plateau (see Section 3.2.2 above); however, these impacts would be minimized or eliminated by design features that have been incorporated into the Proposed Action. Likewise, potential impacts to the ecological integrity of the Monument from the introduction and spread of noxious and invasive species would be minimized or eliminated by design features incorporated into the Proposed Action.

3.6.2.1.2 ACECs

The Proposed Action would have no impacts on the protected resource values of the Ojo Caliente ACEC because the El Rito line is located in a designated ROW corridor within the ACEC, and design features have been incorporated into the Proposed Action to ensure compliance with the BLM's management goals for the ACEC. These same design features would protect the resource values of both the Lower

Gorge and Taos Plateau ACECs; therefore, the Proposed Action would have no impact on either of these ACECs.

3.6.2.1.3 San Antonio WSA

The Proposed Action would have only a temporary impact on the wilderness characteristics of the San Antonio WSA due to the presence of equipment and work crews during the fiber-optic installation along the border just outside of the WSA. Specifically, the opportunity for solitude would be interrupted during implementation of the project. This impact would be minimized because design features have been incorporated into the Proposed Action that include hand-carrying the equipment and materials needed for the installations in areas with no existing access.

3.6.2.1.4 Wild and Scenic Rivers

The proposed aerial installation across the Rio Grande and Red River WSRs would occur on existing poles and in the Red River corridor adjacent to an existing road and bridge across the river; therefore, it would occur in compliance with the BLM management prescription for using existing structures for new utility installations within WSRs. No component of the Proposed Action is expected to compromise or degrade the outstandingly remarkable values or affect the free-flowing character of the river segments.

3.6.2.2 Cumulative Impacts

Although there would be an additional line spanning the Red River WSR following the proposed installation, its presence would only have a negligible cumulative impact on the scenic qualities of the river because the new line would be similar in appearance to the lines already crossing the river.

The Proposed Action is not anticipated to result in any meaningful cumulative impacts to specially designated areas because all fiber-optic installations would occur on existing electric lines within these areas.

3.6.2.3 Mitigation Measures and Residual Impacts

Because design features have been incorporated into the Proposed Action to avoid potential adverse impacts to specially designated areas, no additional mitigation measures are necessary.

3.7 Visual Resources

The BLM uses a visual management system to regulate potential aesthetic impacts to public lands. Management classes describe the degree of landscape modification permissible. The VRM system classifies all agency-owned lands into four VRM classes. The most restrictive classification in the BLM's system is Class 1. Class 1 VRM ratings preserve the existing character of the landscape; natural changes and limited disturbances are allowed. Class 2 VRM ratings strive to maintain the existing character of the landscape. Changes within these areas can be seen but should not attract the attention of the casual observer. Additionally, all changes should repeat the basic elements of form, line, color, and texture that are found in the predominant natural features of the surrounding characteristic landscape. Class 3 and Class 4 VRM ratings are less restrictive but are still managed for visual impacts. Class 3 VRM ratings partially retain the existing character of the landscape. The activity may attract the attention of the casual observer but should not dominate the view. Class 4 VRM ratings allow for major modification of the landscape and may dominate the view of the landscape (BLM 2008).

3.7.1 Affected Environment

Most of the project lines associated with the Proposed Action are located in areas with VRM classifications of 1 or 2. Approximately 1.6 km (1.0 mile) of the El Rito line is located in a Class 3-rated area (Table 7).

The existing visual characteristics of the aerial lines in the KCEC system consist of wooden or steel poles supporting anywhere from two to seven conductors. Most of the distribution lines have two conductors,

and the greatest numbers of conductors are found on transmission lines having underslung distribution lines. Existing buried portions of the lines are for the most part hidden from sight; however, markers, aerial drops, and (in some cases) aboveground transformers are visible along the lines.

Table 7. BLM VRM Classifications for the Vicinity of the Project Lines

Line	VRM Class	Location
Arroyo Hondo	2	all portions of line
Canon del Rio Grande	1	portions of line in the vicinity of the Rio Grande Gorge
	2	portions of line on NM 567 east of Carson
El Rito	2	all portions of line except as noted below
	3	portion of line in Section 35, Township 25 North, Range 8 East west of the NM 554/111 junction
Tres Piedras	2	all portions of line except as noted above
Tres Piedras to Questa	1	Rio Grande Gorge crossing
	2	all portions of line except as noted above
West Questa	1	Red River crossing at the Red River Fish Hatchery
	2	all portions of line except as noted above

3.7.2 Impacts from the Proposed Action

3.7.2.1 Direct and Indirect Impacts

The proposed aerial fiber-optic installations would occur on existing electric lines, no new access roads would be constructed, and any impacts to visual resources would be temporary and mostly due to the presence of equipment and work crews during the installations. The proposed buried installations would not be visible following construction. However, the buried installations would involve ground disturbance, which would result in a temporary impact to visual resources while the disturbed vegetation in the area recovers. Both types of proposed installations would be consistent with BLM Class 1 VRM classifications because disturbance during the installations would be either nonexistent or negligible.

3.7.2.2 Cumulative Impacts

Following the proposed aerial fiber-optic installations, an additional linear feature would be visible on the KCEC project lines. The cumulative visual impact of the additional fiber-optic cable is expected to be minimal because it would be in character with the existing electrical conductors of the lines.

3.7.2.3 Mitigation Measures and Residual Impacts

Because design features have been incorporated into the Proposed Action to avoid potential adverse impacts to visual resources, no additional mitigation measures are necessary.

4 SUPPORTING INFORMATION

4.1 Tribes and Agencies Consulted

The following Tribes were notified and invited to consult on the proposed project:

- Pueblo of Taos
- Pueblo of Picuris
- Pueblo of Isleta
- Pueblo of Pojoaque
- Pueblo of Tesuque
- Pueblo of San Ildefonso
- Pueblo of Santa Clara
- Pueblo of Zia
- Pueblo of Nambe
- Hopi Tribal Council
- Pueblo of Ohkay Owingeh
- Pueblo of Santa Ana
- Comanche Nation of Oklahoma
- Jicarilla Apache Nation
- Kiowa Tribe of Oklahoma
- Navajo Nation
- Southern Ute Indian Tribe
- Ute Mountain Ute Tribe

Consultation with New Mexico State Historic Preservation Office has been completed, resulting in concurrence that no adverse impacts would occur to cultural resources pending compliance with all design features specified under Section 2.1.4.

4.2 List of Preparers

Renee Darling, Director, Tierra Right of Way Services, Ltd.

Sam DesGeorges, Field Manager, BLM Taos Field Office

Merrill Dicks, Archaeologist, BLM Taos Field Office

Brad Higdon, Planning and Environmental Specialist, BLM Taos Field Office

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Theresa Knoblock, Biologist/Environmental Compliance Lead, Tierra Right of Way Services, Ltd.

Jesse Murrell, Archaeologist/Principal Investigator, Tierra Right of Way Services, Ltd.

Luis Reyes, Chief Executive Officer, Kit Carson Electric Cooperative

Valerie Williams, Wildlife Biologist, BLM Taos Field Office

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APPENDIX A. TRS LINE LOCATIONS

Table A.1. TRS Line Locations

Line Name	Length (m)	TRS	Quarter-Quarter
Arroyo Hondo	5,652	T26N R11E, Sec 23	SWNE
		T27N R12E, Sec 17	NESE, SENE, SWSE, SESE,
		T27N R12E, Sec 20	NWNE, NENE, NESW, SESW, SENE, SWNE
		T27N R12E, Sec 29	SWNW, NWNW, NENW
		T27N R12E, Sec 31	SESW
		T28N R12E, Sec 03	SESW
		T28N R12E, Sec 04	NESE, NWSE, SESE, NESE, SESW, SWSE
		T28N R12E, Sec 09	SESW
		T28N R12E, Sec 09	NENW, NWNW
Canon del Rio Grande	6,067	T24N R11E, Sec 20	SESW, NENW
		T24N R11E, Sec 29	NENW
		T24N R11E, Sec 22	NESE, SENE, NENE
		T24N R11E, Sec 27	SESE
		T24N R11E, Sec 23	NENW, NWNE, SENW, SWNE, SWNW
		T24N R11E, Sec 27	NENW, NWNE, NENE, NWSW, SWSW, SESE
		T24N R11E, Sec 28	SWSW, SESE
		T24N R11E, Sec 29	NESE, SENE, SENW, NENW, SWNE
		T24N R11E, Sec 32	NESE, NWNE, SWNE, NESE, SESE, SENE
		T24N R11E, Sec 33	NENE, NENW, NWNE, SENW, SENW
		T25N R11E, Sec 26	SWSE
		T25N R11E, Sec 27	SWSE
		T25N R11E, Sec 35	NWNE
Carson Rio Grande Crossing*	268	T25N R11E, Sec 25	SWNW
		T25N R11E, Sec 26	SENE
El Rito	9,683	T23N R08E, Sec 13	NESW, NWSE, SWSE, SENW, SESW
		T23N R08E, Sec 24	NENW, SENW, SESW
		T23N R08E, Sec 25	NWSW, SWSW
		T23N R08E, Sec 35	NENE, NWSW
		T24N R07E, Sec 01	NENW, NWNW, NWSW, SWNW
		T24N R07E, Sec 14	NENE, NWNE
		T24N R08E, Sec 01	NWNE, SENE, SWNE, SWNE
		T24N R08E, Sec 01	SENE
		T24N R08E, Sec 25	NENW, SWNW, SWNW
		T24N R09E, Sec 07	NWSW
		T25N R08E, Sec 31	SESE, SWSE

Line Name	Length (m)	TRS	Quarter-Quarter
El Rito	9,683	T25N R08E, Sec 33	NESE, SESW, SWSE, SWSW
		T25N R08E, Sec 33	NESE
		T25N R08E, Sec 34	NWSW
		T25N R08E, Sec 35	NWNE, SENE, SENW, SWNE, SWNE, SWNW
		T25N R08E, Sec 35	SWNW
Ojo to Taos*	6,395	T24N R09E, Sec 07	NENW, NESW, NWSW, SWSW, SENE, NENE, SESW, SWNE
		T24N R09E, Sec 08	NWNW, NENE, NENW, NWNE
Tres Piedras	33,391	T27N R09E, Sec 25	NENE
		T27N R10E, Sec 19	SESW
		T27N R10E, Sec 30	NENW, NWNW, SENW, NESW, SWSE
		T28N R09E, Sec 03	NESW, SESW, SWSE, NWNE, SWNE, SENW
		T28N R09E, Sec 03	SESW, NENW
		T28N R09E, Sec 10	NWNE
		T28N R09E, Sec 11	NENW, NWNE, SWNE, SWNE
		T29N R09E, Sec 03	NWNW, SWNW, SWSW, NWSW
		T29N R09E, Sec 03	NWNW
		T29N R09E, Sec 34	NWSW, SWSW
		T30N R09E, Sec 03	NWNE, SWNE, NWSE, SWNE, SWSE
		T30N R09E, Sec 10	NWNE, NWSE, SWNE, SESW, SWNE, NWNE, SWSE, SWSW, NWSW
		T30N R09E, Sec 15	NWNE, NWSE, SWNE, SESW, SWSE
		T30N R09E, Sec 27	NWNW
		T30N R09E, Sec 28	NESE, SESE
		T30N R09E, Sec 33	NENE, SENE, SESE
		T30N R09E, Sec 34	SWSW
		T31N R09E, Sec 04	NWNE, SWNE, NWSE, SWSE, SWNE
		T31N R09E, Sec 09	NWNE, NESE, SWNE, NWSE, SWSE, SWNE, SWSE
		T31N R09E, Sec 10	NWSW, SWNW, SENW
		T31N R09E, Sec 15	SWSW
		T31N R09E, Sec 16	SESE, NWNE
		T31N R09E, Sec 22	NESW, SESW, NWNW, SWNW, SENW, NESW, SWSE, SWNW
		T31N R09E, Sec 27	NWNE, NWSE, SWNE, SWSE
		T31N R09E, Sec 34	NWNE, NWSE, NESE, SWNE, SESE, NESE, SWSE
		T32N R08E, Sec 23	SESW
		T32N R08E, Sec 26	NWSW, NENW
T32N R08E, Sec 27	NESE, SWSW		

Line Name	Length (m)	TRS	Quarter-Quarter
Tres Piedras	33,391	T32N R08E, Sec 33	SENE, NENE
		T32N R08E, Sec 34	NWNW
		T32N R09E, Sec 19	NESE
		T32N R09E, Sec 20	NESE, NESW, NWSE, NWSW, NESW
		T32N R09E, Sec 21	NWSW, SESW, SWSW, SWSW
		T32N R09E, Sec 28	NENW, NESW, NWNW, SENW, SESW
		T32N R09E, Sec 33	NENW, NWSE, SWNE, SENW, SWSE
Tres Piedras to Arroyo Hondo*	6,056	T27N R11E, Sec 15	SWSW, SESW
		T27N R11E, Sec 17	NENE, SENE, NENW, NWNE
		T27N R11E, Sec 22	NENE, SENE, NENW, NWNE
		T27N R11E, Sec 24	SESW
		T27N R11E, Sec 25	NENW, NWNE, NENE, SENE
		T27N R11E, Sec 25	SENE
		T27N R12E, Sec 29	SWNW
		T27N R12E, Sec 30	SENE, SENW, SWNE, SWNW
		T28N R10E, Sec 33	SWNW
Tres Piedras to Questa	21,631	T28N R12E, Sec 02	NWNW, NENW, SENW, SWNE, SWNW
		T28N R12E, Sec 03	SENE, SENW, SWNE, SWNW
		T28N R12E, Sec 04	NENW, NWNE, SWNE, SENE
		T29N R09E, Sec 10	NESE, SESE, SWSE, SESE
		T29N R09E, Sec 13	SWNW, SWSE, NWSW, NESW, SESW
		T29N R10E, Sec 19	NWNW, NENW, SENW, SWNE, SENE
		T29N R10E, Sec 20	SWNW, SENW, SWNE, NWSE, NESE
		T29N R09E, Sec 24	NWNE, NENE
		T29N R10E, Sec 25	NESE, SENE, SWNE, SENW, SWNW
		T29N R11E, Sec 26	NWNE, NENE, SENE, SESE, SESW, SWSE, SWSW
		T29N R11E, Sec 29	SESE, SESW, SWSE, SWSW, NWSW
		T29N R11E, Sec 30	NESE, NESW, NWSE, NWSW, SESE, SESW, SWSE, SWSW
		T29N R12E, Sec 32	NWNW, NESE
		T29N R12E, Sec 32	
		T29N R12E, Sec 33	NWSW, SWSW, SESW
T29N R12E, Sec 35	SWSW		
West Questa	9,471	T29N R12E, Sec 10	NESW, NWSE, SWNE, SENE, SESW, NESW, SWSW, SESW
		T29N R12E, Sec 11	NESE, SWNW
		T29N R12E, Sec 12	NWSW, NESW, SWSW
		T29N R12E, Sec 13	NWNW, NENW, SENW, SENE, SENW, SWNE

Line Name	Length (m)	TRS	Quarter-Quarter
West Questa	9,471	T29N R12E, Sec 15	NWNW
		T29N R12E, Sec 16	NENE
		T29N R12E, Sec 17	SESE
		T29N R12E, Sec 20	NENE, NWSE, SWNE, SWSE, SENE
		T29N R12E, Sec 24	SENE, SWNE
		T29N R12E, Sec 25	NWSW
		T29N R12E, Sec 26	NESE, NWSE, SWSE
		T29N R12E, Sec 28	NESW, SENW, SWNW
		T29N R12E, Sec 29	NWNE, NENE, SESE
		T29N R12E, Sec 35	NWSW, SWNW, SWSW, NWSW

*Lines categorically excluded from analysis in the associated EA since they are independent lines wholly within existing ROWs.