

United States
Department of
Agriculture

Forest
Service

Southwestern
Region



Draft Environmental Impact Statement for the Ojo Caliente Proposed Transmission Line

United States
Department of
the Interior

Bureau of Land
Management

Taos Field
Office



Carson National Forest and Bureau of Land Management Taos Field Office, Taos and Rio Arriba Counties, New Mexico



Draft Environmental Impact Statement for the Ojo Caliente Proposed Transmission Line

Carson National Forest and BLM Taos Field Office Taos and Rio Arriba Counties, New Mexico

Lead Agency: USDA Forest Service

Cooperating Agency: USDI Bureau of Land Management

Responsible Agency: Martin D. Chavez, Jr., Forest Supervisor
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208 Cruz Alta Road
Taos, New Mexico 87571

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BLM Taos Field Office
226 Cruz Alta Road
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208 Cruz Alta Road
Taos, New Mexico 87571
(505) 758-6311

Abstract: In order to provide adequate power for current and future needs, prevent power outages and fluctuations, improve reliability and reduce line loss costs to all Kit Carson Electric Cooperative (KCEC) users, the Carson National Forest and Bureau of Land Management (BLM) Taos Field Office propose to authorize KCEC to construct, operate and maintain a new 115 kV transmission line across National Forest System and BLM lands. It would run from the existing 115 kV transmission line in the 115/345 kV corridor just north of Black Mesa to a proposed substation location on BLM lands north of the Ojo Caliente community. The transmission line proposal should sufficiently serve the power needs of the area.

Besides serving the Ojo Caliente area, KCEC is responsible for serving other areas in Taos County. Electrical service has never been available to residents along a portion of U.S. 285 between the existing 25 kV corridor and Tres Piedras. There is also a need for providing service to these residents along U.S. 285.

In addition to the No Action (Alternative A) and Proposed Action (Alternative B) alternatives, two other alternatives and an Option for a Tres Piedras Connection were developed and analyzed in detail. Alternative C would tap into the existing 115 kV line in the 115/345 kV corridor near Carson and run within the existing 25 kV corridor to the proposed substation on BLM lands near Ojo Caliente. Alternative D would tap into the existing 115 kV line, adjacent to Forest Road 285P. It would cross U.S. 285 close to where the highway makes a 90-degree turn, and then run parallel to U.S. 285, at a distance of up to one-half mile north from the highway, to the proposed substation on BLM lands near Ojo Caliente. The Tres Piedras Connection Option is not a stand-alone alternative. It would allow for the construction of a 25 kV distribution line from the existing 25 kV distribution line in the vicinity of the microwave station just north of the intersection of NM 567 and U.S. 285, and connect into the existing line that comes south from Tres Piedras

along U.S. 285. The Option would be entirely on National Forest System lands. The Preferred Alternative is to select Alternative D with the Option.

Review of Comments: Comments shall be accepted for 45 days following the date of publication in the “Federal Register” pursuant to 40 CFR parts 1500-1508. The decision for this analysis will come under the 36 CFR 215 administrative appeal regulations. It is the responsibility of all individuals and organizations to ensure that their comments are received in a timely manner. Public comments on the proposed action will be accepted for 45 days following the date of publication of the notice of availability in the “Federal Register.” See cover letter for more details on commenting.

Reviewers have an obligation to structure their participation in the National Environmental Policy Act process so that it is meaningful and alerts the Agency to the reviewers’ position and contentions. Vermont Yankee Nuclear Power Corp. v. NRDC, 435 U.S. 519, 553 (1978). Environmental objections that could have been raised at the draft stage may be waived if not raised until after completion of the final environmental impact statement. City of Angoon v. Hodel (9th Circuit, 1986) and Wisconsin Heritages, Inc. v. Harris, 490 F. Supp. 1334, 1338 (E.D. Wis. 1980). Comments on the draft environmental impact statement should be specific and should address the adequacy of the statement and the merits of the alternatives discussed (40 CFR 1503.3).

Send Comments to: Martin D. Chavez, Jr., Forest Supervisor
Carson National Forest
208 Cruz Alta Road
Taos, New Mexico 87571

Comments must be received no later than 45 days from publication of the Notice of Availability (NOA) for this DEIS in the “Federal Register.” The NOA is expected to be published on:

When the “Federal Register” date is known, it will be provided on the forest’s Web site (<http://www.fs.fed.us/r3/carson>) and in “The Taos News” *Classified* section under legal notices.



United States
Department of
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Forest
Service

Southwestern Region
Carson National Forest

208 Cruz Alta Rd.
Taos, New Mexico 8571
505-758-6200
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File Code: **1950**

Greetings:

We are pleased to send a copy of the draft environmental impact statement (DEIS) developed for the Ojo Caliente Proposed 115 kV Transmission Line for your review. The majority of the proposed transmission line is located on the Tres Piedras Ranger District of the Carson National Forest with some of the line and the proposed substation located on lands administered by the Taos Field Office of the Bureau of Land Management.

We have already incorporated the issues and concerns received from those who expressed interest on the proposed action during scoping. Please note that based on your comments and the subsequent analysis, **the preferred alternative is Alternative D with the Option and not the Proposed Action (Alternative B).** We hope you will take time to review this document and submit your comments.* The purpose of this DEIS comment period is to allow the public to provide early and meaningful participation on a proposed action prior to a decision being made by the responsible officials—the forest supervisor for the Carson National Forest and BLM field office manager for the Taos Field Office.

How to Comment and Timeframe

Public comments on the proposed action will be accepted for 45 days following the date of publication of the notice of availability (NOA) in the “Federal Register” (36 CFR 215.5(b)(v)). At the present time, this information is not known. When we have this date, it will be posted on the Carson Web site (www.fs.fed.us/r3/carson). The publication date of the NOA in the “Federal Register” is the exclusive means for calculating the comment period for a DEIS. Those wishing to comment should not rely upon dates or timeframe information provided by any other source. Written, facsimile, hand delivered, oral and electronic comments concerning this action will be accepted.

Those who provide substantive comments during this comment period are eligible to appeal the decision under the Forest Service administrative appeal regulations—36 CFR 215. Substantive comments are comments within the scope of the proposed action, are specific to the proposed action, have a direct relationship to the proposed action and include supporting reasons for the responsible official to consider

*Comments received in response to this solicitation, including names and addresses of those who comment, will be considered part of the public record on this proposed action and will be available for public inspection. Comments submitted anonymously will be accepted and considered; however, those who submit anonymous comments will not have standing to appeal the subsequent decision under 36 CFR Parts 215. Additionally, pursuant to 7 CFR 1.27(d), any person may request the agency to withhold a submission from the public record by showing how the Freedom of Information Act (FOIA) permits such confidentiality. Persons requesting such confidentiality should be aware that, under the FOIA, confidentiality may be granted in only very limited circumstances, such as to protect trade secrets. The Forest Service will inform the requester of the agency’s decision regarding the request for confidentiality, and where the request is denied, the agency will return the submission and notify the requester that the comments may be resubmitted with or without name and address within 7 days.



(36 CFR 215.2). The submission of comments must include a name and address of the commenter and title of the proposed action. The lead responsible official is Forest Supervisor Martin D. Chavez, Jr.

Written comments should be mailed to:

Martin D. Chavez, Jr., Forest Supervisor
Attn: Ojo Proposed Transmission Line
Carson National Forest
208 Cruz Alta Road
Taos, New Mexico 87571
FAX: (505) 758-6213

Hand delivered comments can be submitted at the above office during normal business hours from 8:00 a.m. to 4:30 p.m. weekdays (excluding holidays). Oral comments must be provided at the lead responsible official's office during normal business hours via telephone (505) 758-6311 or in person, or at an official Agency function (i.e. open house) that is designed to elicit public comments. Those wishing to provide oral comments should contact the lead responsible official or their representative to schedule their presentation. Electronic comments must be submitted in a format such as an e-mail message, plain text (.txt), rich text format (.rtf), MS-Word (.doc) or Adobe Acrobat (.pdf) to: *comments-southwestern-carson@fs.fed.us*. In cases where no identifiable name is attached to an electronic message, a verification of identity will be required for appeal eligibility.

Appeal Eligibility

For appeal eligibility each individual or representative from each organization submitting substantive comments must either sign the comments or verify identity upon request. Those using electronic means may submit a scanned signature. Otherwise another means of verifying the identity of the individual or organizational representative may be necessary for electronically submitted comments or comments received by telephone. Individual members of an organization must submit their own substantive comments to meet the requirements of appeal eligibility. Comments received on behalf of an organization are considered as those of the organization only.

We are looking forward to hearing from you, especially if you see that some concern of yours has not been addressed as part of the process. We are particularly interested in new information that you think we may have overlooked. While opinions are also welcome, tangible, verifiable information is the most helpful way for me to make a good, informed decision. A final environmental impact statement and record of decision will be made after reviewing all the comments.

Additional information regarding the DEIS can be obtained from Ben Kuykendall at (505) 758-6311 or at the above address. This document and other information can also be accessed through www.fs.fed.us/r3/carson.

Sincerely,



MARTIN D. CHAVEZ, JR.
Forest Supervisor

Chapter 1. Purpose of and Need for Action

The proposed action described in this chapter has several parts, most of which pertain directly to National Forest System lands and for which the U.S. Department of Agriculture, Forest Service (Forest Service) will make the decision. The proposal also includes activities that pertain to U.S. Department of Interior, Bureau of Land Management (BLM) administered lands, where the BLM has the authority to make decisions. This draft environmental impact statement (DEIS) documents the National Environmental Policy Act (NEPA) analysis of the site-specific environmental effects of a Forest Service and BLM proposal. The Forest Service is the lead agency and the BLM is a cooperating agency.

An interdisciplinary analysis on the proposed action is documented in a project record. An index of the project record is presented in the Appendix. Source documents from the project record are incorporated by reference throughout this environmental impact statement by showing the document number(s) in brackets [24, 58]. This draft environmental impact statement summarizes the project record to make the analysis results as clear as possible.

Scope of Analysis

Constructed in the late 1940s, a 25 kV 1/ distribution line maintained by Kit Carson Electric Cooperative (KCEC) runs from the Los Cordovas substation located just west of Taos and serves the communities of Ojo Caliente, El Rito, La Madera, Canon Plaza, Mesa Vista, Petaca, Las Placitas, Servilleta, Vallecitos, Carson and Pilar (Figure 2). Kit Carson Electric Cooperative purchases electrical power from Tri-State Generation and Transmission Association. Based upon a request made by KCEC, the Carson National Forest and Bureau of Land Management Taos Field Office are preparing this environmental impact statement (EIS) to analyze the effects of a proposal to authorize KCEC to construct, operate and maintain a new 115 kV electric transmission line on National Forest System lands and BLM administered lands from the existing Hernandez to Taos 115 kV line to Ojo Caliente, New Mexico, where a substation is proposed to be located on BLM lands. In addition, the scope of the analysis includes the effects of the existing 25 kV line crossing BLM land between the national forest boundary and Ojo Caliente. A notice of intent to prepare an EIS was published in the “Federal Register” on October 12, 2000 (65 FR 60612). [181]

After the proposed action was developed and published in the “Federal Register,” KCEC approached the Forest Service concerning the need to provide electrical service to residents along U.S. 285 between the existing 25 kV corridor and Tres Piedras (Figure 2). A revised notice of intent adding an option to meet this need on National Forest System lands was published in the “Federal Register” on June 30, 2003 (68 FR 38670). The notice also included other information not in the previous notice of intent, as well as changes to the proposed dates for release of the EIS.

The scope of this analysis includes the areas where KCEC serves—Ojo Caliente, El Rito, La Madera, Cañon Plaza, Mesa Vista, Petaca, Las Placitas, Servilleta, Vallecitos, Carson and Pilar, as well as along U.S. 285 to Tres Piedras (Figures 1 and 2).

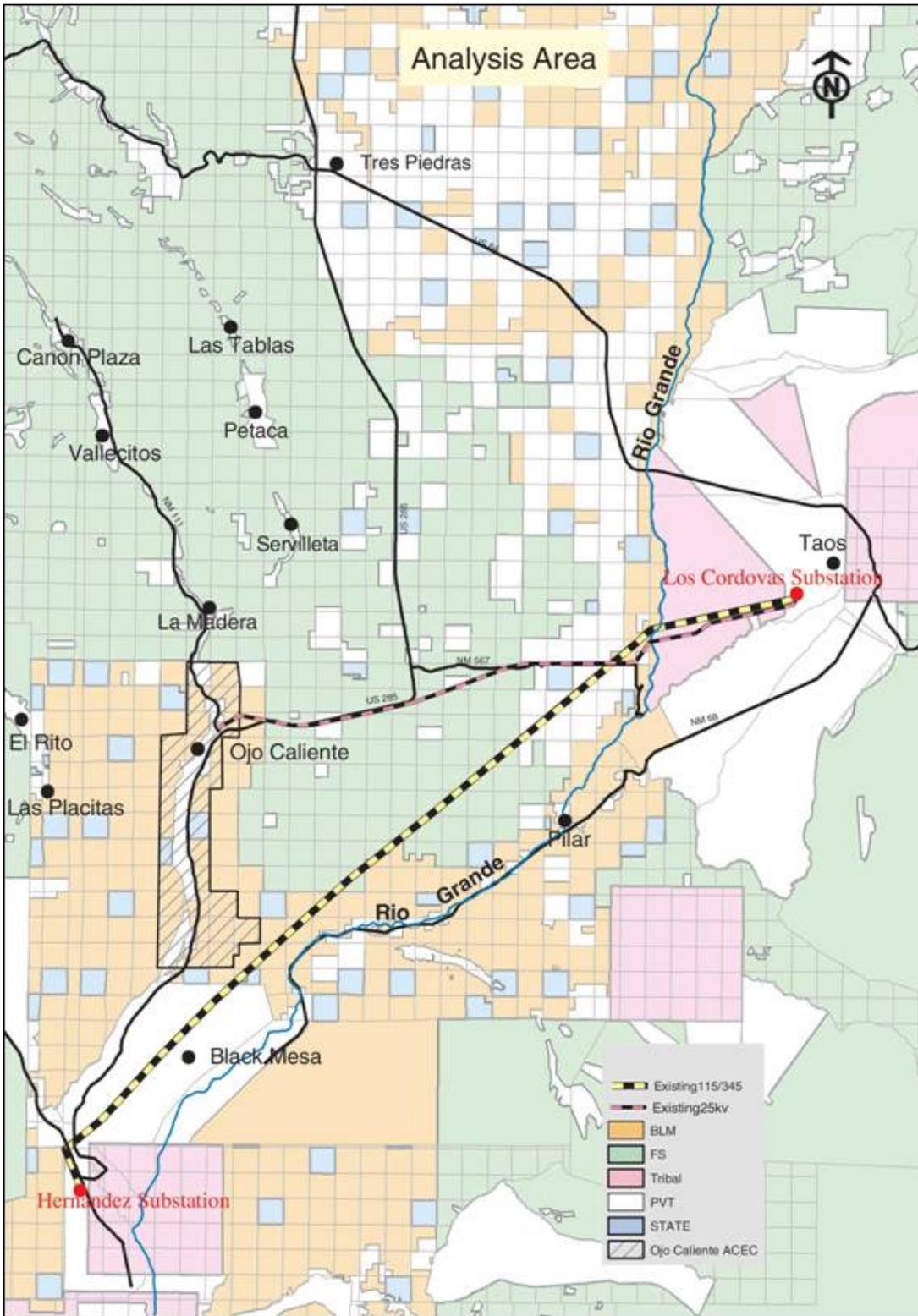


Figure 2. Map of the Ojo Caliente proposed transmission line analysis area.

Purpose and Need for Action

Between 1940 and the late 1970s, the populations of Taos and Rio Arriba Counties were basically static. Since around 1980, the populations of these same counties have nearly doubled in size (U.S. Census 1980-2000).

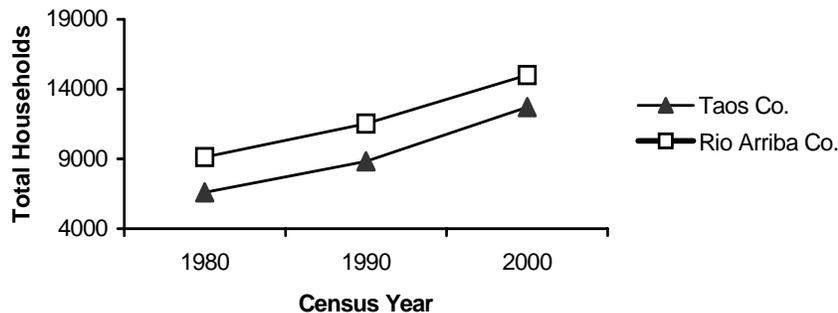


Figure 3. Changes in households for Taos and Rio Arriba Counties.

The communities of Ojo Caliente, El Rito, La Madera, Cañon Plaza, Mesa Vista, Petaca, Las Placitas, Servilleta, Vallecitos, Carson and Pilar lie within Taos or Rio Arriba Counties and have all grown since lines were constructed in the 1940s. These communities are expected to continue to grow at a similar rate as in the past. Although the increase in population is far less in outlying communities, the individual consumption of electrical power has increased with the expansion of electronic technology.

The town of Ojo Caliente and the surrounding service area is fed from the Los Cordovas substation near Taos by a No. 2 aluminum conductor steel reinforced three-phase line. As the demand for power increased over the years, two sets of inline voltage regulators were installed between Taos and El Rito in order to help maintain voltage consistency. Voltage regulators maximize the systems ability to maintain or correct voltage. Although system standards are for operations at 120 volts, most outlets and appliances can operate on 110 volts without damage to electrical equipment. However, voltage drops are occasionally falling below the 110-volt level, which can damage electrical equipment. When the voltage regulators currently added to the system fail, the uncorrected drop in voltage is much greater, causing more significant problems to electrical equipment.

The existing Ojo Caliente system has reached its limitations regarding any additional installations to help maintain voltage during peak usage periods. Current power demands exceed the capacity of the existing line and voltage regulators periodically fail, creating outages and frequent voltage fluctuations to users. These fluctuations have led to intermittent brownouts and “blinks,” causing damage to all types of electrical equipment, from appliances to medical support systems (Table 3).

The original distribution lines were also not designed to carry so much electrical energy; consequently an excessive amount of power is lost directly from the lines through the transmission process. This phenomenon is known as line loss and is both wasteful and costly. This expense is generally distributed to all KCEC users. The projected savings on line loss are estimated to offset around 30 percent of the costs of construction (of the proposed action) over the

loan period, which is approximately \$965,120. [17.2] In addition, the existing distribution system is comprised of a single circuit, rather than a “loop.” A line failure can result in a power outage to the entire distribution area.

Table 3. Past power failures on the Taos to Ojo Caliente distribution line [256].

	2001	2002
Outages	320	366
Brownouts	12	9
Blinks	16	10
Voltage drops	14	7

Using current data on usage and service, there is a need for improving consistency in electrical power to the system serving Ojo Caliente, El Rito, La Madera, Cañon Plaza, Mesa Vista, Petaca, Las Placitas, Servilleta, Vallecitos, Carson, Pilar and surrounding communities.

Besides serving the Ojo Caliente area, KCEC is responsible for serving other areas in Taos County. Electrical service has never been available to residents along a portion of U.S. 285 between the existing 25 kV corridor and Tres Piedras (Figure 2). In addition to the need for providing improved electrical service to the areas described above, there is also a need for providing service to residents along U.S. 285.

Proposed Action

In order to provide adequate power for current and future needs, prevent power outages and fluctuations, improve reliability and reduce line loss costs to all KCEC users, the Carson National Forest and BLM Taos Field Office propose to authorize Kit Carson Electric Cooperative to construct, operate and maintain a new 115 kV transmission line across National Forest System and BLM lands. A 40-foot right-of-way would be designated, unless otherwise identified. It would run from the existing 115 kV transmission line in the 115/345 kV corridor just north of Black Mesa to a proposed substation on BLM lands north of the Ojo Caliente community, Taos County, New Mexico (Figure 4). The transmission line proposal should sufficiently serve the power needs of the area. If at any time the population growth should exceed expectations, the substation equipment could be upgraded. The proposed substation equipment should supply adequate energy for 40 to 50 years. As a part of this analysis, it was discovered that the portion of the existing 25 kV distribution line on BLM land has never been authorized under permit. The proposed action includes the administrative action required by BLM to authorize the existing line and associated access necessary for maintenance and repair.

Proposed Transmission Line

The proposed transmission line location would tap into the existing 115 kV Hernandez to Taos transmission line, approximately 1.5 miles northeast of Black Mesa and about 2.5 miles south of Cerro Azul on national forest land. This connection would include additional poles or similar

structures to allow for the underpass of the 345 kV and a disconnect (small switching device). The tap point and disconnect switch would be fenced out for safety.

The line would run north to northwest for about 7 miles and connect into the existing 25 kV distribution line along U.S. 285, also located on the Carson National Forest. It would proceed west with a 25 kV line underbuild^{2/} for approximately 1 mile, where it would leave the Carson National Forest and enter lands administered by the BLM. Then it would follow the existing 25 kV corridor west and slightly south, for about 2 miles to the location of the proposed substation just north of the intersection of U.S. 285 and NM 111.

The proposed substation would be located at the terminus of the transmission line on BLM lands, just northwest of the intersection of U.S. 285 and NM 111 and 1.5 miles north of Ojo Caliente. It would be approximately 160 yards northeast along the existing line from where the voltage regulators are now located. The total area required for substation equipment would occupy approximately 1.5 acres. A chain link-cyclone fence would enclose the substation. For safety purposes, a grounding grid would be buried around the exterior perimeter of the fence. The purpose of the substation is to convert 115kV transmission power to 25kV distribution lines. Several distribution circuits would then leave the substation underground, following the edge of the access road to NM 111, then surface and connect to the existing distribution system.

Details of the proposed action as it relates to line-pole configuration and appearance, as well as distribution lines, are discussed in Chapter 2, *Items Common To All Action Alternatives*.

Land Use Plan Consistency

The National Forest Management Act of 1976 (NFMA) requires the development of long-range land and resource management plans. Similarly, the Federal Land Policy and Management Act of 1976 (FLPMA) requires the development of a comprehensive land use plan for other public lands, including the Bureau of Land Management.

The 1986 Carson Land and Resource Management Plan (hereby called forest plan) as amended and the 1988 Taos Resource Management Plan (RMP) developed broad, programmatic management direction for the Carson National Forest and BLM Taos Field Office, respectively. [5, 7] This EIS is a project-level analysis, designed in conformance with the applicable Forest Service and BLM plan direction (goals and prescriptions). Where appropriate, this EIS tiers to the environmental impact statements for the Carson Forest Plan and the Taos RMP, as encouraged by NEPA regulations.

Carson Forest Plan

The Carson Forest Plan provides guidance for all natural resource management activities on the Carson National Forest. NFMA requires all projects and activities to be consistent with the forest plan. The forest plan has been reviewed in consideration of this proposal. Forest-wide prescriptions that apply to the proposed action are primarily those related to protection and/or management of: heritage resources (Cultural Resources 1-6), corridors (Facilities and Corridors 1-2), special uses (Special Uses 1-2), visual resources (Visual Quality 1-2), soils (Watershed 1-2) and wildlife habitat (Wildlife & Fish 1-14).

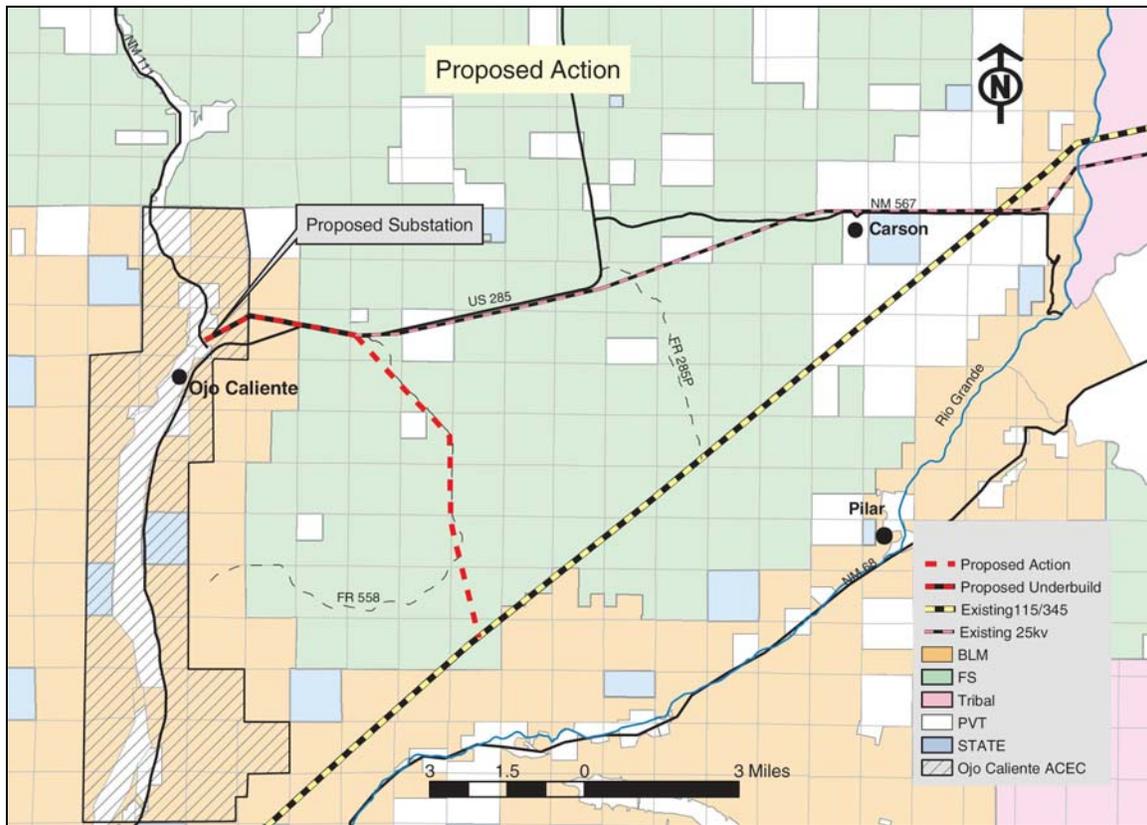


Figure 4. Proposed Action

The forest supervisor of the Carson National Forest has the delegated authority to grant permits, easements, and leases for utility corridors on the Carson National Forest, and uses the forest plan for guidance. The forest plan states:

National forests are adjacent to and surround many small communities and private lands. Therefore, there are demands and needs on forest lands for cemeteries, landfills, solid waste transfer stations, access roads, telephone and electric transmission lines, irrigation ditches, pipelines...and other uses. These uses can be authorized by special use permits or easements to local governments, corporations or individuals. [5, Forest-wide Prescriptions, Special Uses-1]

Additional direction states: “Provide for joint use in corridors and combine uses, to the extent possible, in light of technical and environmental constraints.” [5, Forest-wide Prescriptions, Facilities-1] The proposed action as described would be consistent with the forest plan.

On the Carson National Forest, the proposed action would traverse through three different management areas, which have additional standards and guidelines. These management areas (MA) are: [5] MA 8 – Piñon-Juniper; MA 11 – Revegetation Area; and MA 12 – Sagebrush.

The proposed action is consistent with the standards and guidelines for each of these management areas.

Taos Resource Management Plan

Like the Carson Forest Plan, the Taos RMP provides guidance for all natural resource management activities on BLM lands administered through the Taos Field Office. The FLPMA requires all uses and activities in the resource area to conform to the decisions, terms and conditions as described in the RMP. The Taos RMP has been reviewed in consideration of this proposal. Taos Resource Area prescriptions that apply to the proposed action are primarily those related to protection and/or management of: heritage resources (RMP 2-41), corridors (RMP 2-16), special uses (RMP 2-16), visual resources (RMP 2-50), soils (RMP 2-36) and wildlife habitat (RMP 2-33).

The Taos Field Office grants rights-of-way, leases and permits to qualified individuals, businesses and governmental entities for the use of public lands. A portion of the proposed transmission line would go through the Ojo Caliente Area of Critical Environmental Concern (ACEC). The RMP does not prohibit the construction of a new right-of-way corridor in the Ojo Caliente ACEC (RMP 2-16).

The primary management objective for the Ojo Caliente ACEC (Map 2) is “to preserve cultural and interpretive values” (RMP 5-16). The proposed action would be consistent with this objective and the Taos Resource Management Plan’s overall management direction.

Decision Framework

Given the purpose and need, the responsible officials review the proposed action, the alternatives, the environmental consequences and public input in order to make a decision. The proposed action pertains mostly to National Forest System lands for which the Forest Service will make the decision. The forest supervisor for the Carson National Forest will decide whether to authorize Kit Carson Electric Cooperative to construct a new line as proposed or select an alternative, including taking no action. He will also choose whether to include the Tres Piedras Connection Option in his decision (see *Scope of Analysis*). In addition, the Forest Supervisor may elect to require certain mitigation measures to minimize environmental impacts.

The proposed action also includes activities that pertain to lands administered by the Bureau of Land Management. The Taos Field Office manager is the responsible official for decisions made on these lands, and will decide whether to authorize Kit Carson Electric Cooperative to construct a segment of a new transmission line and substation as proposed or select an alternative, including the no action. In addition, the field office manager may elect to require certain mitigation measures to minimize environmental impacts.

As a part of this analysis, it was discovered that the portion of the existing 25 kV distribution line on BLM has never been authorized under permit. The decision would include the administrative action required by BLM to authorize the existing line and associated access necessary for maintenance and repair.

Public Involvement

Beginning in the summer of 2000, Carson National Forest analysis team members and Kit Carson Electric Cooperative staff participated in a number of meetings and discussions with communities

and their representatives, local citizen groups, interested individuals and representatives from other state and Federal agencies concerning the Ojo Caliente 115 kV transmission line proposal.

On October 12, 2000 a Notice of Intent to prepare an environmental impact statement was published in the “Federal Register” (65 FR 60612) to notify the public and solicit comments on the proposed action. [181] A Revised Notice of Intent to prepare an environmental impact statement was published in the “Federal Register” (68 FR 38670) on June 30, 2003. [258] The revised notice added an option to meet the need for providing service to residents along U.S. 285 to Tres Piedras, and included other information not in the previous NOI and changes to the proposed dates for release of the EIS.

Tribal Contact and Consultation

Native American tribes that may be interested in the project were identified early on [25-30, 35], and according to the 1999 requirements of the National Historic Preservation Act, Section 106, consultation with affiliated tribal officials was initiated in late 1999. Tribal consultation is ongoing. Local pueblos were identified as most likely to still be using the area and were formally consulted. They include San Juan, San Ildefonso, Pojoaque, Tesuque, Nambé, and Santa Clara. Other tribes contacted are Hopi, Navajo, Jicarilla Apache, Comanche, Southern Ute, Ute Mountain, Jemez, Taos and Picuris. Copies of the April 2000 “Enchantment,” describing the proposed action for the Ojo Caliente transmission line, were also sent to the those on the forest’s tribal mailing list. [68-84]

Local, State and Federal Coordination

Contact between the Forest Service and Bureau of Land Management as cooperating agencies began at the inception of the analysis and is ongoing. [49, 52] Discussions with the Town of Taos and Taos County began in spring 2000. [130] The Department of Energy was first contacted in 2000. [148, 153] Preliminary information obtained from the U.S. Fish and Wildlife Service in 1998 was used to initiate discussion with that agency in the fall of 2000. [180]

In April and May 2000, executive summaries of the Ojo Caliente and Talpa-Peñasco proposals were prepared and provided with a briefing to Congressman Tom Udall’s staff, Senator Jeff Bingaman’s staff, Taos County Planning Department, Town of Taos City Manager and the Kit Carson Electric Cooperative Board. [117, 128, 129, 130]

Beginning in the summer of 2000, analysis team members and Kit Carson Electric Cooperative staff participated in several meetings and discussions with communities and their representatives (Ojo Caliente, Carson, and the Council of Neighborhood Associations-Taos County), local citizen groups, and interested individuals concerning the Ojo Caliente proposed transmission line. [131, 156, 166, 171, 186, 242]

Public Individuals and Organizations

The analysis team prepared a brochure entitled “Proposed Action” in March 2000. The brochure described in detail the proposed action, preliminary issues and how to contact the analysis team for information or comments for the Ojo Caliente proposed transmission line. It also contained a proposed action and similar information for a second power line proposal from Talpa to Peñasco. [85, 87, 88]

“Proposed Action” was distributed March 25, 2000 by Kit Carson Electric Cooperative as a supplement to the April 2000 “Enchantment” (Vol. 52, Number 54), a New Mexico newsletter prepared by the electric cooperatives. [65] Copies were mailed to all Kit Carson Electric Cooperative subscribers (17,850 copies). In addition, the “Enchantment” was sent to individuals and groups on the Carson National Forest mailing list of people interested in activities proposed on the national forest. [87, 88]

The proposal was also identified in the April 3, 2000 Carson National Forest quarterly Schedule of Proposed Actions, and has been described in all subsequent quarterly updates. [67, 146, 177, 196, 207, 222, 236, 244, 246, 248-250, 253, 259] Kit Carson Electric Cooperative’s quarterly newsletters for April 2000 and September 2000, “Getting Connected,” discussed the Ojo Caliente proposed transmission line, as well as the Talpa-Peñasco proposal. [85, 173] In 2003, an update on the Ojo Caliente EIS process was included in the March and August issues of “Getting Connected.” [251, 263] The newsletters went out to 21,132 subscribers.

Media

Public notices and newspaper advertisements were also used in April and May 2000 to notify the public about the project and to solicit feedback. Public notices briefly describing the two power line proposals and who to contact for more information or where to send comments were placed in public gathering places around the communities of Ojo Caliente, El Rito, La Madera, Vallecitos and Carson April 13 through 19, 2000 [112]. On April 20, 2000 a paid advertisement was placed in The Taos News and the Rio Grande Sun (Española) soliciting public participation in the planning process and providing contact points for interested members of the public. [118, 120]

From April 14 through 17, 2000, press releases and public service announcements briefly describing the project and requesting public feedback were sent to a number of local and regional papers and radio stations. [108] A number of the stations and publications relayed the information to the general public and/or used the information to initiate a more detailed article. Radio stations and publications contacted were:

The Taos News	Horse Fly
Rio Grande Sun	KTAO (Taos)
Albuquerque Journal North	KKIT (Taos)
Santa Fe New Mexican	KDCE (Española)
Sangre de Cristo Chronicle (Angel Fire)	KRZA (Alamosa)

The Santa Fe New Mexican described the proposal in an article on April 7, 2000. [97] The Taos News also ran an article on April 27, 2000. [126] In the October 15, 2000 edition of the Horse Fly, an article described the proposal in detail, the issues identified to date, and how to contact the analysis team in order to become involved. [182]

Issues and ideas that surfaced through all of these scoping activities have contributed to the development of the proposed action and alternatives. These developments have played a significant role in the identification and analysis of the potential environmental and social effects of this project. The following section of this document describes the issues identified and tracked in this analysis.

Issues

An issue is a point of concern, debate or dispute over the effects of implementing the proposed action. Issues also help define the scope of the analysis. Issue management can usually be broken down into several steps. During the initial introduction of the proposed action, people are asked to comment on the proposal. From the comments, issues are clarified and organized. Once this process is completed, significant issues are identified.

The Forest Service separates issues into two groups: significant and nonsignificant issues. Significant issues are defined as those directly or indirectly caused by implementing the proposed action. Significant issues are used to formulate alternatives, prescribe mitigation measures or analyze environmental effects. Nonsignificant issues are identified as those: (1) outside the scope of the proposed action; (2) already decided by law, regulation, forest plan or other higher level decision; (3) irrelevant to the decision to be made; or (4) conjectural and not supported by scientific or factual evidence. The Council on Environmental Quality implementing regulations for the National Environmental Policy Act explains this delineation in 40 CFR Sec. 1501.7, "...identify and eliminate from detailed study the issues which are not significant or which have been covered by prior environmental review (Sec. 1506.3)..." A list of nonsignificant issues and reasons regarding their categorization as nonsignificant may be found in the record. [247]

Public comments on the proposed Ojo Caliente transmission line covered a wide variety of topics. These included concerns related to effects on wildlife, soils and watershed, cultural resources, economics, scenic values, as well as the use of alternative energy, burial of the line, effects of electromagnetic fields, and the need for improved service. Significant issues were used to develop alternative routes and/or were addressed in the analysis of environmental effects (Chapter 3, *Affected Environment and Environmental Consequences*). Evaluation criteria were used to measure the potential consequences of the alternatives as they relate to each issue. The following are the significant issues and corresponding evaluation criteria identified for the proposed transmission line.

Significant Issue: Environmental Impacts of a New Utility Corridor

The proposed action would create a new utility corridor. Constructing a new line and associated maintenance road could cause unnecessary adverse environmental impacts.

Numerous comments expressed concern about the potential impacts from the construction, maintenance and long-term presence of a new utility corridor and associated temporary roads on natural resources. Concerns include: possible disturbance to wildlife such as goshawks and other raptors, wintering deer and elk; the potential for cutting older, larger trees; and disturbance or damage to forested habitats. In addition, several people voiced their opinion over the potential impacts to soils and watershed condition as well as effects on water quantity and quality.

Guidance in the Carson Forest Plan directs the Forest Service to locate new utilities in existing corridors wherever possible. [5, Facilities-1] Establishing another corridor would cause additional environmental impacts that could be avoided if the new transmission line ran where the 25 kV distribution line currently exists.

Evaluation criteria used for a new corridor:

- Length of proposed transmission line construction in new corridor
- Length of proposed transmission line in existing corridor
- Number of disturbed acres outside existing corridor
- Effects on soils and potential for erosion
- Effects on water quality
- Effects on wildlife (especially raptors) and associated habitats
- Effects on Forest Service sensitive and Federally listed species and habitats
- Effects on plant species and associated habitats

Significant Issue: Impacts to Scenic Values

The proposed transmission line would negatively affect scenic and visual values of the area through which it traverses.

Numerous comments expressed concerns about the possible effects of a power line across the vista between Cerro Vibora and Cerro Azul to the existing corridor. Commenters frequently described the aesthetic sense in this same area as “wilderness” that would be diminished by the presence of a power line. Many feel this unspoiled vista should be preserved in its present condition. Others felt the views as seen by residents and motorists along NM 567 near the area between Carson and Taos Junction would be spoiled. Forest Service lands in the area are administered to maintain some level of visual resources and aesthetic values.

Evaluation criteria used for scenic values:

- Number of acres where scenic integrity would be reduced
- Effects on scenic quality in the Carson community and along NM 567
- Length of U.S. 285 and NM 567 along which transmission line would be visible
- Length of distribution line eliminated
- Consistency with Carson National Forest Visual Quality Objectives and Recreation Opportunity Spectrum

Significant Issue: Tres Piedras Connection

After the proposed action went out for public comment, an issue was raised concerning the lack of service along a portion of U.S. 285 between the existing 25 kV corridor and Tres Piedras. Tres Piedras also has no backup source of electrical power in the event the current distribution system goes down.

Evaluation criteria used for Tres Piedras Connection:

- Whether the area along U.S. 285 south of Tres Piedras has access to the electrical grid serviced by KCEC
- Whether the Tres Piedras area has a backup loop designed into their electrical system

Other Issues: Addressed in Chapter 3 – Affected Environment and Environmental Consequences

A number of people requested that certain environmental impacts of the proposed transmission line be addressed in the environmental impact statement. These include the following, which will be analyzed as part of Chapter 3, *Affected Environment and Environmental Consequences*:

Questions were raised regarding the scale of proposed upgrade and that the proposed transmission line would be too costly to KCEC members—Is a 115 kV line really needed instead of a line carrying between 115 kV and the current 25 kV? Commenters asked whether the environmental tradeoffs were appropriate for that large a power upgrade. Other commenters expressed concerns about the cost of the proposed action, since the costs will ultimately be borne by Kit Carson Electric Cooperative members.

Evaluation criteria:

- o Project reliability
- o Long-term needs
- o Project costs and components (direct, maintenance and line-loss costs)

Some commenters identified specific archeological resource concerns, including possible disturbance to archeological sites identified in and around the old “Chili Line” railroad and Ojo Caliente.

Section 106 of the National Historic Preservation Act (NHPA) of 1966 requires that the possible effects of Federal undertakings on properties included or eligible for the National Register of Historic Places be considered. A recent revision of the NHPA now requires the Agency to identify properties that may be of religious or cultural significance to Native Americans.

Evaluation criteria:

- Effects on archeological sites
- Impacts on traditional gathering areas

Several comments expressed concern about safety because of the possibility of increased wildfires from arching or downed power lines and/or from increased public access to remote areas from construction roads. Other comments voiced concerns about the effects of electromagnetic fields on human and animal health as a result of locating the proposed power line along roadways and near residences as well as through wild areas.

Evaluation criteria:

- Potential for electromagnetic field effects on human health
- Increased potential for wildland fire caused by power line

Additional road access may result in damage to soils and vegetation from vehicles and increased poaching, illegal woodcutting, illegal motor vehicle traffic, and vandalism to the power line, fence lines and other properties. More

people accessing typically inaccessible areas could create greater disturbances for wildlife and be the cause of wildfire starts.

Evaluation criteria:

- o Potential for increased access to areas not currently accessible by motor vehicle
- o Amount of new access (temporary roads) developed
- o Effects of increased access

The issues described above are important and are addressed in the related effects analysis in Chapter 3 – *Affected Environment and Environmental Consequences*.

Other Issues: Addressed in Chapter 2, Alternatives Including the Proposed Action

In addition to significant issues for which alternatives are developed, some respondents suggested alternatives of their own. These are discussed in Chapter 2, *Alternatives* under *Alternatives Considered, but Eliminated from Detailed Study*. Reasons why these alternatives were eliminated are provided in this section of the environmental impact statement.

Additional issues may be identified as the analysis and disclosure process continues; issues identified in the formal comment period for this draft environmental impact statement will be analyzed, described and discussed in the final environmental impact statement. If needed, new alternatives may be developed, and/or additional mitigation or monitoring might be added for the final document as a result of the identification of new issues.

Other Regulatory Requirements

The National Environmental Policy Act requires public involvement and consideration of potential environmental effects. This draft environmental impact statement and associated project record provides documentation to support the process in compliance with NEPA. In addition to NEPA, this environmental impact statement addresses and adheres to several other regulatory requirements as described below.

Federal Land Policy and Management Act of 1976

The primary legal basis for granting easements across National Forest System and Bureau of Land Management administered lands is the Federal Land Policy and Management Act (FLPMA) of 1976 (43 U.S.C. 1715). The Secretaries of Agriculture and Interior are authorized under FLPMA to grant, issue or renew rights-of-way over, upon, or through Federal lands for utility corridors. Issuance of permits, leases, or easements for utility corridor rights-of-way under FLPMA is guided by the regulations at 36 CFR 251 for the Forest Service and 43 CFR for the Bureau of Land Management. This proposed action is consistent with this act.

Forest and Rangeland Renewable Resources Planning Act of 1974

This act declared the public interest to be served by the Forest Service and, as such, that the renewable resource program must be based on a comprehensive assessment of present and anticipated uses, demand for, and supply of the renewable resources from the Nation’s public and

private forests and rangelands. It declared that the Department of Agriculture has both a responsibility and an opportunity to be a leader in ensuring that the Nation maintains a natural resource conservation posture that will meet the requirements of our people in perpetuity.

Endangered Species Act of 1973

The Endangered Species Act (ESA) requires that Federal activities do not jeopardize the continued existence of any species Federally listed or proposed as threatened or endangered, or result in adverse modification to such species' designated critical habitat. In accordance with Section 7(c) of this act, a list of proposed, threatened or endangered species that may be present in the project area will be requested from the U.S. Fish and Wildlife Service. As required by this act, potential effects of this proposed action on listed species will be analyzed and documented in a biological assessment.

Sensitive Species (Forest Service Manual 2670)

Forest Service Manual direction (FSM 2670) requires analysis of potential impacts to sensitive species, those species for which the Regional Forester has identified population viability is a concern. On July 21, 1999, the Regional Forester approved the sensitive species list. [270] Potential effects of this decision on sensitive species will be analyzed and documented in a biological evaluation.

Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act

These laws provide protection for migratory birds, eagles and hawks. Utilities are obligated to make electric wires and poles safe roosts for Federally protected species of hawks and eagles.

Clean Water Act (as amended)

The Clean Water Act (CWA) is to restore and maintain the integrity of waters. The Forest Service complies with this act through the use of best management practices (BMPs). This proposed action incorporates best management practices to ensure protection of soil and water resources.

National Historic Preservation Act (1966)

Archaeological Resources Protection Act of 1979

Native American Graves Protection and Repatriation Act (1990)

Section 106 of the National Historic Preservation Act requires Federal agencies to take into account the effect of a project on any district, site, building, structure, or object that is included in, or eligible for inclusion in the National Register. Section 106 of the National Historic Preservation Act also requires Federal agencies to afford the Advisory Council on Historic Preservation a reasonable opportunity to comment. The Archaeological Resources Protection Act covers the discovery and protection of historic properties (prehistoric and historic) that are excavated or discovered in Federal lands. It affords lawful protection of archaeological resources and sites that are on public and Indian lands. The Native American Graves Protection and Repatriation Act covers the discovery and protection of Native American human remains and objects that are excavated or discovered on Federal lands. It encourages avoidance of archaeological sites that contain burials or portions of sites that contain graves through "in situ"

preservation, but may encompass other actions to preserve these remains and items. This decision complies with the cited acts. Surveys have been conducted for Native American religious or cultural sites, archaeological sites, and historic properties or areas that may be affected by the proposed action and alternatives.

Prior to a decision, consultation with the State Historic Preservation Office will be conducted and documented in the Project Record. Additionally, the Federal government has trust responsibilities to tribes under a government-to-government relationship to insure that the Tribes' reserved rights are protected. Consultation with tribes helps insure that these trust responsibilities are met. The forest will continue to consult with potentially affected tribes. The intent of this consultation is to be informed about tribal concerns.

Civil Rights Act (1964)

This act provides for nondiscrimination in voting, public accommodations, public facilities, public education, Federally assisted programs and equal employment opportunity.

Executive Order 12898 on Environmental Justice (1994)

Executive Order 12898 requires consideration of whether projects would disproportionately impact minority or low-income populations. This environmental impact statement will include an environmental justice analysis to identify any adversely impacted local minority or low-income populations.

Other Lands

The proposed action and scope of this analysis pertain directly to the authorities given to the Forest Service and the Bureau of Land Management. Other parts of the overall project upgrading the electric system of Ojo Caliente and surrounding communities pertain to lands managed by the State of New Mexico, New Mexico State Highway Department (road right-of-way) or private lands for which Kit Carson Electric Cooperative must negotiate with those parties for approval.

Chapter 2. Alternatives Including the Proposed Action

Introduction

This chapter describes and compares the alternatives considered for the Ojo Caliente proposed transmission line. It includes a description and map of each alternative considered. This section also presents the alternatives in comparative form, sharply defining the differences between each alternative and providing a clear basis for choice among options by the decision maker and the public. Some of the information used to compare the alternatives is based upon the design of the alternative (i.e., locating the transmission line as proposed versus along an existing corridor) and some of the information is based upon the environmental, social and economic effects of implementing each alternative (i.e., the amount of change to visual quality caused by locating the transmission line as proposed versus along an existing corridor).

The purpose and need for the proposed action, along with the significant issues serve as the objectives and framework around which the alternatives were developed. Each alternative is designed to address one or more issues that surfaced during the analysis process.

Alternatives Considered but Eliminated from Detailed Study

Federal agencies are required by the National Environmental Policy Act (NEPA) to rigorously explore and objectively evaluate all reasonable alternatives and to briefly discuss the reasons for eliminating any alternatives that were not developed in detail (40 CFR 1502.14). Public comments received in response to the proposed action provided suggestions for alternative methods for achieving the purpose and need. Some of these alternatives may have been outside the scope of the need for improving consistency in electrical power, increasing efficiency in providing that power and expanding the capacity of the system in areas Kit Carson Electric Cooperative (KCEC) provides electrical power through conventional transmission and distribution lines; duplicative of the alternatives considered in detail or; determined to be components that would cause unnecessary environmental harm. Therefore, a number of alternatives were considered, but dismissed from detailed consideration for reasons summarized below.

Energy Conservation

Energy conservation is the more efficient use of electricity by customers. Though energy conservation can reduce energy consumption, this alternative would only forestall the increase in energy demands. It is also doubtful that conservation measures would be adequate to alleviate the existing demands on the system. The fact that these communities have grown over the past 50 or so years, and are likely to continue to grow at a somewhat similar rate, further reduces the chance that conservation alone could provide a reliable level of energy in the future.

This alternative is dependent on individual consumer response to develop conservation habits, select energy efficient appliances, develop and utilize more solar energy and/or heat pumps and thermal storage, as well as to improve insulation properties of homes and businesses. Because energy conservation is voluntary on the part of the consumer, conservation cannot be relied upon as a means of improving reliability of service. Therefore, this alternative would not meet the purpose and need for the proposal.

Alternative Generating Sources

Kit Carson Electric Cooperative is only a distributor of electric power and does not generate it. Therefore, pursuing other generation options is outside the scope of this analysis. In addition, this alternative assumes there would be construction of additional generating and, to some degree, transmission facilities. Such facilities would have to be large enough to satisfy the current and future load growth. The installation and operation costs of a new generating facility would be significant and potentially not economically feasible. There is currently no proposal for any such development, therefore, this alternative would not meet the purpose and need for the project.

This does not preclude any such proposal for development of local or regional alternative energy generation in the future. Any number of options exists for such proposals that could eventually augment energy demands, including natural gas, solar, wind or even solid wood or wood fiber burning electrical generation plants.

Alternative Routes

One route was considered that would use the shortest possible route from the existing 115 KV Hernandez to Taos transmission line to the proposed substation north of Ojo Caliente. This route is similar to the proposed action, but would be basically a straight line which would cross more sensitive portions of the lands administered by the Bureau of Land Management (BLM), including the Ojo Caliente Area of Critical Environmental Concern (ACEC) established for the high density of pueblo sites and cultural values. [7, 8] It would also cross a small area of badlands, which would create difficulties with access and surface protection.

Another route considered was from the Ojo substation southwest of Black Mesa up the Rio Ojo Caliente drainage to the proposed substation north of Ojo Caliente. This would be a new corridor route about twice as long as the proposed action and would run through the entire length of the Ojo Caliente ACEC and the community of Ojo Caliente. It would have high visual and social impacts, and given the numerous pueblo and cultural sites known in the area, there would be excessive expense in both time and money for archeological surveys, mitigation and excavation.

Underground System

A number of scoping comments suggested burying the lines to address the visual impacts of a transmission line on the landscape. The economics of this option are cost prohibitive. Many members of the Kit Carson Electric Cooperative living in Taos County and the service area of Rio Arriba County are on low, fixed incomes. The cost of an above ground 115kV transmission line is estimated at approximately \$112,000 per mile while the cost of 1 mile of a buried system is approximately \$1,363,000. Buried line is done at the request of the residents, with reimbursement of the difference in costs between the above ground versus the buried line.

Although there are visual advantages, there are also significant resource disturbance considerations as a trench approximately 5 to 6 feet deep and about the same width is required for burial. The surface disturbance adjacent to the trenching also becomes much wider. If a failure should occur the cost is much greater along with the outage time for locating and repairing the problem.

Replacement of Current Lines With Heavier Conductors

An option was considered that would convert the existing conductors (lines) with much larger conductors. This option was rejected, because even though the losses could be improved with a much larger conductor, the voltage problem would not be adequately addressed. Also the current poles and crosspieces do not permit sufficient clearance between the heavier conductors or adequate height separation required for transmission currents. This would also require changing out the conductors crossing the Rio Grande Wild and Scenic River Corridor.

In addition, this alternative would not create a loop design that would improve the reliability of the system to all its users. Since the existing distribution system is comprised of a single circuit, a line failure can result in a power outage to the entire distribution area. Retaining portions of the existing 25 kV line would provide a power “loop” that would allow for backup power, if there were problems with the new transmission line or substation. Long-term needs would also not be addressed and the expense would still be over 1.1 million dollars.

Items Common to All Action Alternatives

For any action alternative, the Forest Service or BLM would authorize a 40-foot right-of-way. The permit application would incorporate any guy wire anchor point locations that extend outside the 40-foot corridor as included in the right-of-way.

As a part of this analysis, it was discovered that the portion of the existing 25 kV distribution line on BLM has never been authorized under permit. All action alternatives would include the administrative actions required to authorize the existing 25 kV line along with any associated service drops and upgrades as specified in the alternative.

Substation

In all action alternatives, the proposed substation would be located at the terminus of the transmission line on BLM lands (T. 24 N, R. 9 E, Sec. 7), just northwest of the intersection of U.S. 285 and NM 111 and 1.5 miles north of Ojo Caliente. It would be approximately 160 yards east-northeast along the existing line from where the current bank voltage regulators are located. The total area required for the substation equipment would occupy approximately 1.5 acres. A chain link-cyclone fence would enclose the substation. For safety purposes, a grounding grid would be buried around the exterior perimeter of the fence.

To increase reliability, all action alternatives would convert the existing single circuit distribution system to several 25 kV circuits. No significant change in the existing lines would be required to do this. Several distribution circuits would leave the substation as buried lines to NM 111, then surface and connect into the existing distribution lines. A single pole would remain between the substation and NM 111, which currently provides service to the State Highway Department facility. Buried lines would require a single trench approximately 30 inches wide, 5 feet deep and 175 yards long. The trench would be located alongside the access road from NM 111 to the substation. The access road would consist of an improved hardened surface between the highway and the substation and would also be approximately 175 yards long. [276]

Line and Pole Configuration and Appearance

For any transmission line alternative, single wooden poles approximately 65 feet in height and 24 inches in diameter are proposed. In sections where both the 115 kV transmission line and the 25 kV distribution line would be together, the poles would be similar, except for a wooden cross member installed on the pole under the 115 kV line to carry the 25 kV lines. This is called an “underbuild design” (Figure 5). Poles in a single circuit 115 kV transmission line with no underbuild would be around 60 feet tall and average 12 to 13 poles per mile. The underbuild design would generally have poles at the upper height range.

In areas where the new line coincides with the existing route, new taller poles would replace existing poles. In locations where there would be corners or angles in the route, one brown metal pole or multiple pole structures with guy wires may be used. Metal or multiple pole structures provide greater support and strength than single wooden poles.

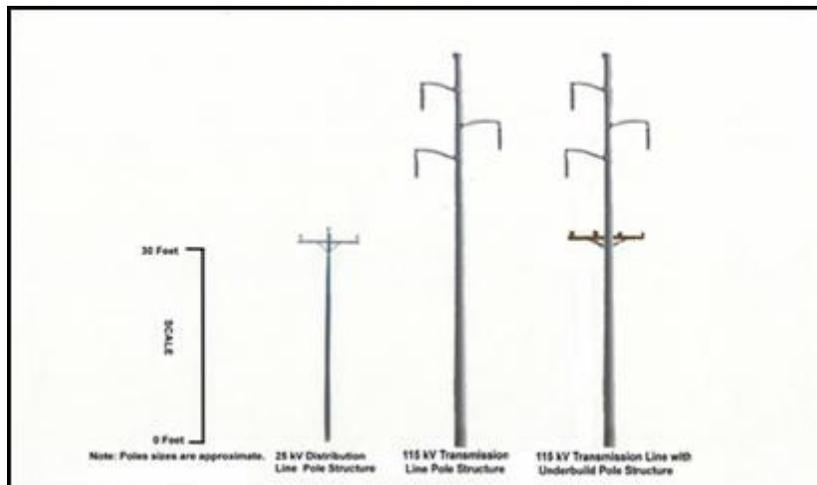


Figure 5. Three types of power line pole structures (pole sizes are approximate).

In all alternatives, a static line containing a fiber optic cable would run atop the poles. The fiber optic capability would only be used for KCEC operational purposes to remotely control switching station and substation equipment. A switching device would also be included in all action alternatives and would be located at the point where the new transmission line taps into the existing 115 kV line. The switching station would be fenced and occupy one-quarter acre or less.

All action alternatives would use a system designed to protect birds, especially raptors, from accidental electrocution. Nonspecular (nonglare) wire would be used for any transmission line alternative and new segments of distribution lines.

To minimize the removal of trees in the piñon-juniper, access along the utility corridor would meander around as many trees as possible. Clearing through piñon-juniper may be required if the trees approach the height of the lines. Although most piñon and juniper trees in this area are less than 30 feet tall, tree trimming may be necessary at the lowest point of line sag to maintain adequate clearance. Poles would be brought in on trucks and laid next to the route. Cranes would be used to insert the poles into holes and buried 8 feet.

Where the line would cross a NM Department of Transportation easement a State permit to aerially cross the highway would be needed.

Distribution Lines

All distributions lines would be retained or relocated to provide the backup loop and increase system reliability. The three existing feeder-distribution lines in all action alternatives would be retained and converted to separate circuits to serve areas to the south including Ojo Caliente, to the west and north serving El Rito, La Madera and surrounding communities, and to the east providing power to Carson and Pilar. The distribution lines would originate at the new substation location and relocation varies by alternative.

In all action alternatives, the existing distribution line that runs from the Los Cordovas substation outside Taos would be retained in its current condition. Retention of the existing above ground distribution line back to the Los Cordovas substation would complete the “loop” needed to provide backup power to all the communities the transmission line would serve.

Alternatives Considered in Detail

Alternatives are used to evaluate different ways to resolve significant issues brought forth by the public (see Chapter 1) and satisfy the purpose and need for action. For this analysis, four alternatives have been considered in detail. In addition to the alternatives, an option was developed to address the need for another distribution line to the Tres Piedras area. This issue came up after the proposed action was developed and released to the public for comment. The option could be included with any action alternative. Because the Tres Piedras Option does not fully meet the purpose and need of the proposed action, it could not stand alone as an alternative. The forest supervisor approved the alternatives, as well as the Option, on May 6, 2003. [257]

Alternative A

No Action

This alternative is the “no action” alternative required by the Council on Environmental Quality for the implementation of NEPA (40 CFR Part 1502.14d). Under this alternative no new upgrade to the existing distribution lines would be authorized across National Forest System or BLM lands. The No Action Alternative is the point of reference for evaluating the action alternatives. This alternative would maintain the existing 25 kV line (Figure 6) in its present location and maintenance of the line would continue as normal. This alternative would not address the purpose and need of the proposed action.

As a part of this analysis, it was discovered that the portion of the existing 25 kV distribution line on BLM lands has never been authorized under permit. Under the No Action Alternative this line would remain and continue to provide electrical service to the area. Any decision by BLM to authorize the existing line and access routes would be an administrative decision unassociated with this alternative.

Alternative B

Black Mesa-Cerro Azul Tap (Proposed Action)

This alternative is the proposed action (Figure 7). It would originate from the existing 115 kV line about 1.5 miles northeast of Black Mesa and about 3 miles southwest of Cerro Azul; it has also been referred to as either the “Black Mesa or Cerro Azul Tap” alternative.

Alternative B would authorize KCEC to construct a new transmission line that would tap into the existing 115 kV Hernandez to Taos transmission line approximately 1.5 miles northeast of Black Mesa on the Carson National Forest. The line would run north/northwest along Forest Road 558 for about 6.7 miles and connect into the existing 25 kV distribution line, located just north of U.S. 285—also located on the Carson National Forest. It would follow the 25 kV right-of-way for about one mile, where it would leave the Carson National Forest and enter lands administered by the BLM. Then the line would follow the existing corridor west and slightly south for 1.9 miles to the location of the proposed substation just north of the intersection of U.S. 285 and NM 111.

This route would total 9.6 miles and involve 7.7 miles on National Forest System and 1.9 miles on BLM administered lands. It would not cross any private land. This alternative would create 6.7 miles of new corridor.

One brown metal pole or 2 to 3 wooden pole structures with guy wires may be used to provide greater support and strength where four to five corners or angles in the line occur. Approximately 3 miles of underbuild would be required from the point where it connects into the existing 25 kV line down to the proposed substation. The 25 kV line would be underbuilt on the same poles to provide a loop and backup system in case of a failure at the substation or along the 115 kV line.

This alternative would include a new substation location, the line and pole appearance and the use of the distribution lines described in the previous section, *Items Common to All Action Alternatives*. Alternative B would be consistent with the Carson Land and Resource Management Plan [5] and the BLM’s Taos Resource Management Plan [7].

Alternative C

Existing Corridor

During the scoping process, a common concern expressed in the comments was that the proposed transmission line would create a new corridor. Alternative C addresses the significant issue of the environmental impacts related to creating a new utility corridor (see Chapter 1, *Issues*). This alternative was developed based on meeting the purpose and need for the proposed action and utilizing the existing power line corridor, rather than creating a new one. It would run entirely through an existing corridor. Alternative C will also be referred to as the “Existing Corridor” alternative.

Alternative C would construct a new transmission line that would tap into the existing 115 kV Hernandez to Taos transmission line on private land in the vicinity of where it crosses NM 567 (Figure 8). A new 115 kV transmission line would proceed west along the existing 25 kV distribution line corridor on State or private land for approximately 2.8 miles, then cross onto the Carson National Forest. It would continue west and then along U.S. 285 (also crossing two parcels of private land) for approximately 10.9 miles (~2 miles on private), where it would enter

lands administered by the BLM. Then the line would follow the existing corridor west and slightly south for 1.9 miles to the location of the proposed substation just north of the intersection of U.S. 285 and NM 111.

This route would total 15.6 miles and cross through 4.8 miles of private land, in addition to 8.9 miles of National Forest System lands and 1.9 miles on BLM lands. This alternative would not create any new utility corridor.

One brown metal pole or 2 to 3 wooden pole structures with guy wires may be used to provide greater support and strength where four or five corners or angles in the line occur. Existing poles would be replaced to enable the higher voltage lines to be positioned properly above the existing 25 kV distribution line. The 25 kV line would be underbuilt on the same poles the entire length of the new line (15.6 miles) to provide a loop and backup system in case of a failure at the substation or along the 115 kV line.

This alternative would include a new substation location, the line and pole appearance and the use of the distribution lines described in the previous section, *Items Common to All Action Alternatives*. Alternative C would be consistent with the Carson Land and Resource Management Plan [5] and the BLM's Taos Resource Management Plan [7].

Alternative D

285P Tap

Another public concern expressed during the scoping process was that the proposed transmission line would impact scenic values to residents and travelers along U.S. 285. Alternative D addresses the significant issue of the visual impacts related to the new transmission line route across the open terrain between Black Mesa and U.S. 285 as proposed (see Chapter 1, *Issues*), and along Highway 567 and U.S. 285 using the existing route in Alternative C. This alternative was developed based on meeting the purpose and need for the proposed action and using topographic features, such as draws, swales and hills, to obscure the majority of the line from the view of residents in the Carson area and/or motorists along U.S. 285. Alternative D will also be referred to as the "285P Tap" alternative.

Alternative D would authorize KCEC to construct a new transmission line that would tap into the existing 115 kV Hernandez to Taos transmission line on National Forest System lands where it intersects Forest Road 285P (Figure 9). A new 115 kV transmission line would proceed north, following the bottom of Cañada Embudo for 4.8 miles. It would swing west and cross U.S. 285 where the highway turns westward to Ojo Caliente. It would run parallel to U.S. 285 for about 5.7 miles on national forest, at a distance of up to one-half mile north from the highway. It would then enter BLM lands and intersect with the existing 25 kV distribution line. The line would follow the existing corridor west and slightly south to the location of the proposed substation just north of the intersection of U.S. 285 and NM 111 for 1.9 miles on BLM lands.

This route would total 12.4 miles and involve 10.5 miles of National Forest System lands and 1.9 miles of BLM administered lands. It would not cross any private land. This alternative would create 11.1 miles of new corridor, however 5 miles of existing line and poles would be removed. One mile of existing line would still remain through private land.

One brown metal pole or 2 to 3 wooden pole structures with guy wires may be used to provide greater support and strength where six or seven corners or angles in the line occur. Since 5 miles of the existing corridor along the south side of U.S. 285 would be eliminated, about 7.6 miles of underbuild would be required from the point where the line connects into the existing 25 kV line down to the proposed substation. The 25 kV line would be underbuilt on the same poles to provide a loop and backup system in case of a failure at the substation or along the 115 kV line.

This alternative would include a new substation location, the line and pole appearance and the use of the distribution lines described in the previous section, *Items Common to All Action Alternatives*. Alternative D would be consistent with the Carson Land and Resource Management Plan [5] and the BLM’s Taos Resource Management Plan [7].

Option

Tres Piedras Connection

This option addresses the significant issue brought forth during public scoping that Kit Carson Electric Cooperative does not have the means of serving the residents south of Tres Piedras along U.S. 285 at all (see Chapter 1, *Issues*). This option would provide electrical service through a new distribution line. This option will also be referred to as the “Tres Piedras Connection.” Since this option does not fully meet the purpose and need for action, it is not a stand-alone alternative. It could only be selected as part of one of the action alternatives.

The Tres Piedras Connection would authorize KCEC to construct a new distribution line that would tap into the existing 25 kV distribution line in the vicinity of the microwave station just north of the intersection of NM 567 and U.S. 285 (Figure 10). It would cross the highway to the west side and proceed north along U.S. 285, where it would cross back east of the highway to connect into the existing line that comes south from Tres Piedras along U.S. 285. This route would total 7.5 miles. With the exception of 1.5 miles through private land, this option would be on National Forest System lands.

Table 4. Comparison of alternatives

	Alternative				Option	
	A	B	C	D		
Total miles new 115 kV line	0	9.6	15.6	12.4		
Miles on NFS lands	0	7.7	8.9	10.5		
Miles on BLM lands	0	1.9	1.9	1.9		
Miles on Private/State lands	0	0	4.8	0		
Miles creating new corridor	0	6.7	0	11.1		
Miles of underbuild	0	2.8	15.6	7.6		
Miles of existing corridor eliminated	0	0	0	5.0		
New substation	No	Yes	Yes	Yes		
Total miles new 25 kV line						7.5
Miles on NFS lands						6.0
Miles on PVT lands					1.5	

**Note: Number of miles is rounded to the nearest 0.1 mile.*

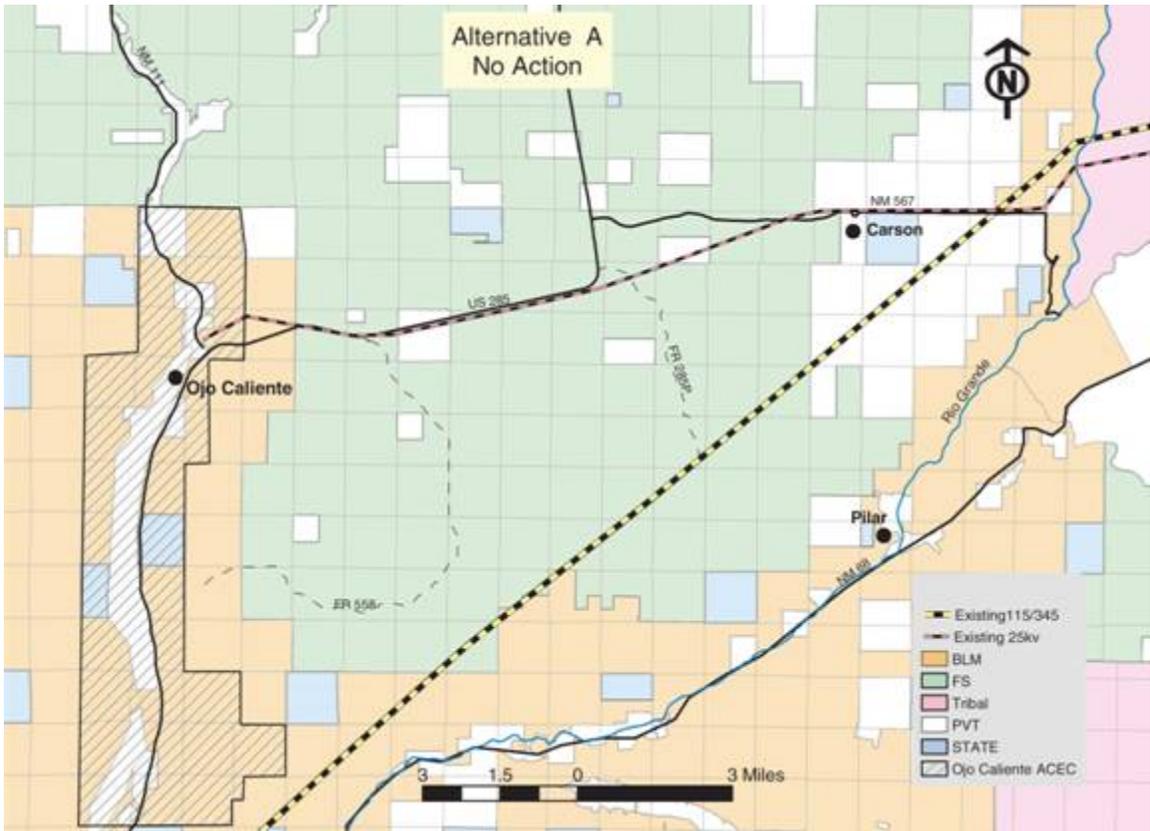


Figure 6. Alternative A – No Action.

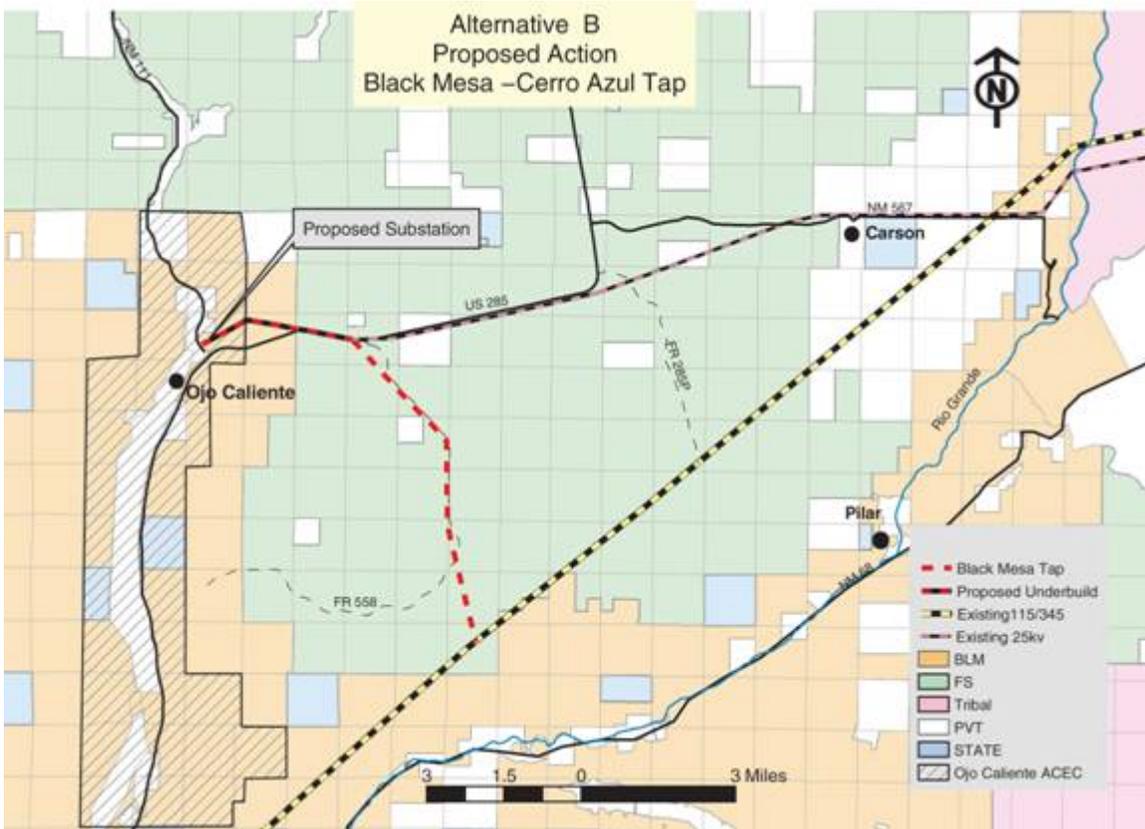


Figure 7. Alternative B – Black Mesa-Cerro Azul Tap.

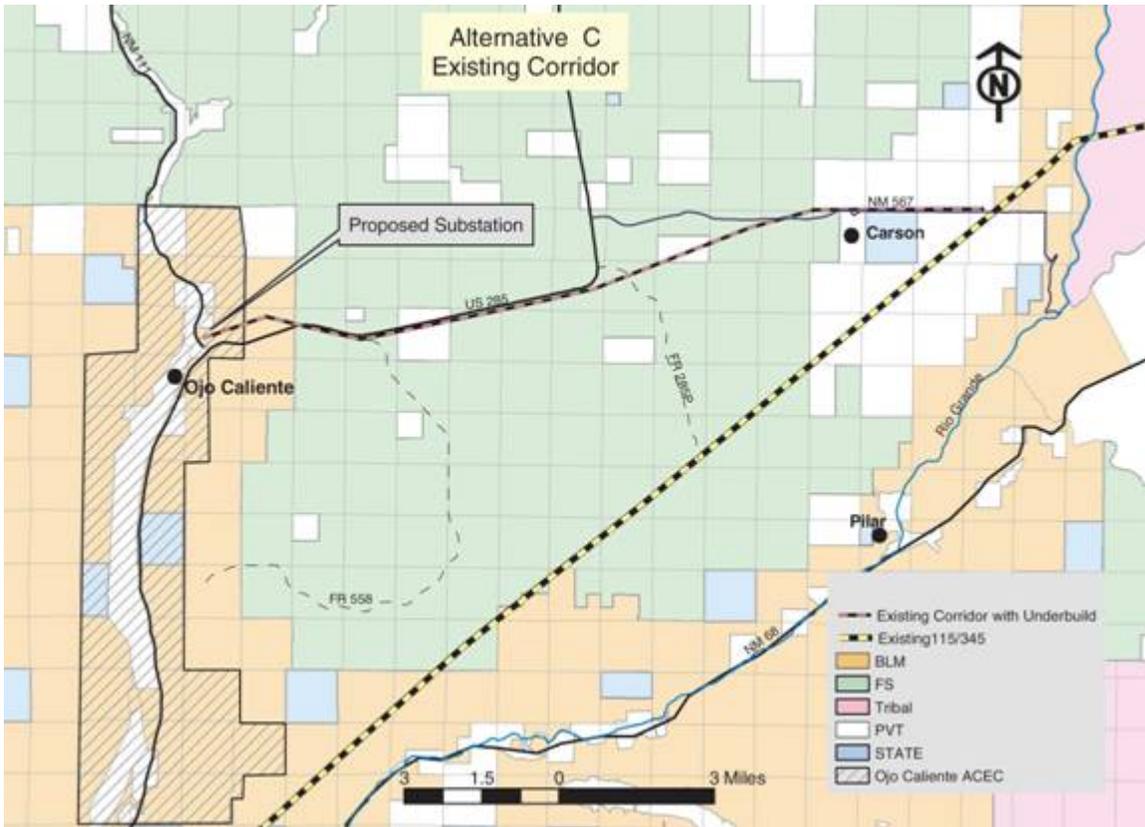


Figure 8. Alternative C – Existing Corridor.

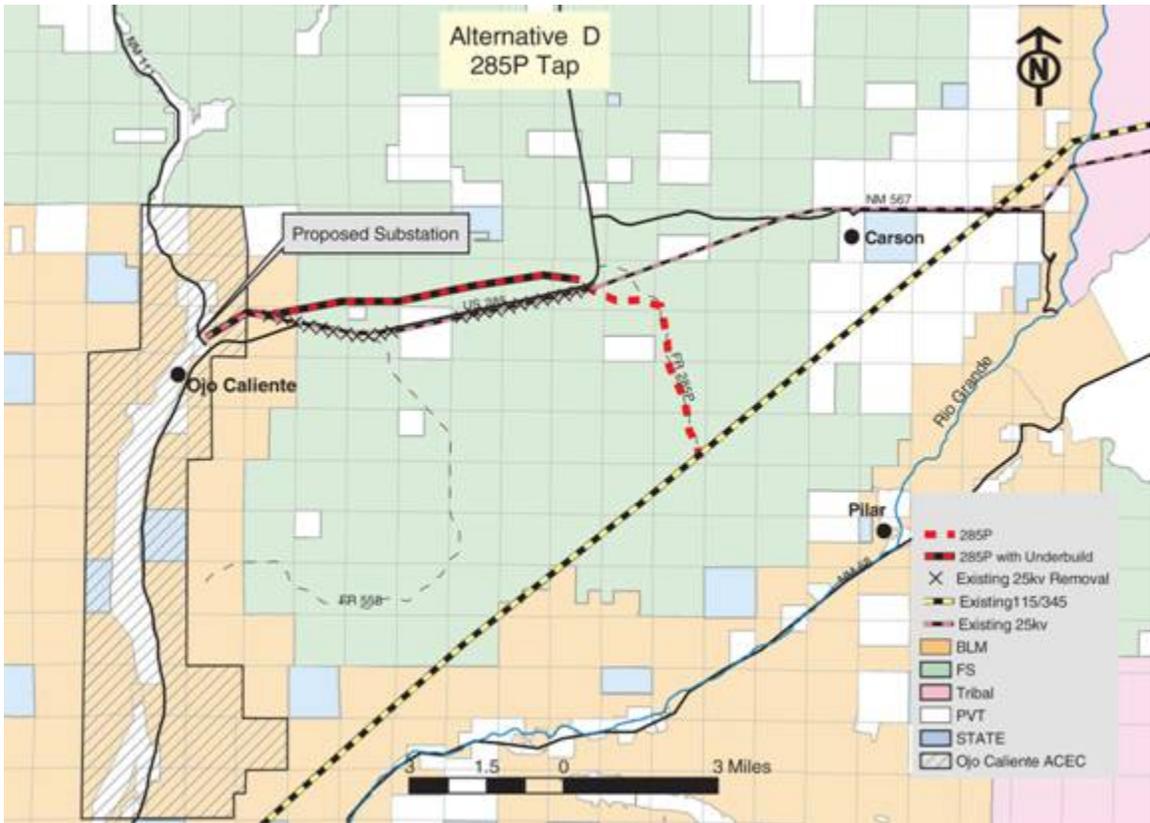


Figure 9. Alternative D – 285P Tap.



Figure 10. Option – Tres Piedras Connection.

Mitigation Common to All Alternatives

To mitigate is to offset or to lessen real or potential impacts of an activity through the application of additional controls or actions. Counter measures are employed to reduce or eliminate undesirable or unwanted results. Mitigation is a tool to ameliorate an undesirable environmental effect; it is identified and included as part of each alternative, and the analysis of environmental effects in Chapter 3, *Affected Environment and Environmental Consequences*.

To minimize resource impacts, the mitigation measures in Table 5 will be followed for any action alternative chosen. Implementation of the required mitigation measures identified below will be considered and documented at the time of project implementation by the Forest Service and/or BLM, based on current conditions and technologies and success of prior measures.

Environmental effects are based upon the application and effectiveness of these mitigation measures. Monitoring is a vital aspect of project implementation because it tracks the application and effectiveness of mitigation, the accuracy of predictions about environmental effects, and whether or not project objectives are being met, and provides a mechanism for changing how the current project is being implemented or how future projects will be designed and implemented.

Table 5 identifies the mitigation and monitoring required for each alternative if that alternative is selected for implementation. The table also identifies the specific resource to be mitigated or monitored; the location where the mitigation or monitoring will be applied; and for mitigation, the predicted effectiveness of that mitigation measure.

To insure proper execution of mitigation measures, their implementation and effectiveness are monitored frequently. This monitoring process occurs before, during and after (up to several years later) project implementation. Monitoring data will contribute to determining the effectiveness of mitigation as well as aid in determining if the project objectives are being met. The table also identifies when the mitigation will be applied and/or when monitoring will be conducted; who will be responsible for ensuring the mitigation or monitoring is done; and how the information will be reported and used.

Kit Carson Electric Cooperative will designate an inspector to monitor all construction activities on National Forest System and Bureau of Land Management lands and to coordinate with a designated Forest Service or BLM representative. The mitigation and monitoring requirements for this project will be assigned to Kit Carson Electric Cooperative as part of the terms and conditions for the special use permit authorizing construction activities on Federal lands.

Table 5. Mitigation measures required for all action alternatives

MM No.	Mitigation Measures/ Monitoring	Location	Effectiveness¹	Timing	Responsible Entity
General					
G1	Construction personnel will be instructed on the laws pertaining to the protection of cultural and ecological resources on national forest and BLM lands, including collection and removal.	Onsite	Will help prevent collection or damage of artifacts or plant products.	Prior to construction	FS BLM KCEC
G2	Engineering design plans will be completed, based on the selected alternative. Unforeseen temporary use areas (TUAs), such as unanticipated pull locations	As determined	Protection of natural resources	Prior to construction	FS BLM KCEC

MM No.	Mitigation Measures/ Monitoring	Location	Effectiveness¹	Timing	Responsible Entity
	or access to them may be identified as necessary. Any TUA not previously identified and analyzed will require coordination with the authorizing agency and appropriate clearances.				

Soils and Water

SW1	Develop an erosion control plan, whereby practices, locations of practices, and specifications for practices will be used to minimize erosion and sedimentations (BMP 41.1). As a part of this, a storm water prevention plan will be submitted and approved by the State of NM Environmental Division.	Project area for selected alternative	By effectively planning for erosion control, soil movement can be reduced. Erosion control objectives usually require a combination of practices that promote the reestablishment of vegetation on exposed slopes, provide physical protection to exposed soil, prevents the downslope movement of soil, or controls drainage.	Prior to construction	KCEC BLM FS
SW2	Structures and access roads will be placed so as to avoid to the degree possible features such as, but not limited to, intermittent watercourses, residential uses, cultural sites and/or allow conductors to clear or span the features, within limits of standard structure design. If any sensitive feature is discovered during construction, avoidance may be accomplished by spanning or through minor realignment of the route.	Project area for selected alternative	By avoiding as much as possible steep slopes, drainages and other sensitive features, the amount of disturbance can be minimized.	During construction	KCEC FS BLM
SW3	All construction vehicle movement or temporary use areas outside the right-of-way will be coordinated with the authorizing agency and restricted to predesignated	Project area for selected alternative	By limiting access to the project area, unnecessary impacts to soils and vegetation can be avoided or minimized. Unforeseen access needs will be	During construction	KCEC FS BLM

MM No.	Mitigation Measures/ Monitoring	Location	Effectiveness¹	Timing	Responsible Entity
	access, contractor acquired access, or existing roads.		coordinated with the authorizing agency to minimize surface disturbance.		
SW4	Low bearing pressure vehicles and/or equipment or even helicopters may be used to the degree possible off any existing roads in construction of the power line.	Off designated roads or where two-tracks are created for installation	By limiting or distributing the weight of heavy equipment, soil compaction and disturbance to ground cover can be minimized.	During construction	KCEC
SW5	Access roads will not be widened unless essential for project implementation. Some locations may be limited to cross-country vehicular access.	Roads/two tracks used for installation/maintenance	By maintaining roads at their existing width, unnecessary damage to soils and vegetation can be avoided.	During construction	KCEC FS BLM
SW6	Access to pole sites and the line will be kept to existing roads or two-track utility corridor, unless the route is not feasible for transport, or more resource damage would develop if these designated access routes are used.	Project area for selected alternative	By limiting access, new, permanent vehicular access can be avoided. This will prevent long-term ground disturbance in areas currently inaccessible to motorized use.	During construction	KCEC FS BLM
SW7	Biological soil crusts will be avoided whenever possible. In the event a biological soil crust crossing is unavoidable, the crossing will be the shortest distance across the crusted area. When feasible, pole locations will be moved to avoid crusts.	Project area for selected alternative	Limiting unnecessary disturbance to soil crusts will protect the function of organisms that aid in soil stability, water infiltration and plant health.	During construction.	KCEC FS BLM
SW8	Existing roads will be properly maintained. Grading may be necessary (BMP 41.14).	Project area for selected alternative	Proper drainage from road surfaces reduces surface erosion and sediment production.	During construction	KCEC FS BLM

MM No.	Mitigation Measures/ Monitoring	Location	Effectiveness¹	Timing	Responsible Entity
SW9	Construction activities may be curtailed at any time during excessively wet periods where muddy conditions would result in watershed damage (BMP 41.11).	Project area for selected alternative	Avoiding working in excessively muddy conditions can prevent unnecessary soil compaction or soil displacement (BMP 41.27).	Wet periods during construction.	KCEC FS BLM
SW 10	Areas with disturbed soils will be rehabilitated by appropriate contouring and replanting with a native seed mix. All seed mixtures will be certified as “weed free.”	Disturbed sites	Establishing vegetation cover on disturbed sites prevents accelerated onsite soil loss. Seed mixes will help prevent undesirable plants becoming established in project area and provide soil stabilization.	During construction in mid-July to August	KCEC FS BLM
SW 11	Trees limbs (2 inches in diameter and smaller) will be lopped and scattered across the disturbance site following completion of power line installation.	Disturbed sites	Scattering small diameter woody material will provide protection to soils from erosion and provide improved conditions for plant regeneration.	During construction	KCEC
SW 12	All onsite servicing or refueling of construction equipment will be performed using protective spill containment or absorption mats.	Project area for selected alternative	To prevent pollutants such as fuels, lubricants and other harmful materials from being discharged on public lands.	During construction	KCEC
SW 13	Storage of oil fluids or petroleum products onsite is prohibited. All petroleum products shall be removed to a disposal facility authorized for disposal.	Project area for selected alternative	Reduces chances of spills and ensures proper disposal. An approved emergency response plan will be prepared and in place in the event of a spill.	During construction	KCEC
SW 14	Oil, fuel or other fluids shall not be spilled or drained onto the ground or into drainages.	Project area for selected alternative	Prevents any contamination of water and soils during equipment servicing or refueling.	During construction	KCEC
SW 15	KCEC will be responsible for implementation of erosion control measures such as water bars, drainage contours, straw bales, filter cloth or similar tools. Any such measures may be	Disturbed sites	Especially in areas with steeper slopes, erosion control measures can minimize soil movement during construction.	During construction	KCEC

MM No.	Mitigation Measures/ Monitoring	Location	Effectiveness¹	Timing	Responsible Entity
	required at any location deemed necessary by the authorized FS or BLM officer during construction activities. Straw bales or other offsite vegetative materials will be certified as “weed free.”				
SW 16	All existing roads would be left in a condition equal to or better than their condition prior to construction of the transmission line.	Project area for selected alternative	Construction will cause additional wear and tear on existing roads. Keeping them maintained and in good repair will minimize disturbance to soils and vegetation adjacent to them.	After construction	KCEC
SW 17	All access that is undesired or not required for regular maintenance will be closed using the most effective method appropriate to the area and developed with concurrence of the landowner or land manager or Forest Service officer. Site-specific requirements for the method of closure will be made on a case-by-case basis.	Project area for selected alternative	If additional access is needed into the project area for construction, it is likely to expand access to other motorized uses. Closing these areas after construction will prevent motorized vehicles from permanently using these areas and causing more disturbances to soil and vegetation.	After construction.	KCEC

Vegetation

VG1	Cutting down green trees to create a two-track corridor or access to pole sites will be kept to a minimum. If feasible, equipment should go around piñons and junipers, especially large, healthy ones.	Two-track corridor and any additional access routes off existing roads.	Selectively cutting trees (especially piñons) will provide the healthiest piñons, having withstood bark beetle infestation, from being removed from the ecosystem.	During construction	KCEC FS BLM
VG2	If green piñon tree removal is required, trees will be bucked no longer than 18” and green branches stacked immediately, covered with 4 mil. plastic and edges secured to the ground with an earthen berm. The plastic must	All live trees that are cut down	This mitigation will slow or eliminate the spread of the Ips beetle from green trees that may be infected.	Optional at discretion of forest officer. During and after construction	KCEC FS BLM

MM No.	Mitigation Measures/ Monitoring	Location	Effectiveness¹	Timing	Responsible Entity
	remain in place for a minimum of 2 weeks—not to exceed 45 days. All plastic will be removed from the site after isolation.			ion	
VG3	Kit Carson Electric Cooperative will be responsible for control of any invasive or noxious plants established through construction or maintenance of a utility corridor. Prior to implementation the Forest Service will approve control or eradication methods.	Project area for selected alternative	These efforts will reduce or eliminate introduction and spread of invasive, nonnative, or noxious plants on public lands.	Prior to construction	KCEC FS BLM
VG4	All vehicles and equipment used during construction and maintenance will be spray washed prior to entering National Forest System and BLM lands. A high pressure hose will be used to clear the undercarriage, tire treads, grill, radiator, and truck beds of any foreign soil, plant matter or seed materials.	Project area for selected alternative	Cleaning will remove mud dirt and plant parts from undercarriages, tires, grills, radiators etc. This will reduce potential of spreading noxious weeds on public lands.	During construction and maintenance	KCEC
VG5	All fill mixture brought into the substation area will be free of noxious weeds.	Substation area	Borrow site should be inspected to minimize movement of noxious weeds.	Prior to use	KCEC BLM
VG6	Any reseeding will be done with a seed mixture authorized by the Forest Service or BLM.	Project area for selected alternative	These efforts will reduce or eliminate introduction and spread of invasive, nonnative, or noxious plants on public lands.	Prior to use	KCEC FS BLM

Wildlife

WL1	Raptor protection clip-on insulators will be installed on both lines adjacent to the pole on any distribution lines associated with new construction for the selected alternative.	Underbuilt lines and any distribution lines.	Application of protection measures can significantly reduce electrocution to birds of prey, and avoid outages resulting from electrocutions.	During construction	KCEC FS
WL2	Clearing of trees for	Woodland	By prohibiting tree cutting	April 1	KCEC

MM No.	Mitigation Measures/ Monitoring	Location	Effectiveness¹	Timing	Responsible Entity
	construction purposes will be prohibited from April 1 to August 1.	types within project area	and removal during the normal migratory bird breeding season, potential disturbance to nesting pairs and/or destruction of nests can be reduced. Will also reduce spread of Ips and loss of habitat.	to August 1	FS

Air

AR1	Water will be sprayed on any area that is producing excessive airborne dust.	Disturbed sites	Airborne dust can be mitigated during extended dry periods by wetting disturbed sites.	As requested	KCEC
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Visual Quality

VQ1	Nonspecular conductors will be used for both 115kV and new 25kV. Wooden poles will be used, unless a metal pole is needed at corners or angles in the route. Metal poles will be treated to turn brown when exposed to the elements.	Full length of selected alternative	Nonreflective conductors and wooden or brown metal poles prevent lines from severely standing out on the landscape.	During construction	KCEC
VQ2	No paint or permanent discoloring agents will be applied to rocks or vegetation. All flagging will be removed upon completion of the project.	Full length of project area	Will prevent any unnecessary visual impact to project area as a result of marking survey or construction areas.	During construction	KCEC FS

Heritage Resources

HR1	A project map will be provided to the contractor identifying all sensitive areas relative to the selected alternative.	Project area for selected alternative	This will serve as an aid to the contractor to be aware of which mitigation measures are pertinent for the area where work is currently ongoing.	Prior to Construction	FS
HR2	A Forest Service representative will be assigned for surface compliance inspection and monitoring in the vicinity of archeological sites.	Project area for selected alternative	Will monitor and work closely with KCEC and contractor to ensure application of mitigation measures.	Duration of construction	KCEC FS
HR3	Use selective pole placement	Pole sites	Preventing disturbance	Dura-	KCEC

MM No.	Mitigation Measures/ Monitoring	Location	Effectiveness ¹	Timing	Responsible Entity
	to avoid impacts to heritage resource sites.		from pole installation will protect heritage resource sites.	tion of construction	FS BLM
HR4	Access routes through significant heritage resource sites will be prohibited.	Project area for selected alternative	Preventing disturbance from equipment accessing the corridor will protect heritage resource sites.	Decision	FS BLM
HR5	In the vicinity of historic structures, single wooden poles, nonglare wire and selective pole placement will be used.	Pole sites	Selectively placing poles using natural terrain and vegetation to obscure them will minimize impacts to structure surroundings.	Decision	KCEC
HR6	If necessary, directionally fall trees near known heritage resource sites away from marked boundaries.	Adjacent to site boundaries	Ensures that there are no impacts to archeology sites.	During construction	KCEC FS
HR7	If any buried antiquities or remains are discovered, the contractor will notify the FS or BLM prior to continuing work.	Onsite	Will allow for proper treatment of any undiscovered sites.	During construction	KCEC

Other Resources

OR1	All construction debris or trash associated with construction will be properly contained while onsite and removed daily	Project area for selected alternative	Daily removal will prevent litter and trash accumulation onsite.	Daily	KCEC
OR2	Fences, gates and cattle guards will be repaired or replaced to their original condition if damaged during construction.	Project area for selected alternative	Property can be damaged during construction activities. If so, replacement or repair is effective resolution.	During or after construction	KCEC
OR3	KCEC will work with the New Mexico Department of Transportation in the design and construction of structures along or crossing the highway right-of-way.	Highway corridors	Requirements for Occupancy of State Highway System Right-of-Way by Utility Facilities, Title 17: Chapter 4, Part 2, have proven to effectively allow public utilities and public travel in close proximity.	During construction	KCEC NMDOT

1/ Environmental effects analyses are based on these assumptions

Comparison of Alternatives

This section provides a summary of the effects of implementing each alternative. Information in the table is focused on activities and effects where different levels of effects or outputs can be distinguished quantitatively or qualitatively among alternatives.

Table 6. Alternative comparison of effects

	Alternative				Option
	A	B	C	D	
Significant Issues					
Environmental Effects of a New Utility Corridor					
Miles of proposed transmission line construction in new corridor	0	6.8	0	11.0	7.5 (but is within highway corridor)
Miles of proposed transmission line in existing corridor	0	2.8	15.6	1.5	0
Total miles	15.6	9.6	15.6	12.5	7.5
Estimated disturbed acres, including substation and temporary use areas (not including existing roads)	None	22.3	33.5	39.7 (Includes removal of 5 miles of existing 25 kV line and poles)	Area within highway right-of-way is already disturbed
Impacts on Scenic Values					
Summary of visual effects	No Change	The primary effect would be on an area that is a relatively open, uninterrupted expanse. Only	This corridor would be the most visible to the most people throughout the majority of its	This alternative is the least visually intrusive. The eastern portion would be located in a	A smaller line, but would be visible for 7.5 miles along the edge of the highway

Table 6. Alternative comparison of effects

	Alternative				Option
	A	B	C	D	
		a mile or two of line would be visible from most locations within the area due to the slightly rolling landscape including from U.S. 285. The entire line would be visible from high points such as Black Mesa, Mesa Vibora and Cerro Azul.	length—by both residents from the Carson area and traveling visitors along U.S. 285.	broad depression and would only be visible to visitors in the immediate area. The western portion would be mostly out of sight from U.S. 285. It would be visible near the boundary of BLM and FS at which all the action alternatives would be equally or similarly visible. Five miles of existing 25 kV line would be removed from along U.S. 285, thus improving visual quality along this section.	right-of-way. Slightly mitigated by being on the west side, with the major viewshed to the east.
Acres where scenic integrity would be reduced	No change	1,490 From Partial Retention to Modification	0	1,055 From Partial Retention Modification	2,486 From Partial Retention to Modification
Acres where scenic integrity would be upgraded	No change	0	0	1,619 From Modification to Retention	0
Effects on scenic quality	No change	No effect	Very visible along NM	No effect	No effect

Table 6. Alternative comparison of effects

	Alternative				Option
	A	B	C	D	
in the Carson community			567 for about 6 miles.		
Miles along U.S. 285 and NM 567 in which transmission line would be visible	8.1 along U.S. 285 6 along NM 567	3.6 along U.S. 285	8.1 along U.S. 285 6 along NM 567	3.7 along U.S. 285	7.5 along U.S. 285
Miles of distribution line eliminated	0	0	0	5	0
Consistency with Carson National Forest Visual Quality Objectives and Recreation Opportunity Spectrum	No change	Does not go below 1 level	No change	Does not go below 1 level	Does not go below 1 level
Tres Piedras Connection					
Whether the area along U.S. 285 south of Tres Piedras has access to the electrical grid serviced by KCEC	No change	No change	No change	No change	Power would become available
Whether the Tres Piedras area has a backup loop designed into their electrical system	No	No	No	No	Yes
Other Environmental Impacts					

Table 6. Alternative comparison of effects

	Alternative				Option
	A	B	C	D	
Need for Proposed Action (Economics)					
Project reliability	No	Yes	Yes	Yes	NA
Long-term needs	No	Yes	Yes	Yes	Yes
Project costs/maintenance	\$8,300	\$2,500,100/ \$5,150	\$3,161,400/ \$8,300	\$2,825,400/ \$6,700	\$163,500/ \$1,900
Estimated annual line loss	\$27,575	\$8,380	\$13,500	\$10,900	\$2,600
Soils and Water					
Effects on soils and potential for erosion	No change	Minimal	Minimal	Minimal	Minimal
Effects on water quality	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant
Vegetation					
Acres of vegetation affected	No change	17.5	28.1	22.5 10.8 (line removal)	No change
Wildlife					
Effects on wildlife (especially potential raptor electrocution)	Low - area is outside raptor concentration areas, but not fully mitigated.	No effect in new construction areas/fully mitigated			
T&E species and associated habitats	No effect	No effect	No effect	No effect	No effect
Effects on Forest Service plant and animal "sensitive species"	No effect	No effect	No effect	No effect	No effect
Public Health and Safety					

Table 6. Alternative comparison of effects

	Alternative				Option
	A	B	C	D	
Potential for electromagnetic field effects on human health	Slight (no change)	None	Slight	None	None
Increased potential for wildland fire caused by power line	No change (Minimal)	Minimal	Minimal	Minimal	Minimal
Roads					
Potential for increased access to areas not currently accessible by motor vehicle	No change	Approximately 2 miles of two-track	No change	Approximately 2 miles of two-track	No change
Effects of increased access	None	Increased recreational access. Temporary habitat disturbance. Vegetation removal and soil compaction and/or erosion.	None	Increased recreational access. Temporary habitat disturbance. Vegetation removal and soil compaction and/or erosion.	None

Chapter 3. Affected Environment and Environmental Consequences

This chapter summarizes the physical, biological, social and economic environments of the project area and the effects of implementing each alternative on that environment. It also presents the scientific and analytical basis for the comparison of alternatives presented in the alternatives chapter. This chapter shows the present condition (i.e., affected environment) within the analysis area and the changes that can be expected from implementing the action alternatives or taking no action at this time. The No Action Alternative sets the environmental baseline for comparing effects of the action alternatives.

The significant issues (see Chapter 1) help define the scope of the environmental concern for this analysis. The environmental effects (changes from present baseline condition) that are described in this chapter address the significant issues identified through the public involvement process.

Specialists have taken the quantitative data for each of the measures listed in Chapters 1 and 2, as well as other qualitative measures, and used them to help describe the affected environment and the alternatives. These measures were also used to evaluate direct, indirect and cumulative impacts.

Note: Environmental effects are estimated with the assumption that all mitigation measures listed in Chapter 2, Table 5 would be implemented. Special reference to a mitigation listed in Table 5 is made with (MM No.). Mitigation measures specific to an alternative are included in the resource discussion to which it is related.

Soil and Water 3/

Affected Environment

The alternatives and option are within the Ojo Caliente and Aguaje de la Petaca 5th code watersheds. These watersheds are very large and analysis at such a scale would not put the alternatives in proper context. Instead, cumulative effects on soils and water will be evaluated at the next lower watershed level. Seven 6th code watersheds overlap the alternatives and the option (Figure 11). A 14-digit Hydrologic Unit Code (HUC) is used to differentiate each watershed. For ease of discussion, a number from 1 to 7 has been assigned to each. Table 7 lists the watersheds with their HUC, analysis number, size in acres and which alternatives they overlap. The watershed area noted for each alternative is the land area used to study cumulative effects for that alternative or the cumulative effects area.

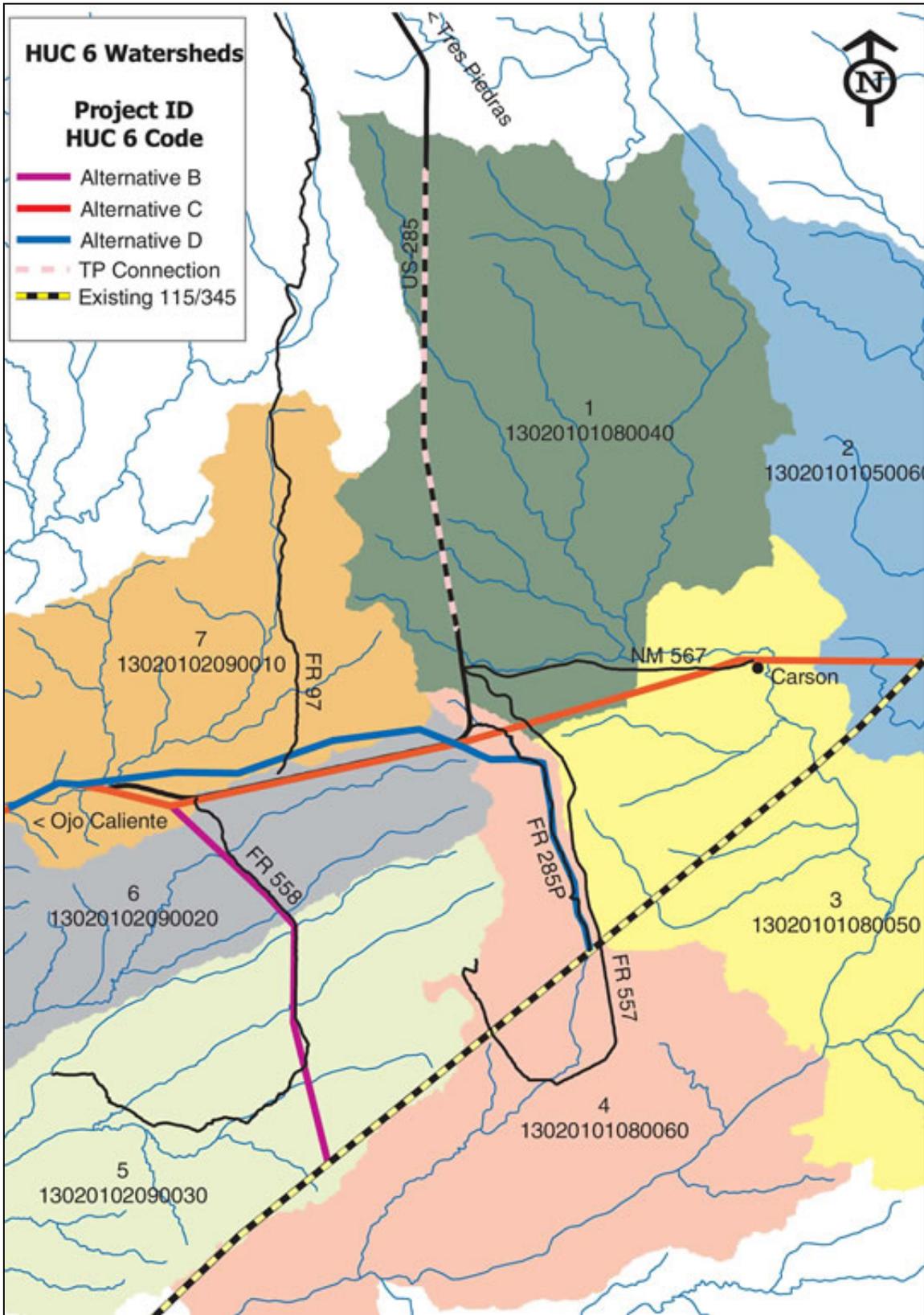


Figure 11. Sixth code watersheds used in cumulative effects analysis.

Table 7. Watersheds used for soil and water cumulative effects analysis by alternative

HUC	Analysis No.	Alternative			Option (acres)
		B (acres)	C (acres)	D (acres)	
13020101080040	1	---	33,610	---	33,610
13020101050060	2	---	29,647	---	---
13020101080050	3	---	39,502	---	---
13020101080060	4	---	30,170	30,170	---
13020102090030	5	40,098	---	---	---
13020102090020	6	26,965	26,965	26,965	---
13020102090010	7	34,284	34,284	34,284	---
Total Area		101,347	194,178	91,419	33,610

The general landform of all the watersheds is a gentle sloping plain declining either to the east toward the Rio Grande Gorge or to the west toward the Rio Ojo Caliente. The area is bisected by intermittent drainages, deeply cut localized arroyos, and high points such as Cerro Azul or Mesa Vibora. The north-facing slopes generally have subtle changes in vegetation indicating changes in moisture and slight changes in temperature.

Since perennial streams or watercourses are absent in most of the study area, it lacks riparian vegetation. The Aguaje de la Petaca crosses the existing power line in the Carson area. La Petaca contains some riparian, but this vegetation type is found up the arroyo outside the study area. Other drainage bottoms tend to be fairly flat with deep alluvial soils.

The Rio Ojo Caliente and the Rio Grande are the only perennial streams within any of seven watersheds. The Ojo Caliente flows through watersheds 5, 6 and 7. It is identified in the State of New Mexico's 2002-2004 §303(d) List for Assessed River/Stream Reaches Requiring Total Maximum Daily Loads (TMDLs) (commonly known as the "303(d) list") in 2002 (http://www.nmenv.state.nm.us/swqb/2002-2004_Draft_NM_CWA_303d_List.pdf). [276] This list directly assessed the Rio Ojo Caliente (from the mouth of the Rio Chama to the confluence of the Rio Vallecitos and Rio Tusas) as "Partially Supporting" the designated or attainable use of a "Warm Water Fishery." Probable causes of nonsupport are stream bottom deposits. The probable sources of nonsupport are: (1) removal of riparian vegetation; (2) recreation (recreational activities); (3) range grazing (riparian and/or upland); (4) natural sources; (5) irrigated crop production; (6) hydromodification (water diversions); (7) habitat modification (other than hydromodification); (8) grazing related sources; (9) crop-related sources; (10) channelization; (11) streambank modification/destabilization; and (12) agriculture.

The Rio Grande flows through watersheds 2 and 3. Only Alternative C, which is the existing corridor, could have any effect to watershed conditions in these two watersheds. The 303(d) assessment identifies the San Juan Pueblo to the Rio Pueblo de Taos as "Not Supporting" the designated or attainable use of either a "Warm Water Fishery" or "Marginal Cold Water Fishery." The probable cause of impairment is turbidity, and the probable sources are: (1) removal of riparian vegetation; (2) range grazing (riparian and/or upland); (3) irrigated crop production; (4) habitat modification (other than hydromodification); (5) grazing related sources; (6) crop-related sources; and (7) agriculture. No other water quality information is available for the ephemeral drainages within the other watersheds.

Since watershed condition is directly related to the condition of and effects on soils within a watershed, this analysis will focus on the amount of surface soil disturbance generated by each of the alternatives and the option. A discussion of the effects of this ground based disturbance on water quality relative to constructing a substation and 2 miles of transmission line construction near the Rio Ojo Caliente will be included in this analysis. The evaluation considerations for soils is described in the following paragraphs.

Soil Erosion

Soil erosion occurs naturally, but can be accelerated by management activities or natural disturbance agents that reduce or remove vegetative ground cover and canopy cover or both. Other site factors influencing erosion rates include the presence and amount of rock fragments, the susceptibility of the surface soil to erosion, and local topography. The amount of vegetative ground cover (vegetation and litter) for a soil unit can be proportional to its soil loss. Those that sustain low levels of ground cover are more susceptible to erosion (with the exception of rock).

Sources of accelerated erosion rates associated with the installation of a linear power line are the development of a two-track route to accommodate construction and maintenance vehicles in the utility corridor and a cleared area around each of the pole sites. Accelerated soil erosion can directly affect the long-term productivity of the site by removal or displacement of the “surface A horizon” which is typically rich in organic matter and serves as the source of much biologic activity that enables these organic inputs to be recycled and returned to the soil profile for plant use.

Sheet and rill erosion is the estimated rate of annual soil loss as predicted by a model called the Universal Soil Loss Equation. Erosion hazard is predicted on the basis of relative susceptibility to erosion upon removal of vegetation and litter. Soil loss rates are useful as an index, thus are not considered absolute values. Tolerance is the maximum rate of soil loss that can occur while sustaining inherent site productivity. Soils with current erosion rates that exceed their tolerance rates are considered unstable or erosive and can be sensitive to disturbance. Such soils tend to move during rainfall events or, if denuded, tend to move with wind events.

Revegetation potential refers to the probable success and ease in establishment of native grasses and improving the ground cover. This rating is influenced by climate, kinds of soils and terrain. Soils with a “high” rating offer the best opportunity for successful revegetation. A “low” or “moderate” rating points to potential problems for an area, where mitigation measures should be considered.

Soil Compaction

Compaction of the surface or subsurface soil layers results in a decrease in soil porosity and increase in soil bulk density. The most common source of soil compaction associated with the construction of a linear power line is the result of forces such as weight or vibration applied to the soil surface by heavy machinery. Long-term direct impacts of soil compaction can include reduced vegetation growth due to reduced water supply in the root zone. Other direct impacts include reduced infiltration of water and increased surface runoff. Indirect effects resulting from soil compaction can be increased erosion losses resulting from a lack of vegetation ground cover and an increase in surface runoff.

As a measure of potential compaction from the alternatives, the risk of soil damage resulting from compaction is proportional to the number of acres of disturbed soils with moderate to severe limitations due to low bearing strength. Unsurfaced road limitations pertain to the use of soils in place for roads. With regard to unsurfaced roads, a severe rating indicates low bearing strength. This is the evaluation criterion to assess the risk of compaction damage that may occur from the use of a two-track route by construction and maintenance vehicles in the utility corridor and heavy machinery around each of the pole sites. This can also result in indirect effects of additional contribution of sediment delivery during significant runoff events.

Organic Matter Removal

Loss of onsite organic matter would most likely occur by removing vegetation during pole installation and line pulling. Organic matter consists of humus, litter and all sizes of dead woody material, which reside on or partially within the surface soil layer. These materials are important because they serve as a base for insect and microbial activity, increase infiltration of water into the soil profile, improve porosity and aeration of the soil, retain moisture and serve as microsites for seedling establishment, and are a reservoir of short- and long-term nutrient supply (Harvey et al. 1981). Since each size class of organic matter performs a different function in maintaining long-term site productivity, the desired arrangement is a balanced distribution of small, medium and large size classes of materials.

The proposed activities of pole installation and the creation of temporary access routes to the pole sites would remove organic matter. However, the impacts would be relatively minor compared to the amount and duration of other activities in the area, particularly off-road vehicle use for firewood gathering and recreation. The existing road system reflects the amount of use it receives in the past. The excessive mortality of piñon trees in the area may encourage firewood gatherers, however, the Forest Service is not likely to encourage this activity. The evaluation of potential effects of each alternative on organic matter removal is based on the amount of new access created for firewood gatherers and recreationists.

Long-Term Soil Productivity

The evaluation of effects of proposed activities on long-term soil productivity involves the evaluation of potential effects of soil erosion losses, soil compaction and removal of organic matter from the site. Literature reviews on forest soils indicate that organic matter removal and soil compaction were the factors most often associated with productivity decline (Alban 1991 and Powers et al. 1990).

The potential to cause damage to long-term soil productivity is difficult to assess directly. It is more likely that an evaluation of potential effects from soil erosion, soil compaction and organic matter removal in the short term (less than 5 years) and the likelihood these effects could persist for a period of time greater than 5 years is the most reasonable means of making this assessment.

Terrestrial Ecosystem Survey

Soils within the study area have been mapped using the Terrestrial Ecosystem Survey (TES) for the Carson National Forest. [6] Soils on lands administered by BLM are mapped using Taos County soil survey data. The TES contains information that is intended for use in land use planning and management on the Carson National Forest. For consistency in analysis, TES data

has been extrapolated to reflect similar conditions found on BLM (and private) as those on national forest. This was done by on-the-ground evaluations and comparing information from the Soil Survey Taos County [9]. This is limited to the areas within alternatives where direct effects of construction might occur.

TES provides predictions for suitability, limitations and hazards of soil and vegetation behavior for selected land uses. The TES also highlights hazards or capabilities inherent in the soils and geology, and aids in determining impacts of selected uses on the environment. It utilizes terminology that has been standardized to describe limitations and hazards associated with the physical and biological characteristics of the soil. The survey is intended to alert the land manager of certain risks associated with a proposed land use. For this analysis, the TES data is used to identify and compare existing soil conditions and determine effects.

TES data interprets map units for road capabilities based on slope, soil strength and drainage without additional surfacing. Potential for revegetation is an important consideration. The combination of various interpretations of survey information provides information on where best management practices (BMPs) or mitigation measures need to be applied, or what areas need to be avoided. Field observations of soil type responses to various activities are also important in evaluating interpretations and the range of limitation ratings.

The cumulative effects study area contains 33 different soil types or Terrestrial Ecosystem Units (TEU). Six soil types are directly or indirectly affected by the alternatives or the option. The vast majority of any alternative affects only TEU 3, 138 and 153. The option is entirely within TEU 142. Table 8 displays the interpretations for selected limitation ratings for the six affected soil types contained in the Terrestrial Ecosystem Survey data.

Table 8. Terrestrial ecosystem units in the Ojo Caliente transmission line study area

TEU	Per- cent Slope	Sheet/Rill Erosion	Erosion Ratio Tot:Cur	Current Ground Cover (%)	Revegetation Potential	Unsurfaced Roads
3	0-15	Slight- Moderate	6.7:0.5	35	High	Moderate
138	0-15	Slight	6.7:0.8	25	Low Too alkaline	Moderate
142	0-15	Moderate	6.7:1.7	35	High	Moderate
153	0-15	Slight	6.7:0.8	30	Low (sandy) High (loamy)	Slight
194	15-40	Severe*	6.7:15.0	15	Moderate	Moderate
268	0-40	Not interpreted	6.7:4.4	40	No interpretations	No interpretations

* A severe rating does not necessarily mean that management activities should be excluded from these areas. It is a caution used to consider or implement mitigation measures.

Typically, no single rating should be used exclusive of others in an analysis. The combination of various interpretations are necessary to properly assess impacts, significance of certain actions, as

well as developing proper mitigation measures. Verification of what is actually happening on the ground provides site-specific information that has also been incorporated into this analysis.

Figure 12 shows the distribution of all the TES map units across the study area. TES data is relatively general and based on fairly gross mapping units. Various small inclusions describing differences in soil types, vegetation and slope are fairly common. Thus site-specific interpretations may vary somewhat from the general limitations listed in the handbook table. The following discussions of the terrestrial ecosystem units encountered by one or more alternatives provides some site-specific discussion. All of the following soil units contain multitaxa ecosystem components.

TEU 3. Soils in this unit are generally found in long, relatively narrow swales of sagebrush grasslands with scattered piñon-juniper. Slopes are relatively shallow. TEU 3 can be subject to damage by off-road vehicles and tends to drain moisture from adjacent areas. Its potential for sheet and rill erosion is slight to moderate. Potential for compaction is moderate. It has a high revegetation potential, which means seeding and other activities to increase ground cover following disturbance should be successful. TEU 3 has relatively high ground cover compared to the other soil types in the area. The exception to these properties occurs where convergence of drainages creates a dry wash.

Within the study area, Forest Road 285P runs almost the entire length of this soil type and shows little sign of erosion problems. Headcutting can be found in a couple of locations where roads climb steeper slopes to an adjacent soil type.

TEU 138. Soils in this unit are usually found on mildly rolling sagebrush grasslands. Within and just west of the community of Carson is the only area where this soil type would be affected by an alternative. Its potential for sheet and rill erosion is slight. Fairly high clay content in the subsoil may result in moderate compaction. Ground cover is rather sparse and the potential for natural revegetation is generally considered low, due to high levels of calcium carbonates in the soil. However, a number of locations within this unit have been plowed and revegetated with crested wheatgrass. The existing 25 kV line goes through this soil type near Carson, and the old road that runs underneath the line is barely visible from natural revegetation, indicating that revegetation is attainable. Existing roads on this soil type typically do not exhibit any excessive erosion.

TEU 142. Soils in this unit are typically found on gently rolling to flat terrain with a mosaic of piñon-juniper and sagebrush. The only location where TEU 142 would be affected is along U.S. 285 where the Tres Piedras Connection is proposed. Its potential for sheet and rill erosion and compaction is moderate and it responds to seeding with drought tolerant species. The southern portion of the existing distribution line coming south from Tres Piedras runs through TEU 142. Its corridor shows no signs of erosion or problems with revegetation.

TEU 153. Soils in this unit are found on slightly rolling elevated plains dominated by sagebrush and piñon-juniper. Varying from sandy to sandy loam, TEU 153 is the most common soil type within the study area. Its potential for sheet and rill erosion is slight. This soil's sandy character explains why it is not very fertile and has little water holding capacity. The potential for compaction is slight. Potential revegetation ranges from low to high. The extremely sandy soils are not very successful in revegetation. The less sandy soil textures have more soil properties

favorable for plant growth. The existing 25 kV line that runs along U.S. 285 is in TEU 153. The soils have more of a loamy character; therefore, revegetation along the corridor is high.

TEU 194. Soils in this unit are similar to TEU 153, but are steeper and more sparsely wooded, mainly with junipers. Only a very small portion of this soil type is affected by an action alternative. It has a relatively high fertility. Production potential is limited only by lack of soil moisture during the growing season. Its potential for sheet and rill erosion is considered severe. Current soil loss exceeds tolerance and ground cover is low. The potential for compaction is moderate. Even though this soil type has a moderate revegetation potential, maintaining adequate vegetation cover should be stressed to minimize soil loss.

TEU 268. Soils in this unit consist of multitaxa terrestrial ecosystem components. Components occur on an intricate pattern and are not separable. It is normally found on plains and hills, moderate slopes. Like TEU 194, only a small portion of this soil type is affected by two of the alternatives. It occurs where U.S. 285 turns sharply, where the eastern plain breaks off the Comanche Rim to the west. A pair of gravel pits sit on the south side of the highway in this unit. Revegetation potential is typically low, likely due to rocky conditions, however the high rock content makes the site fairly durable and reduces likelihood of vehicular damage.

Biological Soil Crusts (Cryptogams)

Biological soil crusts are also known as cryptogamic, microbiotic, cryptobiotic and cirrophytic crusts. Each of these names is meant to indicate common features of the organisms that compose the crusts. Biological crust is the most inclusive term as it distinguishes them from physical crusts while not limiting crust components to plants.

Living organisms and their byproducts, creating a crust of soil particles bound together by organic materials, form biological crusts. These crusts generally cover soil spaces not occupied by vascular plants. Biological soil crusts serve several ecological functions. Not all inclusive, crusts aid in soil stability, water infiltration, and plant health, and may affect plant germination.

Biological soil crusts are well adapted to severe growing conditions and are commonly found in semiarid or arid environments. If disturbed, soil crusts can have visual recovery in 1 to 5 years. Limiting the size of disturbance also increases the rate of recovery.

Past, Present and Reasonably Foreseeable Activities

The cumulative effects area for this analysis has had some type of human use for thousands of years. Cultural resource sites have been located throughout the area near Ojo Caliente and along the Comanche Rim. In addition to prehistoric sites, evidence of historic settlement and abandoned railroad grades exist. Present, historic and prehistoric uses include hunting, farming, removal of firewood, fence posts, collection of piñon nuts and other plant material for foodstuffs, and both domestic sheep and cattle grazing.

Historic, prehistoric, and recent use by humans, and natural events, including insect and disease occurrence, have all contributed to the current ground cover conditions. Climatic conditions, wet and drought cycles have also altered the condition. During wetter periods, tree numbers increase and grass cover decreases. During drought, tree numbers decrease and grass cover increases.

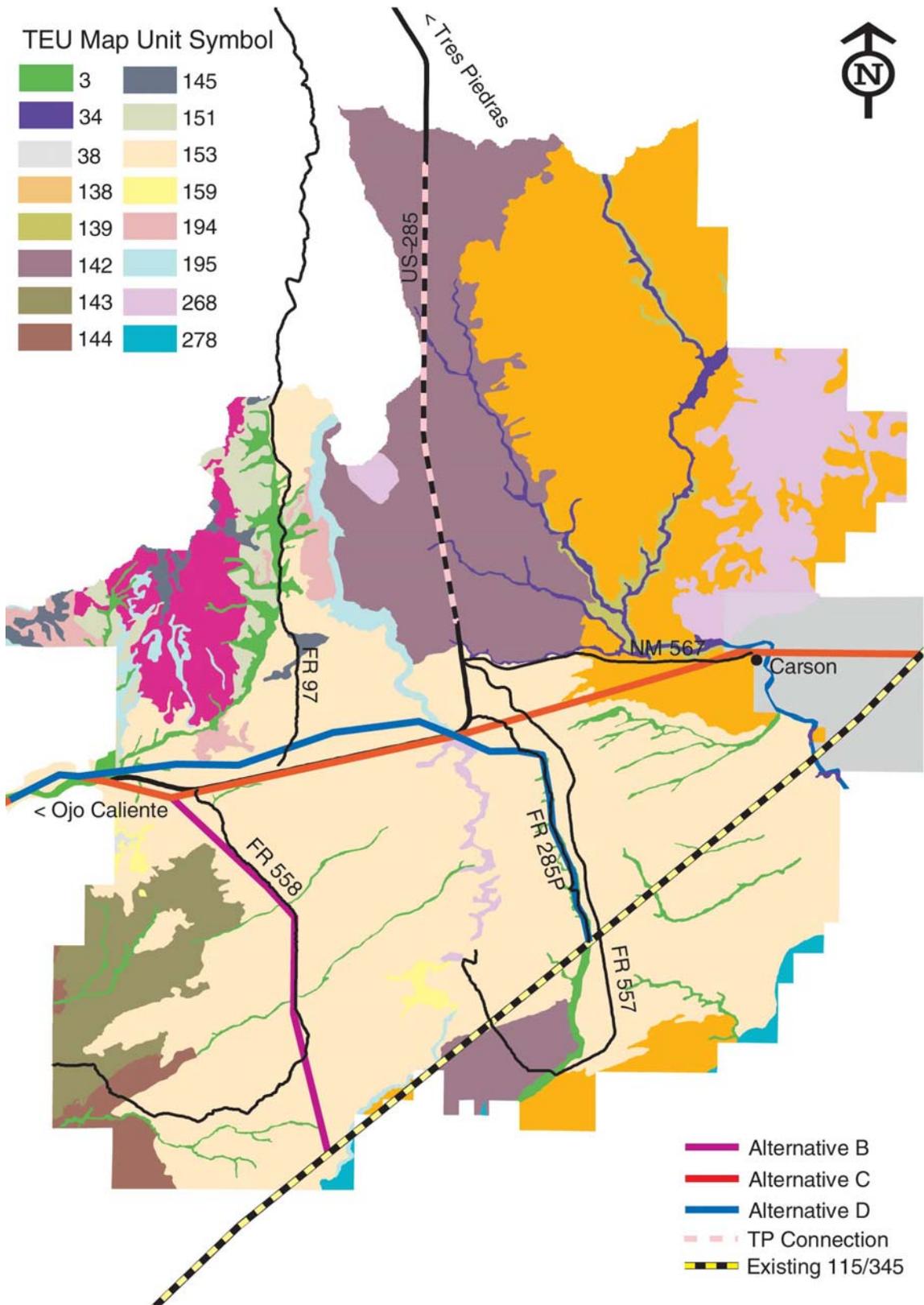


Figure 12. Distribution of terrestrial ecosystem units in watersheds.

Over the last 75 years, various activities requiring the use of motorized vehicles have historically occurred in the area. Almost 47 miles of paved highway (U.S. 285 and NM 567) run through the study area and a considerable network of 620 miles of unpaved roads also exist. The Carson National Forest Land and Resource Management Plan (hereafter, the forest plan) designates areas on the Forest where use of vehicles off of designated roads is restricted. National Forest System lands within the study area are open to off-road vehicle travel. Public access to and around any of the alternative utility corridors is basically unlimited. Motorized travel is restricted on BLM lands to existing roads and trails.

Current uses include open road and off-road use for firewood cutting and recreation. All terrain vehicle (ATV) activity is increasing and it is not uncommon to find closed roads in the area being reopened by ATV users. This reduces vegetation cover and can increase sediment yield from road surfaces.

The study area has been experiencing a drought for the past 5 years. Climatic conditions also play an important part in grazing management and watershed conditions. A species of *Ips* beetle outbreak in 2002 and 2003 has killed and continues to kill many of the piñon pine trees in the vicinity of the alternative power line locations. In the lower elevations nearer to Ojo Caliente the mortality on piñon is approaching 100 percent.

Livestock grazing takes place on two grazing allotments on the national forest (TCLP and Cerro Azul) and one on BLM (505 Ojo Caliente). The current cattle permits are valid and grazing is expected to continue for the next 10 years at the same or reduced levels.

The cumulative effects area includes the utility corridor that contains two power lines—a 345 kV and a 115 kV. In addition, a 25 kV line runs through Carson to Ojo Caliente. The presence of these lines provides a fairly accurate prediction of what the effects would be if one of the action alternatives or the option were implemented. The effects of these lines will be included in the cumulative effects analysis for Alternatives B-D and the Option.

Private lands within the study area are concentrated either outside of the national forest boundary or scattered close to Ojo Caliente. Several parcels of private land have distribution lines to the property. The properties near Ojo Caliente have a power line accessing the existing line and crossing U.S. 285. There is only one parcel south of U.S. 285 where there might be a foreseeable need to extend the current lines across National Forest System lands to access other private lands.

Environmental Consequences

The activities proposed in the action alternatives that would affect soils in the project area are those that cause ground disturbance and compaction (contouring, clearing, vehicle use, etc.) and/or the temporary or permanent removal of vegetation cover. These activities include: transport and installation of power poles; line pulling; periodic maintenance of the completed system; and construction and permanent installation of a substation.

By examining the existing electrical lines and their corridors in the area and on the same soil types, the impacts of a similar proposal are fairly obvious. In areas where access was restricted to construction and maintenance, the environmental effects are minor. Although an old access way may be visible, it has for the most part stabilized and revegetated. These types of impacts on soils and watershed are considered short term.

Where access ways to existing lines remain in use, the effects of a typical backcountry two-track road are apparent. Depending on the location and soil type, these effects are generally compaction and some erosion in the roadbed. The most noteworthy effects on soils would be where new access is required by an alternative and that access way becomes part of long-term use, or a permanent two-track road.

Access to pole locations, preparation of pole sites, line pulling and line maintenance would require the use of vehicles or equipment. It is essential, especially with soils with a severe erosion rating, that revegetation or other mitigation measures take place where soil disturbance occurs. Road or other vehicle access should be limited in order for disturbed areas to recover to natural ground cover. The following table shows what soil types would be affected by either the development of pole locations, or vehicle/equipment use along the entire length of the line or both.

Use of existing National Forest System and BLM roads and existing two-track roads for pole location, line stringing and maintenance would be encouraged under any of the action alternatives (MM SW3, SW5, SW6).

Table 9. Terrestrial ecosystem units affected by any action alternative

TEU	Ownership	Alternative				Option
		A	B	C	D	
3	FS	Not affected	Line access	Line access	Pole location Line access	Not affected
	BLM	Not affected	Pole location Line access	Pole location Line access	Pole location Line access	Not affected
138	FS/Private	Not affected	Not affected	Pole location Line access	Not affected	Pole location Line access
142	FS/Private/ State	Not affected	Not affected	Not affected	Not affected	Pole location Line access
153	FS/BLM/ Private	Not affected	Pole location Line access	Pole location Line access	Pole location Line access	Not affected
194	FS	Not affected	Not affected	Not affected	Mitigate if disturbed	Not affected
268	FS	Not affected	Not affected	Possible pole location	Possible pole location	Not affected

Table 10 displays how much of the line proposed in each alternative would cross through a particular Terrestrial Ecosystem Unit. This table is used to estimate how much ground disturbance would take place related to the development of pole locations and/or vehicle/equipment use. Adjacent BLM and private lands soil types have been evaluated and appropriate TES units assigned to allow for consistent evaluation.

Table 10. Miles of transmission/distribution line through each terrestrial ecosystem unit

TEU	Ownership	Alternative				Option
		A	B	C	D	
3	FS	Trace	0.2	Trace	4.4	0
	BLM	1.0	1.0	1.0	1.0	0
138	FS	2.8	0	2.8	0	0
	Private	2.7	0	2.7	0	0
142	FS	0	0	0	0	7.0
	Private/State	0	0	0	0	0.5
153	FS	6.3	7.5	6.3	11.5	0
	BLM	1.0	1.0	1.0	1.0	0
	Private	1.4	0	1.4	0	0
194	FS	0	0	0	0.1	0
268	FS	0.4	0	0.4	0.5	0
Total		15.6	9.7	15.6	18.5*	7.5

* Temporary disturbance that would be caused by removing the poles of the existing 25 kV line is included in the total acres for Alternative D.

The following table displays the approximate number of acres of disturbance relative to pole placement and removal, as well as accessing the line.

Table 11. Potential disturbance (acres) from the establishment of new two-track construction access and area cleared for pole placement for each terrestrial ecosystem unit

TEU	Alternative								Option	
	A		B		C		D		Pole	Access
	Existing	Pole	Access	Pole	Access	Pole	Access			
3	0	0.2	2.2	0.2	1.8	1.0	9.7	---	---	
138	0	---	---	1.1	9.9	---	---	---	---	
142	0	---	---	---	---	---	---	2.6	13.5	
153	0	1.6	15.3	1.7	15.7	2.4	22.5	---	---	
194	0	---	---	---	---	---	---	---	---	
268	0	---	---	0.1	---	0.1	---	---	---	

Each pole is approximately 24 inches in diameter at ground level. Removal of trees and vegetation at pole locations would be limited to the actual hole and room for maneuvering machinery assumed to be a 30-foot diameter circle (707 square feet or 0.016 acres). Acres cleared for poles are calculated by multiplying 0.016 acres x 12 poles (.192 ac/mi). Due to the effects of a treated pole in the ground, one can expect that a couple of feet diameter around the pole would remain permanently devoid of vegetation. The disturbed area beyond that is expected to regenerate vegetation with reseeded (MM SW10 and SW11).

It is estimated that a two-track route with an average width of 15 feet would be established or reestablished the entire length of the line for construction and maintenance. The area of disturbance is calculated with the assumption that an area 15 feet wide within the line corridor would be affected by vehicle or equipment use or 1.8 acres per mile. In determining where the two-track route should be located, trees would be avoided to the extent possible. The actual location of the line and poles in the utility corridor would keep the power line cables above tree height. For the most part, access to the utility corridor can be made from an existing road. Transport of poles or other equipment can then be made along the two-track utility corridor. However, there may be instances where it may be necessary to create additional access from an existing road to the two-track. This type of access will be kept to an absolute minimum (MM SW6).

Development of the proposed substation on BLM lands is also common to all action alternatives. The substation would require vegetation removal, leveling and hardened surfacing (graveling) of approximately 1.5 acres. The site characteristics are generally consistent to those found on TEU 153, but on the sandy range of conditions. The existing conditions of the nearest drainage include a situation of relatively frequent vehicle access and some heavy equipment use. The drainage for approximately 250 yards above NM 111 has been channelized with earthen berms of unconsolidated channel bottom materials. The southern berm lies between the proposed substation area and the drainage.

Alternative A – No Action

This alternative maintains the current condition. The 25 kV line would continue to exist in its present location. There would be no construction of a 115 kV power line and no additional disturbance in the utility corridor above current disturbance. The existing 25 kV line is within several terrestrial ecosystem units that action alternatives would encounter. An evaluation of these soils and how they have responded to the installation, presence and maintenance of the existing line can support the analysis of effects for the alternatives that impact similar soil types.

The existing line goes through TEU 138, where the community of Carson is located. In the previous section, TEU 138 is described as having sparse ground cover and a low revegetation potential due to high alkalinity. However in the late 1960s, portions of TEU 138 were plowed and successfully reseeded with crested wheatgrass. In addition, the old road that runs underneath the line is quite stable having grown in with grasses and forbs and some sagebrush.

The existing line traverses over 7 miles, across National Forest System lands, a small portion of private land and onto BLM lands north of Ojo Caliente. Five and a half miles west of Carson, the existing line encounters TEU 153, the most common soil type within the study area. The existing line generally traverses this soil unit near NM 587 and then along U.S. 285. For the most part, TEU 153 in this area is characterized as more of a sandy loam, with good potential for revegetation unless extremely sandy. Near the microwave tower, a maintenance route is still used and the road is clear of vegetation. As expected, road compaction from vehicle travel is evident, but there are no signs of excessive erosion. Other portions to the west of the rim are largely obscured by vegetation.

Where U.S. 285 makes a 90-degree bend and drops off the rim, the road and existing line cross TEU 268. Two old borrow pits sit in the middle of this narrow TEU and are almost directly under the existing line. This soil type exhibits little effect from the existing line.

On BLM lands, there are 2.2 miles of existing roads that are in relatively close association with the existing 25 kV line that would continue to be used for inspection and maintenance. Approximately one-half mile is in drainage bottoms similar to TEU 3, and the remainder in TEU 153. The total disturbance area associated with the existing line, including existing roads and underline construction is estimated at 6.7 acres.

Alternative B – Black Mesa-Cerro Azul Tap

This alternative would tap into the existing 115 kV line 1.5 miles northeast of Black Mesa in TEU 153. In this particular area, there are inclusions of TEU 153 that are much sandier than up along U.S. 285. Several existing roads can be used to access the existing 115 kV line and the Alternative B route. Some of these roads currently exhibit head cutting and would need to be stabilized before heavy equipment can be driven on them. About 2 miles from the tap site, very sandy conditions may also make it difficult to drive along the utility corridor. Where vegetation is sparse, wind erosion has created small dune-like mounds. In this area, it is estimated that pole installation and the establishment of a corridor route would result in about 4 acres of ground disturbance. However, since the area is sparsely vegetated and sandy, impacts related to soil erosion, compaction and removal of organic matter would be minimal. The sandy nature of the soil would likely make revegetation of TEU 153 in this area difficult or spotty.

This alternative would continue through TEU 153 for another 6.5 miles, reaching U.S. 285 and traversing west along the highway onto BLM lands. Along this section, soil properties provide better conditions for plant growth, and sagebrush and piñon-juniper are very much in evidence. Forest Road 558 would be used to access the corridor off of U.S. 285. Its condition along this stretch appears to be more stable than to the south. A little over an acre (1.25 ac.) would be cleared for pole placement. A 6.5-mile two-track road under the line would disturb a maximum of 13 acres. The short-term effects of vegetation removal and compaction would be greater than the southern portion of TEU 153. With shallow slope conditions and good surrounding vegetation cover, the effects of sheet and rill erosion are not anticipated to be high. The existing distribution line along U.S. 285 demonstrates that TEU 153 can successfully revegetate, however, continuing drought conditions may dictate the rate of reestablishment.

As the line extends north and then west it would perpendicularly cross several very small portions of TEU 3. Because of their small size, impacts to these areas would be very limited. TEU 3 is characteristically stable on shallow slopes and has a high revegetation potential.

Alternative C – Existing Corridor

This alternative would construct a new 115 kV transmission line from Carson to Ojo Caliente within the existing distribution line corridor. Alternative C would tap into the existing 115 kV line in the vicinity of where it crosses NM 567 in Carson. Extrapolating the TES data onto private land, the line likely starts on TEU 138 and remains on this soil type for 5.5 miles. Since the existing line is in the same location, an evaluation of how this soil unit has responded to the installation and presence of the existing line and its maintenance can be used to determine the effects of this alternative.

Terrestrial ecosystem survey data describes TEU 138 as having sparse ground cover and low revegetation potential due to high levels of calcium carbonates in the soil. However, a number of locations within this unit have been plowed and revegetated with crested wheatgrass. The existing

25 kV line goes through this soil type near Carson, and the old road that runs underneath the line is barely visible from natural vegetation, indicating that revegetation is attainable. Short-term impacts of disturbing 1.1 acres of ground to install poles and almost 10 acres reestablishing a two-track road in the utility corridor is not considered to be substantial. This soil is on shallow slopes and has a slight sheet-rill erosion rating. Revegetation may not be as successful as it was in the past, particularly if current drought conditions continue. Since NM 567 is paved and the line would be fairly close to it, rain and snow runoff would help concentrate water near any disturbance, assisting in revegetation on that portion of the alternative.

Five and a half miles west of Carson, Alternative C would encounter the most common soil type within the study area—TEU 153—across National Forest System lands, a small portion of private land and onto BLM lands. Adjacent to NM 587 and then U.S. 285, the line would traverse over 8 miles, generally within this soil unit. As much as 1.7 acres would be cleared for pole placement and almost 16 acres to use or reestablish a two-track road within the existing corridor. For the portion of TEU 153 associated with this alternative, it can be characterized as a sandy loam, with good potential for revegetation. With the exception of a section of road near the microwave station that is routinely driven, most signs of past disturbance or maintenance in the utility corridor is stabilized by vegetation. Revegetation can be successful, although it may take longer to reestablish ground cover if current drought conditions continue.

Where U.S. 285 makes a 90-degree bend, the road and line would cross TEU 268. One of two old borrow pits is in the middle of the corridor. Again this soil type exhibits little effect from the existing line, and is not likely to exhibit much of an effect from this alternative due to its rocky and durable character.

As the line proceeds northwest along U.S. 285, it would encounter very small areas of TEU 3, including portions on BLM lands near Ojo Caliente. Clearing for pole placement would be no more than 0.2 acres. The reestablishment of a new two-track road through the existing corridor would impact up to 1.8 acres in this soil type. There is little evidence of past impacts to this soil type from the existing line.

Alternative D – 285 P Tap

This alternative would tap into the existing 115 kV line where it intersects with Forest Road 285P. This location is within TEU 3. In Alternatives B and C, the lines would perpendicularly cross small portions of this soil type. Alternative D would traverse north and then west in this soil type along the bottom of an elongated swale for approximately 4.5 miles, just south of U.S. 285 where the highway makes a 90-degree bend off Comanche Rim.

TEU 3 is generally found in long, relatively narrow, gently sloping valleys of sagebrush grasslands with scattered piñon-juniper. This soil type can be subject to damage by off-road vehicles and tends to drain moisture from adjacent areas. Its potential for sheet and rill erosion is slight to moderate. Potential for compaction is about average. This alternative would clear about 1 acre on TEU 3 for pole placement and disturb almost 10 acres for a two-track corridor under the line. Since Forest Road 285P provides easy access along this entire stretch, it would likely limit much actual disturbance. FR 285P would be the used to access this portion of the line for construction and maintenance.

This soil has a high revegetation potential, which means seeding and other activities to increase ground cover following disturbance should be successful. TEU 3 has relatively high ground cover compared to other soil types in the area. Forest Road 285P in this area shows little sign of erosion problems. There is a small head cut along this road, but it occurs just outside the corridor where it climbs up a short, but steeper pitch in the adjacent soil type. Since this portion of road would still be used as an access route, the head cut would be stabilized as part of this alternative. As the line continues west, it would also perpendicularly cross several very small portions of TEU 3.

Where the highway makes a 90-degree bend, this alternative would cross TEU 268. An old gravel borrow pit sits in the middle of the alternative corridor, but is no longer used. Again this soil type exhibits little effect from the existing line and is not likely to exhibit much of an effect from this alternative.

Alternative D would cross and run parallel to U.S. 285 for about 6.5 miles on TEU 153 at a distance of up to one-half mile from the highway. Along this section, soil properties provide better conditions for plant growth and sagebrush and piñon-juniper are very much in evidence. The alternative would cross several sites where old clearings were made to convert piñon-juniper to grasslands. A little over an acre (1.3 ac.) would be cleared for pole placement in TEU 153. A 6.5-mile two-track road under the line would disturb approximately 12 acres. With shallow slope conditions and good surrounding vegetative cover, the effects of sheet and rill erosion are not anticipated to be high. Revegetation would be successful, although it may take longer to reestablish ground cover if current drought conditions continue.

In addition to the construction of a new transmission line, this alternative would entail the removal of a 6-mile section of existing distribution line that runs through TEU 153 along the south side of U.S. 285. The amount of disturbance is similarly calculated to that of placing a new line with regard to access. A little over 1 acre would be disturbed for pole removal and a little less than 11 acres of two-track corridor would be created.

West End of Transmission Line and Substation for Alternatives B-D

For Alternatives B and C, the proposed line would be within the existing 25 kV corridor, as it exits the national forest and enters BLM lands about 2 miles from the proposed substation. As it leaves the national forest, Alternative D would take a slightly different course to the north. It would then join the existing corridor about one-half mile after entering BLM lands. The two different routes traverse the same soil types.

All three alternatives would follow the existing corridor for the last 1.5 miles of its length before terminating at the proposed substation. This portion of the line crosses a dry wash about three-quarters of a mile above the Rio Ojo Caliente. The substation would be located about one-half mile from the Rio Ojo Caliente. There is existing access to, or in close proximity to, that portion of the route on BLM land. Access to any pole locations on BLM land without existing roads would be cross country along the right-of-way and not bladed to reduce surface disturbance.

Ground disturbance associated with construction of the last 1.5 miles of transmission line coming into the substation for Alternatives B, C and D would be on TEU 3 and TEU 153. Since TEU 3 is found in the bottom of the dry wash, it is likely that pole sites would be located mostly on TEU 153, and the line would span the arroyo. Soil movement while construction is underway could flow into the dry wash and eventually enter the Rio Ojo Caliente during a significant rain event.

However, given the current disturbance activities within this portion of the arroyo, temporary construction activities would probably not result in any detectable change or delivery of sediment to the Rio Ojo Caliente. A National Pollution Discharge Elimination System permit for storm water pollution prevention is required for any project that exceeds 5 acres of surface disturbance, and must be approved by the State.

In all action alternatives, the proposed substation would be located at the terminus of the transmission line on BLM lands, just northwest of the intersection of U.S. 285 and NM 111 and north of where a bank of voltage regulators are currently located. The installation of a substation would entail clearing approximately 1.5 acres on soils similar to TEU 153 and constructing an access road to the site. The proposed site is relatively flat, and the potential for sheet and rill erosion is slight. However, since it is in close proximity to the Arroyo de los Comanches, the proposed site would be graveled. Once the project is completed, the flat gravel surface along with mitigation measures would prevent any movement of soil offsite (MM SW1 and SW2).

Some offsite soil movement could occur during construction should a significant rain event occur, but can be kept to a minimum with proper mitigation. The drainage for approximately 250 yards above NM 111 has been channelized with earthen berms of unconsolidated channel bottom materials. The southern berm lies between the proposed substation area and the drainage. It is likely that any sediment generated from the construction activity would be trapped and collected at that point above the berm and would not enter the drainage. A permanent access road from NM 111 to the substation would also be required. This access road would be a hardened surface approximately 175 yards long and 25 feet wide.

With any of the action alternatives, upgrading the existing line to the 115 kV would also require two pull locations resulting in temporary disturbance areas of approximately 100 feet across. Total disturbance on BLM land, including pole placement, existing road access, construction access along the right-of-way, guy wire locations, pull sites, substation access, and the substation would be approximately 8.7 acres.

Option – Tres Piedras Connection

The Tres Piedras Connection would tap into the existing 25 kV distribution line in the vicinity of the microwave station just north of the NM 567/U.S. 285 intersection. It would cross the highway to the west side and proceed north along U.S. 285, where it would cross back east of the highway to connect into the existing line that comes south from Tres Piedras along U.S. 285.

This route would total 7.5 miles and traverse entirely through TEU 142. The Option would disturb less than 0.1 acre for pole placement. Disturbance for access is not considered an additional impact as the right-of-way corridor is occasionally accessed using tractor mounted mowers. The soil has potential for sheet and rill erosion and compaction is moderate and responds well to seeding with drought tolerant species. The southern portion of the existing distribution line coming south from Tres Piedras runs through TEU 142. Its corridor shows no signs of erosion or problems with revegetation. It is expected that similar effects would occur with the construction of the Tres Piedras Connection. There is one site that has a basalt rock outcrop that might require one or two poles to be placed outside the right of way. If this should be the case, there would be less than an acre of total disturbance involved.

Cumulative Effects

Past, present and reasonable activities that contribute to the cumulative effects of soils are those with effects that overlap the effects of each alternative within the study area. The *Affected Environment* section described the past, present and reasonable foreseeable activities that, along with the effects of each of the alternatives, may cumulatively have an effect on soils and water. Past and present effects that overlap with the effects of Alternative B have already been discussed.

Past and Present Effects from:	Future Effects from:
Paved highways	Paved highways
Unpaved roads	Unpaved roads (continued FP management)
Off-road use	Off-road use (continued FP management)
Existing power lines	Power lines
Drought	Drought
Bark beetle (2002-2003)	Bark beetle (5-year forecast)
Livestock grazing	Livestock grazing (continued FP management)
Firewood gathering	Firewood gathering
Private lands	Private lands

In this analysis, the primary source of cumulative effects on soils is the presence and use of unsurfaced roads and off-road vehicle use. The effects of these activities reduce vegetation cover and increase erosion of topsoil. Travel management under the Carson Forest Plan allows for the continuation of the same road network and off-road administration. Motorized travel is restricted on BLM lands to existing roads and trails. Access to the proposed substation would require a permit from BLM.

Mortality of piñon trees from bark beetle in the study area is beyond epidemic proportions and may reach close to 100 percent throughout the lower elevations of the study area. For the first few years after death of infected trees, needle drop will increase and contribute to protecting the soil's surface with litter and adding organic matter to the soil. In 5 to 10 years, dead trees will fall, creating masses of organic matter on the ground. These areas would provide shade and moisture, improving conditions for the growth of grasses and forbs and increasing overall ground cover.

During this period, firewood gatherers are likely to make their way out to areas where piñon mortality is high. It is anticipated that the larger trunks of the dead trees, especially along existing roads, would be removed for firewood. However, enough plant growth and small diameter woody material would remain and overall soil conditions may improve. In addition, fewer piñon trees will reduce plant competition and release growth in the understory, which may also have some beneficial effects on soil properties.

Livestock grazing takes place on two grazing allotments on the national forest (TCLP and Cerro Azul) and one on BLM land (505 Ojo Caliente). The current cattle permits are valid and winter grazing is expected to continue for the next 10 years at the same or reduced levels. Overall soil conditions on the Forest Service allotments are satisfactory, with some unsatisfactory conditions where extremely sandy and unproductive soils occur. Annual adjustments are made to the livestock numbers and grazing season. Due to an ongoing drought and evidence of very little

forage production this summer (2003), the entry dates for pasture rotation are likely not going to be met.

Private lands within the study area are concentrated either outside of the national forest boundary or scattered close to Ojo Caliente. Several parcels of private land have distribution lines to the property. The properties near Ojo Caliente have a power line accessing the existing line and crossing U.S. 285. It is not foreseen that there will be a need to extend the current lines across national forest or BLM lands to access other private lands.

As described earlier in *Affected Environment*, the cumulative effects analysis area for soils and water is a combination of 6th code watersheds through which each alternative would traverse (Figure 11).^{5/} With the exception of the Option, data for the alternatives is largely limited to what is known to occur on the national forest. Forest Service TES and roads data amounts to approximately 50 percent of the cumulative effects analysis areas for each action alternative. From a review of the area outside of national forest (mostly BLM) soils and road densities are fairly similar, therefore, this analysis assumes that the conditions for each alternative's cumulative effects area is also near the same. The Option only traverses through Watershed 1, which is 98 percent National Forest System lands.

Table 12. Cumulative effects of existing roads* by alternative

FS Acres	Acres Affected By Roads	Percent Affected By Roads	Acres Affected By Alt. B	Percent Affected By Roads & Alt. B
Alternative B - Watersheds 5, 6, 7				
101,347 Acres				
50,067	320.91	0.64	19.26	0.68
Alternative C - Watersheds 1, 2, 3, 4, 6, 7				
194,178 Acres				
100,118	109.81	1.10	30.50	1.13
Alternative D - Watersheds 4, 6, 7				
91,419 Acres				
44,721	376.87	0.84	35.70	0.92
Option - Watershed 1				
33,610 Acres				
33,094	477.10	1.44	1.0	--

* These acres include Federal and State roadway

Cumulative Effects of Alternative A

Since the No Action Alternative would not have activities that would affect soils, there would be no cumulative effects under this alternative.

Cumulative Effects of Alternative B

The cumulative effects study area for Alternative B occurs within Watersheds 5-7 for a total of 101,347 acres (49 percent is on national forest). Table 12 provides an estimate of the amount of surface disturbance created by existing roads within the analysis area, as well as what the added

disturbance would be from Alternative B. Currently roads impact .64 percent of the analysis area. If Alternative B were implemented, it would add another .04 percent of disturbance to soils.

Over 194 acres of existing roads are located on TEU 153 within these three watersheds, but at least 25 percent of the analysis area is made up of this soil type, therefore, the impacts from existing roads are minimal and the added impact of Alternative B would be only 0.1 percent. It is not likely that Alternative B, along with existing roads and other past, present and reasonably foreseeable activities previously described would add any appreciable cumulative effect on soils within Watersheds 5-7.

Cumulative Effects of Alternative C

The cumulative effects study area for Alternative C includes Watersheds 1-4, 6 and 7 for a total of 194,178 acres (52 percent is on national forest). Table 12 provides an estimate of the amount of surface disturbance created by existing roads within the analysis area, as well as what the added disturbance would be from Alternative C. Currently roads impact 1.10 percent of the analysis area. If Alternative C were implemented, it would add another .03 percent of disturbance to soils.

Over 400 acres of existing roads are located on TEU 153, but at least 16 percent of the analysis area is made up of this soil type, therefore, the impacts from existing roads are minimal and the added impact of Alternative C would be 0.1 percent. Currently, TEU 138 and 142 are each impacted by over 200 acres of roads, however these roads affect only 1.1 and 1.8 percent of the soil types respectively. Alternative C would add 11 acres of surface disturbance to TEU 138, but this would have an imperceptible cumulative impact on soils.

Cumulative Effects of Alternative D

The cumulative effects study area for Alternative D includes Watersheds 4, 6 and 7 for a total of 91,419 acres (49 percent is on national forest). Table 12 provides an estimate of the amount of surface disturbance created by existing roads within the analysis area, as well as what the added disturbance would be from Alternative D. Currently roads impact 0.84 percent of the analysis area. If Alternative D were implemented, it would add another .10 percent of disturbance to soils.

Over 220 acres of existing roads are located on TEU 153, but at least 22 percent of the analysis area is made up of this soil type, therefore, the impacts from existing roads are minimal and the added impact of Alternative D would be 0.1 percent. Roads currently impact no soil type within the cumulative effects area by more than 2 percent. Additional disturbance from this alternative would be negligible.

Cumulative Effects of the Option

The cumulative effects study area for the Option is Watershed 1 for a total of 33,610 acres (98 percent is on national forest). Table 12 provides an estimate of the amount of surface disturbance created by existing roads within the analysis area, as well as what the added disturbance would be from the Option. Currently, roads impact 1.44 percent of the analysis area. If the Option were implemented, it would add another .05 percent of disturbance to soils. It should be noted that no additional two-track road is anticipated to result from the Option, as virtually all of the pole locations and necessary access will be within the highway right-of-way.

Over 240 acres of existing roads are located on TEU 142, but at least 38 percent of the analysis area is made up of this soil type, therefore, the impacts from existing roads are minimal and there would be no added impact from implementing the Option, since it would not affect this soil type.

The Option could be implemented under any of the action alternatives. If the impacts on soils were added to the cumulative impacts from Alternatives B, C or D, there would be less than 1 percent disturbance on soils with properties that are fairly stable and easy to revegetate.

Air

Affected Environment

Air quality across the area is good with respect to air pollutants and not within or near a Class I designated area. [3, 5] The existing air quality is a result of a relatively low population density and a lack of significant pollution sources in the area. Most areas within the United States are designated as Class II where standard pollution control standards apply. Certain areas are given special protection from air quality degradation through the use of more stringent requirements and are designated Class I areas. These are generally national parks, monuments and wilderness areas.

Environmental Consequences

Air quality impacts resulting from construction related activities would include fugitive dust and exhaust emissions from construction equipment. Exhaust constituents resulting from use of gasoline and diesel powered construction equipment would consist primarily of carbon monoxide, nitrogen oxide, hydrocarbons and sulfur dioxide. It is expected that the proposed action or any of the action alternatives or the option would not generate measurable amounts of air pollutants over the background levels currently resulting from local traffic and other uses of motorized equipment. Additional amounts would be short term.

Fugitive dust would also result from construction activities. Methods to control this form of short-term pollution could include limiting vehicle speeds on dirt roads during construction and watering road surfaces as a dust abatement measure during exceptionally dry periods.

Cumulative Effects

The majority of occasions when a visual deterioration of air quality exists in this area occurs from high winds creating airborne dust or smoke from forest fires. Both are also related to climatic conditions of drought and wind. Excessively dry or windy conditions would exacerbate the potential for airborne particulates. These cyclic patterns are expected to continue indefinitely.

Noise

Affected Environment

Existing levels of noise in the vicinity of the analysis area are generally a function of human habitation and related activities. There are levels of background noise that naturally occur in the environment mostly associated with wind. There is also a difference in the character of noise such as wind rustling branches and birds singing as opposed to vehicle noise. In remote locations of

the analysis area, background noise is likely more natural. Other portions of the area will have noise dominated by traffic or mechanical related sources. These are generally the areas adjacent to paved roads such as NM 567 and U.S. 285 and areas adjacent to the communities of Carson and Ojo Caliente.

Environmental Consequences

Noise levels resulting from construction related activities would increase in any of the action alternatives. These would be short-term for the duration of construction and periods when active construction would be ongoing. Some noise may also be produced from the transmission line itself, referred to as corona, and may be occasionally detected. This is the partial electrical breakdown of the insulating properties of air around the conductors of a transmission line. This can result in an audible hissing or crackling sound. Generally this condition occurs with higher voltage systems when certain high humidity atmospheric conditions occur such as rain or fog.

Alternative A would not result in any additional noise. Alternatives B and D would generate more noise away from the human-caused noise sources. While Alternative C would produce more noise adjacent to highways and communities. More people would likely hear construction noise in Alternative C, but it would be mostly in areas that produce similar types of background noise. The option to connect the 25 kV line to Tres Piedras would be immediately adjacent to the highway along U.S. 285. Although there would be additional noise generated from construction, it would be temporary and similar to other vehicle noise generated by cars and trucks.

Cumulative Effects

Given the number and density of roads across the entire analysis area, any location would occasionally have noise where the sounds are produced by various vehicles. This results from activities such as recreational outings, livestock management, and woodcutting. Back-country as well as highway noise and electrical transmission generated corona is expected to continue indefinitely.

Vegetation 5/

Affected Environment

The effects study area for vegetation is bounded on the north by NM 567, to the east by private lands of Carson, New Mexico, to the south by the Carson National Forest boundary, and the west by the Rio Ojo Caliente (Figure 14). The study area is mainly on the Tres Piedras Ranger District of the Carson National Forest. A small portion of the El Rito Ranger District is included north of U.S. 285. An additional portion of the study area is located along U.S. 285 north of the existing microwave tower to the existing power line coming south from Tres Piedras, New Mexico.

The general landform is a gentle sloping plain declining either to the east toward the Rio Grande Gorge or to the west toward the Rio Ojo Caliente. The area is bisected by intermittent drainages and high points such as Cerro Azul or Mesa Vibora. The north-facing slopes have subtle changes in vegetation indicating changes in moisture and slight changes in temperature.

The predominant vegetation type in the study area is piñon-juniper woodland. Elevations of the higher points in the vicinity reach 7,000 feet, with Cerro Azul being the highest at 7,455 feet. The

majority of the area is less than 7,100 feet, ranging from 6,400 feet to 7,000 feet along NM 567 and continuing to climb to about 7,200 feet along the northern portion of the study area. Elevation differences give rise to woodlands that have varied mixes of piñon and juniper trees—piñon being more common at higher elevations and juniper at lower elevations.

The lower areas are predominately vegetated with one-seed juniper (*Juniperis monosperma*) and some piñon pine (*Pinus edulis*). As the landscape rises, the presence of Utah juniper (*Juniperis osteosperma*) and Rocky Mountain juniper (*Juniperis scopulorum*) become more evident and one-seed juniper decreases. Rocky Mountain juniper becomes the dominant species at the highest elevations of the piñon-juniper vegetation type.

The landform and sandy soils suggest a varied vegetation cover. At first inclination, it is assumed the area is uniformly covered with piñon-juniper. However, the southern portions of the study area near Ojo Caliente are largely juniper with scattered piñon, while the higher areas are predominantly piñon trees with scattered juniper. The undisturbed areas north of the existing power line corridor are piñon with scattered juniper. Much of the area has been harvested for personal use firewood and commercial firewood. These harvests modified the canopy composition with the mix now approaching parity of the tree species. Table 13 provides an estimation of the number of acres of vegetation type within the study area. Figure 14 displays vegetation cover for the study area.

With several site visits to the locations where the alternative routes would traverse, an evaluation of the current vegetation conditions was made for this analysis. Ground cover is approximately 60 percent and consists of many different types of grasses and forbs. Predominate grasses are prairie junegrass, mutton grass, western wheatgrass and needle grasses. Bare ground amounts to about 40 percent.

Table 13. Amount of each vegetation type within the study area

Vegetation Type	Acres
Piñon-juniper	114,764*
Sagebrush	59,467
Low elevation grassland	9,919

* Figures do not reflect changes due to recent bark beetle infestation.

The vegetation is varied with a high percentage of big sagebrush in the understory. Much of the area has piñon pine and juniper seedlings. Dead and down material is scattered with the exception of areas where trees have been felled or fallen through natural causes. Under tree crowns, needles and fallen material have accumulated.



Figure 13. View of common vegetation in the study area. Note bare ground, big sagebrush and scattered piñon trees.

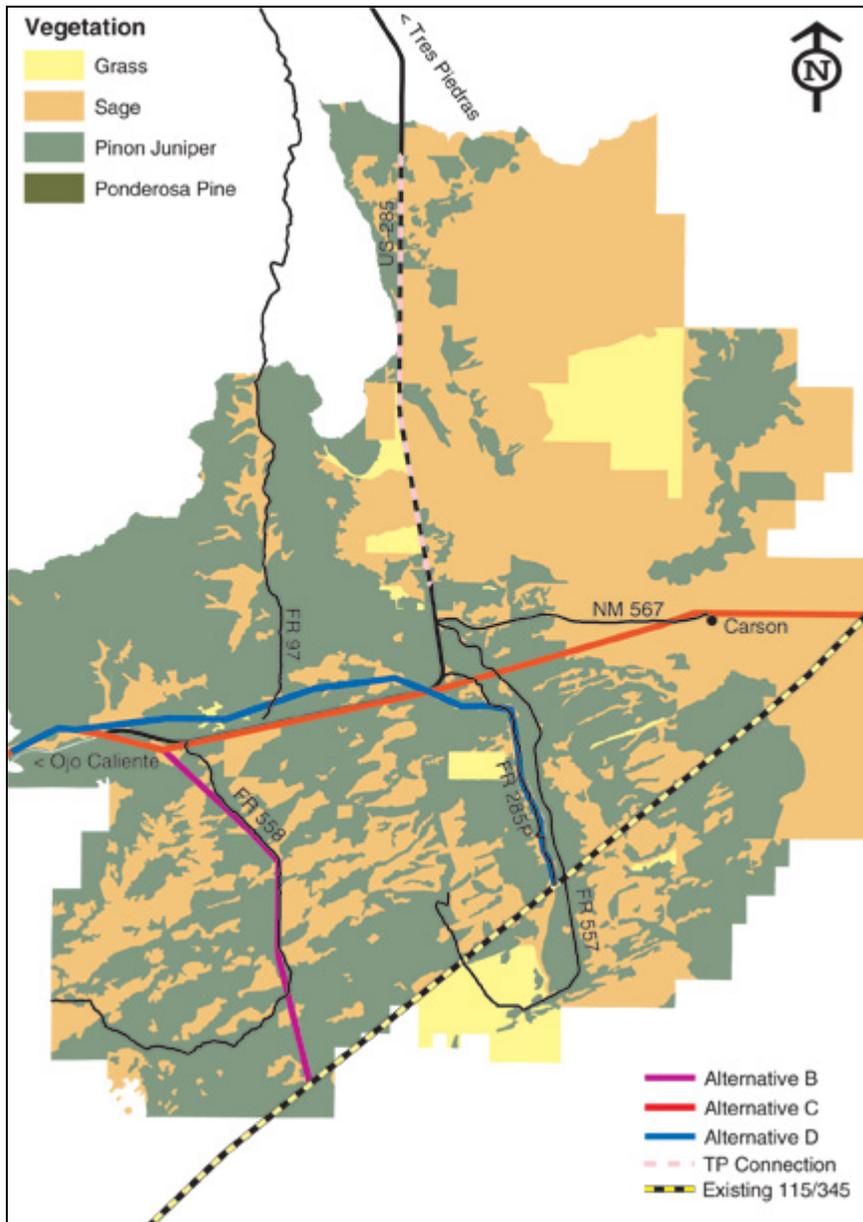


Figure 14. Distribution of vegetation in the study area.

The study area has been experiencing a drought for the past 5 years. Climatic conditions also play an important part in grazing management and watershed conditions. An outbreak of *Ips* beetle in 2002 and 2003 has killed and continues to kill many of the piñon pine trees in the vicinity of the alternative power line locations. In the lower elevations nearer to Ojo Caliente the mortality on piñon is approaching 100 percent (Figure 15).

With the implementation of any of the action alternatives, a mitigation measure is included that would help slow the spread of the *Ips* beetle from green trees that must be cut down and may be infected (MM VG2). During construction, green trees will be bucked no longer than 18” and

immediately covered with heavy black plastic and edges secured to the ground with an earthen berm. The plastic must remain in place for a minimum of 2 weeks—not to exceed 45 days.



Figure 15. Current effects of the bark beetle infestation in the study area.

A nonnative plant found in the study area is downy brome or cheatgrass (*Bromus tectorum*). A winter annual, this plant is an invader species from the Mediterranean area of Europe. The plant grows rapidly in the spring, goes to seed, dries and remains standing. The plant in the dry state is extremely flammable. This plant has the potential to spread across the study area. A change in fire conditions (dry flammable standing material) can cause a change in the vegetation in the area.

Nonnative invasive plant species are best not introduced to an area. One effective method of preventing introduction is to clean the undercarriage of equipment and vehicles entering an area. Cleaning is normally done with a high-pressure spray washer with containment of the wash water and disposal of the materials in the wash water. Kit Carson Electric Cooperative will be responsible for control of any invasive or noxious plants established through construction or maintenance of a utility corridor (MM VG3). Prior to implementation the Forest Service and BLM will approve control or eradication methods. Imported materials such as gravel or fill for the substation will be from sources with no noxious weed occurrence.

Past, Present and Reasonably Foreseeable Activities

The cumulative effects area for the analysis for vegetation has had some type of human use for thousands of years. Cultural resource sites have been located throughout the area near Ojo Caliente and along the Comanche Rim. In addition to prehistoric sites, evidence of historic settlement and abandoned railroad grades exist. Present, historic and prehistoric uses include hunting, farming, removal of firewood, fence posts, collection of piñon nuts and other plant material for foodstuffs, and both domestic sheep and cattle grazing.

Historic, prehistoric, and recent use by humans, and natural events, including insect and disease occurrence, have all contributed to the current vegetation conditions. Climatic conditions, wet and drought cycles have also altered the condition. During wetter periods, tree numbers increase and grass cover decreases. During drought, tree numbers decrease and grass cover increases.

Prior to European influence, piñon-juniper woodlands were typically “savanna-like,” with trees more sparsely distributed or in clumps across the landscape. In piñon-juniper, grass and shrub understories were more dominant plant communities than they are today. In the late 1800s and early 1900s prior to designation as a national forest, large herds of domestic cattle and sheep

grazed the area. Overstocking caused a loss of ground cover and possibly some plant species were extirpated. Current species composition may not replicate what was historically growing in the area in the early 1800s. The same species may still be there, but the relative amounts may be different.

For the benefit of livestock grazing, the Forest Service converted piñon-juniper woodlands to grassland sometime in the late 1940s to 1960s. Large blocks were “pushed” or “chained” and reseeded with mostly crested wheatgrass. Since their conversion, these areas have grown predominately into big sagebrush, interspersed with grasses and some tree reestablishment. The Carson National Forest Land Management Plan (forest plan) currently identifies and manages these “pushes” as revegetation areas.

Piñon-juniper historically had a natural fire regime of 5- to 10-year cycles. Low burning ground fires would travel through the understory, killing small trees in competition with larger ones and stimulating grass growth. A fire suppression policy for the past 50 years has contributed to the increase in numbers of both piñon and juniper trees in the general area of the alternative power line locations, with a corresponding reduction in the amount of grass. However, in some of the revegetation areas, sagebrush and other shrubs have increased and crowded out the grasses. An increase in the number of trees and a decrease in grass cover have contributed to a reduction in overall ground cover.

The absence of wildfire has also affected the composition of low elevation grasslands in the area. Without cyclic burning, sagebrush is outcompeting the grass species, creating vast areas of sagebrush with little grass or forb understory.

Over the last 75 years, various activities requiring the use of motorized vehicles have historically occurred in the area. Almost 47 miles of paved highway (U.S. 285 and NM 567) run through the study area and a considerable network of 620 miles of unpaved roads also exist. The Carson National Land and Resource Management Plan (hereafter, the forest plan) designates areas on the forest where use of vehicles off of designated roads is restricted. National Forest System lands within the study area are open to off-road vehicle travel. Public access to and around any of the alternative utility corridors is basically unlimited. Motorized travel is restricted on BLM lands to existing roads and trails.

Current uses include open road and off-road use for firewood cutting and recreation. All terrain vehicle (ATV) activity is increasing and it is not uncommon to find closed roads in the area being reopened by ATV users. The primary vegetation affected by these user-made roads is sagebrush and plants associated with this vegetation type.

Livestock grazing takes place on two grazing allotments on the national forest (TCLP and Cerro Azul) and one on BLM (505 Ojo Caliente). The current cattle permits are valid and winter grazing is expected to continue for the next 10 years at the same or reduced levels.

Two power line corridors currently run through the study area. A 345 kV and a 115 kV run parallel in the same corridor crossing Black Mesa through Carson and crossing the Rio Grande to Taos. The second corridor is the existing 25 kV line originating at the Los Cordovas substation just west of Taos and running through the Carson area, along NM 567, through Drake Ranch, and along U.S. 285 to the Ojo Caliente area. Both of the corridors predate the Carson National Forest Plan. These existing corridors cross piñon-juniper, revegetation areas and low elevation grasslands. The presence of these lines provides a fairly accurate prediction of what the effects

would be on vegetation if one of the action alternatives or the option were implemented. The effects of these lines will be included in the cumulative effects analysis for Alternatives B-D and the Option.

Private lands within the study area are concentrated either outside of the national forest boundary or scattered close to Ojo Caliente. Several parcels of private land have distribution lines to the property. The properties near Ojo Caliente have a power line accessing the existing line and crossing U.S. 285. There is only one parcel south of U.S. 285 where there might be a foreseeable need to extend the current lines across National Forest System lands to access other private lands.

Forest Plan

The Carson Land Management Plan (hereafter the forest plan) provides discussion and broad direction for the different management areas. [5] The alternative power line locations cross the following management areas within the boundaries of the Carson National Forest: Management Area 8 – Piñon-Juniper; Management Area 11 – Revegetation Areas; and Management Area 12 – Sagebrush.

The predominate management area (MA) is MA 8 - Piñon-Juniper. The MA 11 - Revegetation Areas has, for the most part, converted to sagebrush. Some revegetation areas have piñon and juniper trees growing back in them. The following table gives some highlights for Management Areas 8 and 12.

Table 14. Forest plan management areas and their management highlights

MA	Desired Condition	Management Highlights	Fire	Other
8	Maintain 50 percent or more piñon acres in balanced age class distribution. In juniper areas there will be at least 10 large trees per acre with more than 25 percent living crown. Good habitat for plain titmouse and elk.	Piñon pine, Utah, one-seed and Rocky Mountain juniper comprise the tree canopy. Area is characterized by dry and warm climatic conditions.	Fire occurrence is low.	Do not harvest ponderosa pine [found in this MA].
12	Activities and uses remain visually subordinate to the characteristic landscape and may visually dominate the landscape. Quality habitat for elk and Brewer’s sparrow.	Year long habitat for many species of small game. Two-track unmaintained roads are numerous and useable only during dry periods of the year.	Use fire to maintain production of grass when appropriate.	Primary use is wintering use by big game and livestock grazing.

Bureau of Land Management

There are approximately 2 miles of existing line on BLM lands where some vegetation disturbance has occurred. All but 2 of the 22 poles currently located on BLM lands are in the piñon-juniper grasslands, which correspond to TEU 153 and MA 8 on national forest. There are

2.2 miles of two-track roads in the vicinity of the line on BLM lands, but are not always directly under the line. It is unknown if they became established as a result of the original construction. It is assumed that they would serve as the access if maintenance were required. The total disturbance estimated to have occurred for the construction of the existing 25 kV line is approximately 6.7 acres.

Development of the proposed substation on BLM lands is also common to all action alternatives. The substation would require vegetation removal, leveling and hardened surfacing (graveling) of approximately 1.5 acres. The site characteristics are generally juniper grasslands.

Environmental Consequences

The activities proposed in Alternatives B-D that would affect vegetation in the project area are those that cause the temporary or permanent removal of vegetation cover. These activities include: transport and installation of power poles; line pulling; periodic maintenance of the completed system; and construction and permanent installation of a substation.

The nature of the project is such that a fully cleared corridor is not always necessary. Generally the lines would remain well above the tops of most trees. Areas where trees would have to be removed would be to allow for pole delivery access or pole placement and possibly where the point of maximum line sag between poles would be too close to treetops. Generally access routes within the corridor would be approximately 15 feet wide.

By examining the existing electrical lines and their corridors in the area traversing through the same vegetation types, impacts of a similar proposal are fairly obvious. In areas where access was restricted to construction and maintenance, the environmental effects are minor. Although old access ways may be visible, they have for the most part revegetated very well.

Where access ways to existing lines remain in use, the effects of a typical back country, two-track road are apparent. Depending on the location and soil type, these effects are generally the presence of very little vegetation. The most noteworthy effects on vegetation would be where new access is required by an alternative and that access way should become part of long-term use, or a permanent, two-track road.

Access to pole locations, preparation of pole sites, line pulling and line maintenance would require the use of vehicles or equipment. Road or other vehicle access should be limited in order for disturbed areas to recover to natural ground cover. Use of existing National Forest System and BLM roads and existing two-track roads for pole location, line stringing and maintenance would be emphasized under any of the action alternatives (MM VG1). Table 15 displays the approximate number of acres of disturbance to vegetation relative to pole placement and removal, as well as accessing the line. Adjacent BLM and private lands are assumed to have the same vegetation.

Table 15. Potential disturbance (acres) from the establishment of new two-track access and area cleared for pole placement for piñon-juniper and sagebrush vegetation type

Vegetation Type	Alternative				Option*
	A	B	C	D	
Piñon-Juniper	0	11.3	12.0	20.9	-
Sagebrush	0	6.1	16.1	12.4	-

Vegetation Type	Alternative				Option*
	A	B	C	D	
Total	0	17.5	28.1	33.3**	-

**The Option is within the U.S. 285 right-of-way and similar disturbances are already occurring from mowing.*

*** These figures include removal of 6 miles of existing 25 kV distribution line along U.S. 285.*

It is estimated that a two-track route with an average width of 15 feet would be established or reestablished within the utility corridor for construction and maintenance. The area of disturbance is calculated with the assumption that an area 15-feet wide within the line corridor would be affected by vehicle or equipment use or 1.8 acres per mile. In determining where the two-track route should be located, healthy trees would be avoided to the extent possible. The actual location of the line and poles in the utility corridor would generally keep the power line conductors above tree height.

Alternative A – No Action

This alternative maintains the current condition. The 25 kV line would continue to exist in its present location along with all drop and service points. There would be no construction of a 115 kV power line and no additional disturbance in the utility corridor above current disturbance. The existing vegetation within the forest varies from sagebrush to piñon-juniper. Portions of the sagebrush type have been treated to increase the grass and forbs component.

A corridor exists in the piñon-juniper, with trees averaging 20 feet in height. A two-track exists under this power line. The two-track would continue to be used as access to the line for maintenance. An evaluation of the vegetation and how it has responded to the installation, presence and maintenance of the existing line can support the analysis of effects for the alternatives that go through the same vegetation type.

The existing line goes through sagebrush where the community of Carson is located. The existing conditions illustrate that in the late 1960s portions of this area were plowed and successfully revegetated with wheatgrass but has gradually reverted to sagebrush. In addition, the old road that runs underneath the line is barely visible as it is covered with sagebrush and other grasses and forbs.

Five and a half miles west of Carson, the existing line traverses through piñon-juniper, across National Forest System lands, a small portion of private land and onto BLM lands north of Ojo Caliente. Near NM 587 and then along U.S. 285, the existing line traverses almost 10 miles in piñon-juniper with some sagebrush. For the most part, this area is characterized with good potential for revegetation. Any areas not actively used as a maintenance route or for other vehicle use are generally stable and the route is becoming obscured by vegetation. On BLM lands, there is approximately 4 acres of previously disturbed area. No changes would occur including access or the two existing service drops to the State Highway Department and to the Mesa Vista School.

Alternative B – Black Mesa-Cerro Azul Tap

This alternative would tap into the existing 115 kV line 1.5 miles east of Black Mesa in piñon-juniper. In this particular area, the soil is very sandy. Where vegetation is sparse, wind erosion has

created small “dunes.” It is estimated that pole installation and the establishment of a corridor route would result in about 4 acres of ground disturbance. However, since the area is sparsely vegetated and sandy, impacts related to vegetation removal would be minimal. The sandy nature of some of the soil inclusions would likely make revegetation in this area difficult.

This alternative would continue northwest through mostly piñon-juniper for another 7.5 miles, reaching U.S. 285 and traversing west along the highway onto BLM lands. Along this section, soil properties provide better conditions for plant growth and sagebrush and piñon-juniper are very much in evidence. Forest Road 558 and U.S. 285 would be used to access the corridor. Its conditions along this stretch appear to be more stable than to the south. A 7.5-mile, two-track corridor under the line would disturb a maximum of 14 acres. The short-term effects of vegetation removal and compaction would be greater than the southern portion of this alternative. The existing distribution line along U.S. 285 demonstrates that this area can successfully revegetate, however, continuing drought conditions and *Ips* beetle infestation may dictate the rate of reestablishment.

Alternative C – Existing Corridor

This alternative would construct a new 115 kV transmission line from Carson to Ojo Caliente within the existing distribution line corridor. Alternative C would tap into the existing 115 kV line in the vicinity of where it crosses NM 567 in Carson. Extrapolating the forest vegetation data onto private land, the line starts on sagebrush and remains in this vegetation type for 5.5 miles. Since the existing line is in the same location, an evaluation of how vegetation has responded to the installation and presence of the existing line and its maintenance can be used to determine the effects of this alternative.

Much of the TEU in this area is characterized as having sparse ground cover and a low revegetation potential due to high alkalinity. Existing conditions illustrate that in the past this area was successfully revegetated with wheatgrass. In addition, the old road that runs under the line is barely visible as it is covered with sagebrush and other grasses and forbs. Impacts of disturbing almost 10 acres to reestablish the existing two-track in the utility corridor are not considered substantial. Revegetation may not be as successful as it was in the past, particularly if native vegetation is used.

Five and a half miles west of Carson the vegetation changes from predominantly sagebrush to piñon-juniper. Alternative C would traverse through this common vegetation type on National Forest System lands, a small portion of private land and onto BLM lands. Adjacent to NM 587 and then U.S. 285, the line would traverse over 10 miles generally within this vegetation type, interspersed with patches of sagebrush. Almost 18 acres would be disturbed to reestablish a two-track within the existing corridor. For the most part, piñon-juniper in this area can be characterized with good potential for revegetation. Any sign of past disturbance or a maintenance route in the utility corridor is obscured by vegetation. Revegetation would be successful, although it may take longer to reestablish ground cover if current drought conditions continue.

Alternative D – 285 P Tap

This alternative would tap into the existing 115 kV line where it intersects with Forest Road 285P. Alternative D would traverse through sagebrush grasslands with scattered piñon-juniper for 4.4 miles along the bottom of an elongated swale, just south of U.S. 285 where the highway makes a

90-degree bend. This alternative could disturb as much as 8 acres for a two-track corridor under the line. However, Forest Road 285P runs along this entire stretch and would likely limit the majority of actual disturbance. FR 285P would be used to access this portion of the line for construction and maintenance. This area has a high revegetation potential, which means seeding and other activities to increase ground cover following disturbance should be successful, however, continuing drought conditions may dictate the rate of reestablishment.

Where the highway makes a 90-degree bend, Alternative D would traverse what is mostly one-seed juniper. This area exhibits little effect from the existing line, and is not likely to exhibit much of an effect from this alternative. This alternative would cross and run parallel to U.S. 285 to the west for about 6.5 miles in predominately piñon-juniper at a distance of up to one-half mile from the highway. Along this section, soil properties provide better conditions for plant growth, and sagebrush and piñon-juniper are very much in evidence. Any sign of past disturbance or a maintenance route in the existing utility corridor is obscured by vegetation. A 6.5-mile, two-track corridor under the line would disturb almost 12 acres.

In addition to the construction of a new transmission line, this alternative would entail the removal of approximately 6 miles of the existing distribution line that runs through piñon-juniper along the south side of U.S. 285. The amount of disturbance is similarly calculated to that of placing a new line in order to access the area. However, few if any trees would be removed.

West End of Transmission Line and Effects of Substation for Alternatives B-D

For Alternatives B and C, the proposed line would be within the existing 25 kV corridor, as it exits the national forest and enters BLM lands about 2 miles from the proposed substation. As it leaves the national forest, Alternative D would take a slightly different course to the north. It would then join the existing corridor about one-half mile after entering BLM lands. The two different routes traverse the same type of vegetation. Vegetation removal associated with construction of the last 1.5 miles of transmission line coming into the substation for Alternatives B, C and D would be in piñon-juniper. The amount of disturbance is similarly calculated to that of placing a new line in order to access the area. However, few if any trees would be removed.

The installation of a substation and access road on BLM land would entail permanently clearing up to a 1.5-acre area in sparsely growing juniper grasslands. Ground disturbance associated with the construction of the last 1.5 miles of line coming into the substation would be in both sagebrush and piñon-juniper. Since the sagebrush is found mostly along the edge of the dry wash, it is likely that pole sites would be located more in the piñon-juniper, and the line would span the sagebrush. Temporary disturbance would occur on a little less than 3 acres of both sagebrush and piñon-juniper combined.

Upgrading the existing line to a 115 kV transmission line would also require two pull locations that would result in temporary disturbance areas of approximately 100 feet across. The total disturbance area on BLM lands, including the poles, existing and construction access, guy wire locations, pull sites and substation would be approximately 8.7 acres under any of the action alternatives.

Option – Tres Piedras Connection

The Tres Piedras Connection would extend the existing 25 kV distribution line in the vicinity of the microwave station just north of the intersection of NM 567 and U.S. 285. It would cross the highway to the west side and proceed north along U.S. 285 where it would cross back east of the highway to connect into the existing line that comes south from Tres Piedras along U.S. 285.

This route would total 7.5 miles in a modified vegetation type that now consists of mown shrubs grasses and forbs. The soil in this area responds to seeding with drought tolerant species. The southern portion of the existing distribution line coming south from Tres Piedras runs through this vegetation type. Its corridor shows no signs of problems with revegetation. It is expected that similar effects would occur with the construction of the Tres Piedras Connection.

Cumulative Effects of Alternatives B-D and the Option

Past, present and reasonable activities that contribute to the cumulative effects of soils are those with effects that overlap the effects of each alternative within the study area. The *Affected Environment* section described the past, present and reasonable foreseeable activities that, along with the effects of each of the alternatives, may cumulatively have an effect on soils and watershed. Past and present effects that overlap with the effects of Alternative A have already been discussed.

Past and Present Effects from:	Future Effects from:
Bark beetle (2002-2003)	Bark beetle (5-year forecast)
Nonnative plants	Nonnative plants
“Push” areas	“Push” areas converting back to natural vegetation
Drought	Drought
Paved highways	Paved highways
Unpaved roads	Unpaved roads (continued FP management)
Off-road use	Off-road use (continued FP management)
Existing power lines	Power lines
Livestock grazing	Livestock grazing (continued FP management)
Firewood gathering	Firewood gathering
Private lands	Private lands

In this analysis, the primary source of cumulative effects on vegetation is the presence of the *Ips* beetle and its effects on the piñon trees. Mortality of piñon trees from bark beetle in the study area is beyond epidemic proportions and may reach close to 100 percent throughout the lower elevations of the study area. Lower elevation areas that were once piñon-juniper woodland will convert to only juniper.

For the first few years after death of infected trees, needle drop will increase and contribute to protecting the soil’s surface with litter and adding organic matter to the soil. In 5 to 10 years, dead trees will fall, creating masses of organic matter on the ground. These areas would provide shade and moisture, improving conditions for the growth of grasses and forbs and increasing overall ground cover. During this period, firewood gatherers are likely to make their way out to areas where piñon mortality is high. It is anticipated that many of the dead trees, especially along existing roads, would be removed for firewood.

Preventing unnecessary destruction of healthy piñon trees in Alternatives B through D and the Tres Piedras Connection Option is stressed with the application of mitigation measure, MM VG1. To the extent possible, vehicles and equipment can go around healthier green trees such as in the existing corridor near Comanche Rim. If there is a choice between cutting a piñon or juniper, the latter should be selected.

Existing roads also have an impact on vegetation in the area. Almost 47 miles of paved highway (U.S. 285 and NM 567) run through the study area and a network of 620 miles of unpaved roads also exist. The Carson National Land and Resource Management Plan (hereafter, the forest plan) designates areas on the forest where use of vehicles off of designated roads is restricted. National Forest System lands within the study area are open to off-road vehicle travel. Public access to and around any of the alternative utility corridors is basically unlimited. Motorized travel is restricted on BLM lands to existing roads and trails.

Current uses include open road and off-road use for firewood cutting and recreation. All terrain vehicle (ATV) activity is increasing and it is not uncommon to find closed roads in the area being reopened by ATV users. This reduces vegetation cover, but would not have a measurable effect on either piñon and juniper trees or sagebrush.

Livestock grazing takes place on two grazing allotments on the national forest (TCLP and Cerro Azul) and one on BLM (505 Ojo Caliente). The current cattle permits are valid and winter grazing is expected to continue for the next 10 years at the same or reduced levels. Overall vegetation conditions on the Forest Service allotments are fair, with some poor conditions where extremely sandy and unproductive soils occur. Annual adjustments are made to the livestock numbers and grazing season. Due to an ongoing drought and evidence of very little forage production this summer (2003), the entry dates of October 1 for TCLP and November 1 for Cerro Azul are likely not going to be met.

Private lands within the study area are concentrated either outside of the national forest boundary or scattered close to Ojo Caliente. Several parcels of private land have distribution lines to the property. The properties near Ojo Caliente have a power line accessing the existing line and crossing U.S. 285. It is not foreseen that there will be a need to extend the current lines across national forest or BLM lands to access other private lands.

The cumulative effects area is approximately 190,500 acres. On National Forest System lands, 60 percent (114,500 acres) of the area is piñon-juniper and about 30 percent (60,000 acres) is sagebrush. The implementation of any of the action alternatives would have little if any perceptible (no more than .02 percent) effect on piñon-juniper. Table 16 provides a gross estimate of the alternatives.

Sagebrush is abundant within the cumulative effects area and is continuing to spread into what were once revegetation areas. It is not anticipated that any of the action alternatives or the option would have a measurable effect on sagebrush.

Table 16. Percent of vegetation type affected by alternative within cumulative effects area

Vegetation Type	Alternative				Option
	A	B	C	D	
Piñon-Juniper	0	.01	.01	.02	0
Sagebrush	0	.01	.05	.06	.02

Wildlife ^{6/}

Affected Environment

There are two habitat types that would be affected by the proposed action or any of the alternatives. These are sagebrush identified as Management Area (MA) 12 in the forest plan and piñon-juniper types (MA 8), and are fairly equally distributed in a mosaic pattern across the analysis area (see *Vegetation*, Figure 14). Grasslands and dry washes or arroyos are inclusions or components in the major habitat types. Some grassland were created by woodland removal projects and reseeded. These areas are identified as MA 11 – Revegetation Areas. These revegetation areas have gradually begun to revert to sagebrush and piñon-juniper. However, it is likely that much of the analysis area will lose the majority of the piñon to disease and will become juniper grasslands habitat in the next few years. Wildlife common throughout the analysis area include large ungulates, carnivores, small mammals, raptors, songbirds, reptiles and amphibians associated with the piñon-juniper and sagebrush habitat types.

Avian Species

Breeding season inventories in northern New Mexico (Stahlecker 1989 and LaGory 2001) indicate a variety of avian species use these habitat types. Greater species diversity is expected in the piñon-juniper type with the increase in structural diversity. Birds common to the piñon-juniper habitat include the ash-throated flycatcher, Bewick's wren, bushtit, chipping sparrow, house finch, juniper titmouse, spotted towhee, scrub jay, black-throated gray warbler, blue-gray gnatcatcher, brown-headed cowbird, common nighthawk, gray flycatcher, gray vireo, lesser goldfinch, mountain bluebird, mountain chickadee, mourning dove, piñon jay, dark-eyed junco, broad-tailed hummingbird, northern flicker and solitary vireo.

Avian species common to the sagebrush habitat type include the sage sparrow, vesper sparrow, Brewer's sparrow, green-tailed towhee, mountain blue bird, western meadowlark, broad-tailed hummingbird, common nighthawk, horned lark, mourning dove and sage thrasher.

The most likely bird of prey to nest in the analysis area is the American kestrel. Species known to nest in nearby cliff areas and likely to use the area for hunting include the red-tailed hawk, great-horned owl, prairie falcon and golden eagle. A wider variety of raptors may frequent the area during migration periods including flammulated owl, Swainson's hawk, ferruginous hawk, rough-legged hawk and northern goshawk.

Mammals

Wild ungulates include Rocky mountain elk and mule deer. Common predators include the mountain lion, coyote, gray fox, long-tailed weasel, bobcat and striped skunk.

Small mammals common to the analysis area include the porcupine, rock squirrel, desert cottontail, eastern cottontail, black-tailed jackrabbit, Colorado chipmunk, Gunnison's prairie dog, Bottas pocket gopher, Ord's kangaroo rat, deer mouse, piñon mouse and white-throated wood rat.

Fish

No fisheries occur within or reasonably close enough to the analysis area to be affected by the proposed action or alternatives.

Amphibians and Reptiles

Reptiles that are likely to occur within the analysis area include the prairie rattlesnake, gopher snake, western hognose snake, Chihuahuan spotted whiptail, fence lizard, short horned lizard, collared lizard and the New Mexico spadefoot.

Environmental Consequences

Given the nature of the proposal, there are some environmental effects that are common to all alternatives. All of the alternatives, including the no action, would either create or maintain some openings through the woodland type. There would be minor changes in overall disturbance from motor vehicle access over time. The Forest Service portion of the analysis area is currently designated open to both vehicle and all-terrain-vehicle (ATV) use. The BLM portion is limited to existing roads and trails. There would be some additional activity during construction for any of the action alternatives. Alternatives B and D would have a slight increase in public access capability due to the access routes created during construction.

Some habitat disturbance would occur during the construction of a transmission line. The construction process would result in habitat disturbance in any of the alternative locations for approximately a year. The disturbance factors would be fairly similar for any alternative. Generally, the larger species would experience more displacement than smaller species. This is fairly common across orders. Large predators, big game, upland game and larger birds of prey would all likely exhibit more temporary avoidance of an area during active construction. Smaller species, including small mammals and passerine birds, may not experience much displacement at all. Ground dwelling species would be displaced in the area where access ways are used for construction or at pole placement sites.

Any of the action alternatives would be relatively insignificant from the disturbance caused during construction. There are over 300,000 acres of piñon-juniper and over 80,000 acres of sagebrush on the forest, and only a fraction of a percent of these habitats would be involved in any of the alternatives.

Management Indicator Species (MIS)

The Bureau of Land Management does not use the concept of “management indicator species.” The Carson Forest Plan (as amended) identified 11 wildlife species as management indicator species (MIS) to monitor the conditions of the forest’s ecosystems. [5] The forest plan provides direction on managing quality habitat for management indicator species by management area. Management indicator species are considered to be representative for a variety of other species with similar life requirements and were determined to reflect the habitat needs for the majority of the forest’s species. MIS were selected because population changes are believed to indicate the effects of management activities that occur on the forest.

All eleven management indicator species or species groups were considered for the Ojo Caliente proposed 115 kV transmission line analysis. Management indicator species with representative habitats are listed in Table 17.

Table 17. Forest management indicator species with habitats present or affected

Management Indicator Species	Key MIS Habitat Component for Quality Habitat	Forest Plan Management Areas Within the Analysis Area Managed for Quality Habitat
Brewer's Sparrow	sagebrush	MA 12—Sagebrush
Plain (Juniper) Titmouse	piñon-juniper canopies	MA 8—Piñon-Juniper
Rocky Mountain Elk	general forest	MA 8—Piñon-Juniper MA 12—Sagebrush
Merriam's Turkey	old growth pine	MA 3—Mixed Conifer Under 40% Slope MA 4—Ponderosa Pine Under 40% Slope MA 5—Mixed Conifer & Ponderosa Pine Over 40% Slope MA 7—Unsuitable Timber MA 11—Revegetation Areas MA 13—Oak

Those considered but not included in detailed analysis are listed in Table 18. Representative habitats for these species are not present in the analysis area.

Table 18. Forest management indicator species with habitats not present or affected

Management Indicator Species	Key MIS Habitat Component for Quality Habitat	Forest Plan Management Areas Managed for Quality Habitat
Abert's squirrel	interlocking canopies in ponderosa pine	MA 4—Ponderosa Pine Under 40% Slope MA 5—Mixed Conifer & Ponderosa Pine Over 40% Slope MA 7—Unsuitable Timber
Hairy woodpecker	snags	MA 1—Spruce Under 40% Slopes MA 2—Spruce Under 40% Slopes MA 3—Mixed Conifer Under 40% Slope MA 4—Ponderosa Pine Under 40% Slope MA 5—Mixed Conifer & Ponderosa Pine Over 40% Slope MA 6—Aspen MA 7—Unsuitable Timber MA 14—Riparian
Red squirrel	mixed conifer	MA 3—Mixed Conifer Under 40% Slope MA 5—Mixed Conifer & Ponderosa Pine Over 40% Slope MA 6—Aspen MA 7—Unsuitable Timber
Rocky Mountain bighorn sheep	alpine, subalpine tundra, mtn. meadow grassland	MA 9—High Elevation Grassland
White-tailed	alpine tundra,	MA 9—High Elevation Grassland

Management Indicator Species	Key MIS Habitat Component for Quality Habitat	Forest Plan Management Areas Managed for Quality Habitat
ptarmigan	subalpine deciduous shrub	
Aquatic macroinvertebrates	perennial streams and riparian	MA 14—Riparian
Resident trout	perennial streams and riparian	MA 14—Riparian

Juniper titmouse (*Baeolophus ridgwayi*)

Juniper titmouse, formerly referred to as the plain titmouse, is a resident of deciduous or mixed woodlands, favoring oak and piñon-juniper. The titmouse usually nests in natural cavities or old woodpecker holes. It occurs almost statewide and is considered rare to common. Spot mapping surveys in the Rio Grande Wild and Scenic River Recreation Area (Stahlecker 1998) produced a range of 22 to 61 breeding pair per square kilometer. Surveys on the Jicarilla Ranger District (LaGory 2001) found this species was the third most common species encountered in the piñon-juniper habitat type. This species is the only MIS on the Carson National Forest that has a declining trend in habitat and population. Based on the MIS assessment for the Carson National Forest over the period of the forest plan, it is estimated juniper titmouse habitat has decreased about 6,688 acres due to wildfire and management actions. [261]

In the western portion of the analysis area the pattern of the piñon-juniper habitat becomes much more sparse with much greater distance between trees, and suitability for the species is marginal. However, the need to remove trees to implement any of the alternatives in this area is also greatly reduced.

Alternative Comparison: In Alternatives A (No Action) and C (Existing Corridor) and the Tres Piedras Connection Option, no habitat for this species would be affected. In Alternatives B (Proposed Action) and D (285 P Tap), there would be about 2 to 3 acres of suitable habitat lost to construction activities.

The nature of the project is such that a fully cleared corridor is not necessary. Generally the lines would remain well above the tops of most trees in this habitat type. Areas where trees would have to be removed would be to allow for pole delivery access or pole placement. Generally access routes would be limited to a two-track corridor, approximately 15 feet wide. The opening(s) would be narrow enough that effects are likely to be limited to possible loss of individual trees, but habitats would remain occupied.

Cumulative Effects: The western portion of the analysis area, which is the lowest elevation and most arid area near Ojo Caliente, has lost the majority of piñon trees to drought conditions and bark beetle infestation. In some areas there is near 100 percent mortality, leaving only juniper trees remaining in the habitat type. The effects of the infestation are progressing to the east and north, but as yet mortality is generally between 20 and 50 percent. Additional avian monitoring surveys are being conducted in 2003, but results are not yet available to determine the effects of piñon mortality on juniper titmouse. Based on the 2002 aerial surveys, the Carson has lost approximately 16,240 acres to disease. This would increase as the drought continues.

The most significant of past management activities in the Southwest that altered habitat for the plain titmouse was the plowing, chaining and tree crushing in piñon-juniper woodlands to create forage areas for livestock grazing, beginning in the 1940s and continuing until the early 1970s. The Carson National Forest Plan defines these areas as Management Area (MA) 11 – Revegetation Areas. On the forest, there are approximately 83,000 acres of MA 11, including acres of sagebrush that were type converted as well. Although forest plan standards and guidelines for MA 11 direct the forest to maintain these revegetation areas, the Carson National Forest has focused on maintaining mostly the acres that would naturally convert back to sagebrush by prescribed burning. The forest has allowed piñon and juniper trees to reestablish back into many of the sites where piñon-juniper was once common. This management trend is likely to continue, which should eventually benefit the plain titmouse and its habitat.

Summary: Given the minor number of acres actually affected by tree removal, the nature of the proposed project would not result in any significant habitat loss nor would it affect population viability. The current population trend would not be affected by any of the alternatives or the option.

Brewer's Sparrow (*Spizella breweri*)

In northern New Mexico, the habitat of Brewer's sparrow is sagebrush, brushy plains and the interface of piñon-juniper woodlands and sagebrush. Brewer's sparrow prefers brushy conditions intermixed with grasses. Such habitats are common throughout the study area occurring in a mosaic pattern. The common impacts would be either running over sagebrush habitat or removal for pole placement. The forest-wide habitat trend for this species is up by about 55 percent or 29,152 acres for the sagebrush habitat type. Based on the current GIS vegetation data layer, there is now a total of 81,752 acres of sagebrush. Throughout its range, Brewer's sparrow is listed as G5, (i.e., globally secure and common, widespread, and abundant) (NatureServe 2002). Monitoring information from the North American Breeding Bird Surveys in New Mexico from 1968 to 1999 indicate population and trends are fairly stable for the entire state (Sauer et al. 2001).

On lands administered by the Bureau of Land Management just west of the Questa Ranger District in Taos County, New Mexico, a prey base analysis for peregrine falcon conducted by Eagle Environmental in spring/summer 1995 and 1986 found an average of 50 breeding pairs of Brewer's sparrow per square kilometer in the sagebrush grassland habitat type (Stahlecker et al. 1989).

Alternative Comparison: Alternative A (No Action) would not affect the species. Less than 2 miles of Alternative B would go through Brewer's sparrow habitat. The habitat is relatively sparse and is considered marginal for the species. Alternative C would involve about 7 miles of sagebrush habitat. However, the majority of the area already has a two-track corridor and would not result in habitat loss. The eastern portion of Alternative D runs through a dense sagebrush swale. Forest Road 285P traverses through the entire length of the habitat, but would not completely align with the actual sites for pole location. Some sagebrush would be lost, but it would be insignificant compared to the total sagebrush habitat available both within the analysis area and forest-wide. The Tres Piedras Option is located along the edge of the U.S. 285 right-of-way and is occasionally mown. No loss of habitat is anticipated for this option.

Cumulative Effects: Many of the piñon-juniper and sagebrush acres that were converted to grasses have gradually transitioned from grasslands to sagebrush. This accounts for the significant upward trend in Brewer's sparrow habitat. Given the current loss of piñon to disease, this trend is likely to continue for several years.

Summary: None of the alternatives or the option would affect the current habitat and population trend for Brewer's sparrow. In addition, the nature of the proposed project would not affect population viability.

Rocky Mountain Elk (*Cervus elaphus*)

This large ungulate is both a grazer and browser. It is generally thought that elk populations are increasing across most of the state. The analysis area includes portions of Game Management Units 50 and 51. The New Mexico Department of Game and Fish has increased license sales and provided a limited number of late season cow permits to help hold the population at current levels in both of these game management units. The portions of the analysis area within either unit are considered mostly to be of marginal quality elk habitat, but some year-round occupancy has developed over time.

Alternative Comparison: Under Alternatives B-D, some displacement of elk would occur where active construction is taking place. Long-term disturbance effects are estimated to result from access ways that become part of the permanent back-country road network and are at least 200 meters from any existing access. Given the sandy soil conditions and existing access management for the area that is open to off-road use, it is likely that some access ways would become part of the road network over time. It is estimated that both Alternatives B and D could have about 2 miles of increased road access from the project. Alternatives A and C would remain the same. Since the Tres Piedras Connection would be within the existing highway right-of-way, no habitat would be affected if the option were implemented.

Cumulative Effects: Disturbance to elk would occur only during the construction phase of the project. Periodic examination of the line for maintenance purposes would have little to no disturbance. While construction took place, continued intermittent disturbance by ATV and vehicle use would also occur. This area is remote and not heavily used, but larger species such as elk are more susceptible to disturbance and temporary displacement would be likely. Also the effects of the piñon die off would not necessarily result in loss of habitat but it would change the nature or use of the habitat, reducing cover components and increasing foraging areas.

Summary: Since 1986, the Carson National Forest has been experiencing an upward trend in both elk habitat and populations. Alternatives B-D and the Option would not affect the current habitat or population trend or the viability of the species.

Merriam's Turkey (*Meleagris gallopavo*)

The habitat component for which this species is to be evaluated is old ponderosa pine that provides roost tree habitat. However, the forest plan calls for managing quality habitat for turkey in MA 11 - Revegetation Areas. The analysis area does include revegetation areas, but there are no old ponderosa pine stands near the location of any alternative. This habitat feature is not present and would not be affected by any of the alternatives or the option.

Threatened, Endangered and Proposed Species

The following are brief summaries of the status of each Federally listed species as provided by the U.S. Fish and Wildlife Service [265, 266.1] and the management implications of the proposed project. These are Federally listed threatened or endangered species potentially occurring in Taos County or with historical habitat occurring in Taos County. A biological assessment will be prepared once the preferred alternative is identified and included as part of the project record. No alternative comparison is made where there is no occurrence of the species or suitable habitat.

Black-footed Ferret (*Mustela nigripes*)

Endangered: The black-footed ferret was listed as endangered on March 11, 1967. It is considered extirpated in New Mexico. The historic range of this species is almost identical to that of three prairie dog species that use prairies, grassland plains, and surrounding mountain basins. Based on: (1) the absence of the species in New Mexico; (2) the lack of exceptionally large prairie dog towns that may provide potential habitat; and (3) this type of project having little or no effect on such populations of prairie dogs, there would be no effect on the species or its future population viability.

Bald Eagle (*Haliaeetus leucocephalus*)

Threatened: The bald eagle was listed as “endangered” under the Endangered Species Act on February 14, 1978. In 1995, the U.S. Fish and Wildlife Service reclassified the listing to “threatened” in the lower 48 states. Bald eagles regularly migrate along the Rio Grande drainage in the winter, but are generally confined to areas of large cottonwood trees near the river for roosting. The analysis area is outside the normal migration route along the Rio Grande and Alternatives A-D and the Option would not have any effect on the species, its habitat or population viability.

Mexican Spotted Owl (*Strix occidentalis lucida*)

Threatened: The analysis area does not contain any suitable habitat for the Mexican spotted owl and the proposal would not have any effect on the species.

Southwestern Willow flycatcher (*Empidonax traillii extimus*)

Endangered: The southwestern willow flycatcher was listed as endangered on March 29, 1995. Occupied breeding habitat does occur in Taos County, but no suitable habitat occurs within the analysis area.

Whooping Crane (*Grus americana*)

Nonessential Experimental: The whooping crane in the Central Flyway is an experimental population, where a few individuals were raised by sandhill cranes at Gray Lake Idaho and migrate to the Rio Grande Valley in central New Mexico. The population was not self-sustaining and the experiment was concluded in 1989.

Mountain Plover (*Charadrius montanus*)

Proposed Threatened: The mountain plover is a prairie grassland species. It does occur in northern Taos County, but is associated with the winterfat, fringed sage, western wheatgrass communities west of the Rio Grande and north of NM 64. No suitable habitat occurs within the analysis area. Alternatives A-D and the Option would not jeopardize the mountain plover, its habitat or population viability.

Forest Service Sensitive Species

The Regional Forester has designated certain species as “sensitive” for the Southwestern Region of the Forest Service. [270] Ripley milk-vetch (*Astragalus ripleyi*) is the only species with potential to occur within the analysis area. Ripley milk-vetch does occur on the Tres Piedras Ranger District and may occur within the analysis area. It occasionally can be found where sagebrush transitions into piñon-juniper, but is much more likely to be found near edges of ponderosa pine forests in association with Arizona fescue understories (elevation approximately 7,000 - 9,500 feet). [270] The nearest known occurrence is several miles north of the northernmost point of any of the action alternatives or the option. [270] This milk-vetch requires a fairly open canopy, occurring at forest edges or openings on heavier and less friable soils than are generally found on the majority of the analysis area. A biological evaluation will be prepared on the preferred alternative and included as part of the project record.

Chances are greater that this species could occur along the Tres Piedras Connection option than the alternative routes. However, this location is within the highway right-of-way and is occasionally mowed up to or near the fence line. Implementing the Option should not have any impact on this plant species.

Migratory Birds

Migratory birds have often been referred to as neotropical migratory birds. These are birds that breed north of, and winter south of, the Tropic of Cancer. However, from a biological perspective, there are vast variations in migration between species and, for the most part, wildlife reports on migratory birds include species that migrate south of the United States for winter. Based on the nature of this analysis, all large raptors that could directly suffer from collision and/or electrocution accidents are included in this section and are of the greatest concern with regard to migratory birds.

Raptors and Waterfowl

Collision accidents occur when birds inadvertently strike conductors (lines). This problem occurs mainly with migratory birds, such as waterfowl, at times of poor visibility. Collisions can be a major concern for some structures such as high towers with multiple support cables. Problems can occur in very specific, localized situations where certain factors exist or interact to create high

collision potential. Such instances take place when high use feeding areas are on one side of a line and roosting or nesting areas are on the other (Brown 1994). Problems are also not common with transmission lines unless conductors are located in and perpendicular to a major migration flyway. None of which is the case in the proposed action or any of the alternatives. Collision accidents are not likely to occur.

Electrocution problems occur when conductors are close enough that an animal, typically a large raptor, can span the distance between conductors or the conductor and a ground making skin-to-skin contact. This situation should be avoided both to protect wildlife, as well as to avoid the disruption of power. The conductors on a 115 kV transmission line are too far apart to allow skin-to-skin contact of any bird of prey. There is no measurable conductivity up to 70,000 volts through dry feathers although electrocutions do increase during wet periods. Most raptors naturally stay put in rainy conditions and usually dry quickly in flight. The offset design proposed for the 115 kV portion of any of the action alternatives is identified as a raptor safe configuration in the “Suggested Practices for Raptor Protection on Power Lines – The State of the Art in 1996 by the Avian Power Line Interaction Committee” (Raptor Research Foundation 1996). The New Mexico Avian Protection Working Group has identified and mapped the high raptor density areas in New Mexico. None of the alternatives fall within the high raptor density areas for the state. [270] Nevertheless, the actual design including the underbuilt portions, will incorporate mitigation measures to prevent electrocution of raptors and any other species such as bobcats that could climb poles.

Alternative Comparison: The proposed design is a single pole with the transmission line above the distribution lines. Raptors are most often attracted to the highest perch site on a structure, which helps to mitigate underbuilt crossbars carrying distribution lines. However, it would still be possible to make contact between conductors or a conductor and the ground wire on any section where the 25 kV line would be underbuilt on a crossbar. All of the action alternatives will have Rural Utility Service approved safety measures installed on any new construction associated with the project where distance between conductors or ground is less than 60 inches. These would be an insulated snap-on covering design, and would be safer than the existing line in Alternative A (MM WL1).

Cumulative Effects: The most likely possibility for electrocution accidents occurs where transformers step down the power from a 25 kV distribution line or smaller to household use. This is where skin-to-skin contact can easily be made. Any new poles placed for step down transformers in association with this project will require insulating covers over conductors. There are other locations where the possibility of electrocution could occur. Of particular concern are “preferred poles” which are frequented by large birds of prey such as eagles or red-tail hawks. Just because the potential exists does not mean that there is likelihood of occurrence. It is estimated that “95 percent of all electrocutions could be eliminated by correcting 2 percent of the pole problems (Raptor Research Foundation 1996).” The public is encouraged to contact Kit Carson Electric Cooperative regarding any pole location that is causing wildlife electrocution so that it may be corrected.

Other Migratory Birds

Partners In Flight (PIF) has identified physiographic areas and high priority breeding species by broad habitat types. This information is available from the PIF Web site (partnersinflight.org).

The U.S. Fish and Wildlife Service (FWS) has also developed a list of priority bird species by bird conservation region in the “Birds of Conservation Concern 2002.” [270]

Of the birds previously listed as occurring within or adjacent to the analysis area, certain birds have also been identified as migratory birds that are protected under the migratory conventions of the Migratory Bird Treaty Act (16 USC, 703-711) and as directing Federal agency compliance with the act under Presidential Executive Order 13186 published in the “Federal Register” on January 17, 2001 (66 FR 3853). Executive Order 13186 requires Federal agencies to comply with the conventions of the Migratory Bird Treaty Act.

Federal agencies, such as the Forest Service, are to integrate bird conservation principles, measures and practices into agency activities and avoid or minimize, to the extent practicable, adverse impacts on migratory bird resources when conducting agency actions. Listed below are “Priority Species” identified by the Partners in Flight planning group (as authorized by Presidential Executive Order 13186, Sec. 3(e)(5)). Priority species are species that have known or suspected declining population trends, limited geographical ranges, and deteriorating habitats. In addition to the Partners in Flight priority species, the list includes other species identified by the Fish and Wildlife Service as being a priority.

Direct effects to any of the migratory birds in Table 19 could result from clearing vegetation (nesting habitat) during the breeding season. This can be mitigated, especially in the piñon-juniper habitat, by limiting removal of any trees to the nonbreeding season. Under any action alternative and the option, a mitigation measure prohibiting the clearing of trees for construction purposes between April 1 and August 1 will be applied (MM WL2).

Indirect effects would be minor as loss of habitat is only a few acres for any habitat type for any of the alternatives. Construction activities would have some temporary displacement of birds, but human presence typically does not have much displacement effect on smaller passerine birds that are most likely to be encountered during construction.

Table 19. Migratory birds with potential habitat or occurrence within the study area

Species	FWS	Habitat	GBDS	PMG	PJ	PP	MC	MS
Owl, Burrowing	X	Great Basin desert shrub, open country	HR	HR				
Shrike, Loggerhead		Open brushy areas, w/posts, wires, scattered trees	HP					
Thrasher, Sage		Sagebrush, brushy slopes, mesas	HP					
Sparrow, Sage	X	Sagebrush, open arid desert	HP					
Eagle, Golden	X	Open mountains, foothills, canyons, plains	H					
Owl, Short-eared	X	Open country, marshes, tundra	H					
Thrasher, Bendire’s	X	Open grasslands, brushy desert	HP	HP	HP			
Hawk, Ferruginous	X	Piñon-juniper woodlands		HP	HP			

Table 19. Migratory birds with potential habitat or occurrence within the study area

Species	FWS	Habitat	GBDS	PMG	PJ	PP	MC	MS
Falcon, Prairie	X	Canyons, open mountains, plains, prairies, deserts		HP				
Plover, Mountain	X	Dry upland prairies, plains, semidesert		HP				
Bunting, Lark		Sagebrush, plains, prairies		HP				
Hawk, Swainson's	X	Dry open plains, prairies		H				
Harrier, Northern	X	Open grasslands, marshes		H				
Flycatcher, Gray		Piñon-juniper, sagebrush			HP			
Vireo, Gray	X	Brushy mountain slopes, mesas, scrub oak			HP			
Warbler, Black-throated Gray	X	Dry oak slopes, piñons, junipers			HP			
Jay, Piñon	X	Piñon-juniper, ranges into sagebrush			HR			
Warbler, Virginia's	X	Oak canyons, brushy slopes, piñons			P	HP		P
Goshawk, Northern		Northern forests, mountain woodlands, possible fall/winter migrant				HP	HP	
Owl, Flammulated	X	Open pine and fir forests in mountains fall migrant				HP	P	
Towhee, Green-tailed		Dry, brushy mountain slopes, open pines, sage						HP

Source: USFWS 2002.

PP = Ponderosa Pine

FWS = Identified as Birds of Conservation Concern by U.S. Fish and Wildlife Service

MC = Mixed Conifer

GBDS = Great Basin Desert Shrub

MS = Montane Shrub

PMG = Plains and Mesa Grassland

HP = Highest Priority; P = Priority; HR = High Responsibility; H = Species utilizes this habitat.

PJ = Piñon-juniper

Table 20. FWS listed or Partners in Flight species with little potential of occurring within analysis area

Species	FWS	Habitat	GBDS	PMG	PJ	PP	MC	MS
Hummingbird, Lucifer		Canyons in extreme SW NM	HP					
Thrasher, Crissal	X	Montane shrub (southern NM)	P					

Table 20. FWS listed or Partners in Flight species with little potential of occurring within analysis area

Species	FWS	Habitat	GBDS	PMG	PJ	PP	MC	MS
Warbler, Red-faced		High mountains (southwestern NM only, Gila NF)		HP				
Pewee, Greater		Mountain pine-oak woodlands (AZ, southwestern NM)			HP			
Warbler, Olive		High mountains (southwestern NM, Gila NF and SE AZ)			HP			
Warbler, Grace's	X	Pine-oak forests of mountains				HP		
Owl, Mexican Spotted		Thickly wooded canyons, mixed conifer				HP	HP	
Woodpecker, Lewis's	X	Middle elevation riparian				P		
Sapsucker, Williamson's	X	Higher conifer forests				P	HP	
Flycatcher, Olive-sided		Conifer forests, burns					HP	
Flycatcher, Dusky		Open coniferous forest					HP	
Warbler, MacGillivray's		Low dense undergrowth; shady damp thickets						HP
Sparrow, Black-chinned		Brushy mountain slopes, open chaparral, sage in southern NM						HP
Curlew, Long-billed		High plains, rangeland; eastern NM						HP
Flycatcher, Scissor-tailed		Semiopen country; eastern NM						HP
Dicksissel		Alfalfa fields, prairies; eastern NM						HP
Falcon, Peregrine	X	Open wetlands near cliffs	No Habitat					
Grouse, Gunnison Sage	X	Sagebrush, foothills, plains; not found in NM	No Habitat					
Godwit, Marbled	X	Migrates through central NM	No Habitat					
Plover, Snowy	X	Barren sandy beaches, and flats, southern NM	No Habitat					
Pipit, Sprague's	X	Rare migrant in alpine meadows	No Habitat					
Sandpiper, Solitary	X	Migrates through central and eastern NM	No Habitat					

Table 20. FWS listed or Partners in Flight species with little potential of occurring within analysis area

Species	FWS	Habitat	GBDS	PMG	PJ	PP	MC	MS
Swift, Black	X	High elevation riparian, cliffs, waterfalls						No Habitat
Phalarope, Wilson's	X	Wet meadows						No Habitat
Longspur, Chestnut-collared	X	Moist upland prairie						No Habitat
Cuckoo, Yellow-billed	X	Woods, orchards, streamside willow/alder						No Habitat
Swallow, Cave		Caves in southern NM						No Habitat

Alternative Comparison:

Alternative A, No Action—The No Action Alternative would normally be considered an alternative with minimal or possibly no impacts to migratory birds. However in this case, the original distribution line design is such that an electrocution accident is possible for large birds of prey. As part of this analysis, significant portions of the existing line were either driven or walked. No signs of such accidents from electrocution were detected or that specific problem poles exist, although evidence of remains may not last very long. Nevertheless, all the action alternatives will require protective insulation (MM WL1), which would be an improvement over the existing situation. An old hawk nest (likely a red-tailed hawk) was discovered on BLM lands on a pole with a double cross member. The nest was not active at the time and showed signs of deterioration.

Alternative B, Proposed Action or Black Mesa-Cerro Azul Tap—Alternative B would create a new utility corridor across open terrain of sagebrush and piñon-juniper habitats. Habitat disturbance from construction activities would last approximately 1 year. Ground vegetation would be overrun by equipment and some trees would have to be removed. Disturbance to migratory birds from accessing the line's location would not likely be very discernible, since the area is already heavily roaded and is also open to off-road use. Most of this alternative is close to or follows existing two-track roads and would require little additional access. It is likely that 3 to 4 miles of temporary access disturbance may be required. New access locations may be required due to very sandy soils. Future maintenance requirements are not likely to be significant.

Alternative C, Existing Corridor—The existing corridor would follow the current route replacing poles and conductors. There would be some disturbance to areas where sagebrush has grown back in since the original distribution line was installed 50 years ago. Disturbance would be limited to pole locations and driving equipment along the right-of-way for pole delivery and stringing conductors. Although the affected area has been previously disrupted, portions have had little disturbance for the past 50 years, and it is the longest of the

alternatives with the most total acres of disturbance. Some species such as Brewer's sparrow may be affected by the new construction along this route. Future maintenance requirements are not likely to be significant.

Alternative D, 285 P Tap—This alternative would involve some disturbance and removal of sagebrush for pole placement and construction along Forest Road 285P in the Canada Embudo drainage. Access in this section of the alternative would be via the existing road, which would keep disturbance to a minimum. There would be some loss of habitat for species like the sage and Brewer's sparrow. This alternative is similar to Alternative B in that after it crosses U.S. 285 it would result in habitat disturbance to some piñon-juniper habitat and additional construction access would be necessary. The section paralleling U.S. 285 about one-half mile to the north does not have as much existing road access. The portion requiring piñon-juniper habitat removal would be approximately the same as Alternative B. The effects would be temporary displacement or habitat loss for species such as the juniper titmouse using this habitat type. This alternative would also involve temporary disturbance along 6 miles of the existing corridor for removal of that portion of the line adjacent to U.S. 285. Future maintenance requirements are not likely to be significant.

Option, Tres Piedras Connection—The Option would have little habitat disturbance as the proposed location is within the highway right-of-way. The majority of this stretch of highway is mown close to the fence. Brush or trees are not anticipated to be affected. Habitat disturbance adjacent to the line location would be temporary and minimal.

Cumulative Effects: The most significant of past management activities in the Southwest that altered habitats for migratory birds found in this analysis area was the plowing, chaining and tree crushing in piñon-juniper woodlands to create forage areas for livestock grazing beginning in the 1940s and continuing until the early 1970s. The Carson Forest Plan defines these areas as Management Area 11 – Revegetation Areas. There are approximately 83,000 acres of Management Area 11, but they also include acres of sagebrush that were type-converted as well. Although forest plan standards and guidelines for MA 11 direct the forest to maintain these revegetation areas, the Carson National Forest has focused on maintaining mostly the acres that would naturally revert back to sagebrush by prescribed burning. The forest has allowed piñon and juniper trees to reestablish into many of the sites where piñon-juniper was once common. This management trend is likely to continue.

The western portion of the analysis area, which is the lowest elevation and most arid area near Ojo Caliente, has lost the majority of piñon trees to drought conditions and bark beetle infestation. In some areas there is nearly 100 percent mortality, leaving only juniper trees in the habitat type. The effects of the infestation are progressing to the east and north, but as yet mortality is generally between 20 and 50 percent. Additional avian monitoring was conducted in 2003, but results are not yet available to determine the effects of piñon mortality on avian populations using these habitats. Based on the 2002 aerial surveys, the Carson lost approximately 16,240 acres to disease. The 2003 survey indicates that around 70 percent of all piñon stands have some degree of infestation. This is likely to increase as the drought continues.

Summary: Loss of habitat from any of the action alternatives would only be a few acres, which is inconsequential compared to natural events currently taking place across the landscape. A mitigation measure minimizing the cutting of healthy piñon trees and stacking and covering branches (MM VG1 and VG2) may help prevent the spread of infestation into unaffected areas.

Visual Resources 7/

A significant issue raised by the public during scoping involves the potential effects on landscapes as seen from sensitive viewing areas (homes, travel corridors, overlooks, etc.) and whether the alternative corridors would be able to meet forest plan standards and guidelines for visual quality.

This analysis identifies, describes and maps significant visual resources that may be affected by the construction, operation and maintenance of the proposed 115 kV transmission line proposal and its alternatives, and analyzes the potential visual impacts. Baseline data have been recorded in sufficient detail to assess direct and indirect impacts of the Ojo Caliente proposed power line and alternatives.

This analysis addresses an area of visual influence containing the alternative corridors, as well as the area associated with construction and operation activities. The visual analysis area is defined by the relationship of the project facilities and activities for each alternative to the surrounding topographic and vegetation patterns. The purpose of the analysis was to describe the existing visual condition of the visual analysis area and identify potential impacts to visual resources and modifications to present views.

The visual resource analysis follows guidelines established from both the Forest Service's 1974 Visual Management System (VMS) and the more recent 1995 Scenery Management System (SMS) and the Visual Resource Management System used by BLM. [274] Impacts to visual aesthetics would be direct, adverse and long-term (lasting for the life of the project). Construction and operation activities can typically result in visual contrasts that may affect:

- The quality of aesthetic resources.
- Scenic resources having rare or unique value.
- The view from, or the visual setting of, designated or planned parks, wilderness, or natural areas, or other visually sensitive land uses.
- The view from, or the visual setting of, travel ways.
- The view from, or the visual setting of, established, designated, or planned recreation, education, preservation, or scientific facility, use area activity, communities, and viewpoint or vista.

For this analysis, the quality of the visual environment is based on the synthesis of scenic quality and visual sensitivity. The measure of the adverse response of the visual and aesthetic resources is defined as visual contrast. The degree to which the project would adversely affect the aesthetic quality of the landscape depends on the amount of adverse visual contrast that would be created by the project in relation to the existing landscape character and visual condition. The amount of contrast between the proposed project and the existing landscape character was measured by separating the landscape into its major features—landform, vegetation and structures—and then predicting the project-related magnitude of change in contrast of each of the basic visual elements (form, line, color, and texture) to each of the features.

The “Visual and Recreation Resources Report” [274] used a compilation of four visual resource inventories:

1. Existing visual condition;
2. Key observation points and associated viewsheds;
3. Visual absorption capability; and
4. Visual quality objectives/levels.

The analysis in this document focuses on visual quality objectives/levels and key observation points.

In the early to mid-1980s, the Carson National Forest conducted a forest-wide inventory based on the Visual Management System. The initial forest-wide visual quality inventory was compiled using topographic map interpretation and some field verification. It included an assessment of variety classes, sensitivity levels and distance zones, combined through a matrix to determine the existing visual quality for the forest. The forest plan adopted the existing visual quality as the visual quality objectives (VQOs) for the Carson National Forest over the life of the plan.

The forest-wide visual inventory was at a broad-scale level. The Visual Management System recognized the need to refine the inventory when assessing visual quality at a site-specific level. The EIS study team reviewed, refined and revised the visual quality objectives using orthophotographic maps and additional field verification for this project-level analysis.

Since “objectives” cannot be assigned to non-Federal lands, this analysis has mapped the existing visual quality levels for these State and private areas, and assessed what changes in visual quality would occur with the implementation of any alternative.

Key observation points were identified and mapped for both Federal and non-Federal lands and are used in the cumulative effects analysis.

The following considerations were used as the critical physical and perceptual factors in identifying, describing, and mapping visual resources in the study area:

- **Expected Images Exist.** Although studies of people’s images resulted in varied response from one geographic region to another, one factor generally remains constant—people expect to see a naturally appearing landscape character within each general region.
- **Aesthetic Concern Varies.** Aesthetic concern varies among land users. People most concerned about aesthetics are those who are in an area because of, or who have a major interest in, the scenic qualities or amenities. This group of people may include recreation area visitors, travelers or residents.
- **View Duration is Critical.** The visual impacts of project activities increase as the duration of view increases.
- **Number of Viewers is Critical.** The visual impacts of project activities generally become more important as the actual or potential number of viewers increases, particularly along travel corridors, developed recreation areas, and residential areas and communities.
- **Viewing Distance is Critical.** The visual impact of project activities usually increases as viewing distance decreases.

- **Diverse Landscape Character is Important.** All landscapes have a definable character. Those with a character having greater variety or diversity have the greater potential for high scenic value.
- **Retention of Character is Desirable.** Landscapes with distinctive variety in form, line, color, and/or texture should be retained and perpetuated.
- **Focus of Viewer Attention is Critical.** The dominance and arrangement of elements in the landscape can focus viewers' attention to certain areas. Distinctive features (such as major, unusual landforms, water forms, and framed views) are typical areas that attract attention. The potential for visual impacts is higher in areas that are the focus of viewers' attention.
- **Alteration of Character.** Managed landscapes with little or no visual variety may be enhanced by alteration.

Affected Environment

Certain terms (Visual Resource Inventory Components) used in this effects analysis are better defined here than in the glossary.

Visual Dominance Elements

Four visual elements compete for dominance in any landscape:

Form. Landscape forms are determined by topography and vegetative pattern. If either of these is opposed by utility structures, the visual impact will be negative. The forms of many utility structures are geometric, forceful and large. They often contrast with, and visually dominate, the more subtle forms of the landscape.

Line. Line is anything that is arranged in a row or sequence. It can be the silhouette of a form, the edge of a meadow, a ridge line, a tree trunk, a river, the path of an avalanche. Overhead power lines and access roads are among the more common types of "linear" utilities. Such installations create the least contrast with the landscape when they are sited and designed to take advantage of the natural lines of their surroundings.

Color. Color enables us to distinguish among objects of identical form, line and texture. It can also be used to subdue differences between manmade and natural objects. To be successful, color selection for utilities must be based on a study of local conditions and how the colored object will be seen from crucial points of view. Foreground colors tend to be distinct. Background colors are usually muted blue-greens and grays. The texture of a surface affects its color—the more texture, the darker the color tone. Colors that blend well with the background may appear almost black when seen in the shade.

Texture. Textures in the landscape are determined by geology, soils, topography and vegetation. The more variety there is in the landscape, the easier it is to plan and design a utility that is visually subordinate to its natural surroundings. Natural textures can seldom be matched in utility structures. This makes it doubly important that a utility be designed and located to minimize its visual impact (USDA 1975a).

All four elements are usually present but exert differing degrees of visual influence, power or dominance. To diminish the contrast between utilities and their surroundings, advantage must be taken of landscape features in the location and design of all needed installations.

Landscape Character

The National Forest Visual Management System requires a frame of reference and criteria for the identification and classification of scenic quality (variety class). The establishment of landscape character types that provide the frame of reference for the variety class criteria does this.

Landscape character types are geographical areas that have similar visual characteristics of landform, vegetation and water form. No single landscape feature alone determines a character type; all features combine to create a certain visual image, but landform is usually more influential than the other characteristics. The character types are developed as a frame of reference and must be broad enough to logically stratify into differing degrees of diversity.

The study area is located in two character types—the San Juan and the Mexican Highland in New Mexico. The Mexican Highland type is further subdivided into the eastern and western types. A portion of the project area is in the Mexican Highland Eastern character subtype; the remainder of the project area is in the San Juan character type. The BLM uses a designation referred to as the “Southern Rocky Mountains.” Since the Forest Service designations are at a finer scale and are compatible, they were used in the analysis.

The San Juan character type is described as a volcanic area of complex mountains separated by intermontane basins. The Mexican Highland Eastern character type is piñon-juniper woodland; plains grassland and sagebrush dominate the basins. Vast, flat plain broken by the Rio Grande Valley and several isolated mountain ranges. Piñon-juniper woodlands dominate the foothills and lower mountains.

Visual Quality Objectives/Visual Quality Levels

Forest plan-adopted visual quality objectives (VQOs) are standards by which the visual resources of an area are managed on National Forest System lands. VQO categories are determined by synthesizing (in matrices) inventories of variety classes (i.e., scenic quality), visual sensitivity and distance zones. Each VQO describes the degree of acceptable modification in the basic elements (line, form, color and texture) of the landscape. The acceptable degree of alteration is judged by evaluating the amount of visual contrast created by the landscape alteration to the surrounding natural landscape. Although non-Federal lands are not bound by Forest Service visual management guidelines, these non-Federal lands were assigned a similar inventoried VQL (visual quality level) in order to evaluate consistently the visual resources of those lands and to compare them with Forest Service managed lands.

Four classes of VQOs/VQLs were identified in the study area: Retention (R), Partial Retention (PR), Modification (M) and Maximum Modification (MM). Figure 17 shows visual quality determined at a site-specific or project level, along with the corresponding crosswalk to the BLM classification system.

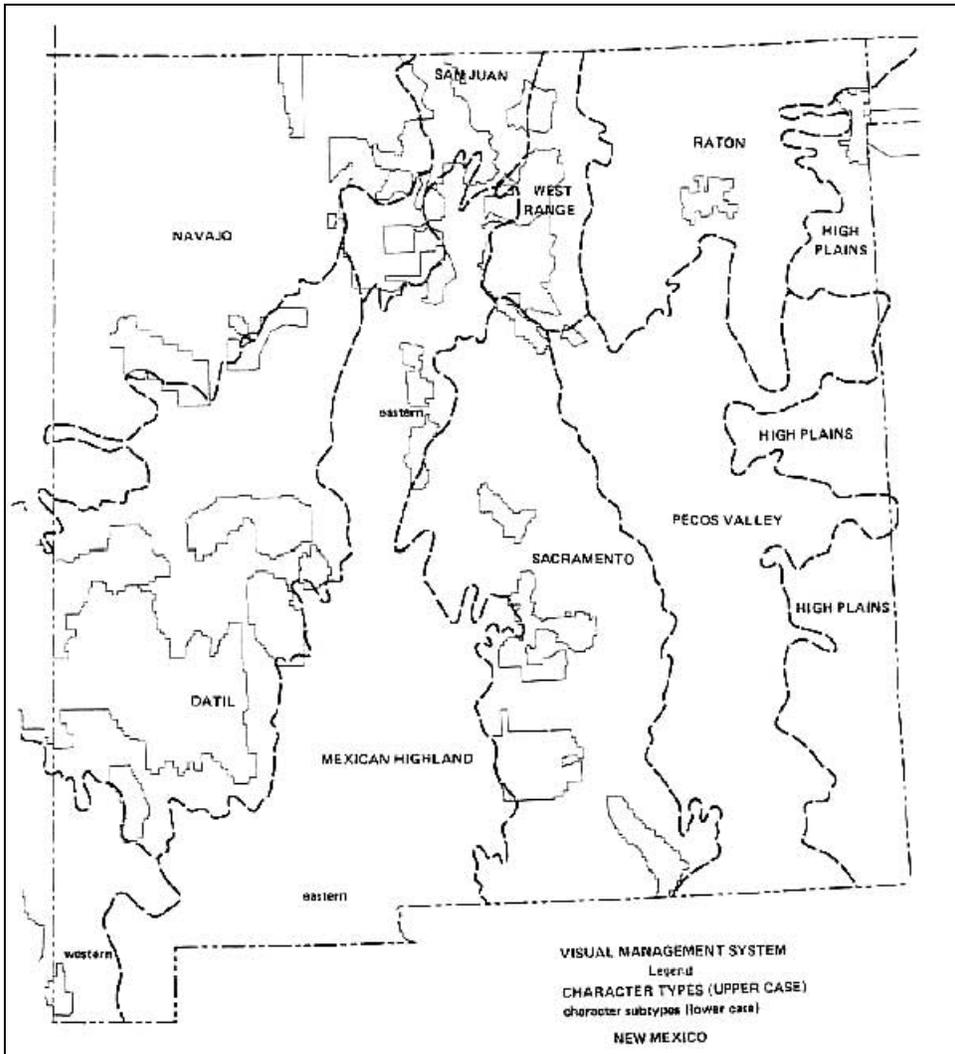


Figure 16. Landscape character types of New Mexico with study area highlighted (USDA 19075b).

Table 21. Visual quality definitions

Retention	In general, management (human) activities are not evident to the casual forest visitor. BLM Class I.
Partial Retention	In general, management (human) activities may be evident, but must remain subordinate to the characteristic landscape. BLM Class II.
Modification	Management (human) activities in foreground and middle ground are dominant but appear natural. BLM Class III.
Maximum Modification	Management (human) activity may dominate the characteristic landscape, but should appear as a natural occurrence when viewed as background. BLM Class IV.

Along U.S. 285, between the 90-degree turn and the western boundary of the national forest near Ojo Caliente, the visual quality is Retention to the north and Modification to the south. The highway is wide enough that the existing 25 kV line along the south side of the highway can easily be seen in the foreground looking south, but not to the north. Although the existing line can be considered a dominant feature, the wood poles spaced next to the highway and the presence of vegetation under the line (not a bare swath) create a natural appearance. Since private lands along U.S. 285 are within the same area as the national forest, they are considered to have similar visual quality.

In the same area of U.S. 285, the middle ground is obscured by hills and ridges and is, therefore, considered Partial Retention. Activities may be evident, but must remain subordinate to the characteristic landscape from common travel ways and viewpoints. The exceptions are two small areas of Retention located on the western flank of Cerro Azul and Mesa Vibora; these distinct features can be seen from U.S. 285 in the middle ground.

Looking southeast from the 90-degree bend, topography and vegetation completely screen the middle ground. Activities may dominate their immediate surroundings, but would not be seen from U.S. 285. A visual quality of Modification extends out to within one-half mile of the existing 345 kV/115 kV corridor. As the two utility lines traverse across the landscape to the south and east of U.S. 285, visual quality changes to Maximum Modification for one-half mile on either side of the utility corridor.

Along NM 567 west of Carson to the junction with U.S. 285, the road traverses through an area that visually is not very interesting and portions were once type-converted from piñon-juniper woodland to grass. The visual quality for this area is calculated to be Modification. Visual quality from private lands east of the forest boundary to the 345 kV/115 kV intersection with NM 567 is Maximum Modification.

Right along U.S. 285 north of the Comanche Rim to Tres Piedras, visual quality is considered Partial Retention, with a few pockets of either Modification or Maximum Modification where private lands are developed. From the highway in the middle ground, private residences and structures can be seen on the slopes where visual quality is Modification.

The “Carson Land and Resource Management Plan” (hereby called the forest plan) provides guidance for all natural resource management activities on the Carson National Forest. The National Forest Management Act requires all projects and activities to be consistent with the forest plan. The forest plan has been reviewed as it relates to visual quality on the Carson National Forest. The forest plan states,

Manage the visual resources on the forest according to the Visual Quality Objectives listed on inventory maps. Utilize forest management activities to increase visual variety. The overall goal is to meet the planned objective, however, this objective may be reduced by one level to meet other resource goals on a case-by-case basis. [5, Visual-1-2]

Key Observation Points

Key observation points (KOPs) are representative viewing locations where the project facilities are visible in the surrounding landscape and are an important factor in evaluating the visual impacts of proposed landscape alterations. KOPs were identified along study area travel corridors

(roads), post office and in other sensitive land use areas, such as residential locations and communities. Factors considered in selecting KOPs included:

- o Number of viewers
- o Sensitivity of viewers
- o Duration of view
- o Viewing distance and relative project size
- o Season of use

Determining the visibility of an alternative corridor from its surrounding landscape is a central component of a visual analysis, and plays an important role in evaluating potential visual impacts and in guiding mitigation efforts. Figure 17 displays the location of each key observation point. Table 22 displays the sensitivity level, the VQO/VQL rating, type of viewpoint, typical viewer, duration of view and season of view.

Table 22. Key observation points within the study area

KOP	Feature	Jurisdiction	Sensitivity Rating	VQO/VQL	View Points	Typical Viewer	Speed of Travel	Viewing Season
1	Intersection of NM 567 and existing power lines in Carson	Non-Federal	1	Maximum Modification	Roads, Dwellings	Resident, Traveler	Moderate, about 40 mph.	All
2	Post Office in Carson on NM 567	Non-Federal	1	Maximum Modification	Roads, Dwellings	Resident, Traveler	Slow, about 15 mph.	All
3	U.S. 285 and Comanche Rim.	Federal	1	Retention (N) Modification (S)	Road	Traveler	Fast, about 60 mph	All
4	Vista point on U.S. 285 where Cerro Azul and Mesa Vibora are both in view.	Federal	2	Retention (N) Modification (S)	Road	Traveler	Fast, about 60 mph	All
5	Voltage regulators at the NM 111 and U.S. 285 intersection in Ojo Caliente	Federal	2	Maximum Modification	Road, Dwellings	Resident, Traveler	Moderate, about 40 mph.	All
6	U.S. 285 at Cerro Mojino	Federal	2	Partial Retention	Road, Dwellings	Resident, Traveler	Fast, about 60 mph	All
7	West Rim Trail and NM 567	Federal	Medium (2)	BLM Class II (Retention) to east, Class III to west (Modification to Rural)	Road, Trail	Traveler, Hiker	Slow, about 3 mph to 15 mph	All

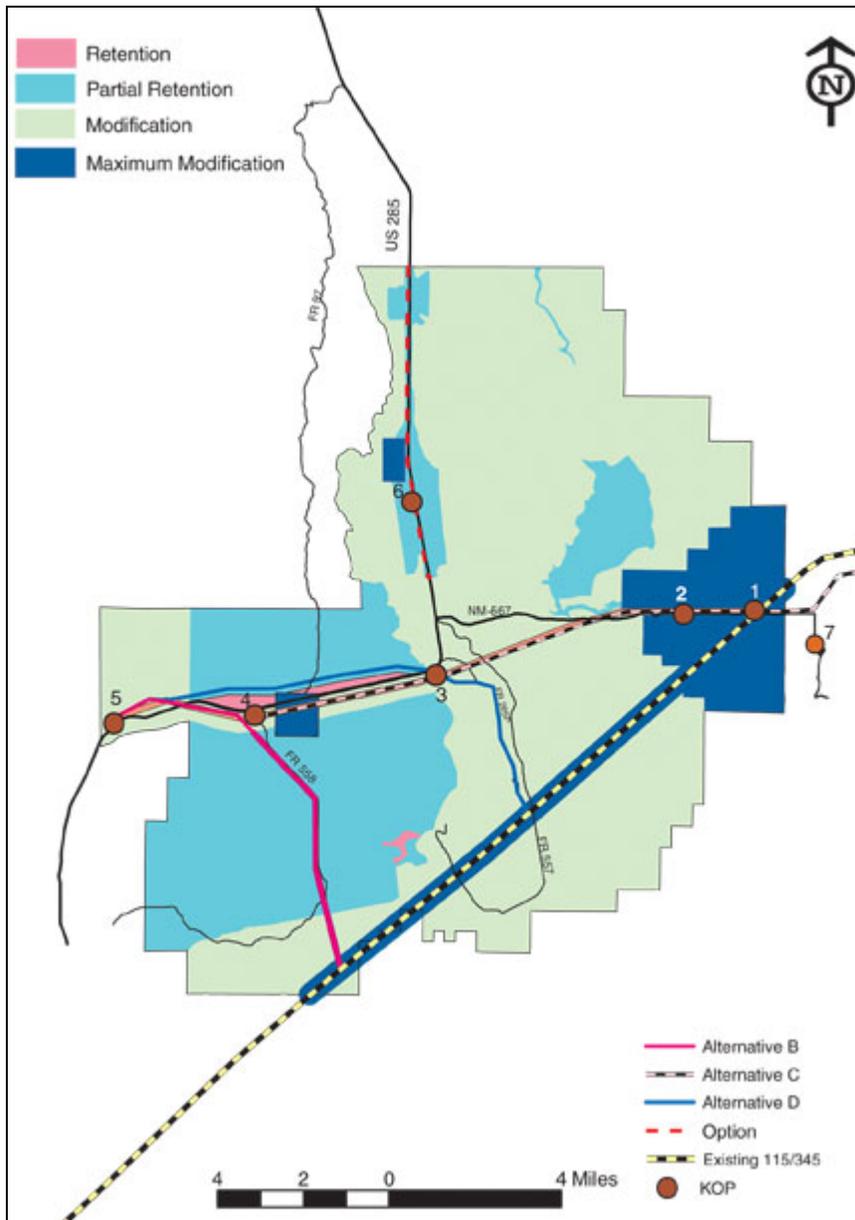


Figure 17. Existing visual quality objectives/levels and key observation points identified within the study area.

KOP 1: This key observation point is located in the community of Carson. The existing 345/115 kV corridor crosses NM 567 in the Carson community west of the intersection of the Rim Road and NM 567. At this KOP looking from directly under the power lines, the lines can be seen in a distance running in a straight line to the southwest and northeast. The view to the north is scattered occupied dwellings and a travel route (Rim Road) for the community to access Taos; to the east is scattered occupied dwellings; to the south is also scattered occupied dwellings and a travel route for the community to access Taos; and west includes occupied dwellings and the old schoolhouse (National Historic Site). This KOP is within the view of the majority of residents of the Carson community on a daily basis. The existing visual quality at this point is Maximum

Modification—human activities dominate the landscape. The buildings, roads, and power lines are obvious, but the visual sensitivity level of local residents is high.

KOP 2: This key observation point is located at the Post Office located in the community of Carson. The Post Office functions as a community center, since most residents visit the building five to six times per week. The existing 25 kV utility corridor passes in front of the Post Office. Vehicles leaving the parking lot head north directly facing this line. The view to the north is toward new residences under construction and others occupied; to the east is scattered dwellings and the existing power line; to the south is more occupied dwellings and an access route to additional dwellings; and west is toward the national forest. The existing visual quality at this point is Maximum Modification—human activities dominate the landscape. The buildings, roads, and power lines are obvious, but the visual sensitivity level of local residents is high.

KOP 3: This key observation point is located on U.S. 285 at its intersection with Comanche Rim. Comanche Rim is a natural feature, the edge of a basaltic outflow. The drop from the Taos Junction area to the lower country to the west is dramatic. U.S. 285 makes a sweeping curve at this point changing direction from a general north-south alignment to east-west. The existing 25 kV line is on the south side of the road. A small drainage crosses the highway and runs in a general west-northwest, east-southeast direction. The country changes in elevation quickly. One proposed alternative would cross the highway at this point. The existing visual quality of the landscape to the north is Retention. The highway right-of-way, the existing distribution line, radio tower and two old borrow pits south of U.S. 285 put this area in Modification—human activities in foreground and middle ground are dominate but appear natural.

KOP 4: This key observation point is located at a point on U.S. 285 where the vista of Cerro Azul, Black Mesa and Mesa Vibora is able to be seen in its entirety. This panorama is visible for approximately 5 seconds at highway speeds. The view to the north is obstructed by vegetation and topography. Looking down U.S. 285 to the east and west is cleared right-of-way. To the south, the existing 25 kV power line is in the foreground, with Cerro Azul and Mesa Vibora in the background. In the middle ground, the landscape view to the south is Partial Retention. The immediate foreground is Modification since one looks across to the cleared right-of-way and under or through the existing 25 kV distribution line. Beyond the immediate foreground, the landscape changes to Partial Retention—human activities may be evident, but should remain subordinate to the characteristic landscape.

KOP 5: This key observation point is at the proposed substation location in Ojo Caliente. The current voltage regulators are just north and west of the NM 111 and U.S. 285 intersection and adjacent to the proposed substation location. This point is near other disturbed areas such as a propane distribution company, NM Department of Transportation maintenance yard and several dwellings, as well as near the Mesa Vista School complex. The view to the north looks up a drainage toward the Mesa Vista buildings; to the east is the gas company and the maintenance yard both atop the ridge; to the south are several dwellings visible across NM 111; and to the west is a ridge and parts of the Mesa Vista School. The area around this observation point is intruded by manmade structures. The existing visual quality at this point is Maximum Modification—human activities dominate the landscape. The school buildings, maintenance yard, business buildings, homes and roads are very obvious on the landscape.

KOP 6: This key observation point is on U.S. 285 near Cerro Mojino, where the proposed Tres Piedras Connection Option might be located. Private lands lie west of the highway. These private

lands have been converted to a ranching operation with vegetation type conversions of sagebrush to grass. The private lands are visually different from the surrounding national forest and are a focal point for travelers headed to the south coming out of a “tunnel” of piñon-juniper woodland. Cerro Mojino is a high, rounded peak rising from the sagebrush. The dramatic view at this point is to the east across a large opening with the Sangre de Cristo Mountains in the background. The view to the south also opens to a portion of the Sangre de Cristo range in the background. The view to the north is a highway corridor entering piñon-juniper woodland. The immediate foreground to the west is Modification, because of the development of private land. To the east, however, it is Partial Retention—human activities may be evident, but should remain subordinate to the characteristic landscape.

KOP 7: This key observation point is at the intersection of the West Rim Trail and NM 567 at the top of the rim on the west side of the Rio Grande Gorge. Private and Federal BLM lands lie on both sides of the highway. The private lands have been converted to a ranching operation with vegetation type of sagebrush and grass. The private lands are visually different from the surrounding Federal lands due to topography. The majority of the Federal lands are along or below the Rio Grande Gorge Rim to the east. The dramatic view at this point is to the east across the gorge with the Sangre de Cristo Mountains in the background. The view to the south also opens to a portion of the Sangre de Cristo range in the background. The view to the north along the gorge rim opens to a portion of the Sangre de Cristo range in the background. The existing 115/345 kV line lies to the west across the sagebrush flat. The connection to the 115 kV line is to the northwest. The country has a gradual rise to the west from the trail crossing at NM 567. This rise obscures the existing 345/115 kV lines in the area of the proposed connection.

Environmental Consequences

Screening or locating a power line corridor with power poles of about 60 to 65 feet in height in a landscape lacking overstory vegetation that equals or exceeds pole height can be difficult if not impossible. There is some topographic relief that would allow some mitigation or screening of the facilities from viewpoints in the action alternatives. Typically, power lines are difficult to impose on any landscape, and retain its characteristic without appearing unchanged. Viewer location is critical in relation to a facility—the closer the viewer is to the structure, the more impact it has on one’s senses. Generally a landscape view of one-quarter to one-half mile from the viewer’s eyes is considered the distance where details become fuzzy. Overhead items become nearly unnoticeable due to heights of dominate objects within one-quarter mile of the view and view angles needed to look over these objects.

The immediate corridor, the centerline plus one-quarter mile to each side, will have its current visual quality disturbed by placement of a power line. A reduction in visual quality would be limited to these corridors due to distance from viewing points.

A mitigation measure requiring the use of nonspecular conductors, natural color poles and onsite selection of pole locations will help reduce the visual impacts and is assumed for all action alternatives and the Tres Piedras Connection Option (MM VQ1). In addition, the Tres Piedras Connection would be a 25 kV distribution line. Poles would be between 30 to 40 feet high, instead of the 60 to 65 foot poles needed for Alternatives B-D. The utility structure for the Option would have no underbuild design and would only entail four lines.

For ease in analysis, each alternative is described in segments. These segments are identified on alternative maps. Segments will obviously be different for each alternative.

Alternative A – No Action

This alternative maintains the current condition. The 25 kV line would continue to exist in its present location. There would be no construction of a 115 kV power line and no change to the visual resources within the study area.

Alternative B – Black Mesa-Cerro Azul Tap

Table 23. Impacts of Alternative B on visual quality

	Segment B1	Segment B2
Existing Condition (area)	Partial Retention	Modification/Maximum Modification
Alternative B Implemented (corridor only)	Modification	Modification/Maximum Modification
Overall Designation Following Implementation (area)	Partial Retention	Modification/Maximum Modification

Segment B1: This first segment is where Alternative B would tap into the existing 115 kV line, within the 115 kV/345 kV corridor, 1.5 miles east of Black Mesa. Segment B1 runs north to northwest, where it would connect with the existing 25 kV along U.S. 285. This segment resides in the Mexican Highland Eastern landscape character type, which is piñon-juniper woodland, plains grassland and sagebrush dominating the basins. Piñon-juniper woodlands dominate the foothills and lower mountains. The location of this segment stays in Partial Retention for about 5.5 miles until it intersects with the U.S. 285 corridor.

Segment B1 is in varied piñon-juniper with some openings and trees reaching a maximum height of about 25 feet. Poles of 60 to 65 feet and conductors would be visible in the immediate area as this line travels across the landscape. The visible topographic relief would allow some site-specific placement to reduce the view of the line from one direction, but would be obvious from another location. The visual quality objective for the corridor in Segment B1 would change from Partial Retention to Modification. The visual quality for the overall broad area would be maintained as Partial Retention due to distances from the viewpoints.

As Alternative B traverses toward U.S. 285, the view from the highway provides another perspective of Segment B1. U.S. 285 is a heavily used route between north-central New Mexico and southern and south-central Colorado. It is estimated that more than 200 cars per day use this route. Short trees and low ridge lines bound the highway corridor, as well as the existing 25 kV line (on the south side) and several private dwellings. Travelers on U.S. 285 naturally look south toward the major landforms of Cerro Azul and Mesa Vibora, with the Sangre de Cristo Mountains further to the south. Viewed from a distance, the broad expanse of natural landscape between

these two major features appears with little evidence of man’s influence. The only signs of human activity are some allotment fences and scattered roads, developed by past woodcutters, hunters or recreation use. When driving west along U.S. 285, the topographic relief obscures the panorama for an extended period (10 seconds or more). Except for approximately one-half mile along U.S. 285, where low ridges do not conceal the view, for several miles a traveler along U.S. 285 cannot see the entire vista. The higher portions of Cerro Azul, Mesa Vibora are visible, while their lower portions and the location of the proposed power line are generally not entirely visible.

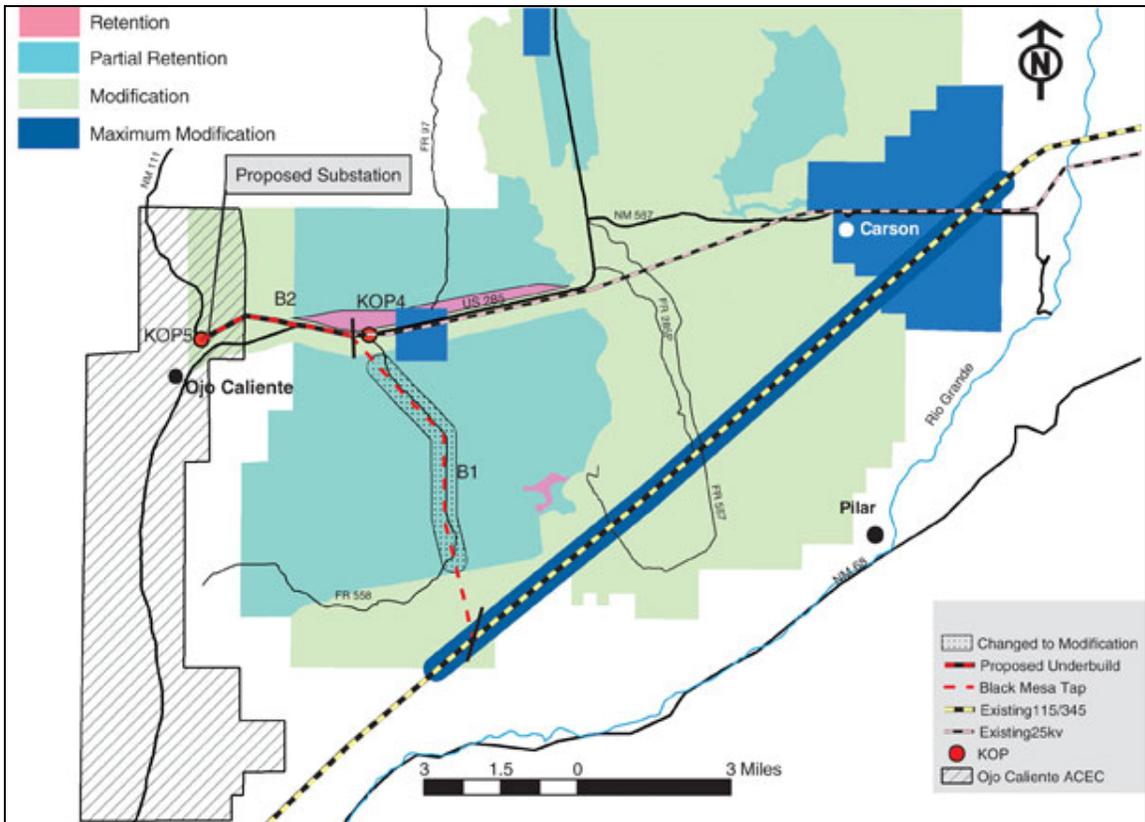


Figure 18. Visual quality impacts from Alternative B.

The U.S. 285 corridor is a cleared linear path of over 100 feet, between two right-of-way fences. Along the south side is the existing power line corridor. These alterations to the landscape cause this area to have a visual quality of Modification. The north side, however, has little evidence of man’s activities and has a visual quality of Retention. As Segment B1 becomes visually noticeable in the foreground to travelers along U.S. 285 and connects into the existing 25 kV line, the visual quality in this area would remain Modification under Alternative B.

Another visual perspective for this segment would be from users climbing Cerro Azul (estimated to be less than 20 visitors per year) as they look across the Partial Retention landscape from a Retention zone. They would look at the proposed 115 kV line for Alternative B traversing across several miles. Minimizing clearing (except for pole locations) and use of nonspecular cables and treated wooden poles would reduce visual disturbance of a linear feature on the landscape. The distance from the viewpoint, Cerro Azul, would also mitigate the visual disturbance causing the power line to blend into the background. The overall visual quality of the middle ground from Cerro Azul would still be maintained at Partial Retention.



Figure 19. View to the south from Key Observation Point 4. This southerly view is the first view of Cerro Azul to Mesa Vibora. This depicts the area between the high points. Note existing power line in foreground, and the texture variation in the remainder of the picture.

Segment B2: Segment B2 is 3 miles along U.S. 285, from the point where Alternative B would connect to the existing 25 kV line into the proposed Ojo Caliente substation (Figure 19). Segment B2 is also in the Mexican Highland Eastern landscape character type, dominated by piñon-juniper woodland, plains grassland and sagebrush.

One mile of this segment is on national forest and about 2 miles is on BLM lands. Along the eastern portion of this segment, topographic relief and piñon-juniper trees provide limited screening. The view to the south is bounded by higher ground starting at the highway and going south. Because of the fairly low height of the existing line, it is evident from some areas and screened in other locations. On national forest, the existing line runs south of the highway and the visual quality is Modification. To the north of U.S. 285 on national forest, the visual quality is Retention. Near the forest boundary, the existing 25 kV line crosses the highway and extends westward on BLM lands before angling back south into Ojo Caliente. This northern strip, where the existing line can be seen from U.S. 285, is considered Class III to the Ojo Caliente Area of Critical Environmental Concern (ACEC) boundary (Modification in VQO). The small portion in the ACEC is a Class II with current disturbance levels giving the area a Class III rating.

At the eastern end of this segment, Alternative B would include poles with an underbuild to carry the 25 kV line. The primary view along Segment B2 is generally to the north. The view to the north is mesas and points. These mesas and points have lighter colors from their midslopes upward to their tops. The lighter colors tend to draw focus to the slopes. The lower slopes and flat ground between U.S. 285 and the mesas is covered with scattered piñon-juniper. The highway is on a bench above the flatter ground, giving the viewer a superior point of vision. The existing power line is not a focal point due to the position of the viewer and the background color and texture. Where Alternative B would follow the existing 25 kV corridor to the south, the visual quality on the north side of the highway on national forest would remain Retention.

The line would be more evident from the forest boundary through BLM lands because fewer options are available for screening, and Alternative B calls for crossing the road and paralleling it in the existing corridor to the proposed substation. There is much less overstory vegetation for screening. The topographic relief north of U.S. 285 tends to draw the eye to the large mesas and ridge lines. Even though the existing power line is fairly hidden with dark colors and dark vegetation coloring, the Mesa Vista School buildings and their color scheme quickly become the focal point for travelers on U.S. 285. The power line becomes nearly invisible as the school

buildings draw attention (Figure 20). In this area, the visual quality along the corridor and in the general area would be maintained as Modification. On national forest, the impact of Alternative B would maintain the visual quality as Modification. The area where Segment B2 terminates would continue to be Maximum Modification.



Figure 20. View to the west from U.S. 285 showing the Mesa Vista School complex and surrounding scenery. The bright colors draw attention to the school buildings. The existing power line is lost in the view. The power line is between the school and viewpoint.

Alternative C – Existing Corridor

Table 24. Impacts of Alternative C on visual quality

	Segment C1	Segment C2	Segment C3	Segment C4	Segment C5
Existing Condition (area)	Maximum Modification	Modification	Modification	Modification (U.S. 285 south)	Modification/Maximum Modification
Alternative C Implemented (corridor)	Maximum Modification	Modification	Modification	Modification	Modification/Maximum Modification
Overall Designation Following Implementation (area)	Maximum Modification	Modification	Modification	Modification	Modification/Maximum Modification

Segment C1: This first segment begins where Alternative C would tap into the existing 115 kV line, within the 115 kV/345 kV corridor, in the vicinity of where it crosses NM 567 near Carson (KOP 1). It extends approximately 3 miles within the existing 25 kV corridor, along NM 567 to the national forest boundary. Segment C1 is entirely on private land. This segment is in the San Juan character type located in northern New Mexico. The terrain is unvaried, the vegetation is unvaried, and the waterform consists of ephemeral watercourses or is absent. KOP 7 is located at the edge of the Rio Grande Gorge rim at the intersection of NM 567 and the West Rim Trail. It is about 2.5 miles southeast of where Alternative C would connect with the existing 115 kV

transmission line. From this vantage point, the undulating terrain obscures the majority of both the 345 kV and 115 kV lines. Thus, it is unlikely that a new transmission line in the same location would be seen from this location.

Carson is comprised of scattered homes along and within sight of NM 567. Many other homes are located south and north of NM 567 and out of sight of the highway. A historic schoolhouse is located along the road. The existing 25 kV power line runs along the north side of NM 567. The residents of Carson see this power line on a daily basis, either traveling outside the community or to retrieve mail (KOP 2). Man has modified this area in many ways, including the development of buildings, roads and changes in vegetation type. The current visual quality level is considered Maximum Modification.

The full length of the line in Alternative C would be designed with an underbuild—poles carrying the existing 25 kV service, as well as the new 115 kV service. Poles would be 60- to 65-feet tall with 8 or more lines. No overstory vegetation exists along this route, so screening of the power line would not be possible. Since this line would be within an existing power line corridor, it would seem that the overall impact would be less than if it was proposed in a new location. However, there are already several power lines located closely together for the first one-half mile of this segment. Alternative C would add more structures and lines in an area that is very visible from a number of homes in the Carson area, as well as along NM 567. Alternative C along this segment would not change the Maximum Modification visual quality, but the visual impact on local residents would be much greater than in some locations where the visual quality level actually changes.



Figure 21. Looking west toward Carson and 115 /345 kV power line intersection with NM 567. Note different buildings, the majority of which are occupied dwellings. Key Observation Point 1 is at the intersection of the power lines and the highway.



Figure 22. Easterly view from parking lot of Key Observation Point 2 (Carson Post Office). Note overhead power lines, highway and the occupied dwellings in the area.

Segment C2: This segment starts east of the Carson National Forest boundary and runs approximately 1 mile to the NM 567 intersection with the power line crossing. This segment is in the San Juan character type located in northern New Mexico. The terrain is unvaried, the vegetation is unvaried and the waterform consists of ephemeral watercourses or is absent. Segment C2 follows the existing 25 kV line on the north side of NM 567 for a little over a mile to where it crosses the road and heads southwest. The visual quality objective for this short section is Modification near and on the south side of the highway. No overstory vegetation exists along this route so screening of the power line would not be possible. The impact of this alternative is anticipated to maintain the visual quality at Modification.

Segment C3: This segment follows the existing 25 kV corridor, where it diverges from NM 567 and extends northeast/southwest through Drake Ranch (private land) to where it intersects with U.S. 285. Segment C3 is approximately 2 miles and is not visible from NM 567 or U.S. 285. The area was formerly converted to grassland and is now mostly sagebrush. The visual quality is Modification in the portion viewed from NM 567 and through Drake Ranch.

Segment C4: This 5.5-mile segment is almost entirely adjacent to U.S. 285. It begins near the radio towers, where U.S. 285 makes a 90-degree change in direction, and ends near where Forest Road 558 intersects with U.S. 285 (KOP 4). This segment resides within the Mexican Highland Eastern landscape character type, which is piñon-juniper woodland, plains grassland and sagebrush dominating the basins. The vast, flat plain is broken by the Rio Grande Valley and several isolated mountain ranges. Piñon-juniper woodlands dominate the foothills and lower mountains. With the existing corridor south of the highway, the current visual quality is considered Modification. Existing visual quality for the north side of the highway is Retention.

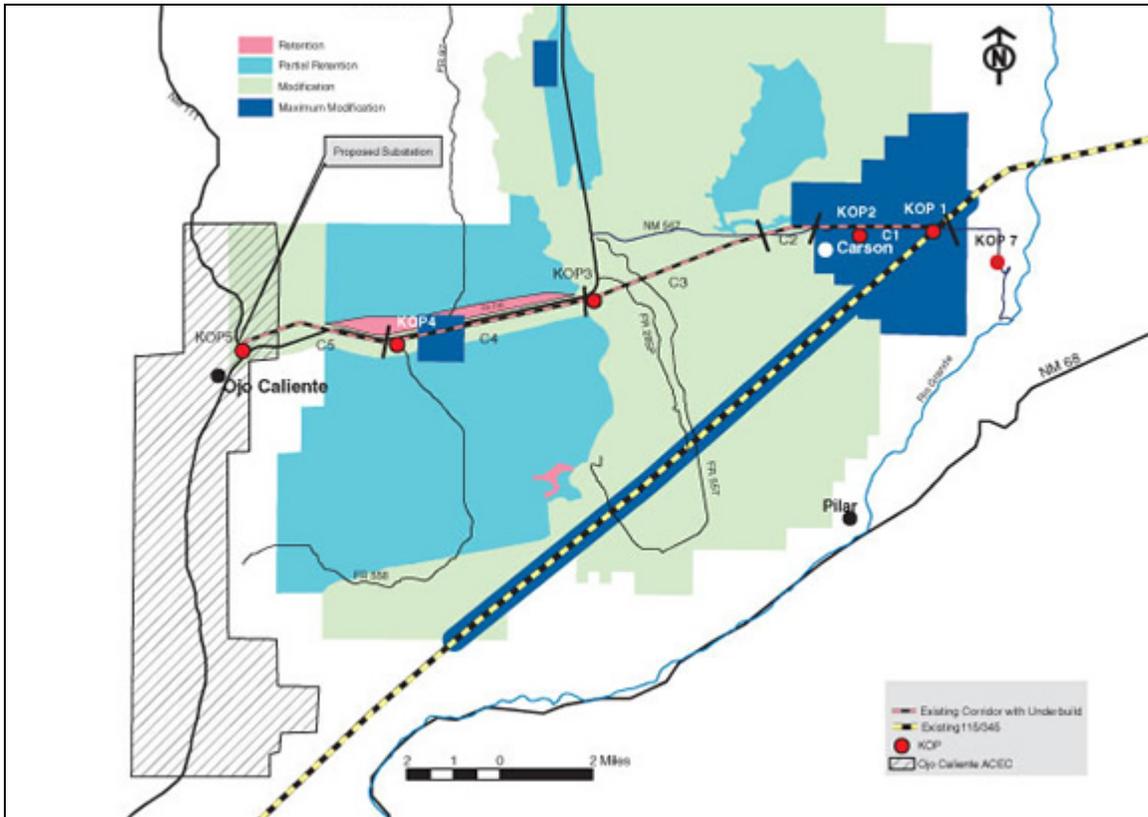


Figure 23. Visual quality impacts from Alternative C.



Figure 24. View from U.S. 285 looking to the south. Black Mesa is in the center of the photo (KOP 4). Note lack of detail in the middle and background.

The existing line varies from being very evident to insignificant along this segment. Location, topography and vegetation all contribute to reducing the impact of the existing line. Alternative C, however, would change the existing utility poles to between 60 and 65 feet, with additional conductors and underbuild. The taller poles would keep the line from easily being screened, so the structure would be more evident along the south side of U.S. 285. The view north would remain unhampered by utility corridors. The impact would keep the view to the south as Modification and Retention to the north.

Segment C5: This segment is the same as Segment B2. Alternative C would have the same impacts as Segment B2.

Alternative D – 285 P Tap

Table 25. Impacts of Alternative D on visual quality

	Segment D1	Segment D2	Segment D3		Segment D4	Segment D5
			Along U.S. 285 North	Proposed Corridor		
Existing Condition	Modification	Modification	Retention	Partial Retention	Modification	Modification
Alternative D Implemented (corridor)	Modification	Modification	Retention	Modification	Modification	Modification/ Maximum Modification
Overall designation following Implementation (area)	Modification	Partial Retention/ Modification	Retention	Retention/ Partial Retention	Modification/ Maximum Modification	Modification/ Maximum Modification

Segment D1: This segment begins where Alternative D would tap into the existing 115 kV line as it intersects with Forest Road 285P. This segment is in the San Juan landscape character type. Segment D1 traverses through sagebrush grasslands with scattered piñon-juniper for about 4 miles along the bottom of an elongated swale called Cañada Embudo. The segment ends just a mile south of U.S. 285 where the highway makes a 90-degree bend. The swale is approximately one-quarter mile wide and 50 to 60 feet deep. There are no features in this valley that draw visitors. The visual quality objective is Modification.

The vegetation is varied, with piñon-juniper on the ridgetops and sagebrush openings in the broad bottom of Cañada Embudo. The topography of the land, plus the height of the trees (approximately 25 feet) would permit poles to be screened from other roads, such as Forest Road 557. The power line would be plainly visible along the entire length of FR 285P. FR 285P would be used for accessing the power line corridor. Alternative D impact along this segment is anticipated to maintain a visual quality of Modification, immediately adjacent to both sides of FR 285P, as well as from viewpoints above the swale bottom.

Segment D2: About 1 mile long, this short segment begins at the ridgetop south of U.S. 285, runs down a small drainage, crosses the highway at approximately a 90-degree angle, continues on down the drainage and ends at the western edge of Section 5, Township 24 North, Range 10 East. All lands in this segment are located on the national forest. When traveling north, the scenery is basically a common view with little to pull the viewer, except for the Comanche Rim. Traveling

south, viewers are pulled to the mesas scattered to the west and south of the road, where the existing 25 kV line is located. The forest-wide visual inventory assesses this area as a convergence of Retention, Partial Retention and Modification. Actual visual quality for this segment meets the criteria of Modification.

This segment resides in the Mexican Highland Eastern landscape character type. South of the highway, Alternative D would transition from a single 115 kV to a 115 kV with a 25 kV underbuild. The proposed power line would be in a small drainage that is common in variety. While a transmission line with underbuild would be visible crossing U.S. 285, the crossing is at the sweeping curve where U.S. 285 descends from the Comanche Rim into the lower country. The change in direction of the road tends to hold the viewers eyes. The line would be in view from U.S. 285 for about 5 seconds. In addition the change in direction of the highway tends to be the focal point. Crossing the highway in this location in this alternative would also eliminate a crossing on BLM land near Ojo Caliente.

The line then crosses the road against a dark mottled background. The background at this point is a basalt outcrop with piñon and juniper trees scattered over the rock face. This same rock outcrop runs for several miles from this crossing to the north. The line would continue away from the highway down a drainage. The line would then change direction behind a low ridge about one-half mile north of U.S. 285. The visual quality on this segment would not change from Modification.



Figure 25. Looking down drainage where the proposed power line would cross U.S. 285 for Alternative D (KOP 3). The highway, in the right center edge of the photo, is making a sweeping turn at this point.

Segment D3: About 6 miles in length, this segment, starts at the western edge of Section 5, Township 24 North, Range 10 East and runs to where it crosses onto BLM lands north of Ojo Caliente. This segment also resides in the Mexican Highland Eastern landscape character type.

The segment is on the north side of U.S. 285, at a distance of one-quarter to one-half mile. When traveling north, the scenery is basically a common view with little to pull the viewer, except for the Comanche Rim. Traveling south, viewers are pulled to the mesas scattered to the west and south of the road, where the existing 25 kV line is located. Since the existing 25 kV line is not visible when looking to the north along this section of U.S. 285, visual quality in the foreground to the north, running parallel to this segment is Retention.

Alternative D was developed to address visual quality concerns with the proposed action. The power line proposed in Alternative D would be hidden or screened from view due to topography,

vegetation, and distance from the road. The dominant landforms to the south of the road are the focal point for visitors. Since the highway is buffered from the proposed power line location by a ridge, the corridor would not be entirely visible. Some portions may be visible for 10 seconds or less and would have little impact on the visual landscape. Even though the proposed location takes advantage of topographic features to hide the line, the separation of one-quarter to one-half mile from the road is an important factor. The visual impact of a line that far from U.S. 285 would be greatly reduced. The implementation of Alternative D would not change the classification of Retention to the north from U.S. 285.

The proposed location for Alternative D is nearly on the demarcation between Partial Retention and Retention. There are no features along this segment that draw visitors. In the immediate proximity of the corridor, the visual quality would change from Partial Retention to Modification.

Segment D4: This segment would begin where Segment D3 ends at the forest boundary and would cross BLM lands for about 2 miles to the proposed substation. This segment would have similar effects to Segment B2.

Segment D5: This segment begins where Segment D1 ends and D2 begins and the existing 25 kV corridor runs parallel to U.S. 285 on the south side of the highway. Segment D5 ends where the existing 25 kV corridor intersects with the proposed line in Alternative D on BLM lands. The visual quality of this segment is assessed as Modification.

Alternative D would remove the existing 25kV power line, enhancing the view to the south along this segment. Visual quality would actually change from Modification to Retention.



Figure 26. View to the north and east from the existing power line and U.S. 285 crossing, where Alternative D would tie into the existing 25 kV line. Note the gray to gray-green middle ground and light colors higher on the slopes. This scene is typical of the eastern Mexican Highlands landscape character.

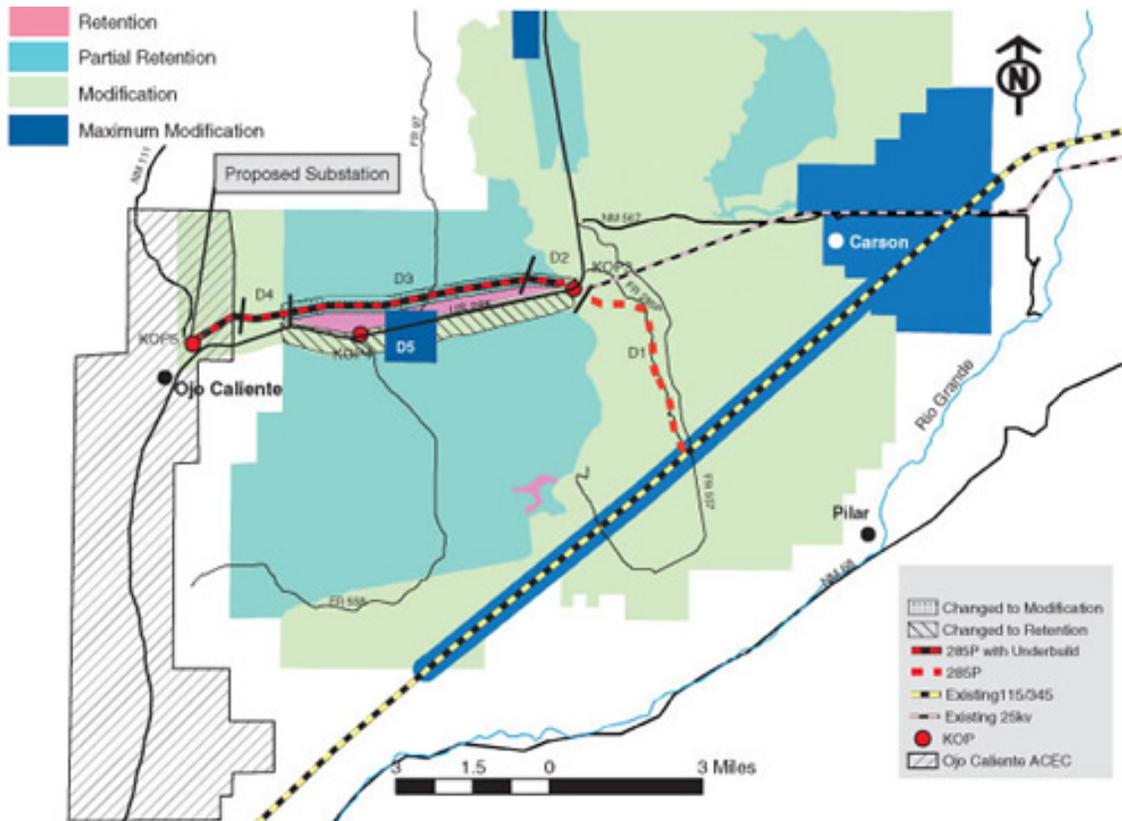


Figure 27. Visual quality impacts from Alternative D.

Effects of West End of Transmission Line and Substation for Alternatives B - D

The development of a power substation is common to Alternatives B through D. The proposed 1.5-acre site would be north of the existing voltage regulators near the NM 111 and U.S. 285 intersection. A substation would be necessary to step down incoming voltage and distribute the electric power to the lower voltage distribution lines. This planned substation would receive the 115 kV line and distribute that power to four smaller distribution circuits. The distribution circuits would use existing lines. A 115 kV substation is approximately the same size as a 69 kV substation. One difference is that the ground clearance needed by the 115 kV line is greater than the 69 kV line. The appearance of the substation would be similar.

The actual intersection is atop a ridge with the voltage regulators closer to the drainage bottom. The view from U.S. 285 of the proposed substation area would be from a superior vantage point. The substation would be approximately 400 to 500 feet from NM 111, and the view from this highway would be from a neutral vantage point (same level). The substation would be located in a sparse piñon-juniper area, with juniper as the dominant tree species. The trees in this area have a maximum height of about 20 feet and tend to be bushy in form. Trees break the monotony of the landscape and present a wide rather than tall appearance.



Figure 28. Typical substation showing the fence, cleared area, and equipment needed for switching the power to other circuits.

The area is within an “Area of Critical Environmental Concern.” This BLM designation is for the recognition and protection of significant cultural resources within the area—especially south of the highway. It indicates the possible long-term use by man. Long-term use and the proximity to Ojo Caliente reinforce the likelihood that much of the area has been occupied, settled, grazed, farmed and otherwise utilized for an extended time period. The existing lines, highway corridors, highway maintenance yard, homes and propane company all cause impacts to the visual quality in the immediate vicinity of the NM 111 and U.S. 285 intersection. The intersection itself is Maximum Modification. Sited below eye level of U.S. 285 and away from NM 111, the proposed substation location meets Class III or Modification.

Several occupied homes view the existing voltage regulators, which would be removed if a substation were installed. Placing the substation 400 to 500 feet further north would provide screening for these homes. Topography, the ridge to the west, the arroyo west of the existing line, and scattered trees provide screening. The view from NM 111 would be screened by existing vegetation and a short time period view of less than 5 seconds. The view from U.S. 285 would be partially screened by topography and vegetation, and a short travel time view of less than 5 seconds. The visual quality for the area of the substation would change from Modification to Maximum Modification.



Figure 29. View of the proposed substation site from U.S. 285 looking to the west. Substation location would be behind and below bushes in the lower center of the photo. Pole to the left of bushes would be within the substation location. Buildings to the left center of the photo are occupied homes.

Option – Tres Piedras Connection

Table 26. Impacts of the option on visual quality

	East of U.S. 285	West of U.S. 285
Existing Condition	Partial Retention	Partial Retention
Option Implemented	Partial Retention	Modification
Overall Designation Following Implementation (area)	Partial Retention	Modification

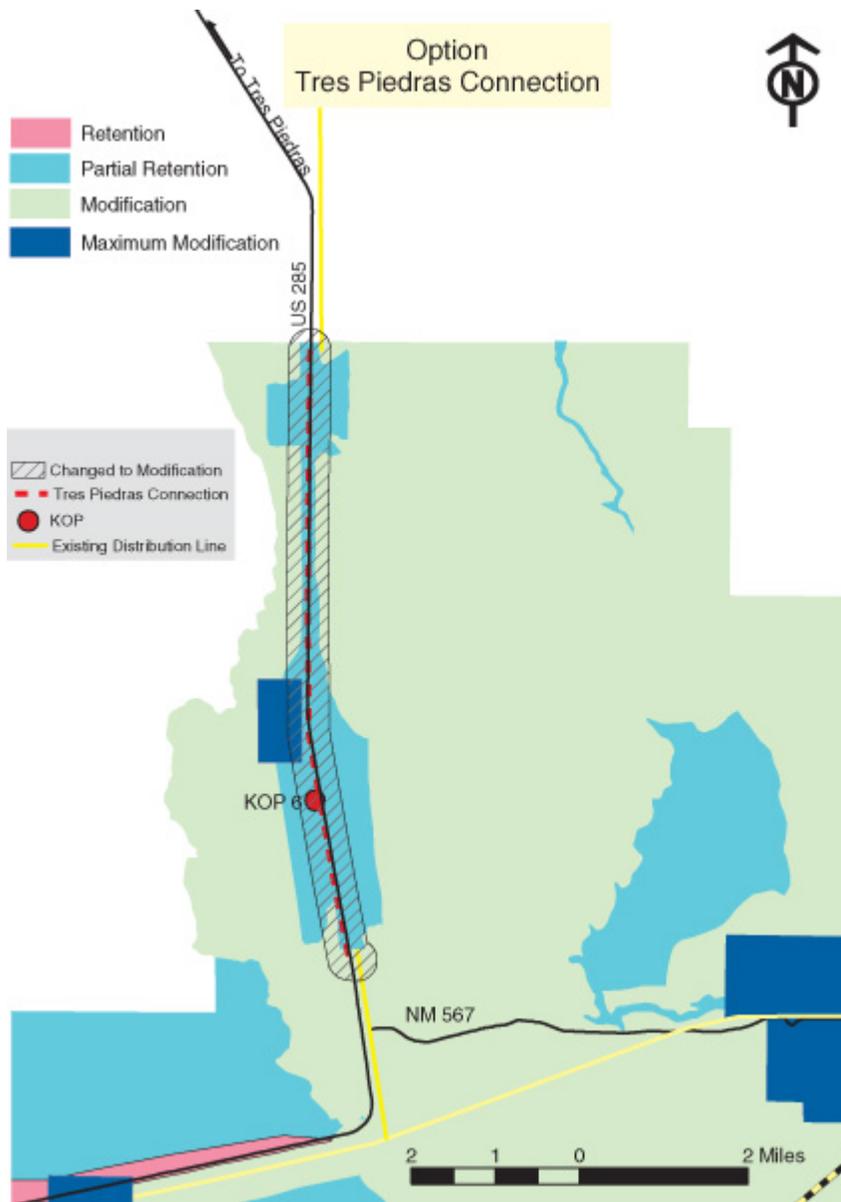


Figure 30. Impacts of the Option on visual quality.

The Tres Piedras Connection would tap into the existing 25 kV distribution line in the vicinity of the microwave station just north of the intersection of NM 567 and U.S. 285. It would cross the highway to the west side and proceed north along U.S. 285, where it would cross back east of the highway to connect into the existing line that comes south from Tres Piedras along U.S. 285. This proposed 25 kV distribution line would be constructed with 30- to 40-foot single poles, along the edge of the existing U.S. 285 highway right-of-way.

This route would total 7.5 miles and traverse through mostly sagebrush with scattered juniper. The proposed distribution line would be visible from U.S. 285 for its entire length. The predominate land features are to the east of U.S. 285. The panorama of the Sangre de Cristo Mountains to the east is striking and dramatic during various seasons and time of day. Cerro

Mojino, a tree covered high point, lies to the west of U.S. 285 and serves as a backdrop zone from the highway. The visual quality for this area is Partial Retention.

Along U.S. 285, the natural view is east toward the Sangre de Cristo Mountains. The proposed line location would be on the west side of the highway, maintaining the view to the east. The visual impact of the Option would change the visual quality on the west side of the highway from Partial Retention to Modification. The visual quality would not change on the east side of U.S. 285.

Cumulative Effects of Alternatives B-D and the Option

Past, present and reasonable activities that contribute to the cumulative effects of visual resources are those with effects that overlap the effects of each alternative within the study area. The *Affected Environment* section describes the past, present and reasonable foreseeable activities that, along with the effects of each of the alternatives, may cumulatively have an effect on visual resources. Past and present effects that overlap with the effects of Alternatives B-D have largely been discussed in the previous sections.

Past and Present Effects from:	Future Effects from:
Bark beetle (2002-2003)	Bark beetle (5-year forecast)
“Push” areas	“Push” areas converting back to natural vegetation
Paved highways	Paved highways
Unpaved roads	Unpaved roads (continued FP management)
Existing power lines	Power lines
Livestock structures	Livestock structures (continued FP management)
Development on private lands	Development on private lands

The most significant of the past actions at landscape level are the piñon-juniper push areas. From a vertical or superior perspective, these are still quite obvious. Once on the ground, and with the passage of time, the contrast is less striking. Other past actions are still quite similar in effects.

In this analysis, the primary source of present cumulative effects on visual resources common to any alternative is infestation of the *Ips* beetle and its effects on piñon trees. In the study area, mortality of piñon trees from bark beetle is beyond epidemic proportions and may reach close to 100 percent throughout the lower elevations. Lower elevation areas that were once piñon-juniper woodland will convert to only juniper. At a distance, patches or epicenters will begin to sorrel out. The needles of affected piñon trees first turn to a rust color that is striking against the landscape. As needles drop, the dominant color changes to that of the trees’ branches and trunks—a muted dark brown or gray—that is not as obvious to the viewer.

For the first few years after death of infected trees, needle drop will increase. In 5 to 10 years, dead trees will fall, creating gray masses of dead wood. During this period, firewood gatherers are likely to make their way out to areas where piñon mortality is high. It is anticipated that many of the dead trees, especially along existing roads, would be removed for firewood, thus exposing the

light brown color of the ground. Fewer piñon trees will reduce plant competition, which may increase the size of remaining trees and increase the amount of grass and other plants.

Cumulative Effects of Alternative A

Since the No Action Alternative would not have activities that would affect visual resources, there would be no cumulative effects under this alternative.

Cumulative Effects of Alternative B

Alternative B would change the visual quality in the immediate vicinity, approximately one-quarter mile from the centerline. The change would be the view of poles and wires not in context with the surrounding background. Construction would entail some clearing; however, over time the cleared area would recover, leaving a small disturbance at pole locations. The majority of the line from the existing 115 kV line to within one-quarter mile of U.S. 285 would not be readily visible from the highway. The dark colored poles, nonspecular cables, dark gray-green background, and varied textures and colors of the landscape would serve to hide the line.

In addition to the effects from past and present activities already discussed for Alternative B, it is anticipated that there would be some additional development (buildings) on private lands south of the proposed power line along U.S. 285. Due to economical land prices, the general area could see an increase in building opportunities. On the other hand, the die off of piñon trees could make the area less attractive for development. The addition of buildings in this area would cause this parcel to assume more rural characteristics. Since this parcel is not visible from U.S. 285 due to topography, additional buildings would not change the current visual characteristics of the area. This alternative would not change the availability (locality) of electrical power and, thus, would not influence any development.

Cumulative Effects of Alternative C

Alternative C would change the visual quality in the immediate vicinity, approximately one-quarter mile from the centerline. The change would be the view of poles and wires not in context with the surrounding background. Pole locations would entail some clearing; however, over time the cleared area would recover, leaving a small disturbance at pole locations. Taller poles (averaging 65 feet) and an underbuild would change the overall scenic character along the existing corridor and would be clearly visible through the community of Carson, along NM 567 and U.S. 285 to Ojo Caliente. Sections of the existing line not currently visible from well traveled roads would likely become visible due to pole height. Portions visible would continue to be visible. The vista between Mesa Vibora and Cerro Azul would continue to have a power line in the foreground. The power line would be highlighted against the sky detracting from the views.

In addition to the effects from past and present activities already discussed for Alternative C, it is anticipated that there would be some additional development (buildings) on private lands both in Carson and along U.S. 285. Due to economical land prices, Carson is seeing an increase in building opportunities. The addition of buildings would cause the community to assume more rural characteristics. The private land along U.S. 285 would be available for more home building. The current homes are visible from U.S. 285. Any increase would likely also be visible. Visual quality on private land would change from Partial Retention to Modification by actions of private landowners. Federal lands to the north of U.S. 285 would continue in their current conditions.

However, Federal lands to the south of U.S. 285 in the foreground would change from a condition of Modification to Maximum Modification.

The loss of woodland cover from the bark beetle outbreak has already affected the visual quality along U.S. 285. The homes on private land previously undetectable are now visible due to tree loss. The gray tree trunks have become a focal point for the traveling public and residents. The variety and change in texture in the landscape would detract viewers from focusing on a power line.

Cumulative Effects of Alternative D

Alternative D would change the visual quality in the immediate vicinity, approximately one-quarter mile wide along the centerline. The change would be the view of poles and wires not in context with the surrounding background. Pole locations would entail some clearing; however, over time the cleared area would recover, leaving a small disturbance at pole locations.

The majority of the 115 kV line proposed in Cañada Embudo to within one-quarter mile of U.S. 285 would not be readily visible from the highway or surrounding area. The dark colored poles, nonspecular cables, dark gray-green background, and varied textures and colors of the landscape would serve to hide the line. No private lands would be affected south of U.S. 285 near Cañada Embudo. Reasonably foreseen activities in the vicinity of Cañada Embudo would likely be thinning, removal of firewood, fence building, or other low impact activities. These activities, in addition to the transmission line proposed in Alternative D, would not change the visual quality of the area, except for what has already been discussed.

The segment of corridor crossing U.S. 285 would be near the sweeping curve of U.S. 285, south of Taos Junction. The existing line is visible at this point. The upgraded line would not change the visual quality from Modification.

The segment of the corridor north of U.S. 285 from the highway crossing to the intersection with the existing line would be placed behind ridges and other topographic and vegetation features. This placement would permit the removal of most of the existing 25 kV line adjacent to U.S. 285. This removal would change the present condition from Modification to Retention, except for the private land area. Across private land, the existing 25 kV line or poles would be maintained to provide power for private dwellings. The power source would be relocated to the new line north of U.S. 285. The present highway crossing of a 12.5 kV line would be maintained.

In addition to the effects from past and present activities already discussed for Alternative D, it is possible that there would be some additional development (buildings) on private lands north and south of U.S. 285. Due to economical land prices, the general area is seeing an increase in building opportunities. The addition of buildings in this area would cause private lands to assume more rural characteristics. The current homes are visible from U.S. 285 as are the power lines providing power to these buildings. Any increase would likely be visible from the highway. The visual quality on private land could change from Partial Retention to Modification by actions of private landowners. Federal lands to the north of U.S. 285 would continue in their current visual condition of Retention. However, Federal lands to the south of U.S. 285 in the foreground would change from a condition of Modification to Retention.

The loss of woodland cover from the bark beetle outbreak has already affected the visual quality along U.S. 285. The homes on private land previously undetectable are now visible due to tree

loss. The gray tree trunks have become a focal point for the traveling public and residents. The variety and change in texture in the landscape would detract viewers from focusing on a power line.

Cumulative Effects of Substation and West End of Transmission Line for Alternatives B-D

In addition to the effects from past and present activities already discussed for Alternatives B-D, it is anticipated that there would be some additional development (buildings) on private lands in the Ojo Caliente area near where the proposed substation would be located and the last mile of transmission line that would terminate at the substation. The change would be considered a permanent structure. The substation would be visible from U.S. 285 and NM 111, although for a short time when driving. The Mesa Vista School complex to the west tends to draw the focus. The substation would be below eye level from the heavily traveled U.S. 285.

NM 111 drops down a hill to the west from the highway intersection with U.S. 285. The hill is steep requiring driver concentration. The view to the north is partially blocked by existing vegetation; hence the substation would be difficult to focus on. The view on NM 111 coming from the west is partially blocked by a ridge, then an arroyo, and travel up the ridge to U.S. 285. Trees partially screen the view toward the substation location. The view from existing homes is partially obscured by vegetation, location of the homes and distance to the substation. The highway right-of-way, plus the setback distance totals nearly 0.1 mile or more. The apparent size of the structure becomes reduced at this distance. The visual quality objective would not change from Maximum Modification. Additional development on private land would not change the visual quality level for the area.

Cumulative Effects of the Option

In addition to the effects from past and present activities already discussed for the Option, it is anticipated that there would be some additional development (buildings) on private lands north along U.S. 285. Currently, homes are not obvious from U.S. 285 in the Cerro Mojino area. The private land near U.S. 285 and Cerro Mojino would be available for more development. Depending on the location, any new construction may be visible from the highway.

The addition of power lines in the Cerro Mojino area would reduce the visual quality from Partial Retention to Modification adjacent to the power line corridor. The general area designation would not change from Partial Retention. Visual quality on private land would change from Retention to Modification by actions of private landowners and the addition of the power line. Federal lands along the east side of U.S. 285 would continue in their current visual condition of Partial Retention. The western side of the highway would change to Modification from Partial Retention. This line would not tower above the existing vegetation since the line would be the same approximate height. This would help hide the line and preserve the viewshed to the west in wooded areas.

Recreation 8/

Recreation can be more than just camping, fishing and hiking. Research has shown that people choose a specific setting for each of these activities in order to realize a desired set of experiences. For example, camping in a large, undeveloped setting with difficult access and few

facilities offers a sense of solitude, challenge and self-reliance. In contrast, camping in a setting having easy access and highly developed facilities offers more comfort, security and social opportunities.

The Recreation Opportunity Spectrum (ROS) offers a framework for understanding these relationships and interactions. This analysis uses ROS to analyze and compare the effects of constructing a transmission line in three possible locations or not constructing one at all. It also takes a look at what the effects would be on implementing the Tres Piedras Connection. The spectrum is divided into six major classes for Forest Service use. Table 27 describes the ROS designations found in the transmission line proposed corridors.

Table 27. Description of Recreation Opportunity Spectrum (ROS) designations

ROS	Description
Semiprimitive Motorized (SPM)	<ul style="list-style-type: none"> ▪ Moderate probability of experiencing solitude, closeness to nature, tranquility. High degree of self-reliance, challenge and risk in using motorized equipment. Predominately natural appearing environment. Low concentration of users but evidence of other on trails. ▪ Minimum on site controls and restrictions present but subtle. ▪ Vegetative alterations very small in size and number, widely dispersed, and visually subordinate.
Roaded Natural (RN)	<ul style="list-style-type: none"> ▪ Opportunity to affiliate with other users in developed sites but with some chance of privacy. Self-reliance on outdoor skill of only moderate importance. Little challenge and risk. ▪ Mostly natural appearing environment as viewed from sensitive roads and trails. ▪ Interaction between users at campsites is of moderate importance. ▪ Some obvious onsite controls of users. ▪ Access and travel is conventional motorized including sedan, trailers, RVs and some motor homes. ▪ Vegetation alterations done to maintain desired visual and recreation characteristics.
Rural (R)	<ul style="list-style-type: none"> ▪ Opportunity to observe and affiliate with other users is important as is convenience of facilities. Self-reliance on outdoor skills of little importance. Little challenge and risk except for activities such as downhill skiing. ▪ Natural environment is culturally modified yet attractive (i.e. pastoral farm lands). Backdrop may range from alterations not obvious to dominant. ▪ Interactions between users may be high as is evidence of other users. ▪ Obvious and prevalent onsite controls. ▪ Access and travel facilities are for individual intensified motorized use.

The end product of recreation management is the experience people have. The key to providing the experience opportunities is the setting and how it is managed. ROS looks at a number of desired experiences or setting indicators to classify an area. They include:

- Access includes type and mode of travel. Highly developed access generally reduces the opportunities for solitude, risk and challenge. However, it can enhance opportunities for socializing and feelings of safety and comfort.
- Remoteness refers to the extent to which individuals perceive themselves removed from the sights and sounds of human activity. A lack of remoteness is important for some setting experiences.
- Naturalness refers to the degree of naturalness of the setting; it affects psychological outcomes associated with enjoying nature. This indicator is portrayed by using a compatible visual quality objective for each setting.
- Facilities and site management refers to the level of site development. A lack of facilities and site modifications can enhance feelings of self-reliance and independence, and can provide experiences with a high degree of naturalness. Highly developed facilities can add feelings of comfort and convenience and increase opportunities for socializing.
- Social encounters refers to the number and type of other recreationists met along travel ways or camped within sight or sound of others. This setting indicator measures the extent to which an area provides experiences such as solitude or the opportunity for social interaction. Increasing the number of visitors to an area changes the kind of recreation experience offered, attracting new users and causing others to leave.
- Visitor impacts refers to the impacts of visitor use on the environment.
- Visitor management includes the degree to which visitors are regulated and controlled as well as the level of information and services provided for visitor enjoyment.

Affected Environment

Recreation within the analysis area is limited to mostly hunting, firewood gathering, piñon nut collecting and all-terrain-vehicle (ATV) use. Over the last 75 years, various activities requiring the use of motorized vehicles have historically occurred in the area. Almost 47 miles of paved highway (U.S. 285 and NM 567) run through the study area and a considerable network of 620 miles of unpaved road also exists. The Carson Forest Plan designates areas on the forest where use of vehicles off of designated roads is restricted. National Forest System lands within the study area are open to off-road-vehicle travel. Public access to and around any of the alternative utility corridors is basically unlimited. Motorized travel is restricted on BLM lands to existing roads and trails.

Because of historic use and current management, most of the study area is considered Semiprimitive Motorized. About one-quarter mile on either side of U.S. 285 and NM 567 is considered to have an ROS designation of Roaded Natural. The areas immediately surrounding the communities of Carson and Ojo Caliente are considered to have an ROS of Rural.

Environmental Consequences

The only setting indicator likely to change if a transmission line is constructed within the study area is Naturalness, which is directly related to visual quality. Effects on visual resources are discussed in the previous section of this chapter.

Alternative Comparison

Visual quality in the majority of the study area that is considered an ROS of Semiprimitive Motorized would experience little change, therefore it is not anticipated the level of recreation experience would move from Semiprimitive Motorized to Roded Natural if either Alternative B or D were implemented.

The visual quality within both the U.S. 285 and NM 567 corridors would also undergo little change if any of the action alternatives or the option were implemented. The ROS designation within these areas would remain Roded Natural.

The areas around Carson and Ojo Caliente already have a visual quality of Maximum Modification and would not change under any of the alternatives. Therefore, it is anticipated that the ROS classification of Rural would also stay the same.

Cumulative Effects

Past, present and reasonable activities that contribute to cumulative effects of recreation are those with effects that overlap the effects of each alternative within the study area. The existing Recreation Opportunity Spectrum designations within the study area reflect past and present activities that may cumulatively affect recreation. The following activities are considered in assessing the cumulative effects on recreation.

Past and Present Effects from:

Bark beetle (2002-2003)

“Push” areas

Paved highways

Unpaved roads

Existing power lines

Livestock structures

Development on private lands

Future Effects from:

Bark beetle (5-year forecast)

“Push” areas converting back to natural vegetation

Paved highways

Unpaved roads (continued FP management)

Power lines

Livestock structures (continued FP management)

Development on private lands

The most significant past and present action related to recreation is the existing road system—either formally designated or user-created roads. There is estimated to be 620 miles of dirt roads within the study area. Access to pole sites and the line would be kept to existing roads or two-track utility corridor (MM SW5-6). No additional improved roads would be developed as a result of implementing either Alternatives B or D. It is possible that a couple of miles of two-track could result from construction activities in either alternative. A transmission line in combination with the road system would not change the experience for which recreationists use the study area.

As mentioned in the previous section, *Visual Resources*, the primary source of present cumulative effects on visual resources and, to some extent, recreation is infestation of the *Ips* beetle and its effects on piñon trees. In the study area, mortality of piñon trees from bark beetle is beyond epidemic proportions and may reach close to 100 percent throughout the lower elevations. Lower elevation areas that were once piñon-juniper woodland will convert to only juniper. At a distance,

patches or epicenters turn to a rust color that is striking against the landscape. As needles drop, the dominant color changes to that of the trees' branches and trunks—a muted dark brown or gray—that is not as obvious to the viewer.

In 5 to 10 years, dead trees will fall creating gray masses of dead wood. During this period, firewood gatherers are likely to make their way out to areas where piñon mortality is high. It is anticipated that the larger dead trees, especially along existing roads, would be removed for firewood, thus exposing the light brown color of the ground. Fewer piñon trees will reduce plant competition, which may increase the size of remaining trees and increase the amount of grass and other plants. Along with a possible transmission line, the area may seem different to local recreationists, but would not likely prevent them from visiting the area or cause more visitors to come into the area.

Wild and Scenic Rivers

In 1968, Congress enacted the National Wild and Scenic Rivers Act, establishing a system for preserving outstanding free-flowing rivers. The Forest Service is required to evaluate rivers for potential inclusion to the system by the Secretary of Agriculture pursuant to Section 5(d) of the act. This section of the act states, the “Secretary of Agriculture shall make specific studies and investigations to determine which additional wild, scenic, and recreational river areas within the United States shall be evaluated in planning reports by all Federal agencies as potential alternative uses of the water and related land resources involved.”

The Carson National Forest has conducted a forest-wide assessment of its rivers to determine which have the potential as a wild and scenic river and what would be their potential classification (wild, scenic or recreational). This inventory was performed for the Tres Piedras Ranger District in 1999.

No drainages within the study area meet the criteria for consideration as potential inclusion in the Wild and Scenic Rivers System. Therefore, none of the alternatives or the option would have an effect on the values of an eligible section of river or stream.

Alternatives B, C and D would tap into an existing 115 kV line that crosses the Rio Grande, one of the first rivers to be designated by Congress under the Wild and Scenic Rivers Act. The Rio Grande Wild and Scenic corridor runs approximately one-quarter mile on either side of the river, from the Colorado line to Embudo Station. Alternative B would tap into the existing line approximately 1.5 miles from the Rio Grande Wild and Scenic Corridor. Alternative C would tap in at the closest point—about 1 mile from the corridor. The tap for Alternative D would be around 4 miles from the corridor. None of the alternatives would have any effect on the Rio Grande's Wild and Scenic designation.

Rails to Trails

Forest Road 557 is located on the abandoned railway bed of the Denver and Rio Grande Western Railroad (DRGW), also known as the “Chili Line.” The tracks and ties were removed by the DRGW in 1941 following permission given to abandon the rail line from Antonito, Colorado to Santa Fe, New Mexico. Permission to abandon the line was effective September 1, 1941 (Gjevre 1984). The roadbed became an access route to the southern end of the Tres Piedras Ranger District following abandonment and salvage of the tracks and other useable materials.

Prior to the enactment of the Transportation Act of 1920, state and local authorities constrained railroad companies in their efforts to abandon unprofitable tracks. The Interstate Commerce Commission had jurisdiction over abandonment until it ceased to exist following the Interstate Commerce Commission Termination Act of 1995. Since that point in time, the Surface Transportation Board has had jurisdiction over track abandonment. The Chili Line abandonment was done following regulations of the Transportation Act of 1920.

At the point of abandonment, the railroad easement reverted to the landowners. Another option available to railroads in lieu of abandonment is “railbanking.” In railbanking, the railroad maintains ownership of the rail corridor, a third party makes interim use of the rail corridor, and the Interstate Commerce Commission/Surface Transportation Board maintains jurisdiction over the rail corridors. This is pursuant to the National Trail System Act of 1983. The DRGW did not have the option of railbanking at their disposal in 1941.

The DRGW abandoned the Chili Line in September of 1941, and the railroad easement was terminated. Lands within the national forest returned to multiple use management from the single use of railway. The railroad bed has been used to provide vehicular access to a portion of the Tres Piedras Ranger District. The stations on the line, such as Servilleta, Caliente (Taos Junction) and Barranca, were also abandoned.

The Carson Forest Plan, as amended (1986), does not include any foreseeable conversion of the existing Forest Road 557 into a trail under National Trails System Act provisions. In addition, the Bureau of Land Management’s Taos Resource Management Plan does not discuss adapting any portion of the abandoned “Chili Line” railroad bed to a trail.

Environmental Consequences

Alternative Comparison

Alternative A would not change the existing situation of the Chili Railroad Line. The route for Alternative B would not be near the old railroad grade. The existing 25 kV distribution line would be maintained where it crosses the old Chili Line (Forest Road 557). The 25 kV line crossing has existed since about the time abandonment of the railroad line took place. The current line is barely noticeable. Since this portion of the line would not change in Alternative B, this alternative would have no effect on the railroad grade.

Alternative C is the only alternative that would pass over the old Chili Line (Forest Road 557) at the crossing described in the previous paragraph. Since this is the same location where the existing 25 kV line crosses, some additional impacts would occur in that area. An upgraded line (115 kV with a 25 kV underbuild) would be more noticeable for approximately one-quarter mile in each direction of the road from the crossing.

Like Alternative B, Alternative D would maintain the current 25 kV distribution line where it crosses Forest Road 557. Alternative D would run along Forest Road 285P, which runs parallel to Forest Road 557 to the west. The transmission line would be located in a swale and hidden from view except for one point directly under the existing 115/345 kV corridor. The topography, scattered tree cover and location of the old railroad grade all contribute to hiding this alternative from view from Forest Road 557.

At this time, there is no foreseeable effort to convert this well-used road to a trail. None of the alternatives would preclude Forest Road 557 from being declared a trail some time in the future.

Heritage Resources 9/

Affected Environment

Heritage resources are generally regarded as resources associated with human use of an area. They can include archaeological sites or ethnographic locations associated with past and present use of an area by a community. Archeological sites are a type of heritage resource. They are defined as the tangible remains of past human activity. Archeological sites are distinct geographic units that can include architecture, isolated features such as agricultural terraces or historic road corridors, and artifact scatters. The Carson National Forest defines archeological sites as loci of purposeful human activity which has resulted in a deposit of cultural material beyond the level of one or a few accidentally lost artifacts. Manifestations that do not meet this site definition as described in Forest Service Handbook 2309.24 are considered isolated occurrences.

When these physical manifestations are associated with living peoples they may be considered ethnographic resources. Most often ethnographic resources are associated with “traditional cultural properties” (TCPs), which have “traditional cultural significance” (National Register Bulletin 38). Traditional cultural properties can range from a traditional plant gathering area to a set of historic structures to an entire landscape that is considered sacred by a particular culture. Traditional cultural properties can be considered eligible for inclusion in the National Register of Historic Places because of their association with cultural practices or beliefs of a living community.

The USDA Forest Service and Bureau of Land Management are required to comply with the implementing regulations (36 CFR Part 800) of the National Historic Preservation Act (NHPA) of 1966 (P.L. 89-665) as amended. Heritage resource inventories and evaluations are required prior to any ground disturbing activities in an effort to locate and identify heritage resource sites. These requirements are carried forward in the forest plan standards (USDA 1987) as follows:

Section 106 of the NHPA requires a Federal agency head with jurisdiction over a Federal, Federally assisted, or Federally licensed undertaking to take into account the effects of the agency's undertaking on properties included in or eligible for the National Register of Historic Places (NRHP)...(36 Code of Federal Regulations 800.1)

In addition to identifying and determining whether archeological sites located within the boundaries of an undertaking are eligible to the National Register, the Government also has obligations under the NHPA of 1966 as amended, National Environmental Policy Act, the American Indian Religious Freedom Act, and Executive Order 13007 to consult with tribal entities regarding potential impacts of projects on areas of tribal concern. Consultation deals with concerns about Federal actions with the potential to affect locations of traditional concern, religious practices and other traditional cultural uses, as well as archeological sites and other modern and/or ancestral tribal remains.

The BLM portion of the analysis area is within an area designated in the Resource Management Plan, 1988, as an Area of Critical Environmental Concern (ACEC). This designation is to serve as a red flag for any type of proposals that could affect pueblo remains of the cultures that could have used the valley as early as 9500 BC. In this case, the preliminary proposal was modified by KCEC with BLM input, to the current proposed action in order to avoid pueblo sites. This also avoids significant issues due to potential disturbance of archeological resources.

Cultural History

The proposed project area is located on the Tres Piedras Ranger District of the Carson National Forest and the Taos Field Office of the Bureau of Land Management. Not all of the alternative routes have been surveyed for heritage resources at this time, but will be completed soon. Archaeological remains in the vicinity of Carson to Ojo Caliente indicate that this area was first occupied several thousand years ago. A more detailed discussion of the cultural history can be found in Young and Lawrence 1988, Irwin-Williams 1973, Cordell 1979, Stewart and Gauthier 1980, and Chambers Group 1991. A discussion of the time periods represented on this portion of the forest is available in the heritage resources report. [266]

Tribal Consultation

Traditional cultural properties (TCPs) are often difficult to identify during standard heritage resource surveys, and none have been identified in the project's area of potential effect. Traditional cultural properties are most often identified through tribal consultation. The analysis team initiated ongoing consultation for the Carson to Ojo Caliente proposed 115 kV transmission line in October 1999. [25-30, 35]

Initially, the six closest tribes to the project area were contacted and invited to participate in the consultation process. In October 1999, they were sent a letter, information about the project, and a map showing the project location. [25-30, 35] Followup phone calls were also made, and in some cases several calls were placed to verify that the package had been received. [34, 38, 42, 43, 46, 47, 48] These tribes were the Tewa pueblos of San Juan, Santa Clara, San Ildefonso, Pojoaque, Tesuque, and Nambe. In April 2000, these and 10 other tribes (Taos, Picuris, Jemez Pueblo, Jicarilla Apache, Ute, Ute Mountain Ute, Comanche, Navajo, Hopi and Zuni) were sent information about the project and asked if they had any concerns about TCPs, shrines, religious sites, resource gathering areas, or any other issues important to the tribe. [68-84] All of these tribes either have ancestral ties to the area or have expressed an interest in projects on the Carson National Forest. In addition, this project was included in a project list with location maps of Carson National Forest undertakings that was sent to these 16 tribes on May 17, 2002 as part of the initial annual tribal consultation for the Carson National Forest. [247.2] This project is also identified on the Carson National Forest NEPA quarterly report sent four times a year to these same tribes. [67, 146, 177, 196, 207, 222, 236, 244, 246, 248-250, 253, 259]

To date, five tribes (Ute Mountain Ute, Jicarilla Apache, San Ildefonso, San Juan, and Santa Clara) requested a field trip, and three have visited the project area. [53, 55, 56, 57] Meetings were also held at the request of four tribes (Taos, Picuris, Hopi, and Jicarilla Apache). [74, 202, 164, 168] Five tribes have requested copies of the archaeological clearance reports and will provide comments after they review the reports (Santa Clara, San Juan, Nambe, San Ildefonso, and Pojoaque). Five tribes have expressed that they have no concern or deferred to other tribes that are involved in the consultation process (Hopi, Taos, Comanche, San Ildefonso and Navajo).

None of the tribes involved in the consultation process have identified any shrines, TCPs or other locations within the proposed project area that have been or are currently being used for resource gathering or other types of traditional or religious use. The Hopi Tribe submitted a list of general concerns about burials, site avoidance, eagles, and certain plants that may be in the area, and asked that they be considered in project planning. One common theme was raised by several of the tribes. There was a concern about archaeological sites, and they wanted to be sure that the undertaking did not disturb the sites. Some requested monitoring to ensure site avoidance. Several tribes voiced concerns about burials and wanted to be contacted if any human remains were found. No other tribal issues have been raised.

To date, there are no known TCPs, shrines, religious sites, or resource gathering sites in the proposed undertaking's area of potential effect. Because the project can be designed to avoid direct impacts to archaeological sites, it is anticipated that all sites will be avoided (MM HR 1-6). If sites cannot be avoided, or if human remains are found during project implementation, the tribes, State Historic Preservation Office and Advisory Council will be contacted and mitigation measures will be developed (MM 7). No other tribal issues have been identified.

Environmental Consequences

Heritage resources are nonrenewable resources that are easily damaged by ground-disturbing activities. Although some artifacts are susceptible to damage from heavy equipment use, ground disturbance, or burning, it is the provenience of the artifacts, or their horizontal and vertical location in relation to each other and to the soil deposits, that is most important.

Impacts to heritage resources could result from direct or indirect project effects. Direct effects are caused by physical destruction resulting from project intrusion, construction activities, or post-construction operation and maintenance procedures. Potential direct effects may take one or more of the following forms:

- Ground disturbance associated with transmission line construction such as: boring of holes with an auger for pole placement; trenching if the line is to be buried; cutting and removal of trees in the immediate vicinity of poles; cutting and removal of trees in the transmission line corridor; removal of distribution line poles; staging areas; and equipment and construction employee parking.
- Access road improvements and construction such as grubbing and clearing of trees with a dozer, blading and heavy maintenance with a dozer, opening previously closed roads with a dozer, and construction of new access roads.
- Heavy equipment/vehicle movement across archeological site areas during construction and maintenance of the line.
- Exposure of previously unidentified sites during construction.

Indirect effects can result from such things as providing access to previously inaccessible areas, illegal artifact collecting, or increased erosion due to newly constructed roads or tree cutting. Indirect effects of a power line could also include changing settlement patterns and/or land development as a result of the availability of electricity in areas that previously had no electrical service.

These direct and indirect impacts could lessen the value of heritage resources by destroying important scientific data and diminishing the physical setting of sites. Heritage resources can be

diminished by any change in their historical, architectural, archaeological, cultural character or ecological setting. Adverse impacts to heritage resource sites can result in their damage or complete destruction, the effects of which are irreversible. In cases of partial damage, the undisturbed portion of the site may still provide valuable information.

Under the National Historic Preservation Act, an impact is considered significant if it would result in an adverse effect to a heritage resource that is on or eligible for the National Register of Historic Places. An adverse effect is found when an undertaking may alter, directly or indirectly, the characteristics of a historic property that qualify the property for inclusion in the National Register of Historic Places. Examples of adverse effects can include:

- physical damage;
- disruption of the setting of the resource when that setting contributes to the resource's significance;
- introduction of visual or audible elements that are out of character;
- neglect or abandonment; and/or
- transfer, sale or lease.

If it is found that a project will have an adverse effect on heritage resources, the forest will consult with the State Historic Preservation Office, the Advisory Council, and any interested parties including tribes to develop a memorandum of agreement concerning the steps to be taken to lessen or mitigate adverse effects.

As a result of the heritage resource investigations, scoping and consultation with tribes and the State Historic Preservation Office, several mitigation measures to avoid or minimize potential effects to heritage resources would be applied under any of the alternatives and the option. The application of these mitigation measures is assumed in the analysis of effects on heritage resources:

- Use selective pole placement to avoid direct impacts to heritage resource sites.
- Do not designate or construct access routes through heritage resource sites.
- In the vicinity of historic structures, use single wooden poles, nonglare wire, and selective pole placement to minimize impacts to the structures' surroundings.
- Monitor construction activities in the vicinity of archaeological sites.

Alternative A - No Action

Under the No Action Alternative, the power line would remain as is in its current location with no upgrade. There would be no undertaking. Because there would be no changes in the status quo, this alternative would have no potential to impact heritage resources.

Alternative B - Black Mesa-Cerro Azul Tap

The removal of poles and the boring of holes for poles could damage or destroy subsurface artifacts, features or human remains if they occur within heritage resource site boundaries. The cutting of trees within the corridor through the piñon-juniper woodland along the proposed right-of-way could damage or destroy surface artifacts or features by use of mechanical equipment or falling of trees within site boundaries. Access road improvements, two-track development and site preparations such as grubbing could damage or destroy archeological sites, surface features and

artifacts. Driving large, heavy vehicles across sites could also damage and destroy heritage resources.

Under this alternative, all of the proposed route including the new construction from Black Mesa north to the existing corridor and the existing corridor from there to Ojo Caliente has been surveyed. Three sites consisting of small historic trash scatters are within the proposed location of Alternative B. These sites have been determined to be not eligible for the National Register of Historic Places. As such, the alternative would have no direct effects to heritage resources.

Creating more access to the area could attract more vehicular traffic with direct impacts to the road and increased erosion. It could also lead to an increase in illegal artifact collecting of nearby sites. Overall the increased access would be minimal, as there are already roads in the vicinity. There would be minimal indirect effect to heritage resources.

Alternative B was developed in conjunction with BLM and KCEC in order to avoid pueblo sites that occur within the BLM ACEC. The preliminary proposal was a straight line from the proposed tap to the substation, which would have crossed over a pueblo site. A modification was developed as the proposed action that follows the existing route and avoids cultural resources.

Alternative C - Existing Corridor

The removal of poles and the boring of holes for poles could damage or destroy subsurface artifacts, features or human remains if they occur within heritage resource site boundaries. Access road improvements, two-track development and site preparations such as grubbing could damage or destroy archeological sites, surface features and artifacts. Driving large, heavy vehicles across sites could also damage and destroy heritage resources.

Under this alternative, the existing corridor has been surveyed. Six sites are in the existing right-of-way, consisting of three historic trash scatters and a small disturbed lithic scatter that have been determined to not be eligible for the national register, one lithic scatter that is eligible for the register, and the Carson School House, a property that is listed on the National Register of Historic Places. The project can be designed to avoid direct impacts to these sites. As such, the alternative would have no direct effects to heritage resources.

There would be no increase in access to the area as this alternative follows an existing right-of-way. The area around Carson has several historic properties adjacent to the power line. Upgrading the line could make the power line more visible and could detract from the properties' settings. The use of single wooden poles and nonglare wire would help to minimize the impact (MM VQ1). Alternative C combined with the existing impacts of the current power line would not be adverse.

Alternative C would follow the same route as Alternative B through the BLM ACEC and would not result in any effects to cultural resources.

Alternative D - 285 P

The removal of poles and the boring of holes for poles could damage or destroy subsurface artifacts, features or human remains if they occur within heritage resource site boundaries. The cutting of trees within the corridor through the piñon-juniper woodland along the proposed right-of-way could damage or destroy surface artifacts or features by the use of mechanical equipment

or the falling of trees within site boundaries. Access road improvements, two-track development and site preparations such as grubbing could damage or destroy archeological sites, surface features and artifacts. Driving large, heavy vehicles across sites could also damage and destroy heritage resources.

Surveys for the new construction portion of this alternative have not yet been completed for heritage resources. Nearby surveys indicate that the site density would be similar to Alternatives B and C. There are three sites along the existing portion of the right-of-way that would be used. These three historic trash scatters have been determined to not be eligible for the register. The majority of Alternative D would follow the same route as Alternatives B and C through BLM lands with a slight variation along the west edge of those lands. The project can be designed to avoid direct impacts to sites in the unsurveyed areas. As such, the alternative would have no direct effects to heritage resources as long as the sites are avoided.

Creating more access to the area could attract more vehicular traffic with direct impacts to the road and increased erosion. It could also lead to an increase in illegal artifact collecting. Overall, the increased access would be minimal, however, as there are already roads in the vicinity. If there are any historic structures along the right-of-way, upgrading the line could make the power line more visible, and could detract from the visual setting. The use of single wooden poles and nonglare wire would help to minimize the impact (MM VQ1). The indirect effects are not considered to be adverse.

There would also be approximately 6 miles of the existing 25 kV line removed under this alternative. There are no poles in any sites that would result in disturbance along this section of line.

Option - Tres Piedras Connection

The boring of holes for poles along the edge of the piñon-juniper type could damage or destroy both surface and subsurface artifacts, features or human remains. Access road improvements and site preparations such as grubbing could damage or destroy archeological sites, surface features and artifacts. Driving large, heavy vehicles across sites could also damage and destroy heritage resources.

Heritage resources surveys have not yet been completed for this option. Nearby surveys indicate that the site density would be similar to Alternatives B and C. The project can be designed to avoid direct impacts to sites, particularly if the power line stays in the U.S. 285 right-of-way. As such, the option would have no direct effects to heritage resources as long as the sites are avoided.

Because this option follows the existing highway, it would not result in any new clearing, and would not increase access to the area. If there are any historic structures along the right-of-way, the presence of a new power line would be visible and could detract from the visual setting. The use of single wooden poles and nonglare wire would help to minimize the impact (MM VQ!). The indirect impacts would not be adverse.

Cumulative Effects

Cumulative effects to heritage resources can be difficult to assess. One of the major reasons for this is that in order to assess the cumulative effects, we must consider past, present and

reasonably foreseeable future activities and the impacts that all these actions have had and will have on the resources. Unlike other forest resources, when we consider past activities on the Carson National Forest and the impacts they have had on heritage resources, we are not looking at a 100- to 200-year period. In the case of the Tres Piedras Ranger District, we are looking at 8,000 years of past activity. Through this long span of time, archeological sites might endure such natural events as fire and floods. They might also exist through such prehistoric land use activities as firewood harvests, plant gathering, adobe soil collection, and clay gathering. The effects of these past activities on the resource are difficult to determine. Attention must focus on the contemporary activities that have taken place in the recent past or near future that may impact a heritage resource and the cumulative impacts of these actions over time.

One approach to determine cumulative effects would be to consider the effects of the proposed action as well as past and future undertakings on heritage resources. Federal undertakings must take the effect to heritage resources under account during the planning process. As a result, most projects are designed to avoid heritage resources. This part of the Carson National Forest is not heavily developed, there have been few undertakings, and future projects in the area would likely be limited to scattered firewood sales and range projects. Impacts from these types of undertakings could be minimized by site avoidance. Since site avoidance generally results in no direct impacts to heritage resources, the cumulative effects that the proposed project or future projects might have is minimal.

Another approach would be to evaluate cumulative effects based on the language used in the National Historic Preservation Act and National Register Bulletin 15. As discussed earlier, a significant impact to heritage resources that are eligible to the National Register of Historic Places is called an adverse effect. An adverse effect is found when an undertaking may alter, directly or indirectly, the characteristics of a historic property that qualify the property for inclusion in the national register. Adverse effects can include: physical damage, disruption of the setting of the resource when that setting contributes to the resource's significance, and the introduction of visual or audible elements that are out of character. These effects could result in an undesirable cumulative impact to heritage resources by either destroying the resource or altering the characteristics of the property.

According to National Register Bulletin 15, an historic property must exhibit both of the following to be eligible to the NRHP: (1) It must be shown to be significant under the national register criteria; and (2) It must have site integrity. Site integrity is "the ability of the site to convey its significance." The seven aspects of integrity include: location, design, setting, materials, workmanship, feeling and association. When site integrity is compromised through actions that destroy or damage any of the seven aspects, the significance of the site can be diminished.

As noted earlier, through site avoidance, physical damage to sites is unlikely. Disruption of the setting and/or the introduction of the visual elements that are out of character would be the most probable impacts of a 115 kV transmission line through any of the alternatives. These impacts could result in some degradation of site integrity and result in undesirable cumulative effects to the heritage resources within the proposed project area, if these effects cannot be mitigated. While disruption of a setting would likely impact any heritage resource site, it seems the effects of introducing elements out of character with a site's surroundings would be more significant for standing historic structures. Under any of the alternatives, cumulative effects are considered to be minimal.

Alternative Comparison

Under the No Action Alternative, there is no undertaking. Cumulative effects from impacts to the sites and their surroundings from future firewood sales or other forest management activities in the area would not affect the qualities of the sites that may make them eligible for the national register as long as the sites are avoided.

Under Alternatives B, C, D and the Option, cumulative effects from increased access to the area, erosion or future development would be minimal. Impacts to the sites and their surroundings from future firewood sales or other forest management activities in the area would not affect the qualities of the sites that may make them eligible for the national register as long as the sites are avoided. Long-term access to BLM lands would remain limited to existing roads and trails so no additional cumulative effects are anticipated within the Ojo Caliente ACEC.

Social and Economic Environment 10/

The social environment is perhaps the most diverse and emotionally charged arena in ecosystem management. The social environment for this analysis comprises the people living in and adjacent to the project area in northern New Mexico. Forest resources play an important social role for the people of northern New Mexico. The goods, services and uses available from public lands represent major components in the lives of many residents within this area. Geographically this region can be described as mostly rural with large tracts of open lands and small communities that rely on a commercial center to augment their lifestyles. Recent population trends have moved the Southwest to be more urban oriented.

Humans have been an integral part of the Southwest for over 12,000 years. The arrival of Europeans had a catastrophic effect on native populations, as was the case throughout the New World (USDA 1997). During colonization of the New World by Spain, the non-Indian population grew very slowly and was estimated to be no more than 20,000 to 25,000 by the late 18th century (Simmons 1979). Throughout this period, small nonintensive agriculture farms were the staple for the community and family. The basic goal of the village economy was for local subsistence, not for commercial production (Raish 1995).

There is a long history of human use in the area. Prehistoric Anasazi made their homes on rivers and plateaus in the Sangre de Cristo Mountains from about A.D. 475 to 1100. Pueblo groups have farmed these lands for over 1,000 years. The Ojo Caliente Spanish Land Grant was granted in 1793. The project area communities are within the El Rito Ranger District and portions of the Tres Piedras Ranger District. The people influenced by the resources on these districts live in nearby villages. These communities are interwoven into the landscape with private lands within the valley bottom and National Forest System lands on the higher elevations.

Few generalizations can be made about the communities across the Southwest. They are as diverse as the people who live there. The ever increasing popularity of the Southwest as a highly desirable living location continues to increase the region's diversity (Figure 31). It should not be expected that all residents would have the same or even similar points of view on various issues. Within each community, there is a strong sense of independence and self-sufficiency. No matter what its size, there is no single viewpoint on most topics; each community has groups with varying opinions. Most of the time, people like to solve their own problems (Eastman and Gray,

1984, deBuys and Harris 1990, deBuys 1985, Horgan 1970).

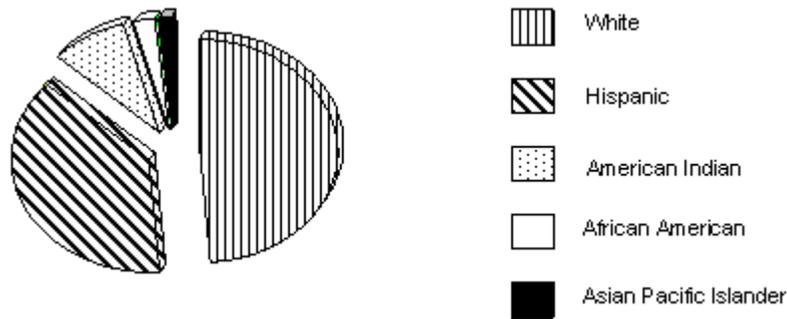


Figure 31. Percentage of the population of New Mexico by race (Census Bureau 2000).

The scope of this analysis is limited to the purpose and need for the proposed action (Chapter 1) and the development of alternatives for constructing an 115 kV transmission line to Ojo Caliente, New Mexico and an optional 25 kV grid connection line to the area south of Tres Piedras, New Mexico (Chapter 2).

In order to evaluate the affected social environment, the issues of a social nature that surfaced during scoping must be examined. The following issues were identified based upon review and evaluation of the array of comments received and discussion with members of the interdisciplinary team:

- The proposed action would create a new utility corridor. Constructing a new line and associated maintenance road could cause unnecessary adverse environmental impacts.
- The proposed transmission line would negatively affect scenic and visual values of the area through which it traverses—especially around Cerro Azul and Mesa Vibora.
- The proposed power line may negatively impact property values for private land adjacent to the power line.
- Proposing a power line along roadways and near residences, as well as through wild areas, may create negative effects on human and animal health as a result of the electromagnetic field.
- The cost of the proposed action may be unreasonably high, since the costs will ultimately be borne by Kit Carson Electric Cooperative members.
- The proposed action may disproportionately impact minority or low-income populations.

In addition to the issues listed above, the purpose and need for the proposed action needs to be evaluated. The purpose and need can be viewed as the “issue” that prompted the proposal.

Affected Environment

Kit Carson Electric Cooperative, Inc. (KCEC) is an electric distribution cooperative that provides electric service to consumers in Colfax, Mora, Rio Arriba and Taos Counties. This study area is located in the western part of Taos County and a small portion of Rio Arriba County. The current

25 kV distribution line originates near Taos, New Mexico and serves numerous small communities. The existing distribution line services Ojo Caliente, El Rito, La Madera, Canon Plaza, Mesa Vista, Petaca, Las Placitas, Servilleta, Vallecitos, Carson and Pilar (Figure 32). It was built approximately 50 years ago and is experiencing demand overload and excessive line loss.

The existing Ojo Caliente system has reached its limitations regarding any additional installations to help maintain voltage during peak usage periods for approximately 1,700 domestic accounts. Current power demands exceed the capacity of the existing line, and voltage regulators periodically fail, creating outages and frequent voltage fluctuations to users. These fluctuations have led to intermittent brownouts and “blinks,” causing damage to all types of electrical equipment, from appliances to medical support systems. The Ojo Caliente system currently experiences the greatest maximum voltage drop of any service area within KCEC territory. Due to the age and type of line, the service area is also experiencing one of the highest line losses within the service territory. Line loss is a cost that is handed down to the consumer.

Demographics

Of the estimated 2,750 people who are served by the current Ojo Caliente system, the majority of residents (75 percent) are Hispanic whose families have lived in the area for many generations. The community of Carson is an exception, as most of the residents in this community and surrounding developments are white (72 percent). Figure 32 graphically displays the ethnic breakdown of the service area.

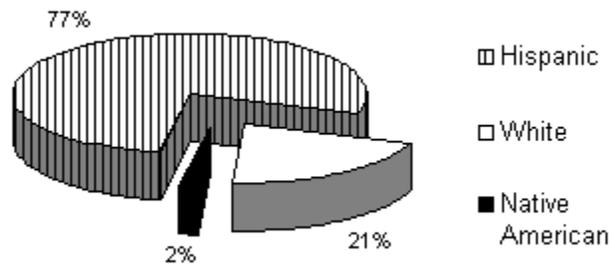


Figure 32. Percentage of the population by race within the zip code tabulation area's for the service area (Census Bureau 2000).

The populations of Taos and Rio Arriba Counties have increased since the existing 25 kV distribution line was constructed in the late 1940s. The population was basically static for about the first 20 to 30 years after line construction. The population of Taos County has nearly doubled in the last 30 years (17,516 in 1970 to 29,979 in 2000). A similar change is shown in Rio Arriba data (25,170 in 1970 to 41,190 in 2000). Although the population increase may not be uniform across a county, these changes indicate an increase in demand for electrical power through increase in population. The Carson, Ojo Caliente and the Vallecitos general areas have all seen increases in population as evidenced by home construction.

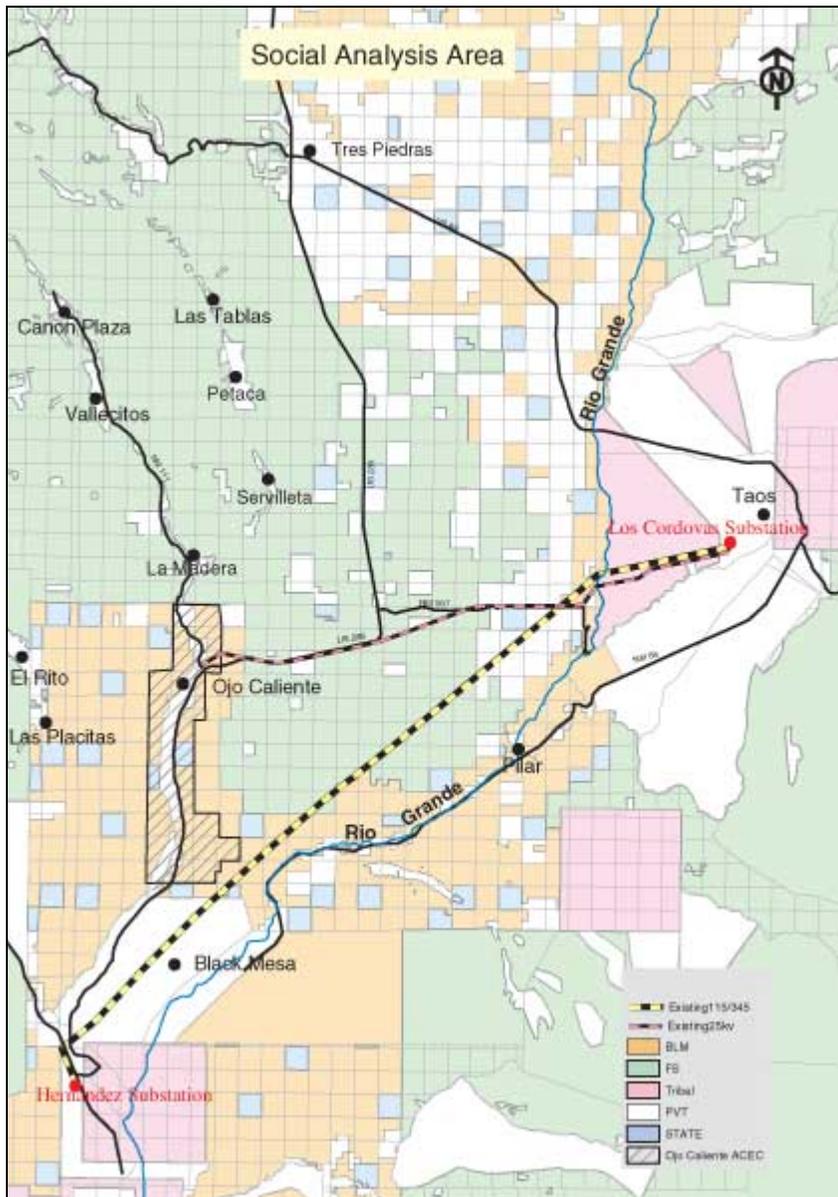


Figure 33. Kit Carson Cooperative service area for Ojo Caliente region.

Local Economy

Rural forest communities have long been known for their cultural distinctiveness, independent spirits and comparatively high poverty rates. Many of these communities rely on the potential economic and livelihood opportunities that the national forest provides them. In many places special forest products have important historic and contemporary uses (Emery 1999). Economic history of the small, rural communities of northern New Mexico illustrates links to both formal and informal markets. Wage labor, bartering, and petty commodity production and sale, along with subsistence activities, all exist in and are essential to many of these communities. A variety of research has been completed on villages in the service area, especially those linked to the

Vallecitos Federal Sustained Yield Unit. These studies support the contention that these villages depend heavily on the natural resources in the area.

All the communities in the service area rely on the region for many of their needs. Special forest products and small commercial ventures contribute toward household livelihoods in northern New Mexico through both nonmarket and market strategies. Nonmarket strategies include subsistence activities for direct personal consumption and gifts. Sale of raw products and products processed into crafts comprise market uses. Special forest products increase in value when there is a financial emergency or a change in economic conditions of the household. At such times, subsistence uses can be critical and even small amounts of cash income can be very important to the household (Emery 1999).

Forest products also have important cultural and recreational values. The majority of these small rural communities were established as Spanish or Mexican “colonies.” These communities have established a cultural value of “stewardship” through many generations of interactions with the natural resources in the area. Quite often it is imperative for these residents to have a “hands on” relationship with the forest that has sustained them for generations, as it is part of their cultural identity. These communities maintain a certain degree of self-sufficiency by meeting many of their own needs through self, family and friends. Sustainability of the land and its resources is a common need.

A common thread woven through these communities is a sense of place. Few want to leave the area. For some, property has been handed down from one generation to another for centuries. Also they regard the national forest as communal land once belonging to their ancestors (deBuys 1985). For most special forest products and small commercial products there is little investment required to participate in the action. Thus activities such as firewood and latilla gathering have become important recreational and subsistence activities in these communities (Eastman and Gray 1987). Additionally, their relationship with the land takes on an intrinsic spiritual value that is passed on to succeeding generations.

The primary influences on the local economy are recreation and tourism (service sector), and agriculture (ranching, small produce farming and miscellaneous forest products). Many of the residents commute to larger commercial centers for employment opportunities in manufacturing, construction, retail and government sectors. The per capita income for Taos County in 2000 (\$16,103) was 93.2 percent of the state average. Rio Arriba County per capita income in 2000 (\$14,268) was only 82.6 percent of the average and one of the lowest in the state. The Mesa Vista Consolidated Schools covers almost all the service area. In 1997, 37 percent of school age children in the district were living below the poverty threshold (Census Bureau 1997).

Environmental Consequences

As discussed previously, the primary social and economic issues of public concern as identified during scoping are potential effects of the proposal on visual quality and property values, the impact on public health from electronic magnetic fields, and impacts on electrical users, low income and minority populations. This assessment focuses on these issues as they help determine the scope of analysis required.

Private Property and State Lands

The evaluation of potential impacts to social and economic variables considered changes in the existing characteristic that could result from the proposed project. To evaluate potential impacts to social and economic variables in the study area, the following evaluation criteria were developed. Potential project impacts considered include:

- The number of private or state parcels crossed by alternative (land sections or parts of sections crossed).
- The proximity of residences to the centerline of the transmission line.
- The juxtaposition of the transmission line to minority and/or low-income populations.

Geographic Information Systems (GIS) maps of the route, along with digital ortho photographs, and field visits were used to help determine the extent of the impacts. Tables 28 and 29 highlight this geographic reference analysis.

Table 28. Number of non-Federal sections or partial sections crossed by alternative and the option.

Land Status	Alternative				Option
	A	B	C	D	
Private	5	0	5	0	2
State	1	0	1	0	0

Private lands counted as sections or portions of sections crossed. These sections may be further subdivided increasing the actual number of landowners.

Table 29. Number of homes within proposed 115 kV centerline by alternative and the option.

Land Status	Alternative				Option
	A	B	C	D	
Private residences within 50 feet of centerline	8	0	8	0	0
Private residences within 50-300 feet of centerline	0	0	0	0	0

Property Values

There is a potential impact of the proposed project on the value of real estate near the route. There is no generally accepted methodology or standard analytical technique for identifying electrical transmission line property value impacts, nor is there consensus on whether such impacts occur. While no specific studies were conducted for this project, studies have been conducted since the 1950s on the effects of power lines on property values. Until recently most studies have focused on visual effects¹¹ and associated value loss. More recent research has included Electric and Magnetic Fields (EMF) and its role on property values. Research on effects of overhead transmission lines on property values have expanded over the past 20 years to include appraisal studies, attitudinal studies, and statistical analysis. Conclusion of these studies has varied widely, with some reporting no effects, others finding small effects and still others reporting substantial effects.

The available literature summarizes two types of potential adverse economic effects on property values when loss actually occurs: (1) a possible decrease in value of the property; and (2) an increase in the time required to sell property thus causing an economic loss associated with increased marketing time. Past studies have range widely from those focused on 65 kV to high voltage transmission lines, from rural agriculture lands to urban residential areas. Kroll and Priestly (1992) note existing studies provide little evidence that the level of impact is directly related to line voltage, but state the relationship between line characteristics such as voltage, height, material of pole, etc. and the impact on property values has yet to be systematically researched.

In general, the following findings emerge from literature:

- Transmission lines have a greater potential to reduce the value of urban or residential properties over other types of properties. Many open space properties are not affected at all.
- The overall property value impact for single-family residential properties is generally cited as less than 10 percent, but in some cases has been 15 percent or more.
- Other factors (e.g., neighborhood, square footage, size, view and shape of lot) are much more likely to be major determinants of the sales price of the property.
- Effects are most likely to occur for properties crossed by or immediately adjacent to the line.
- Effects are generally greater for smaller parcels than for larger parcels.
- Effects are greatest immediately after construction but decrease over time.
- Although there is no clear consensus about impacts of EMF on humans, there is enough concern over the issue that attitudes toward this effect may impact property values.

Alternative B (Black Mesa-Cerro Azul Tap) and Alternative D (285P Tap) do not cross private lands. Alternatives A (No Action) and C (Existing Corridor) both cross private lands. Each of these alternatives is located partially in the Carson community. The Tres Piedras Connection Option crosses some undeveloped private lands.

The majority of studies on property values and transmission lines have been in urban or suburban areas. It is anticipated that the construction of a 115 kV transmission line near or crossing private property would result in a small decrease in single-family residential property values. The more important factors are the location and shape of the property and the neighborhood. The largest impact is during and after construction, but this effect is mitigated by time.

Project Costs and Employment

On a county scale, the effects of power lines and substations on existing social structures and economic activities are relatively small. Impacts to social variables related to the construction are typically minimal due to the relatively small size and short-term workforce characteristics of power line and substation construction. Table 30 illustrates the different costs and jobs associated with the alternatives. The demand for temporary housing and accommodations during construction would depend upon the workers place of residence. Given the relatively small size of the workforce and the close proximity of Taos and Espanola, it is expected that existing facilities should be able to adequately provide for temporary accommodations.

Table 30. Comparison of construction and maintenance costs by alternative and the option (SGS Witter 1999)

	Alternative				Option
	A	B	C	D	
Construction Costs					
Labor	0	658,300	1,062,800	857,100	100,000
Equipment	0	167,900	271,200	218,700	25,500
Material	0	248,400	401,100	323,500	38,000
Substation	0	1,425,400	1,425,400	1,425,400	N/A
Total	0	2,500,100	3,161,400	2,825,400	163,500
Other Costs					
Estimated annual line loss	27,575	8,380	13,500	10,900	2,600
Annual maintenance	12,015	6,254	6,395	6,320	1,900

Table 31. Comparison of associated employment by alternative and the option

Jobs	Alternative				Option
	A	B	C	D	
Direct	0	30	25	28	0
Indirect	0	6	5	6	0
Induced	0	7	6	7	0
Total	0	43	36	41	0

Jobs were rounded to nearest whole position and calculated using multiplier provided by IMPLAN.

The IMPLAN model uses the county level as the smallest impact area. In this analysis, Taos County is the impact area. This is not to discount Rio Arriba County. Sources of data for this model include university research, local chambers of commerce, Department of Labor and county records. These records are collected by the IMPLAN group and distributed to the Forest Service.

The numbers generated by the IMPLAN model give an indication of the effects of an action or no action. Direct jobs are jobs related directly to the action, in this case construction of a 115 kV electrical transmission line. Indirect jobs are those jobs related indirectly to the construction and maintenance of the 115 kV line. These jobs would be a worker added in the county to help support the direct jobs. An example is a store clerk. Induced jobs are job positions that would result from the action of having the 115 kV line to Ojo Caliente in place. These are the estimated long-term jobs.

Alternative A is the status quo. There would be no change in the job market. The continued power fluctuations could contribute to a loss of positions. The IMPLAN model does not estimate the potential losses.

Alternatives B, C and D are the action alternatives. A 115 kV transmission line is constructed. The IMPLAN model estimates each of these alternatives would create within the county several jobs. Alternative B would create the most jobs, Alternative D the second highest number of jobs and Alternative C the fewest. If the Option were to be constructed, it would not generate any additional jobs. Construction would be added to whatever action alternative is chosen.

These employment numbers are estimates. It would be reasonable to assume that a portion of these jobs would be in and near the service area. However, a limited land base, low employment levels, and a majority of residents working outside their communities are all factors that limit the number of jobs that would be created in local communities by the construction of a new 115 kV transmission line.

Dependability and Reliability

Table 32 gives information related to outages, brownouts, blinks and voltage drops all of which impact the dependability and reliability of electric power.

Table 32. Existing condition of power in the Ojo Caliente/El Rito/La Madera vicinity

Incident	Year		
	2001	2002	2003 (projected)
Outage	320	366	343
Brownouts	12	9	11
Blinks	16	10	13
Voltage Drops	14	7	11
Total power changes per year	362	392	378

Data obtained from Kit Carson Electric Cooperative, May 2003.

The current and recent past power fluctuations show some kind of change averaging at least once a day. This indicates the electric power is not dependable or reliable. Power fluctuations and even outages are the norm.

Alternative A - No Action

Alternative A would leave the landscape in its present condition. Currently the line passes within 50 feet of eight homes in the Carson area. These are the only homes within 100 feet of the existing power line. The majority of the houses along the existing distribution line were built after the line was established in the late 1940s. Homes were generally established in relationship to available private property, access to property via highway and county roads, proximity of family, and availability of resources (water, pasture lands and electricity). The No Action Alternative would require maintenance of the existing distribution line, thus residents near the current line would experience infrequent disruptions to their privacy due to maintenance crew activities. Property values, particularly residential properties, would not be altered from their current trend of increasing in value.

Under Alternative A, anticipated problems associated with reliability and marginal voltage levels for approximately 1,700 service accounts served by the existing line would continue. It would be expected that outages would occur more frequently as the system is placed under additional stress due to increases in power demands. This would be a particular problem during times of the year when electricity use peaks. The reliability of electric service would continue to deteriorate, voltage levels would become unacceptable, and curtailment of electricity to some customers may become necessary during peak loading periods. Over the past 2 years, the service area has experienced 366 outages, of which 26 outages had an average length of power disruption of over

3 hours. These disruptions have affected an average of 1,700 consumers (accounts). The costs associated with increased energy line losses would be absorbed in higher billing rates to the consumers, even though a lesser quality of service would occur. A lower quality of service would result in possible damage to computers, electrical appliances and devices, and an increase in complaints about low voltage.

Alternative B - Black Mesa-Cerro Azul Tap

This alternative would originate from the existing 115 kV line, about 1.5 miles northeast of Black Mesa and 3 miles southwest of Cerro Azul. Over the entire length (9.6 miles) of this alternative, no homes are within 15 meters or 100 meters of the proposed location. The existing distribution line would still be needed to serve the Carson area and to provide a backup loop. Thus eight buildings in the Carson area would still be within 100 meters of the 25 kV distribution line.

As with the other action alternatives, this alternative does improve the overall delivery of electrical service to the service area. The substation in Ojo Caliente would “route” the electricity out over several circuits and distribution lines throughout the service area to increase reliability. Property values would be unlikely to be affected. This route was selected to maximize the use of existing roads. This alternative would access the Ojo Caliente substation. The existing 25 kV distribution line would be retained.

Alternative C - Existing Corridor

This alternative would originate at the existing 115 kV Hernandez to Taos transmission line on private land in the vicinity of where it crosses NM 567 near Carson. The transmission line proposed under Alternative C would pass within 50 feet of eight homes, nearly all in the Carson area. All these homes are located along the existing 25 kV line corridor. The existing 25 kV line would still be needed to serve as a distribution to homes within the Carson to Ojo Caliente areas. It would be strung under the 115 kV line as an underbuild. This transmission/distribution line would be within 50 feet of eight homes.

The majority of the houses along the existing distribution line were built after the line was established in the late 1940s. Homes were generally established in relationship to available private property, access to property via highway and county roads, proximity of family and availability of resources (water, pasture lands and electricity). The existing corridor alternative would require maintenance, thus residents near the line would experience infrequent disruptions to their privacy due to maintenance crew activities. Property values, particularly residential properties, would not be altered from their current trend of increasing in value.

The existing corridor alternative, as with all action alternatives, does improve the overall delivery of electrical service to the service area, including the Carson community. As mentioned previously, the existing distribution line would also be used to provide service to homes through the Carson to Ojo Caliente area. Demand on this line would be reduced, as the transmission line, which runs over the same route, would be used to serve a new substation in Ojo Caliente, which would “route” the electricity out over several circuits and distribution lines throughout the service area to increase reliability.

Alternative D - 285P Tap

This alternative would originate at the existing 115 kV Hernandez to Taos transmission line on National Forest System lands where it intersects Forest Road 285P. Alternative 285P Tap would consist of a 115 kV transmission line with a 25 kV distribution line underbuilt on the same poles for a portion of the route. The portion would be on and near the Bureau of Land Management administered lands to the intersection of the existing line at the top of Comanche Rim. The remainder of the route to the existing power line corridor to the south would consist of a 115 kV transmission line on single poles.

The Alternative D route would not be readily visible from private lands. In fact, the line would be hidden from view behind ridges and in gentle valley bottoms, except where it would cross U.S. 285 and a portion through BLM lands near Ojo Caliente. The line would only be visible on lands administered by Federal agencies, therefore, property values would unlikely be affected.

Alternative D also includes removing about 5 miles of the existing distribution line that runs along U.S. 285. Portions of the existing line that accesses private property would remain. The existing distribution line that immediately serves their property would continue to be seen from private residences.

As with all action alternatives, this alternative does improve the overall delivery of electrical service to the service area. As mentioned previously, the existing distribution line would be removed and a new 25 kV distribution line would be underbuilt on the same poles as the transmission line and would serve as a backup loop for the Ojo Caliente substation. The substation in Ojo Caliente would “route” the electricity out over several circuits and distribution lines throughout the service area to increase reliability.

Option - Tres Piedras Connection

This connection between two existing distribution lines, the 25 kV line near the junction of NM 567 and U.S. 285 and the 12.5 kV line coming south from Tres Piedras to a block of private land, would be located inside the highway right-of-way. The line would use single poles and pass along the west side of the highway for approximately 9.1 miles. This route would use a cleared and revegetated area readily accessible from the highway. There are no homes adjacent to this route; private land does exist near and under the proposed corridor. This connection would provide a power source, possibly increasing the values of private lands.

This Option would provide service through a new distribution line to residents living south of Tres Piedras along U.S. 285 who are not currently on the electrical grid. The Tres Piedras Connection would tap into the existing 25 kV distribution line in the vicinity of the microwave station just north of the intersection of NM 567 and U.S. 285. It would cross the highway to the west side and proceed north along U.S. 285 where it would cross back east of the highway to connect into the existing line that comes south from Tres Piedras along U.S. 285. This route would total 7.5 miles. With the exception of 1.5 miles through private land, this option would be on National Forest System lands.

This connection does improve the overall delivery of electrical service to the service area, Tres Piedras and points north. It also provides a link into the power grid for those who currently are not on it.

Cumulative Effects

Cumulative effects of social and economic effects for any of the alternatives and the Tres Piedras Connection are relatively small. While a reliable source of electricity makes a location, such as Ojo Caliente, attractive for business opportunities, available literature suggests reliable electricity alone does not attract new jobs to an area. However, combined with other improvements to infrastructure such as new and/or improved highways, reliable gas supply, available skilled workforce, affordable housing and other factors, an increase in potential employment growth could occur in the area.

Property values in northern New Mexico continue to escalate at remarkable rates due to sustained economic growth at regional and national scales. Large undeveloped parcels are highly desirable as private getaways, while smaller parcels are harder to find at affordable prices due to population growth and in-migration of new residents. A large-scale recession would probably curtail some of the property value increases especially in the more rural parts of the county. Because of this trend, there is a strong likelihood certain areas in and around the service area will continue to see limited population growth.

Although the exact nature of development is impossible to determine at this time, alternatives, which create utility corridors into this area, may impact property values on developed lands while providing easier access to services such as electricity. Growth along the transmission line is more likely to be limited to “infill” as there are no large undeveloped tracts along the proposed transmission line locations. Undeveloped tracts are committed to agriculture practices or are owned by the Federal Government. The communities in the service area are landlocked. The lands surrounding the communities are mostly owned and administered by either the Forest Service or the Bureau of Land Management.

Public Health and Safety 12/

Electric and Magnetic Fields

Electric and magnetic fields (EMF) exist wherever there is electricity, including transmission lines, distribution lines (even underground), household wiring, and appliances. Regardless of the source of the fields, the strength of the field reduces rapidly with increasing distance from the source. Similar to how the heat from a campfire decreases with distance. For both electric and magnetic fields, strength decreases more quickly with distance from “point” sources like appliances than from “line” sources such as power lines (CDHSPHI 1999).

For “line” sources, the voltage on the conductors of transmission lines generates an electric field in the space between the conductors and other conducting objects (e.g. ground). The electric field is calculated or measured in units of volts-per-meter (V/m) or kilovolts-per-meter (kV/m) at a distance of 1 meter (3 feet) above the ground. The current flowing in the conductors on transmission lines generates a magnetic field in the air and earth near the transmission line. The magnetic field is expressed in milligauss (mG) and is usually measured for “line” sources at 3 feet above the ground. The electric field at the surface of the conductors causes a phenomenon known as corona. Corona is the electrical breakdown or ionization of air in strong electric fields and is the source of audible noise, electromagnetic radiation, visible light and very small quantities of ozone.

Like sound, electric and magnetic fields are made of a mixture of components and can be described in many different ways. Both have wave-like properties such as strength and “frequency.” Similar to sound, EMF can be strong or weak, have a high or low frequency, have sudden increases in strength or be constant. For example, the strength of a field can be weak and constant, as in most nighttime home environments, or it can be strong and vary from high to low every few seconds, as is the case with an electric blanket set on high (CDHSPHI 1999).

There are standard techniques and principles for calculating electric and magnetic fields. For both electric and magnetic fields, the maximum or peak field occurs in areas near the centerline and at the mid-span of the transmission line where the conductors are closest to the ground. Electric fields can be shielded or weakened by surrounding vegetation, topography, building and even the human skin. Magnetic fields are not so easily weakened by these elements. Table 33 illustrates predicted magnetic field strengths at a height of 3 feet above ground at various distances away from a similarly constructed 115kV line.

A typical American home has a background magnetic field level ranging from 0.5 mG to 4 mG, with an average value of 0.6 mG. Most ordinary electrical equipment produces higher magnetic fields closer to the source (USDE 1996). For comparison purposes, Table 34 provides magnetic field strengths at various distances from typical household appliances. Both tables use milliGauss as the unit of measure.

Table 33. Predicted mean magnetic field strengths from centerline for a 115kV power line (NIEHS 2002)

Distance in Feet Three Feet Above Ground	Predicted Fields (mG)
0 (centerline)	29.7
50 (edge of right-of-way)	6.5
100	1.7
200	0.4
300	0.2

Table 34. Examples of magnetic fields at particular distances from appliances

Appliance	At 1 foot (mG)	At 3 feet (mG)
Can opener	7.19-163.02	1.3-6.44
Coffee machine	0.09-7.30	0-0.61
Computer monitor	0.20-134.7	0.01-9.37
Dishwasher	4.98-8.91	0.84-1.63
Microwave oven	0.59-54.33	0.11-4.66
Radio	0.43-4.07	0.03-0.98
Refrigerator	0.12-2.99	0.01-0.60
Television	1.80-12.99	0.07-1.11
Toaster	0.29-4.63	0.01-0.47
Vacuum	7.06-22.62	0.51-1.28

While research has not indicated that exposure to any specific field strength results in an adverse health effect, the above comparative data illustrates the fields from the proposed 115 kV line are

similar to many typical fields people encounter daily. Using standard epidemiological practices, several EMF human health studies have used average exposures of 2 or 3 mG as an arbitrary cutoff point to define broad categories of exposures. Below this level, subjects were considered “unexposed,” and above this level, they were considered “exposed” (USDE 1996).

Affected Environment

Possible effects associated with the interaction of transmission line EMF with people on and near a right-of-way fall into two categories: short-term effects that can be perceived and may represent a nuisance and potential long-term health effects. Short-term effects from transmission line electric fields are associated with the perception of induced currents and voltages or perception of the field. Induced current or spark discharge shocks can be experienced under certain conditions when a person contacts objects in an electrical field. Such effects occur in fields associated with transmission lines with voltages of 230 kV or higher, thus would not occur under this proposal.

Short-term effects from magnetic fields are not anticipated. There is no evidence that suggests people, animals or plants can respond to or be harmed by magnetic fields at levels associated with this project. Electric fields greater than 2 kV/m in theory may interfere with cardiac pacemakers. Most pacemakers, however, are designed to be immune to such interference, and few people wear susceptible pacemakers (USDA 1996, pp. 4.16-10).

Concern about possible long-term health hazards from electric power use is supported by results from some scientific studies, but the evidence they provide is still incomplete and inconclusive and even, in some cases, contradictory (CDHSPHI 1999). Scientific research has studied the potential effects from long-term exposure to EMF. Questions about cancer and reproductive effects have been raised on the basis of biological responses observed in cells or in animals, or on the basis of associations between surrogate measures of power line fields and cancer reported in some of the epidemiological studies.

In 1998, a working group of experts gathered by the EMF – Research and Public Information Dissemination (EMF-RAPID) program met to review research that has been done on the possible health risks associate with EMF. This group reviewed studies that had been completed on the subject. They released their final report to Congress in 1999, which explains the program’s findings, including the results of its working group and many research projects. The final report states the National Institute of Environmental Health Sciences believes there is weak evidence for possible health effects from ELF-EMF exposures, and until stronger evidence changes this opinion, inexpensive and safe reductions should be encouraged.

After reviewing all the data, the U.S. National Institute of Environmental Health Sciences (NIEHS) concluded in 1999 that the evidence was weak, but that it was still sufficient to warrant limited concern. The NIEHS rationale was that no individual epidemiological study provided convincing evidence linking magnetic field exposure with childhood leukemia, but the overall pattern of results for some methods of measuring exposure suggested a weak association between increasing exposure to EMF and increasing risk of childhood leukemia. The small number of cases in these studies made it impossible to firmly demonstrate this association. However, the fact that similar results had been observed in studies of different populations using a variety of study designs supported this observation (NIEHS 2002).

In a report prepared by the Virginia Department of Health (1995), it was determined that “it is not yet possible to ascribe EMF from high voltage transmission lines as an etiologic factor for cancers in humans.” Moreover, these reviews indicate that apart from suggesting some biological responses, particularly in higher strength fields, the data do not indicate exposures, such as those encountered in daily life, can be said to have adverse effects. For additional information, see *Summary of Electric and Magnetic Field (EMF) Studies and Bibliography*. [275]

Environmental Consequences

Table 35. Number of homes within proposed 115 kV centerline by alternatives and the option

Land Status	Alternative				Option
	A	B	C	D	
Private residences within 50 feet of centerline	8	0	8	0	0
Private residences within 50-300 feet of centerline	0	0	0	0	0

Alternative C is the only action alternative that would be in proximity of residences. Homes in the vicinity of the existing 25 kV line (Alternative A) would not change under any of the action alternatives. Alternatives B and D or the Option would have no potential EMF effects on residents.

Fire

Affected Environment

General fire hazards and risk to forest land are based on several factors: local climate, vegetation type and density, accessibility and response time from local fire protection agencies. The study area for fire is the southern half of the Tres Piedras Ranger District. NM 567 bisects the study area, and U.S. 285 passes through the area making an approximate 90-degree bend upon crossing Comanche Rim. Many National Forest System roads and user-created, two-track roads exist in the study area. The forest cover type is piñon-juniper woodland. Interspersed within the woodland areas are low elevation grasslands, revegetated areas and sagebrush.

Usually the higher portions of the Tres Piedras District experience deep snowpack during winters and frequent rain during the months of June through early August. The general climate is warm with small amounts of snow in winter and scattered thunderstorms June through August. Since 1996, the study area has experienced drought weather conditions. Past history using tree ring evidence has shown that the southwestern portion of the study area underwent extended droughts. The weather pattern since 1996 mimics a long drought period in the 1950s. Historically, wildfires have occurred during these drought periods. According to Forest Service fire personnel, any type of vegetation is susceptible to fire during periods of local drought. Tree density, downed fuels, and ground cover influence the rate of spread and the intensity of the fire.

Trees in the piñon-juniper woodland are dense with ground vegetation covering up to 40 percent of the surface with minimal downed fuels. The extensive outbreak of the *Ips* beetle will contribute to woody debris and potential fuels in the project area over the next few years. Insects (mainly ants) or other organisms tend to rapidly decompose downed fuels. Woody material over about 2 inches in diameter is likely to be collected and used for domestic firewood. In short, downed

woody material normally disappears from the site quickly and ground cover is not sufficient to permit extensive ground fires.

Fire History: The study area has no recorded wildfires in the past 20 years (personal discussion with Loren Suazo, Tres Piedras Ranger District fire management officer). Prescribed burning to improve range conditions by reducing big sagebrush or preserving revegetation areas has proven to be difficult. The large interspaces between grasses, which carry a fire, and sagebrush, which is the vegetation that needs to be burned, have contributed to the difficulty in completing prescribed burns. Consequently, current vegetation conditions are also unlikely to permit wildfires to burn or even become large in size. However, a wind driven event could occur that may cause a large fire to develop.

Table 36. Estimated firefighter response times in minutes

Station	North End of Study Area (Tres Piedras Connection to Comanche Rim)	South End of Study Area (Ojo Caliente to Comanche Rim)	Middle of Study Area (Tres Piedras/Ojo Caliente to Carson)
Tres Piedras District Office (FS)	20 to 40	20 to 40	35 to 45
Taos Pueblo (BIA)	75 to 105	90 to 130	75 to 105
Taos Field Office (BLM)	75 to 105	90 to 130	90 to 130
Tres Piedras Volunteer Fire Dept.	20 to 40	20 to 40	35 to 45
Ojo Caliente Volunteer Fire Dept.	15 to 30	30 to 40	15 to 30

Fire Protection Services: Forest Service and Bureau of Land Management fire crews, and two volunteer fire departments (Tres Piedras and Ojo Caliente) are available for assistance in the event of a wildfire or a fire started by a downed power line. The New Mexico State Forestry Department is the umbrella agency for all New Mexico rural volunteer fire departments. The Forest Service has a Joint Powers Agreement with the Bureau of Indian Affairs (BIA), Bureau of Land Management and the New Mexico State Forestry Department to fight fires regardless of jurisdiction. The Bureau of Land Management's Taos Resource Area office is located in Taos, New Mexico. Although the majority of the proposed project falls outside of their land jurisdiction, they do have firefighting resources, which are at the disposal of the Carson National Forest because of the Joint Powers Agreement.

Environmental Consequences

In any of the alternative locations, the proposed 115 kV transmission line could affect future fire events in several ways. Normally, a transmission corridor removes the vegetation down to low shrubs and ground cover. However, the tree canopy of the piñon-juniper in the study area has a maximum height of about 30 plus feet. The removal of vegetation is not expected for the alternative corridors. The development of a two-track under the line would be needed to access the area for construction and would act as a firebreak. The height of the proposed transmission line (approximately 55 plus feet above ground) poles would make it susceptible to lightning strikes. Consequently, the transmission line would be equipped with a static wire as the uppermost line. The static wire is designed to ground out lightning strikes before ignition. As with all electric lines, there is the possibility that the line or the pole could be knocked down by wind

or some other natural cause which could result in arcing and lead to a fire start. The fire history of the area indicates any arcing would not lead to a wildfire affecting other than a few trees and a small area of vegetation.

Alternative Comparison: Alternative A would result in no changes to the existing fire risk. In case of fire occurrence along the Alternative B route, Forest Road 558 and U.S. 285 would provide access to anywhere along its location. Since the existing corridor runs almost entirely along NM 567 and U.S. 285, accessing a fire caused by the possible downing of Alternative C would not be a problem. Forest Road 285P and then a two-track under the line north of U.S. 285 would provide access for firefighters to Alternative D. The Tres Piedras Connection would be fully accessible from U.S. 285.

The height of the transmission line proposed in any of the alternatives would be above the tree canopy. Safety features built into the line would likely prevent a first start from a broken line. Without continuous forest canopies and downed fuels the rate of fire spread is slowed down, making it much easier to control the fire event. In the event a fire started, history shows minimal spread. The result would be minimal changes to the existing fire risk for any action alternative.

Roads 1

A forest roads analysis report was released in April 2003. [271] The roads analysis provides information regarding arterial and collector roads, as well as highways. It is designed to identify the components of an optimum road system, one that reflects land management objectives. The primary objective of the report is to provide the forest supervisor and district rangers with information necessary to implement road systems that are efficiently managed, have minimal ecological effects, and are in balance with available funding.

Roads maintained for high clearance vehicles, closed roads and unidentified roads are not included in the forest roads analysis. This project-level analysis includes existing roads that may be used for construction or maintenance of a new power line located in existing or proposed utility corridors. Since the most relevant effects of roads are associated with watershed conditions, a more detailed effects analysis regarding roads is found in that section.

Affected Environment

The area of consideration for this project-level roads analysis is limited to the alternatives for the proposed power line to Ojo Caliente from an existing 115 kV line west of the Rio Grande Gorge in Taos County, New Mexico. Three alternatives leave the existing line at different locations, proceeding north and/or west to a proposed substation location near the intersection of NM 111 and U.S. 285 in Ojo Caliente. The study area is bounded on the east by private lands near Carson; the north along NM 567; the south by the Carson National Forest boundary; and the west by the Rio Ojo Caliente. The study area is on the Tres Piedras Ranger District of the Carson National Forest and Bureau of Land Management lands on the western edge. A portion of the study area is located adjacent to U.S. 285 north of the existing microwave tower (where U.S. 285 makes a 90-degree bend) to the existing power line coming south from Tres Piedras.

The topography of the study area is fairly flat, interspersed with low, broad ridges and wide drainage bottoms. Comanche Rim is the most abrupt change in the topography. This rim does not continue south of U.S. 285.

The general area south of U.S. 64, including the study area, is an unrestricted off-road vehicle travel area. This designation was made during the forest planning process and is included in the Carson National Forest Plan implemented in 1986. This designation has not been changed for the study area. This project does not propose to modify or otherwise change the current unrestricted off-road designation for the study area.

The study area contains portions of four roads included in the forest roads analysis. Three of these roads are paved roads maintained by the State of New Mexico—U.S. 285, NM 567 and NM 111. The fourth is FR 97, a National Forest System road, a native surface road maintained by the Forest Service (Figure 17). Other major roads not in the forest roads analysis are Maintenance Level 2 roads. The Forest Service maintains these roads. User-created, two-track roads are not numbered and are not part of the national forest road system.

Currently Forest Service system and nonsystem roads provide access for a variety of uses. These uses include firewood gathering, hiking, hunting, as well as, access to private lands, electronic sites and existing utility lines. The roads in this area are not seasonally closed, except Forest Road 97 to protect wildlife resources.

An old service road is located on National Forest System lands immediately beneath the existing 25 kV distribution line, running from Carson west along NM 567 through the national forest to BLM lands, approximately 2 miles east of Ojo Caliente. Although Kit Carson Electric Cooperative maintenance crews utilize the road for access, several stretches are too rough to be used by vehicles so crews hike in. The remainder of the service road is more accessible and can be used by maintenance crews. Some portions of the distribution line are accessed from other existing roads and highways.

There are 2.2 miles that are considered to be associated with the existing 25 kV line on BLM land. Only about one-half mile of these roads is directly under the existing line. Although the remainder of these roads are in the vicinity of the line and are likely to be used if maintenance or repairs were required, it is uncertain as to the origin of the road, and the majority of the use is likely not to be associated with the power line.

Due to the relatively flat, open terrain and the open policy to motorized use, forest users have developed numerous two-track roads within the study area. These roads may be used once to access sick livestock, hunting successes, fences, and firewood or for cross-country driving. Other two-track roads were developed for the same reasons, but now exist due to others driving the same route. These roads are unplanned and may be poorly located. There is no proposal in this project to close any of these unnumbered and mostly unmapped two-track roads. Usually within one season of a road closure, a new two-track road forms within a few feet of the closed road.

The topography of the study area is fairly flat, interspersed with low, broad ridges and wide drainage bottoms. Comanche Rim is the most abrupt change in the topography. This rim does not continue south of U.S. 285. Travel is basically unrestricted. A new two-track road within a few feet of the closed road would follow closure of a road usually within one season.

Environmental Consequences

Since cross-county travel is unlimited, additional two-track roads may be developed during construction and/or maintenance of a utility corridor. Any two-track roads developed for construction and/or maintenance of a utility corridor will have measures taken to minimize travel

(MM SW5, SW 6 and SW17). This effects analysis assumes these mitigation measures will be applied under any of the action alternatives and the option.

The mileage of anticipated two-track roads that may be developed is predicated on driving the entire length of the utility corridor in a high clearance vehicle. Use of low ground pressure vehicles or equipment would reduce the impacts and estimated mileage (MM SW4). The travel route would not be as noticeable as two distinct tracks across the landscape. Since the area is unrestricted on the national forest for off-road travel, there would be no restriction from traveling under a new utility corridor. To the extent possible, existing roads would be used for corridor inspection. Hence two-track roads that may be developed during construction could disappear through nonuse.

Alternatives B and D were developed considering access for construction and maintenance of the proposed line. The alternative routes were identified in close proximity to existing roads wherever possible. Any new two-track roads developed to place poles and string lines would be restricted to vehicular use after line construction. Line maintenance activities would use any two-track roads developed during line construction. Placement of slash and reseeded would aid in restricting vehicular use to minimal levels. Other National Forest System roads provide access to many parts of the proposed locations and short walking access to much of the remainder of the proposed line locations. These roads would remain open.

Road use can cause direct, indirect and cumulative effects on watershed resources and forest user access. The *Soil and Water* section of this chapter identifies the number of miles of estimated two-track road development that would occur for each alternative and discusses the effects on watershed values. This section discusses the direct, indirect and cumulative effects of roads resulting from each alternative on forest user access.

Alternative A - No Action

Alternative A would result in no effects to existing roadways. No new roads would be developed and public access to the national forest would not change. No increased forest user access would be associated with this alternative.

Alternative B - Black Mesa-Cerro Azul Tap

Alternative B would tap into the existing 115 kV Hernandez to Taos transmission line approximately 1.5 miles northeast of Black Mesa on the Carson National Forest. The line would run north/northwest along Forest Road 558 for about 6.7 miles and connect into the existing 25 kV distribution line, located just north of U.S. 285—also located on the Carson National Forest. It would follow the 25 kV right-of-way for about 1 mile, where it would leave the Carson National Forest and enter lands administered by the BLM. Then the line would follow the existing corridor west and slightly south for 1.9 miles to the location of the proposed substation just north of the intersection of U.S. 285 and NM 111.

Existing roads would be the main access for most of the proposed corridor. Construction vehicles would need to cross some unroaded terrain near where Alternative B taps into the existing 115 kV line. Once the route aligns with the existing 25 kV corridor, current access routes would be utilized. It is likely that the newly created access would be open during the full construction period, estimated to be approximately 1 year. Forest Service roads currently open that are used for construction would remain open.

Alternative C - Existing Corridor

Alternative C would result in no effects to existing roadways. No new roads would be developed and public access to the national forest would not change. No increased forest user access would be associated with this alternative.

Alternative D - 285P Tap

Alternative D would tap into the existing 115 kV Hernandez to Taos transmission line on National Forest System lands where it intersects Forest Road 285P. A new 115 kV transmission line would proceed north, following the bottom of Cañada Embudo, along existing Forest Road 285P, for 4.8 miles. It would swing west and cross U.S. 285 where the highway turns westward to Ojo Caliente. It would run parallel to U.S. 285 for about 5.7 miles on national forest, at a distance of up to one-half mile north from the highway. It would then enter BLM lands and intersect with the existing 25 kV distribution line. The line would follow the existing corridor west and slightly south to the location of the proposed substation just north of the intersection of U.S. 285 and NM 111 for 1.9 miles on BLM lands.

Existing Forest Road 285P would provide access to pole locations along almost 5 miles of corridor. After crossing U.S. 285, mostly other existing two-track roads and FR 97 would be used to access the proposed utility corridor. Once the route aligns with the existing corridor, current access routes would be utilized. It is likely that the newly created access would be open during the full construction period, estimated to be approximately 1 year. Forest Service roads currently open that are used for construction would remain open.

Option – Tres Piedras Connection

This route would use the existing U.S. 285 highway right-of-way for access during construction. There would be no need to construct or use other roads. The disturbed right-of-way provides room to place poles and maintain the power line connection to Tres Piedras.

Cumulative Effects

The above effects analysis took into consideration the past and present road system in the study area for each alternative. Cumulative effects also include any actions that are reasonably foreseeable that may, along with the implementation of an alternative, have a cumulative effect on road access in the study area. The forest roads analysis reviewed the existing road system and did not recommend closing existing roads or creating any new roads. It is, therefore, anticipated that no additional cumulative impacts on public land access would occur as a result of any of the action alternatives or the Tres Piedras Connection. Chapter 3, *Soil and Water* provides a comprehensive cumulative impact analysis of the physical impacts of roads relative to each of the alternatives.

Short-term Uses and Long-term Productivity

NEPA requires consideration of “the relationship between short-term uses of man’s environment and the maintenance and enhancement of long-term productivity” (40 CFR 1502.16). As declared by Congress, this includes using all practicable means and measures, including financial and technical assistance, in a manner calculated to foster and promote the general welfare, to create

and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans (NEPA Section 101).

Soils and Water Quality

The soil resource is a key ingredient for maintaining the long-term productive potential for an area. Erosion and effects that may be detrimental to the soil resource would be insignificant even in the short term. Soil protection measures in the Southwestern Region Soil and Water Conservation Practices Handbook [9] and forest plan standards and guidelines [5] would maintain critical soil parameters and nutrients, ensuring long-term productivity if any of the action alternatives were implemented.

Short-term effects of the proposed activities could include a small change in sediment delivery to the Rio Ojo Caliente. However relative to current or background conditions, any increase in sediment delivery would be insignificant. These effects are negligible and would not affect long-term productivity. Beneficial uses, including the Rio Ojo Caliente, would not be adversely affected to any measurable degree.

Vegetation

Although the effects to vegetation from any of the alternatives pales in comparison to the natural events of piñon pine die off, any changes from cutting trees to construct a new power line should not be considered short term. The nature of the project should be considered permanent. For all other plant species, long-term productivity would not be significantly altered.

Wildlife

Short-term uses of the area would consist of the construction phase of the project. Habitat disturbance would occur during this period. Existing suitable habitats for special status species would not decline from the implementation of any action alternative. In spite of this, juniper titmouse populations, a management indicator species, is likely to decline with the loss of habitat based on the natural mortality of piñon. This proposal would have an insignificant contribution to the situation and is largely unrelated. Based on the large amount of remaining habitats, it is unlikely that viability of the species is in jeopardy from piñon mortality in the area. There would be no potential impacts to the long-term productivity for other wildlife resources.

Visual Resources

The nature of the project should be considered a permanent visual fixture on the landscape. Any of the action alternatives for both the short and long term are expected to diminish visual and scenic quality. The greatest visual impacts to both the traveling visitor and local residents would be Alternative C. Other than the No Action Alternative, the least visual intrusion would be Alternative D, which would actually improve visual resources for approximately 6 miles along U.S. 285. The only short-term visual intrusion would be the removal of that portion of the existing 25 kV. This improvement would be offset if the Tres Piedras Connection were to be constructed further north on U.S. 285.

Recreation

Recreation within the analysis area is limited to mostly hunting, firewood gathering, piñon nut collecting and all-terrain-vehicle (ATV) use. These and other recreational activities are mostly related to vehicle access. The average user in the Semiprimitive Motorized setting would experience little change. A transmission line in combination with the road system would not significantly change the experience for most of the recreationists who currently use the study area. The only setting indicator that would change if a transmission line were to be constructed is Naturalness, which is directly related to the visual quality portion of the recreation experience. Again, the nature of the project should be considered a permanent alteration and not short term. Alternatives B and C would have a more far reaching effect on naturalness of the area because they could be seen from much further distances than Alternative D.

Heritage Resources

Through proper mitigation and site avoidance there should be no short- or long-term gains or losses in heritage resources.

Social and Economic Environment

In the short term, the average user should notice an immediate increase in reliability of electrical power. Damage to sensitive equipment should no longer be a worry. Since the proposal should provide adequate power indefinitely, the long-term economic benefits to the service areas should be positive.

Public Health and Safety

Alternative C is the only alternative that could generate any EMF concerns. Other safety concerns—such as fire—would not increase as a result of the proposal.

Roads

In the short term there would be some additional access ways created for construction. It is anticipated that a couple of miles of two-track may result over the long term from continued use by motorized recreationists. No additional improved roads would result from the project. Any post construction access on BLM lands would remain limited to existing roads and trails.

Irreversible and Irretrievable Commitment of Resources

Irreversible commitments of resources are those that cannot be regained, such as the extinction of a species or the removal of mined ore. Irretrievable commitments are those that are lost for a period of time such as the temporary loss of timber productivity in forested areas that are kept clear for use as a power line right-of-way or road.

Soils and Water

Any soil lost from construction of a new transmission line within the project area would be considered an irreversible and irretrievable commitment of the soil resource. Best management

practices would be used to minimize soil productivity losses from construction activities. None of the proposed activities would result in irretrievable effects to water.

Vegetation

For any of the action alternatives, and to some degree Alternative A, any site-specific location required for long-term maintenance access would be considered an irretrievable commitment of vegetation resources. Actual pole placement sites would also be considered as such. There would not be any irreversible commitment of resources.

Wildlife

None of alternatives are likely to involve or invoke the irreversible commitment of wildlife resources. As stated in “vegetation” above, some of the removal of vegetation would be irretrievable with regard to habitat alterations.

Visual Resources

Although not irreversible, any of the action alternatives would, for all practical purposes, involve the irretrievable commitment of visual resources. Any of the action alternatives would change the character of the scenery over at least the next 50 years. The removal of the line would instantaneously change visual quality.

Recreation

Although no irreversible and irretrievable commitments of recreational opportunities would be made, the “naturalness” in the vicinity of any of the action alternatives would be diminished and would be considered irretrievable.

Heritage Resources

Through proper mitigation and site avoidance there should be no irreversible and irretrievable commitment of heritage resources.

Social and Economic Environment

With the exception of the No Action Alternative, any of the alternatives should provide adequate power indefinitely. The long-term economic benefits to the service area should be positive. None of the alternatives are expected to have any irreversible or irretrievable commitments to the social or economic environments.

Public Health and Safety

None of the alternatives are expected to have any irreversible or irretrievable commitments to the public health and safety aspects of the communities.

Roads

As stated earlier, there would be some additional access ways created for construction. It is anticipated that a couple of miles of two-track may result over the long term from continued use

by motorized recreationists. No additional improved roads would result from the project. Any post construction access on BLM land would remain limited to existing roads and trails. There would be no irreversible commitment of resources, but based on the intent and nature of the project, new access ways (two-track) should be considered irretrievable commitments of resources.

Unavoidable Adverse Effects

Soils and Water

Long-term soil productivity would not be significantly affected. However, soil erosion may contribute to a slight decrease in soil productivity at pole locations and would be unavoidable adverse effects to soils.

None of the proposed activities would result in an unavoidable adverse environmental effect on water.

Wildlife

None of the alternatives would cause unavoidable adverse effects related to wildlife resources.

Visual Resources

Under any of the action alternatives, unavoidable effects to scenic resources would occur. Based on the alternative selected, the intensity of effects and the amount of area where the project could be visible and the type of user affected varies considerably.

Recreation

The unavoidable adverse effects to recreational users are almost entirely based on visual intrusion of the naturalness of the area.

Heritage Resources

Based on a complete inventory of the area prior to any decision and implementation of proper mitigation such as avoidance, there would be no unavoidable adverse effects to heritage resources associated with the alternatives or the option.

Social and Economic Environment

None of the proposed activities would result in an adverse impact on the social and economic environment.

Public Health and Safety

Alternative C is the only alternative that could generate any electric and magnetic field (EMF) concerns. Other safety concerns, such as fire, would not increase as a result of the proposal. It is unlikely that the proposal would result in any unavoidable adverse impact on public health and safety.

Roads

None of the proposed activities would result in any unavoidable adverse impact on roads.

Other Required Disclosures

NEPA at 40 CFR 1502.25(a) directs “to the fullest extent possible, agencies shall prepare draft environmental impact statements concurrently with and integrated with other environmental review laws and executive orders.” Each section in this chapter identifies all known and related actions specific to that resource. These are also identified in Chapter 1 of this document.

Chapter 4. List of Preparers

Name	Position/ Organization	Contribution	Education	Relevant Years Experience
Carpenter, Jack D.	Natural Resource Planner, Carson NF	Interdisciplinary Team, Soils & Water, Vegetation, Visual Quality, Recreation, Social & Economic Environment, Public Health & Safety, Roads	B.S. Forestry	29
Churchill, Sher	Environmental Coordinator, BLM	Interdisciplinary Team, Scoping, alternatives, BLM coordination	M.S. Regional Planning, B.S. Wildlife Science	29
Corral, Patricia	District Archeologist, Carson NF	Scoping, alternatives	M.A. Anthropology, B.A. Anthropology	15
Granger, Geneen	Assistant Regional NEPA Coordinator, Southwestern Region, FS	Content analysis of comments during scoping, Project Record	M.S. Library & Information Science, B.A. Cultural Anthropology	14
Johnson, David	Forest Archeologist, Carson NF	Heritage Resources	M.S. Archeology	26
Kuykendall , Audrey	Forest Environmental Coordinator, Carson NF	Interdisciplinary Team, NEPA Coordination, Writer-Editor	Graduate work Plant Ecology, B.S. Biological Sciences	16
Kuykendall , Ben	Wildlife Biologist, Carson NF	Interdisciplinary Team Leader, Soils & Water, Wildlife	B.S. Wildlife & Fisheries Science	30
Miller, Gregory	Forest Soil Scientist	Soils & Water	B.S. Soil Science	22
Muehleck, Jeffrey	GIS IT Database Specialist	GIS maps, data	B.A. Geography & Environmental Studies	10
Otero, Paul	GIS IT Database Specialist	GIS maps, data	H.S.	10
Seesholtz, David	Forest Planning Staff Officer	Social & Economic Environment, Public Health & Safety	B.S. Forest Resource Mgt & Wildlife Biology	17
Wenk, Tom	Forest GIS Coordinator	GIS & database coordination	Biology course work	13

Chapter 5. Agencies, Organizations and Persons to Whom Copies of the DEIS are Sent

This environmental impact statement has been distributed to individuals who specifically requested a copy of the document or provided comments during the scoping process. In addition, copies have been sent to the following Federal agencies, Federally recognized tribes, State and local governments, and organizations representing a wide range of views regarding the Ojo Caliente proposed 115 kV transmission line.

Tribes

Comanche Tribe of Oklahoma
Eight Northern Pueblos
Jicarilla Apache Nation
Pueblo of Jemez
Pueblo of Nambe
Pueblo of Picuris
Pueblo of Pojoaque
Pueblo of San Ildefonso
Pueblo of San Juan
Pueblo of Santa Clara
Pueblo of Taos
Pueblo of Tesuque
Pueblo of Zuni
The Hopi Tribe
The Navajo Nation
The Southern Ute Tribe
Ute Mountain Ute Tribe

Federal Agencies and Lawmakers

Advisory Council on Historic Preservation
U.S. Department of Agriculture, Office of Civil Rights
U.S. Department of Energy
U.S. Environmental Protection Agency
U.S. Department of Agriculture, Animal and Plant Health Inspection Service
U.S. Department of Agriculture, Forest Service

U.S. Army Engineer
U.S. Department of Interior, Bureau of Indian Affairs, Northern Pueblos Agency
U.S. Department of Interior - Bureau of Land Management
U.S. Department of Interior - Fish and Wildlife Service
U.S. Department of Interior - National Park Service
U.S. Department of Interior - Office of Environment
U.S. Housing and Urban Development
Office of U.S. Representative Tom Udall
Office of U.S. Senator Pete Domenici
Office of U.S. Senator Jeff Bingaman
Office of State Senator Carlos Cisneros

State Agencies and Local Governments

NM Department of Game and Fish
NM State Forestry
NM Environment Department
Rio Arriba County Planning Office
Taos County Manager
Taos County Planning Department

Libraries

Colorado State University Library
New Mexico State Library
National Agricultural Library

Organizations and Businesses

Albuquerque Journal
Amigos Bravos
Audubon Society
Bates Lumber Company
Biodiversity Legal Fund
Carson Forest Watch
Center for Biological Diversity, Phoenix, AZ
Center for Biological Diversity, Tuscon, AZ
Common Ground
Continental Divide Trail Society
Deertrack and Associates
ENSR Consulting and Engineering
Forest Guardians
Forest Conservation Council
Forest Trust
ICF Kaiser Engineering
J & R Partnership
Kit Carson Electric Cooperative
KDCE Radio
KKIT Radio
KKSS/KAFE Radio
KRZA Radio
KTAO Radio
Western Network
National Wildlife Federation
Native Forest Network
New Mexico Public Lands Council
Albrecht, Kathy
Amelan, Bjorn Guil
Anderson, Robert
Anderson, Agnes
Anderson, Steve
Archuleta, Jerry
Archuleta, Billy
Archuleta, Michael
Archuleta, Jose Manuel

NM Cattlegrowers Association
NM Environmental Law Center
NM Farm and Livestock Bureau
NMSU Cooperative Service
NM Wilderness Alliance
NM Wool Growers Association
Northern New Mexico Stockman's Association
Public Forestry Foundation
Rio Grande Forest Products
Rio Grande Sun
Santa Fe New Mexican
Sierra Club National Forest Campaign
Sierra Club - Santa Fe Group
Sierra Club -Rio Grande Chapter
Sipapu Ski Area
Sonoran Biological Diversity
SW Energy Institute
Taos County Chamber of Commerce
The Santa Fe New Mexican
Taos Outdoor Recreation Association
The Taos News
Tricon Timber Company
Valdez Land and Cattle Company
Western Environmental Law Center
Western Land Exchange Program
Western Network
Wild Watershed

Individuals

Austin, Jon

Bahn, Leslie
Bain, Cliff
Balen, Jo Ann
Barela, Mario
Barnard, Randy and Pearl
Barnes, Tom
Barrone, Dan

Barton, John and Polly	Dwye, Karen
Bell, Larry	
Benavides, Ray B.	Elliott, Christan
Bianco, Benjamin	Evans, Stephen
Bingham, Haven	
Bonneau, Bonnie	Feight, Rolland and Evelyn
Borket, Steve	Fernandez, Abran E.
Bougin, David	Fleming, Jock
Bradley, Carolyn and Sharon	Fournier, Nancy
Brown, Andrew	Fraiser, Doug
Brown, Patrika	Furman, David and Luann
Bull, Stephen	
	Gallegos, Frank
Camfield, David	Gallegos, Tony
Caster, John	Gibson, Jr., Bill and Beth
Chacon, Prudencio	Gonzales, Leroy and Dorothy
Chacon, Charlie	Goodin, Ben
Chavez, Roberto	Gray, Neil
Cisneros, Larry A.	Green, Cidney
Clemente, Francisco	Griego, Leo
Coker, Carol	Gronewold, Kevin
Coker, Carl	Grossman, George
Conklin, Donald	Gurule, Aurelio
Cordova, Max	Gurule, Manuel
Courrier, Suzanne	Gustin, Alice
Cozart, Barbara and Duke	
Cruz, Benjamin	Harris, Steve
Culloden, Ken	Hambrock, Mary and Dan
	Hawley, Richard
Deadwyker, Sr., Robert B.	Haynes, Parker
DeLise, Mica	Haynes, Tea
Denver, Butchie	Heister, Caral G.
DeVargas, Delbert	Helgeson, Courtney and Phil
DeVargas, Antonio	Henson, Clint
Diamond, Victoria	Herrera, Dan
Dinowitz, Barry	Hershiser, Mark
Doon, Ben	Hildner, Mike
Doyle, Kevin	Hillyard, John
Draney, Scott	Himes, James

Holmes, Edna	Lucero, Siby
Holzer, Thomas	Lucero, Elizabeth
Howard, Keith	Lujan, Isaac
Hughes, Rob and Barb	
Hughes, Robert	MacHolmes, Edna
Hurt, Elizabeth and Roger	Malachie, Robert
Hutton, Lauren	Marshall, William
	Martin, Greg
Jaramillo, Marvin	Martin, Suzanne
Jaramillo, Carlote	Martinez, Horacio
Jaramillo, Meloya	Martinez, Palemon A.
Johnson, Robert W.	Martinez, Mary
Johnson, Robert D.	Martinez, Erminio
Johnson, Terrell H.	Martinez, Pablo
Jones, William T.	McCallan, Norma
Jones, Lynn	McKinney, Tom
	Medina, Greg
Kalogeros-Chattan, George and Jane	Murray, James
Katz, William	Myers, Charlie
Keith, Kit	Mylet, Tim
Keller, Nancy and Artie	
Klingel, Jon	Nequin, Lynn
Knee, Dana	Newill, Jean and Pat
Knight, Billy	Nottingham, Jack and Phyllis
Konie, Vicki	Nunneley, Dick and Judy
Kuhlman-Hambrock, Mary	
Kuykendall, Gene	O'Brien, Lisa
	Olds, Melissa
Lackey, Joanna	Orr, W. Donald
Lamb, Wendy	Ortega, Carlos
Lawrence, Bob	Ortega, Leon
Leherissey, Tanya	Ortega, Jimmy J.
Lewis, Aaron	Ortega, Augustina
Lewis, Al	Ortiz, Veronica
Libman, Elliot	
Lisko, Paul and Susan	Pacheco, Michael
Logue, Bob	Page, William D.
Lord, Andrew	Pasaka, Louise
Love, Richard and Judy	Peralta, Frederick

Peterson, Roger
Phillips, Suzanne

Rhea, Barry
Richerson, David
Rivera, Macario
Rodarte, Art
Romero, Gabriel J.
Romero, Barbara
Romero, Ernest
Romero, Floyd J.
Rubin, Howard A.

Samora, Sandra
Sanchez, Ben
Sandoval, Andrew
Santistevan, Orlando
Schiller, Mark
Schneberger, Laura
Schofield, Randy
Schwartz, Ira and Lorraine
Segura, Gilbert
Shepard, Sheila
Spies, C. G.
Stewart, Bob
Stoer, John
Stone, Joy W.
Stone, Jay
Sugarman, Steve
Syrjala, Edward

Taylor, Sam and Connie
Temple, Larry
Valdez, Floyd
Valdez, Arturo
Vallejos, Jim
Van Balen, JoAn
Van Veersen, Marilyn
Velarde, Rudy
Velhagen, Edward H.
Vigil, Gary
Vigil, Patrick
Vigil, Jose
Vigil, Jake M.
Vigil, Eric

Walters, Ray
Wardell, Gwen
Werkmeister, Mark
White, Courtney
Williams, Callie
Williams, Shanon
Wimett, Nicholas
Wolff, Terry and Linda
Woods, Jack and Donna
Woods, Roy L.
Wright, S. J.

Yellen, Arthur
Young, Karen

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Glossary

A

Allocation — The assignment of a land area to a particular use or uses to achieve management goals and objectives.

Alternating Current (AC) — Electric current that reverses direction, usually many times per second. Through common expression, the term refers to a wave form that provides for efficient transmission of electrical energy over long distances.

Antiquities — A general term for archaeological or paleontological resources which are at least 100 years of age and which tangibly represent or have the potential to yield information on historical or prehistoric cultures or extinct plants and animals.

Area of Critical Environmental Concern (ACEC) — A geographical area within lands administered by the Bureau of Land Management that require special measure to protect sensitive resources such as scenic, cultural or wildlife resource values.

B

Background — The viewing area of a distance zone that lies beyond the foreground-middle ground. Usually from a minimum of 3 to 5 miles to a maximum of about 15 miles from a travel route, use area, or other observer position. Atmospheric conditions in some areas may limit the maximum to about 8 miles or increase it beyond 15 miles.

Best Management Practice (BMP) — Application of the best available demonstrated control, technology, processes, measures and operating methods that are socially, economically, and technically feasible for controlling soil loss or improving water quality.

Big game — Species of wildlife such as deer and elk that are managed for hunting.

Biological soil crusts — Soil crust formed by living organisms and their byproducts creating a crust of soil particles bound together by organic materials. Often found in arid regions where the vegetative cover is sparse. Also known as cryptogam.

Biotic — Pertaining to life and living organisms.

C

Canopy — The more or less continuous cover of branches and foliage formed collectively by the crown of adjacent trees and other woody growth.

Capability — The maximum load which a generating unit station transmission system or other electrical apparatus can carry under special conditions per a given period of time without exceeding approved limits of temperature and stress.

Capacitor — A device that stores electrical charges and can be used to maintain voltage levels in power lines and improve electrical system efficiency.

Carson Forest Plan — The land and resource management plan developed to meet the requirements of the National Forest Management Act of 1976, as amended, that guides all

resource management activities and establishes management standards and guidelines for the Carson National Forest.

Carson National Forest — Lands within the boundaries administered by the USDA Forest Service in northern New Mexico.

CFR — Code of Federal Regulations, the compilation of Federal regulations adopted by Federal agencies through a rule-making process.

Characteristic landscape — The established landscape within an area being viewed. The term does not necessarily mean a naturalistic character, but may refer to features of the cultural landscape, such as a farming community, an urban landscape or other landscape that has an identifiable character.

Closure — See *Road closure*.

Conductor — A thing or substance that conducts electricity. In the case of power lines, copper, aluminum, or aluminum/steel combination wires encased in a protective sheath or left bare. Size and construction of the conductor determine the amount of current that can be transported.

Contrast — The effect of a striking difference in the form, line, color, or texture of the landscape.

Cooperating agency — Another agency, Federal, state or local, which has jurisdiction over portions of the project area that must make a decision on the proposed project. In the case of the Ojo Caliente proposed transmission line project, the Bureau of Land Management is a cooperating agency.

Cryptogam — See *Biological soil crusts*.

Cultural resources — The physical remains (artifacts, ruins, burial mounds, carvings, etc.) that represent former human cultures.

Cumulative effects — The impact on the environment which results from the incremental effect of the proposed action, when added to other past, present, and reasonably foreseeable future actions, regardless of who undertakes such actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time.

Current — The flow or rate of flow of electric force in a conductor, from a point of higher potential to one of lower potential.

D

Demographic — Pertaining to the study of human population characteristics including size, growth rates, density, distribution, migration, birth rates and mortality rates.

Desired condition — The preferred condition of the landscape and resources based upon input from the public, Forest Service specialists and the Carson National Forest Plan.

Disconnect — A switch used to deenergize a power line prior to repairs being made, basically an on and off switch.

Dispersed recreation — A general term referring to recreation use outside the developed recreation site; this includes activities such as scenic driving, hunting, backpacking and recreation in primitive environments.

Distribution line — A power line designed to carry lower voltage from a substation to the consumers. A distribution line generally transmits an electric current of 25 kV (25,000) or less. Common distribution lines are 12.5 kV (12,500 volts) attached to a single pole and 25 kV (25,000 volts) attached to a cross member on a single pole. See *Transmission line*.

Disturbed area — Area where natural vegetation and soils have been removed or disrupted.

Diversity — The distribution and abundance of different plant and animal communities and species within the area covered by a land and resource management plan (Carson National Forest Plan).

Drainage — Natural channel through which water flows or may flow during a period of the year.

E

Effects — Environmental consequences as a result of a proposed or alternative action. Included are direct effects, which are caused by the action and occur at the same time and place, and indirect effects, which are caused by the action and are later in time or further removed in distance, but which are still reasonably foreseeable. Also referred to as impacts.

Electric and magnetic fields (EMF) — Invisible lines of force produced by voltage and current that surround any electrical device or electrical power line.

Electric field — Field produced by voltage in a conductor and increases in strength as the voltage increases. Field strength is measured in units of volts per meter (V/m). The field strength decreases as the distance from the source increases.

Endangered species — Any species of animal or plant which is in danger of extinction throughout all or significant portions of its range and has been designated “endangered” in the Federal Register by the Secretary of the Interior. The Endangered Species Act of 1973, as amended, prohibits adverse modification to critical habitat of endangered species.

Environmental Impact Statement (EIS) — An environmental document that discloses the environmental effects of the No Action Alternative and other action alternatives.

Environmental Justice — Executive Order 12898 (February 11, 1994) mandates Federal agencies to identify and address disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations.

Ephemeral drainage — A drainage area or a stream that has no base flow. Water flows for a short time but only in direct response to adequate rainfall or snowmelt events.

Erosion — The processes whereby earthy or rocky material is worn away, loosened, dissolved and relocated from any part of the earth’s surface to another.

Escarpment — An inland cliff or steep slope, formed by the erosion of inclined strata of hard rocks, or possibly as a direct result of a fault.

F

Federally listed species — See *Listed species*.

Fiber optics — A cable containing thin tubes permitting the exchange of electronic information for controlling substation activities from a remote point.

Fisheries — Streams and lakes used for fishing.

Fisheries habitat — Streams, lakes and reservoirs that support fish.

Flood plain — That portion of a river valley, adjacent to the channel, which is built of recently deposited sediments and is covered with water when the river overflows its banks at flood stages.

Forage — Vegetation used for food by wildlife, particularly big game wildlife and domestic livestock.

Foreground-middle ground — The area visible from a travel route, use area, or other observer position to a distance of 3 to 5 miles. The outer boundary of this zone is defined as the point where the texture and form of individual plants are no longer apparent in the landscape and vegetation is apparent only in pattern or outline.

Forest structure — The horizontal and vertical arrangement of trees and tree sizes.

G

Game species — Animals commonly hunted for food or sport.

H

Habitat — The place or type of site where a plant or animal naturally or normally lives and grows. Includes all biotic, climatic, and soils conditions, or other environmental influences affecting living conditions.

Habitat diversity — The distribution and abundance of different plant and animal communities and species within a specific area.

Herbaceous — The plant strata that contain soft, not woody, stemmed plants that die to the ground in winter.

I

Indirect effects — As defined by 40 CFR 1508.8, these are effects which are caused by the action but occur later in time or are removed in distance from the action, but are still reasonably foreseeable. This term is synonymous with indirect impacts.

Interdisciplinary team (IDT) — A team composed of specialists in different disciplines. An interdisciplinary team is assembled because no single scientific discipline is sufficient to

adequately identify and resolve issues and problems. Team member interaction provides necessary insight to all stages of the assessment.

Intermittent stream — A stream which flows only at certain times of the year when it receives water from alluvial ground water, springs or from some surface source such as melting snow in mountainous areas.

Issue — An unresolved point of discussion, debate, or dispute about the environmental effects of the proposed action.

Irretrievable — Applies to the loss of production, harvest or use of natural resources. For example, some or all of the timber production from an area is lost irretrievably while an area is serving as a winter sports site. The production lost is irretrievable, but the action is not irreversible. If the use changes, it is possible to resume timber production.

Irreversible — Applies primarily to the use of nonrenewable resources, such as minerals or cultural resources, or to those factors that are renewable only over long time spans, such as soil productivity and aspen regeneration. Irreversible also includes loss of future options.

J

K

Key Observation Point (KOP) — Critical viewpoint that is usually along commonly traveled routes or at other likely observation overlooks.

Kilovolt (kV) — Measure of voltage carried by a power line or conductor. One kV is equal to 1000 volts.

L

Landform — Any physical, recognizable form or feature of the earth's surface, having a characteristic shape and produced by natural causes. Includes major features such as plains, plateaus, and mountains, and minor features such as hills, valleys, slopes, canyons, arroyos and alluvial fans.

Landscape character — The arrangement of a particular landscape as formed by the variety and intensity of the landscape features as defined as the four basic elements (form, line, color, and texture). These factors give the area a distinctive quality that distinguishes it from its immediate surroundings.

Line — The conductors placed between the poles on a distribution or transmission line. May be used as short hand to describe the complete power transporting poles and conductors on the poles.

Listed species — Any species which occurs on a state or Federal (as specified in context) threatened or endangered species list.

Lithic scatter — Is a surface scatter of cultural artifacts and debris that consists entirely of lithic (i.e., stone) tools and chipped stone debris. This is a common prehistoric site type that is contrasted to a cultural material scatter, which contains other or additional artifact types such as

pottery or bone artifacts, to a camp which contains habitation features, such as hearths, storage features or occupation features, or to other site types that contain different artifacts or features.

Load — The amount of electric power drawn at a specific time from an electric system or the total power drawn from the system.

Locus — Is a discrete place or physical location generally used in describing the qualities of a site. When the term is used in contrast to a site, it refers to a locality containing the traces of a brief, limited or transient cultural activity.

Long-term effects — Long-term effects are effects that would remain following completion of the project. As an example, the loss of vegetation from the development of an open pit would be a long-term effect if the pit were not reclaimed and vegetation not reestablished at the end of the project.

Losses — The general term applied to energy and power lost in the operation of an electric system. Losses occur principally as energy transformations from kilowatt-hours to waste heat in electrical conductors and apparatus.

M

Magnetic field — Field produced from the flow of current through conductors and increases in strength as the current increases. Magnetic field is measured in units of gauss (G) or tesla (T) (1 T equals 10,000 gauss). The field strength decreases as the distance from the source increases.

Management area — An area composed of aggregate pieces of land (generally several to many analysis areas) to which a given management objective and prescriptions are applied.

Management direction — A statement of multiple use and other goals and objectives along with the associated management prescriptions and standards and guidelines included in a forest plan to direct resource management.

Management indicator species (MIS) — An indicator species designated in the Carson National Forest Plan to represent other groups of species.

Milligauss — A measurement of electrical current (mg).

Mitigation — Measures designed to reduce or prevent undesirable effects. Mitigation can be used to avoid, minimize, reduce, eliminate, or rectify the impact of a management practice.

Mitigate — To lessen the severity of an impact to a resource.

N

National Forest Management Act (NFMA) — A law passed in 1976 that amends the Forest and Rangeland Renewable Resources Planning Act and requires the preparation of forest plans.

National Register of Historic Places — A list (maintained by the National Park Service) of areas designated as being of historical significance. The register includes place of local and state significance as well as those of value to the Nation.

Neotropical migratory birds — Birds that breed north of, and winter south of, the Tropic of Cancer. However, from a biological perspective there are vast variations in migration between species and, for the most part, wildlife reports on migratory birds included species that migrate south of the United States for winter. Many of the common songbirds are neotropical migrants.

NEPA — The National Environmental Policy Act of 1969 is the national charter for protection of the environment by Federal agencies. NEPA establishes policy and provides a process for carrying out the policy. Regulations at 40 CFR 1500-1508 implement the act.

Net present value — Total discounted revenue (referred to as “present value of revenues”) less total discounted costs (referred to as “present value of costs”). This method is one of the better financial measures of an investment. The higher the net present value, the more desirable the investment from an economic standpoint. A negative net present value represents the fact that costs were higher than revenue and the investment may not seem desirable in an economic sense.

No Action Alternative — The most likely condition expected to exist in the future if current management direction would continue unchanged.

Nonspecular — Conductors used in distribution and transmission lines which do not reflect light sources. Nonspecular conductors are less visible from a distance.

Noxious weeds — An alien, introduced or exotic undesirable species that is aggressive and overly competitive with more desirable native species.

O

Overstory — The uppermost canopy (treetops) in a stand of trees.

P

Passerine — A taxonomic order that includes perching birds and songbirds.

Perennial — A plant whose life cycle lasts longer than 2 years. The tops of herbaceous perennials die down at the end of the growing season, buds, roots, and underground portions persist. Can also refer to a perennial stream, which has water flowing in it year-round.

Poles — Vertical shaft, wood or metal, and usually rounded used to hold fixtures to which conductors are attached.

Power line — A distribution or transmission line used to distribute electric power from the generation point.

Preferred alternative — The alternative(s) recommended for implementation based on the evaluation completed in the planning process.

Q

R

Range — Land producing native forage for animal consumption and lands that are revegetated naturally or artificially to provide forage cover that is managed like native vegetation, which are amenable to certain range management principles or practices.

Ranger District — Administrative subdivisions of the forest supervised by a district ranger who reports to the forest supervisor.

Raptor — A bird of prey with sharp talons and strongly curved beaks that preys on living animals (e.g., eagles, hawks, falcons, and owls). Their relatively large size makes them vulnerable to electrocution on power lines without devices designed to protect them.

Reclamation — The process of restoring disturbed areas using any of several methods: recontouring, spreading topsoil or growth medium, seeding, and planting, among others.

Record of Decision (ROD) — A document required by NEPA that is separate from, but associated with, an environmental impact statement. The ROD publicly and officially discloses the responsible official's decision on which alternative assessed in the EIS will be implemented.

Recreation Opportunity Spectrum (ROS) — A system of measuring the land's ability to meet the expectations of recreation users. Six recreation categories, from primitive (natural) to urban (highly modified) describe the activities, settings and experiences an area offers. The following categories may be found in or near the analysis area:

Rural — an area characterized by the sights and sounds of rural residential and agricultural land uses. The interaction between users is often moderate to high.

Roaded Natural — a road corridor with a landscape that is characterized as natural or natural appearing. The road has moderate to high use.

Semiprimitive Motorized — a natural area predominantly unmodified by man. There are opportunities for isolation from the sights and sounds of man, but occasional evidence of other area users.

Region 3 — A Forest Service organizational unit—the Southwestern Region—consisting of all national forests in New Mexico and Arizona, plus four national grasslands in Texas, Oklahoma, and New Mexico.

Reliability — Electric system reliability consists of two components—adequacy and security. Adequacy is the ability of the electric system to supply the total electrical demand and energy requirements of the customers at all times taking into account scheduled and unscheduled outages. Security is the ability of the electric system to withstand sudden disturbances such as electric short circuits or unanticipated loss of system facilities.

Right-of-way (ROW) — An accurately located strip of land with defined width, point of beginning, and point of ending. It is the area within which the user has authority to conduct

operations approved or granted by the landowner in an authorizing document, such as a permit, easement, lease, license or memorandum of understanding.

Riparian — Lands that are directly influenced by water. They usually have visible or physical characteristics showing water influence. Streambanks, lake borders, or marshes are typical riparian areas.

S

Scatter (archeological) — Random evidence of prior disturbance that is distributed about an area rather than concentrated in a single location.

Scoping — An early and open process for determining the scope of issues to be addressed, and for identifying the significant issues related to a proposed action. Scoping is a requirement under the implementing regulations of NEPA (40 CFR 1501.7).

Sensitive species — Those species of plants or animals that have been recognized and listed by the Regional Forester as “sensitive” meaning that they may need special management to prevent their being placed on Federal or state lists.

Sensitivity Level — A particular degree or measure of viewer interest in the scenic qualities of the landscape.

Sensitivity Level 1 — The highest sensitivity level, referring to areas seen from travel routes and use areas with moderate to high use.

Sensitivity Level 2 — An average sensitivity level, referring to areas seen from travel routes and use areas with low to moderate use.

Sensitivity Level 3 — The lowest sensitivity level, referring to areas seen from travel routes and use with low use.

Specular — Conductors used in distribution and transmission lines that reflect light sources. These are opposed to nonspecular conductors.

Substation — An electrical branch station where electric power from a transmission line is either boosted to continue on a transmission line or reduced in voltage and spread to several distribution lines.

T

Taos Field Office — A subdivision of the Bureau of Land Management managing resources in a large portion of northern New Mexico (once called Taos Resource Area).

Temporary road — An unspecified road needed for short-term use during the construction of a power line.

Terrestrial Ecosystem Survey (TES) — A systematic inventory based on the concept that within the landscape there are naturally occurring ecosystems with unique sets of properties. These terrestrial ecosystems form a continuum and can be recognized at different levels in classification systems. The soils component of the ecosystem is inventoried through the use of “Soil

Taxonomy,” USDA Soil Conservation Service Handbook 436, and the “Terrestrial Ecosystem Vados and Phreatic Survey Procedure,” a Forest Service handbook. The vegetation component of the ecosystem is inventoried through the use of the International Classification and Mapping of Vegetation, UNESCO, and the above-mentioned Forest Service handbook. The terrestrial ecosystem inventory is sometimes referred to as “soil survey.”

Terrestrial Ecosystem Unit (TEU) — A TEU identifies one of numerous map units composing the Terrestrial Ecosystem Survey.

Threatened species — Those plant or animal species identified by the Secretary of Interior as threatened in accordance with the Endangered Species Act of 1973.

Tolerance, Soil Loss — The maximum rate of soil loss that can occur while sustaining inherent site productivity.

Two-track — An undesigned path created by forest users following the tracks of (road or off-road) vehicles of other forest users. A two-track may develop to 10 feet in width.

Traditional Cultural Property (TCP) — Land area used by Indian tribes or other groups for activities that are tied to their culture background. This may include plant collection and material collection areas.

Transformer — Electromagnetic device for changing the voltage of alternating current electricity.

Transmission line — Power line used to efficiently carry electric current long distances from a power generation source to a substation. These lines carry higher voltages. Some common transmissions lines in northern New Mexico are 69 kV, 115 kV and 345 kV lines. See *Distribution line*.

Tri-State/Tri-State Generation and Transmission Association — A public utility company that generates electrical power, purchases electrical power, and transmits the electrical power to member electrical cooperatives such as Kit Carson Electric Cooperative.

U

Underbuild/underbuilt — A wooden cross member placed on the same power pole to carry a distribution line below a transmission line.

Understory — The trees and other woody species growing under a more-or-less continuous cover of branches and foliage formed collectively by the upper portion of adjacent trees and other woody growth. May also refer to herbaceous vegetation under a stand of trees.

V

Variety class — A particular level of visual variety or diversity of landscape character. There are three variety classes: A, B and C.

Variety Class A — distinctive

Variety Class B — common

Variety Class C — minimal

Vegetation — All of the plants growing in and characterizing a specific area or region; the combination of different plant communities found there.

Visual resource — The composite of basic terrain, geologic features, water features, vegetation patterns, and land use effects that typify a land unit and influence the visual appeal the unit may have for viewers.

Visual Resource Management System — The BLM system for evaluating and classifying visual resources. The system uses line, form, color, texture, scale and space to categorize lands into one of four classes:

Class I — Preservation

Class II — Retention

Class III — Partial Retention

Class IV — Modification

Visual Quality Objectives (VQO) — Degree of acceptable alterations of the characteristic landscape based on users' expectations and visual perceptions.

Volt — The unit of electromotive force that will cause a current to flow in a conductor.

W

Wildlife — All undomesticated mammals, birds, reptiles, amphibians and insects living in a natural environment. Animals or their progeny that were once domesticated but escaped captivity and are running wild (i.e. feral animals) such as horses, burros and hogs are not considered wildlife.

X**Y****Z**

Appendix – Project Record Index

PR No.	Date	Author	Author Affiliation	Recipient	Recipient Affiliation	Doc Type	Description or Title
1	80.06.03	Gonzales, Stella	BLM			Ease-ment	Easement for Right-of-Way for Electrical Power Transmission Line across Public Lands [Ojo to Taos Transmission Project]
2	86.01.01	U.S. Government					36 CFR 251 Regulations
3	86.10.31	Carson NF	USDA FS			EIS	EIS for the Carson National Forest Land and Resource Management Plan
4	86.10.31	Carson NF	USDA FS			ROD	ROD for EIS for the Carson National Forest Land and Resource Management Plan
5	86.10.31	USDA FS	Carson NF			Forest Plan	Carson Forest Land and Resource Management Plan as Amended
6	87.08.01		USDA FS			Inven-tory	Terrestrial Ecosystems Survey of the Carson National Forest
7	88.10.01	BLM	BLM			Report	Taos Resource Management Plan, October 1988.
8	90.06.27	Chavez, M. J.	BLM			Report	A cultural resource management plan for the Ojo Caliente ACEC, Albuquerque District, Taos Resource Area, June 1990
9	92.08.10		USDA FS			Direc-tive	Soil and Water Conservation Practices Handbook, R3 Supplement 2500-92-1, effective 8/10/92.
9.1	94.01.01	APLIC				WL Report	Mitigating Bird Collisions With Power Lines State of the Art in

Appendix. Project Record Index

PR No.	Date	Author	Author Affiliation	Recipient	Recipient Affiliation	Doc Type	Description or Title
							1994
10	96.01.01	APLIC				WL Report	Suggested Practices for Raptor Protection of Power Lines, the State of the Art in 1996. Avian Power Line Interaction Committee (APLIC)
11	97.09.02	County of Taos, NM	Taos County Planning Department			Ordinance	County of Taos, NM, Ordinance 1997-4, Land Use Regulations.
12	98.06.09	Hanson, Brian	USFWS	Cisneros, Larry	KCEC	Letter	In response to KCEC request (5/1/98) for USFWS comments concerning fish and wildlife and their habitats within the project area.
13	98.08.05	Suedkamp, Bob	USDA FS	Files		Memo	Meeting with Larry Cisneros, SGC Witter and Forest Service on KCEC project work plan. Told them they need to do the NEPA.
14	99.04.01		KCEC		Carson NF	Map	Initial proposal for tapping the Ojo Caliente upgrade presented by KCEC.
15	99.04.05					Memo	List of things to do to get ready for 4/6/99 meeting with Kit Carson
16	99.04.06	Churchill, Sher	USDA FS			Meeting Notes	Discussion with Kit Carson on planning process, proposed action development, initial concerns,

PR No.	Date	Author	Author Affiliation	Recipient	Recipient Affiliation	Doc Type	Description or Title
							responsibilities.
17	99.04.07	Churchill, Sher	USDA FS			Field Notes	Preliminary field review of types of lines, etc. in area.
17.1	99.05.04	NIEHS				EMF Report	Health effects to exposure to power line EMF.
17.2	99.05.18	SGS Witter, Inc.	KCEC			Plan	Kit Carson Cooperative 4 Year Construction Work Plan 1999-2002/selected excerpts.
18	99.07.21	Churchill, Sher	USDA FS			Meeting Notes	Discussion on planning process, public participation, tribal consultation, landowners, purpose and need from Kit Carson, need Ojo map.
19	99.09.17	Churchill, Sher	USDA FS			Meeting Notes	Briefing with Larry Cisneros, KCEC, regarding timeframes, field trips, etc.
20	99.09.21	Churchill, Sher	USDA FS			Meeting Notes	Discussing types of lines, substations, locations, etc.
21	99.09.23	Churchill, Sher	USDA FS			Field Notes	Viewed area, located potentially better takeoff point, need landscape architect review.
22	99.09.28	Churchill, Sher	USDA FS			Meeting Notes	Preliminary discussion with Bill Larson, Regional Landscape Architect.
23	99.10.01		KCEC			Memo	Ojo Caliente Transmission Line and Substation [preliminary information from Kit

Appendix. Project Record Index

PR No.	Date	Author	Author Affiliation	Recipient	Recipient Affiliation	Doc Type	Description or Title
							Carson].
24	99.10.07	Churchill, Sher	USDA FS	Cisneros, Larry	KCEC	Letter	Transmitting maps indicating preliminary proposed route from take-off point to tie-in point; need their agreement soon. [maps not attached]
25	99.10.22	Corral, Patricia	USDA FS	Moquino, Antonio	San Juan Pueblo	Letter	Initiates preliminary consultation with San Juan Pueblo.
26	99.10.22	Corral, Patricia	USDA FS	Dasheno, Walter	Santa Clara Pueblo	Letter	Initiates preliminary consultation with Santa Clara Pueblo.
27	99.10.22	Corral, Patricia	USDA FS	Aguilar, Terry	San Ildefonso Pueblo	Letter	Initiates preliminary consultation with San Ildefonso Pueblo.
28	99.10.29	Corral, Patricia	USDA FS	Perez, David	Nambe Pueblo	Letter	Initiates preliminary consultation with Nambe Pueblo.
29	99.10.29	Corral, Patricia	USDA FS	Viarrial, Jacob	Pojoaque Pueblo	Letter	Initiates preliminary consultation with Pojoaque Pueblo.
30	99.10.29	Corral, Patricia	USDA FS	Herrera, Milton	Tesuque Pueblo	Letter	Initiates preliminary consultation with Tesuque Pueblo.
31	99.11.04	Churchill, Sher	USDA FS			Field Notes	With Corral, walked existing power line, potential routes, etc. Discovered various remains, a camp, etc. Visual and cultural impacts need to be considered.
32	99.11.09	Churchill, Sher	USDA FS			Meeting Notes	Briefing with Gilbert Vigil and Patricia Corral on status of process, consultation

PR No.	Date	Author	Author Affiliation	Recipient	Recipient Affiliation	Doc Type	Description or Title
							with Navajo and Hopi.
33	99.11.10	Churchill, Sher	USDA FS			Memo	Discussion with Larry regarding contacts and notification of public and substation specs.
34	99.11.16	Corral, Patricia	USDA FS			Memo	Followup telephone conversation with Myron Gonzales, Cultural Preservation Officer, San Ildefonso Pueblo, answering questions regarding location, tree cuts, archaeology surveys, future involvement, etc.
35	99.12.01	Corral, Patricia	USDA FS			Memo	Notes to file regarding Tribal Consultation Strategy in light of Section 106 revision, team will do extensive consultation.
36	99.12.07	Corral, Patricia	USDA FS	Moquino, Antonio	San Juan Pueblo	Letter	Overview of field trip with Herman Agoyo, Cultural Preservation Officer, on the Ojo Caliente routes and possible cultural effects.
37	99.12.17	Dasheno, Walter	Santa Clara Pueblo	Corral, Patricia	USDA FS	Letter	Response to 10/22/1999 letter initiating consultation expressing concern over possible archaeological sites. Would like copies of all archaeological clearance reports and surveys.

Appendix. Project Record Index

PR No.	Date	Author	Author Affiliation	Recipient	Recipient Affiliation	Doc Type	Description or Title
38	99.12.17	Corral, Patricia	USDA FS			Memo	Telephone conversation with Herman Agoyo, San Juan Pueblo. He had not briefed tribal council yet on their field trip, but said it was okay to send out proposed action.
39	99.12.30	Churchill, Sher	USDA FS			Meeting Notes	Discussion with Larry Cisneros on public outreach, GPS needs, possible propane operation, future meetings.
40	00.01.01	BLM	BLM			Report	The Rio Grande Corridor Final Plan, January 2000.
41	00.01.03	Vigil, Gilbert	USDA FS	Gutierrez, Denny	Santa Clara Pueblo	Letter	Mailed 11 archaeological survey reports directly to Alvin Warren to cut down on paperwork.
42	00.01.04	Corral, Patricia	USDA FS			Memo	Telephone conversation with Nambe Pueblo to followup on 10/29/1999 letter; Mr. Yates no longer worked there; talked to Councilman Ernest Mirabal, tribe's NAGPRA representative.
43	00.01.04	Corral, Patricia	USDA FS			Fax	Fax transmittal to Tesuque Pueblo of 10/29/1999 letter and map.
44	00.01.06	Corral, Patricia	USDA FS			Meeting Notes	Discussion on proposals and further needs among Larry

PR No.	Date	Author	Author Affiliation	Recipient	Recipient Affiliation	Doc Type	Description or Title
							Cisneros and team; need to meet with Picuris and Taos Pueblos.
45	00.01.12	Vigil, Gilbert	USDA FS	Bird, John	San Juan Pueblo	Letter	Concern over changes in tribal representative may affect continuity of consultation.
46	00.01.14	Corral, Patricia	USDA FS			Memo	Telephone conversation with Ernest Mirabal, Nambe Pueblo, regarding consultation, archaeology reports, etc.
47	00.01.14	Corral, Patricia	USDA FS			Memo	Telephone conversation with Myron Gonzales, San Ildefonso Pueblo, regarding his review of archaeological reports.
48	00.01.24	Corral, Patricia	USDA FS	Moquino, Gary	Tesuque Pueblo	Fax	Fax transmittal to Tesuque Pueblo of 10/29/1999 letter and map.
49	00.01.28	Churchill, Sher	USDA FS			Meeting Notes	BLM positive to alternative using existing corridor, mitigate for original line not incorporated into project; possible alternative out of ACEC.
50	00.01.31	Vigil, Gilbert	USDA FS	Martinez, Perry	San Ildefonso Pueblo	Letter	Requesting a letter detailing Mr. Gonzales' initial input into proposal, and expressing concern over change in tribal officers and effect on continuity.

Appendix. Project Record Index

PR No.	Date	Author	Author Affiliation	Recipient	Recipient Affiliation	Doc Type	Description or Title
51	00.01.31	Vigil, Gilbert	USDA FS	Perez, David	Nambe Pueblo	Letter	Requesting a letter detailing Mr. Mirabal's initial input into proposal, and expressing concern over change in tribal officers and effect on continuity.
52	00.02.02	Churchill, Sher	USDA FS			Meeting Notes	Discussion with KCEC, BLM and FS regarding ROW, etc.
53	00.02.04	Churchill, Sher	USDA FS			Field Notes	Discussion and field trip with Gilbert Gutierrez and Fidel Naranjo of Santa Clara Pueblo regarding archaeological sites and their involvement, pole height and safety, alternative development process.
54	00.02.09	Churchill, Sher	USDA FS			Memo	Briefing of proposal status, consultation efforts, issues, and process.
55	00.02.15	Vigil, Gilbert	USDA FS	Viarrial, Jacob	Pojoaque Pueblo	Letter	Documenting field trip with Charlie Tapia, Pojoaque Pueblo Warchief and his wife Francis, their issues of archaeological sites and protection, and our request for letter detailing input in proposal.
56	00.02.15	Vigil, Gilbert	USDA FS	Gutierrez, Denny	Santa Clara Pueblo	Letter	Describing issues identified and suggestions made during 2/4/2000 field trip: protecting

PR No.	Date	Author	Author Affiliation	Recipient	Recipient Affiliation	Doc Type	Description or Title
							archaeological sites, raptor protection, and health effects from electromagnetic fields, pole placement.
57	00.02.15	Vigil, Gilbert	USDA FS	Tapia, Charlie	Pojoaque Pueblo	Letter	Documenting field trip with Charlie Tapia, Pojoaque Pueblo Warchief and his wife Francis, their issues of archaeological sites and protection, and our request for letter detailing their input.
58	00.02.15	Corral, Patricia	USDA FS	Vigil, Gilbert	Tesuque Pueblo	Letter	Documenting attempts to speak with Gary Moquino, Cultural Preservation Officer for Tesuque Pueblo, and desire for consultation.[letter addressed to Gilbert Vigil in error?]
59	00.02.18	Vigil, Gilbert	USDA FS	Gutierrez, Denny	Santa Clara Pueblo	Letter	He left out discussion of possible alternative in existing corridor in the 2/15/2000 letter; it will be analyzed.
60	00.02.24	Kuykendall, Ben	USDA FS/KCE C			Map	Ojo Caliente Proposed Action map.
61	00.03.07	Churchill, Sher	USDA FS			Meeting Notes	Public Release Strategy: who's doing what, when?

Appendix. Project Record Index

PR No.	Date	Author	Author Affiliation	Recipient	Recipient Affiliation	Doc Type	Description or Title
62	00.03.08	Corral, Patricia	USDA FS			Meeting Notes	Public Release Strategy Meeting; mail out proposed action with KCEC Enchantment Magazine in April (about 20,000 subscribers).
63	00.03.16	Gutierrez, Denny	Santa Clara Pueblo	Vigil, Gilbert	USDA FS	Letter	Documenting Gilbert Gutierrez's and Fidel Naranjo's 2/4/2000 visit to Ojo area and their concerns about archaeological sites and raptor protection.
64	00.03.24	Reyes, Luis A.	KCEC	Vigil, Gilbert	USDA FS	Letter	Describing Ojo Caliente and Peñasco proposed actions.
65	00.03.25	Kit Carson Electric Co-op	KCEC			Proposed Action	Supplement to April 2000 "Enchantment," v.52, no. 54: Kit Carson Electric Cooperative Proposes Two New Transmission Lines [proposed action].
66	00.03.31	Corral, Patricia	USDA FS			Memo	Telephone conversation with Herman Agoyo, Acting Cultural Preservation Officer from San Juan Pueblo about Corral not receiving his update to Tribal Council. He said they had no concerns and he would send her brief letter detailing Council's input.
67	00.04.01	Carson Planning	USDA FS	Kuykendall, Ben, et al.	USDA FS	SOPA	April 2000 Schedule of Proposed Actions for the Carson National Forest, plus SOPA

PR No.	Date	Author	Author Affiliation	Recipient	Recipient Affiliation	Doc Type	Description or Title
							mailing list, for their use in project records.
68	00.04.01	Vigil, Gilbert	USDA FS	Wauqua, Johnny	Comanche Tribe of Oklahoma	Letter	Initiates consultation with Comanche Tribe of Oklahoma on Ojo power line proposal, requesting their input. Releasing proposed action.
69	00.04.01	Vigil, Gilbert	USDA FS	Kuwaninwisima, Leigh	Hopi Tribe	Letter	Initiates consultation with the Hopi Tribe. Releasing proposed action. Mailed again on 5/25/2000.
70	00.04.01	Vigil, Gilbert	USDA FS	Gachupin, Raymond	Jemez Pueblo	Letter	Initiates consultation with Jemez Pueblo on Ojo power line proposal, requesting their input. Releasing proposed action.
71	00.04.01	Vigil, Gilbert	USDA FS	Vicenti, Rodger	Jicarilla Apache Tribe	Letter	Initiates consultation with Jicarilla Apache Tribe on Ojo power line proposal, requesting their input. Releasing proposed action.
72	00.04.01	Vigil, Gilbert	USDA FS	Perez, David	Nambe Pueblo	Letter	Documenting our response to consultation with NAGPRA Representative Ernest Mirabal and his concern about archaeological sites. Releasing proposed action.
73	00.04.01	Vigil, Gilbert	USDA FS	Begay, Kelsey	Navajo Nation	Letter	Initiates consultation with Navajo Nation on Ojo power line

Appendix. Project Record Index

PR No.	Date	Author	Author Affiliation	Recipient	Recipient Affiliation	Doc Type	Description or Title
							proposal, requesting their input. Releasing proposed action.
74	00.04.01	Vigil, Gilbert	USDA FS	Rael, Red Eagle	Picuris Pueblo	Letter	Documenting our response to consultation with Richard Mermejo and his concerns [mainly Peñasco]. Releasing proposed action.
75	00.04.01	Vigil, Gilbert	USDA FS	Viarral, Jacob	Pojoaque Pueblo	Letter	Documenting our response to consultation with Warchief Tapia and his concerns about archaeological sites and human remains. Releasing proposed action.
76	00.04.01	Vigil, Gilbert	USDA FS	Tapia, Charlie	Pojoaque Pueblo	Letter	Documenting our response to consultation with Warchief Tapia and his concerns about archaeological sites and human remains. Releasing proposed action.
77	00.04.01	Vigil, Gilbert	USDA FS	Martinez, Perry	San Ildefonso Pueblo	Letter	Documenting our response to consultation with Cultural Preservation Officer Myron Gonzalez and his concerns about archaeological sites; Mr. Gonzalez would also defer to the San Juan Pueblo.
78	00.04.01	Vigil,	USDA	Bird, John	San Juan	Letter	During consultation

PR No.	Date	Author	Author Affiliation	Recipient	Recipient Affiliation	Doc Type	Description or Title
		Gilbert	FS		pueblo		with Herman Agoyo he stated the Tribal Council had no concerns about the proposed power line at this point. Releasing proposed action.
79	00.04.01	Vigil, Gilbert	USDA FS	Gutierrez, Denny	Santa Clara Pueblo	Letter	Documenting our response to 3/16/2000 letter from Gilbert Gutierrez and Fidel Naranjo about protection of archaeological sites and raptor safety and his concurrence with them. Releasing proposed action.
80	00.04.01	Vigil, Gilbert	USDA FS	Baker, John E.	Southern Ute Tribe	Letter	Initiates consultation with Southern Ute Tribe on Ojo power line proposal, requesting their input. Releasing proposed action.
81	00.04.01	Vigil, Gilbert	USDA FS	Mirabal, Isidro	Taos Pueblo	Letter	Documenting their concurrence with 1999 Warchief Cordova's input on the Peñasco Line. Releasing proposed action.
82	00.04.01	Vigil, Gilbert	USDA FS	Vigil, Gilbert	Tesuque Pueblo	Letter	Documenting attempts since October 1999 to initiate consultation with Tesuque Pueblo and transmitting proposed action. [letter to Vigil in error?]
83	00.04.01	Vigil, Gilbert	USDA FS	House, Ernest, Sr.	Ute Moun-	Letter	Initiates consultation with Ute Mountain Ute

Appendix. Project Record Index

PR No.	Date	Author	Author Affiliation	Recipient	Recipient Affiliation	Doc Type	Description or Title
					tain Ute Tribe		Tribe on Ojo power line proposal, requesting their input. Releasing proposed action.
84	00.04.01	Vigil, Gilbert	USDA FS	Bowekaty, Malcolm	Pueblo of Zuni	Letter	Initiates consultation with Pueblo of Zuni on Ojo power line proposal, requesting their input. Releasing proposed action.
85	00.04.01	Kit Carson Electric	KCEC			Book/pub	“Getting Connected” volume 1, issue 6; page 2 has article on two power line proposals.
86	00.04.02	Castor, John and Lynn Nequin			USDA FS	Scoping Form	Comment: Strongly support; concerned about having adequate electrical supply.
87	00.04.03					Mailing List	Mailing list for proposed action with tribe-specific cover letter.
88	00.04.03					Mailing List	Mailing list for proposed action mailed on 4/3/2000, plus copies of those returned and removed from mailing list.
89	00.04.04	Lackey, Marcy			USDA FS	Scoping Form	Comment: why can't power lines be underground?
90	00.04.04	Churchill, Sher	USDA FS			Meeting Notes	Public Release of proposed action: tasks and timeframes.
91	00.04.04	Page, William D.			USDA FS	Scoping Form	Comment: Strongly in favor; too many variations and outages

PR No.	Date	Author	Author Affiliation	Recipient	Recipient Affiliation	Doc Type	Description or Title
							now; concerned line to LaMadera won't be upgraded; consider co-generation.
92	00.04.04	Goodin, Ben			USDA FS	Scoping Form	Comment: Lines need to go underground; visual impact is unacceptable; cutting trees is unacceptable.
93	00.04.06	Archuleta, Jerry			USDA FS	Scoping Form	Comment: Thanks for planning to improve quality; outages are outrageous.
94	00.04.06	Mathews, Guy			USDA FS	Scoping Form	Comment: Very much in support.
95	00.04.07	Wimett, Nicholas and Melissa Old			USDA FS	Scoping Form	Comment: Prefer using existing corridors.
96	00.04.07	Schutze, S.D.			USDA FS	Scoping Form	Comment: Is there no way these could be put underground? What is additional cost?
97	00.04.07	Neary, Ben				Article	"Co-op plans Taos power lines" from the Santa Fe New Mexican
98	00.04.08	Levison, Lorie			USDA FS	Scoping Form	Comment: Prefer using existing corridors; can you work with osprey program and put in nesting boxes?
99	00.04.10	Bolander, Bruce			USDA FS	Scoping Form	Comment: Do as soon as possible; roads should be left open for future maintenance of lines and multiple use including ORV.
100	00.04.10	Barton, John and Polly		Power line Analysis	USDA FS	Memo	Object to proposed overhead line in plain

Appendix. Project Record Index

PR No.	Date	Author	Author Affiliation	Recipient	Recipient Affiliation	Doc Type	Description or Title
				Team			view of their house. Inappropriate to cut large section of virgin forest. Wildlife, plant life, public use, fire risk effects should be considered. Use existing pole lines, shorter route, and underground lines.
101	00.04.10	Bolander, Lloyd			USDA FS	Scoping Form	Comment: Expedite construction; roads should be environmentally friendly and left usable for maintenance and other forest access.
102	00.04.10	Johnson, Robert W.			USDA FS	Scoping Form	Comment: Please complete this project as soon as possible.
103	00.04.11	Stoer, John S.			USDA FS	Scoping Form	No Comment.
104	00.04.14	Corral, Patricia				Memo	Telephone conversation with Jimmy Arterberry, Cultural Preservation Officer, Comanche Tribes of Oklahoma, requesting consultation and to see areas.
105	00.04.14	Arterberry, Jimmy		Corral, Patricia	USDA FS	Letter	Formal request from Comanche Tribe of Oklahoma to be involved in consultation with KCEC.
106	00.04.15	Rymer, Ann			USDA FS	Scoping Form	Comment: Opposed to adding more poles; why not use existing poles and add more lines?

PR No.	Date	Author	Author Affiliation	Recipient	Recipient Affiliation	Doc Type	Description or Title
107	00.04.15	Emerson, Connie L.			USDA FS	Scoping Form	Comment: As long as Kit Carson respects the environment (birds), go for it.
108	00.04.16	Carson NF	USDA FS			Notice	News Release (long) regarding two transmission lines and scoping period, plus media list.
109	00.04.17	Sturgen, Winson			USDA FS	Scoping Form	Comment: People need this service, please do go ahead with your plans.
110	00.04.17	Lujan, Isaac		Churchill, Sher	USDA FS	Letter	Please send copy of analysis.
111	00.04.17	Carson NF	USDA FS			Notice	Paid ad in Taos News regarding two proposals.
112	00.04.17	Carson NF	USDA FS			Notice	Public notice posted locally (list attached).
113	00.04.18	Sferrazza, Lynn			USDA FS	Scoping Form	Comment: put on mailing list.
114	00.04.18	Churchill, Sher	USDA FS	Carson SO employees	USDA FS	Memo	Update on two proposals for all employees.
115	00.04.19	Webber, Kimberly			USDA FS	Scoping Form	Comment: Encourage No Action Alternative; time is for solar based electricity.
116	00.04.19	Craig, Laura			USDA FS	Scoping form	Comment: Bury all lines.
117	00.04.20	KCEC and Carson NF		Bingaman, Jeff (Sen.)		Book/pub	Executive Summary: proposed 115 KV to Ojo Caliente & 69 KV Talpa to Peñasco [package sent to Staffer Munds]

Appendix. Project Record Index

PR No.	Date	Author	Author Affiliation	Recipient	Recipient Affiliation	Doc Type	Description or Title
118	00.04.20	Taos News				Notice	Ad in the Taos News regarding two proposals.
119	00.04.20	Churchill, Sher	USDA FS			Meeting Notes	Discussion with Ocean Munds, staff for Senator Bingaman, and others, regarding status of proposals; will keep her informed.
120	00.04.20	Rio Grande SUN				Notice	Ad in the Rio Grande SUN regarding two proposals.
121	00.04.20	Corral, Patricia	USDA FS			Memo	Telephone conversation with Terry Knight, NAGPRA Representative for Ute Mountain Ute Tribe, documenting their interest and concern over archaeological sites.
122	00.04.21	Benavidez, Ray B.			USDA FS	Scoping Form	Comment: This proposed upgrade will hopefully resolve multiple outages around Vallecitas. In favor!
123	00.04.21	Rubin, Howard A.			USDA FS	Scoping Form	Comment: We are in favor of this program.
124	00.04.25	Churchill, Sher	USDA FS	Lujan, Isaac		Letter	Response to his 4/17/2000 letter; sent copy of proposed action.
125	00.04.25	Barnes, Tom				Memo	Comment record: He asked if fiber optic cable would be buried; he is designing an alternative route; wants to be on mailing list.

PR No.	Date	Author	Author Affiliation	Recipient	Recipient Affiliation	Doc Type	Description or Title
126	00.04.27	Cordova, Kathy	Taos News			Article	“Kit Carson expands facility, plans lines”
127	00.04.30	Deadwyler, Robert B., Sr.			USDA FS	Scoping Form	Comment: Sounds good to me. Go for it.
128	00.05.01	Churchill, Sher	USDA FS			Meeting Notes	Discussion with Bill White, staff for Representative Tom Udall, and others, regarding project status, pueblos involvement, could lines be buried, keep him involved.
129	00.05.02	KCEC and Carson NF		Udall, Tom (Con)		Book/pub	Executive Summary: proposed 115 KV to Ojo Caliente & 69 KV Talpa to Peñasco [package sent to Staffer White] [see 4/20/2000 Bingaman for document]
130	00.05.02	Churchill, Sher	USDA FS			Meeting Notes	Discussion with Taos County members Carlos Miera, planning director, and Edward Vigil, planner, and Martin Martinez, KCEC, regarding coordinating planning efforts; need to obey ordinance 1997-4 on slope, storage sheds, and pole height.
131	00.05.02	Taos County		USDA FS		Mailing List	Neighborhood Associations Addresses
132	00.05.02	Bale, Edward L., Jr.			USDA FS	Scoping Form	Comment: Favor anything that will improve service.
133	00.05.05	Malm, Linda (Dr.)		Power Line Analysis	USDA FS	Scoping Re-	Comment: concern over raptors; use

Appendix. Project Record Index

PR No.	Date	Author	Author Affiliation	Recipient	Recipient Affiliation	Doc Type	Description or Title
				Team		sponse	wooden poles; inform of any hearings.
134	00.05.07	Leherissey, Tanya			USDA FS	Scoping Form	Comment: nothing seems very destructive; concerned over EMF around transfer station.
135	00.05.10	Bull, Stephen			USDA FS	Scoping Form	Comment: No new corridors should be cut in forest; significant habitat for wildlife, i.e., elk. Use U.S. 285; propose limiting power usage to existing use.
136	00.05.11	Boxberger, H. Gerald			USDA FS	Scoping Form	Comment: agree with general route; would not agree with any alternative through Carson.
137	00.05.15	Carpenter, Jack D.			USDA FS	Scoping Form	Comment: Fiber optic system is not for power; have economic analysis of pure power without fiber optic system; social fabric needs addressing; soil disturbance; would roads be constructed; etc.
138	00.05.18	Cowan, Caren	NM Cattle Growers' Association	Power Line Analysis Team	USDA FS	Scoping Re-sponse	Comment: support two new power lines; benefits would outweigh short-term effects.
139	00.05.18	Merritt, Ron L., Jr.	NM Wool Growers, Inc.	Power Line Analysis Team	USDA FS	Scoping Re-sponse	Comment: support two new power lines; benefits would outweigh short-term effects.
140	00.05.18	Eppers, Bud	NM	Power Line	USDA	Scoping	Comment: support two

PR No.	Date	Author	Author Affiliation	Recipient	Recipient Affiliation	Doc Type	Description or Title
			Public Lands Council	Analysis Team	FS	Response	new power lines; benefits would outweigh short-term effects.
141	00.05.22	Churchill, Sher	USDA FS			Meeting Notes	El Rito district employees meeting (Churchill and Corral): Questions on burying lines, meetings dates, Jemez Mtn. Coop option, roads are open, raptor protection, health effects, safety pods, cost, etc.
142	00.05.25	Corral, Patricia	USDA FS			Memo	Telephone conversation with Adelaide Paiz, cultural resources specialists, Jicarilla Apache Tribe; she had not proposed action yet but wants to consult and bring elders to see area.
143	00.06.05	Kuwanwisiwma, Leigh J.	Hopi Tribe	Vigil, Gilbert	USDA FS	Letter	Would like to invite David John, Carson forest archaeologist, to Kykotsmovi to meet regarding projects and a process to defer consultation to Taos Pueblo and northern Rio Grande Pueblos.
144	00.06.22	Elliott, Christian			USDA FS	Scoping Form	Comment: prefer below ground distribution lines along existing motor vehicle avenues.
145	00.06.30	Churchill, Sher	USDA FS			Meeting Notes	Power Ranger discussion: update/strategizing on priority things to work on.

Appendix. Project Record Index

PR No.	Date	Author	Author Affiliation	Recipient	Recipient Affiliation	Doc Type	Description or Title
146	00.07.01	Kuykendall, Audrey	USDA FS	Churchill, Sher	USDA FS	SOPA	July 2000 Schedule of Proposed Actions for the Carson National Forest with mailing list.
147	00.07.11	Churchill, Sher	USDA FS			Memo	Briefing with Gilbert Vigil: update; need to meet with KCEC.
148	00.07.11	Thornton, H. Wayne	USDA FS	Gollomp, Lawrence A.	DOE	Letter	As required by 36 CFR 251.54(f)(2), notifying Secretary of Energy of project and 30-day comment period (enclosed proposed action pamphlet).
149	00.07.12	Churchill, Sher	USDA FS			Meeting Notes	Discussion on identifying alternatives and ones eliminated from detailed study (matrix?); NHPA and NEPA consultation requirements and alternative involvement; need to get in field with KCEC.
150	00.07.17	Churchill, Sher	USDA FS			Meeting Notes	Meeting with KCEC on status, alternatives, information needed.
151	00.07.18	Associated Press	SF New Mexican			Article	"PNM predicts shortage of power lines"
152	00.07.19	Corral, Patricia	USDA FS			Meeting Notes	Discussion on alternatives for TP (5) and Ojo (3) routes and how to present to Gilbert Vigil, including matrix, bullets of effects, etc.
153	00.07.19	Gollomp, Lawrence A.	DOE	Churchill, Sher	USDA FS	Letter	In response to 7/17/2000 telephone

PR No.	Date	Author	Author Affiliation	Recipient	Recipient Affiliation	Doc Type	Description or Title
							conversation with Mr. Kirkpatrick; DOE is unable to locate the lines in question from submitted documents; suggest FS forward documents which sufficiently identify the lines.
154	00.07.31	Churchill, Sher	USDA FS			Meeting Notes	Project status briefing for forest supervisor, rangers and staff; forest supervisor approval of Alternatives A, B, and C, and issues.
155	00.08.03	Corral, Patricia	USDA FS			Meeting Notes	Met with Luis Reyes to discuss alternatives selected for detailed analysis approved by Gilbert Vigil; he had no objections; also discussed meeting in Peñasco 8/7/2000.
156	00.08.07	Churchill, Sher	USDA FS			Meeting Notes	Presentation of proposals at Council of Neighborhood Association Meeting. Concerns were cutting trees, a hearing process, and something to respond to (like DEIS).
157	00.08.07	Haynes, Parker	Carson Community Association			Scoping Form	No comment; note from Sher to keep Parker apprised of any meetings and volunteered team to come to their meetings.
158	00.08.07	Martinez, Martin	KCEC	Churchill, Sher	USDA FS	Letter	KCEC mailed 17,850 supplements on March 25, 2000. They cannot

Appendix. Project Record Index

PR No.	Date	Author	Author Affiliation	Recipient	Recipient Affiliation	Doc Type	Description or Title
							release mailing list.
159	00.08.14	Corral, Patricia	USDA FS			Memo	Telephone conversation with Comanche CPO Jimmy Atterberry regarding consultation; KCEC does not have funds to bring them to area; they still want to consult.
160	00.08.15	Corral, Patricia	USDA FS			Memo	Telephone conversation with Steven Begay, Director Traditional Culture Program, Navajo Nation regarding consultation; they have no concerns.
161	00.08.15	Corral, Patricia	USDA FS	Whatley, Bill	Jemez Pueblo	Fax	Faxed executive summary and maps of two proposed actions.
162	00.08.15	Corral, Patricia	USDA FS			Memo	Telephone conversation with Jimmy Atterberry, CPO, Comanche Tribe of Oklahoma regarding consultation; they have no concerns.
163	00.08.21					Mailing List	CAN mailing list from WELC
164	00.08.23	Corral, Patricia	USDA FS			Meeting Notes	Meeting with Hopi Cultural Preservation Office regarding streamlining tribal consultation. Hopi would defer to Taos Pueblo on this project.
165	00.08.24	Churchill, Sher	USDA FS			Meeting Notes	Discussion with Larry Cisneros
166	00.08.24	Churchill,	USDA			Meet-	Kit Carson Electric

PR No.	Date	Author	Author Affiliation	Recipient	Recipient Affiliation	Doc Type	Description or Title
		Sher	FS			ing Notes	Cooperative, Inc., Community Meeting, Ojo Caliente Fire Department. Concerns were cost and visuals. Including KCEC fact sheet, sign in sheet, and poster.
167	00.08.25	Churchill, Sher	USDA FS			Meeting Notes	Discussion with James Charters, WAPA, about process for verification.
168	00.08.25	Corral, Patricia	USDA FS			Meeting Notes	Meeting with Adelaide Paiz, CRS, and Jicarilla Apache: she wants to visit sites.
169	00.08.25	Churchill, Sher	USDA FS	Gollomp, Lawrence A.	DOE	Letter	Should forward required maps in early September.
170	00.08.25	Ortega, Carlos				Scoping Form	Comment: In favor of the Cerro Azul power line. West side needs more power.
171	00.08.26	Haynes, Parker	CCA	Churchill, Sher	USDA FS	Letter	Community meeting in late October would like project on the agenda. Consensus is that Carson prefers Cerro Azul Tap.
172	00.08.29	Kuykendall, Ben	USDA FS	Files		Memo	Comment record from Steve Harris: need to resolve outages, no reason for new corridor, what is cost, keep, visual impacts should be kept in one location.
173	00.09.01		KCEC			Article	Kit Carson Electric Newsletter, Sept. 2000, vol. 3, issue 3,

Appendix. Project Record Index

PR No.	Date	Author	Author Affiliation	Recipient	Recipient Affiliation	Doc Type	Description or Title
							mentions the new power lines.
174	00.09.01	Corral, Patricia	USDA FS			Telephone Log	
175	00.09.12	Begay, Steven	Navajo Nation	Vigil, Gilbert	USDA FS	Letter	No concerns about the two lines, but they must be consulted with if any remains are discovered.
176	00.09.29	Taylor, Wayne, Jr.	Hopi Tribe	Vigil, Gilbert	USDA FS	Letter	In response to August 23, 2000 visit by Archaeologist David Johnson to Hopi Cultural Preservation Office. Contains list of standard concerns.
177	00.10.01	Carson Planning	USDA FS			SOPA	October 2000 Schedule of Proposed Actions for the Carson National Forest.
178	00.10.04	Haynes, Parker	CCA	Churchill, Sher	USDA FS	Letter	Invitation to attend community meeting October 25. Attached "Carson Opinion" October 2000.
179	00.10.05	Barton, John				Memo	Comment record: Prefer existing corridor over proposed action; visuals; want to see costs for buried line.
180	00.10.10	Okamoto, Steve	USDA FS	Nicholopoulos, Joy	USFWS	Letter	Request for official list of Federally threatened, endangered and proposed species.
181	00.10.12					NOI	"Federal Register" copy of the NOI dated 10/12/2000, vol. 65, no. 198.

PR No.	Date	Author	Author Affiliation	Recipient	Recipient Affiliation	Doc Type	Description or Title
182	00.10.15					Article	“Horse Fly” vol. 2, no.2, October 15, 2000, article about power lines.
183	00.10.20	Churchill, Sher	USDA FS			Meeting Notes	Discussed Carson community meeting needs, Ojo contingencies, buried line costs, etc.
184	00.10.20	Syrjala, Edward S.		Power Line Team Leader	USDA FS	Letter	Request to be on mailing list.
185	00.10.25					Surveys	30 returned surveys that the Carson Community Association distributed at their community meeting regarding the project.
186	00.10.25	Churchill, Sher	USDA FS			Meeting Notes	Carson community meeting notes: questions on how power is produced, fiber optics, increase private residential development, reduce consumption, green power, hum, pole height, bury line. Includes sign in sheet.
187	00.10.27	Churchill, Sher	USDA FS	Syrjala, Edward		Letter	Response to his letter of interest, with update on project.
188	00.10.29	Haynes, Parker	CCA	Churchill, Sher	USDA FS	Letter	Understands necessity of upgrading lines, but not sure which route is best. Greatest concern is increasing demand for electricity; KCEC should make efforts to

Appendix. Project Record Index

PR No.	Date	Author	Author Affiliation	Recipient	Recipient Affiliation	Doc Type	Description or Title
							reduce consumption. [missing page 2]
189	01.01.11	Lewis, Al (Dr.)				Memo	Very concerned over Forest Service and KCEC continuing with status quo of more lines rather than forcing citizens to conserve.
190	00.11.06	Walters, Ray				Memo	Comment record: He's a solar power expert; Carson Community Association asked him to help them explore "green" alternative; asked for cost data and household numbers.
191	00.11.17	Okamoto, Steve	USDA FS	Walters, Ray		Letter	Providing estimated 1 line construction costs, but cannot provide household numbers.
192	00.11.20	Lewis, Al (Dr.)				Memo	Meeting in Sher's office: he's concerned about EMF effects; postpone project until more research; gave her publication list; discuss conservation.
193	00.11.20	Van Balen, JoAn				Memo	Meeting Sher's office with Dr. Al Lewis: prefers proposed action over Carson due to loud hum of lines; need to discuss tradeoffs of more lines versus conservation.
194	00.12.20	Kozell, Gladys				Memo	Telephone record: concerned that Taos Pueblo residents did not know about the project; Sher explained

PR No.	Date	Author	Author Affiliation	Recipient	Recipient Affiliation	Doc Type	Description or Title
							consultation; asked what else we could do.
195	00.12.28	Okamoto, Steve	USDA FS	Gollomp, Lawrence A.	DOE	Letter	Provides detailed information and a systems map for two lines; submitted to fulfill requirements under 36 CFR 251.54(f)(2).
196	01.01.01	Carson Planning	Carson NF			SOPA	January 2001 Schedule of Proposed Actions for the Carson National Forest.
197	01.01.03	Corral, Patricia	USDA FS	Frost, Clement	S. Ute Tribe	Letter	Inviting Mr. Frost to visit forest to view the routes and make input on how we can address their concerns.
198	00.11.06					Petition	List of people supporting KCEC construction projects.
199	01.02.05	Corral, Patricia	USDA FS			Meeting Notes	Review of Talpa to Peñasco power line proposal; last sentence says regarding Ojo Caliente line, they would support whatever input the Tewas provided for the project.
200	01.02.12	Churchill, Sher	USDA FS	Saber, Nick	WAPA	Memo	Transmitting purpose and need statements for 2 projects.

Appendix. Project Record Index

PR No.	Date	Author	Author Affiliation	Recipient	Recipient Affiliation	Doc Type	Description or Title
201	01.02.13	Saber, Nick	WAPA	Churchill, Sher	USDA FS	Memo	Western Area Power Administration (WAPA) has reviewed and concurs and supports the need for the construction of the two lines. Request copies of any transmission study reports.
202	01.02.14	Corral, Patricia	USDA FS	Romero, Ruben	Taos Pueblo	Letter	Documenting 2/5/2001 meeting with Taos Pueblo Warchief and staff on Talpa to Peñasco route; says he would support whatever input the Tewas provide on Ojo Caliente.
203	01.02.14	Saber, Nick	WAPA			Memo	Telephone record: he says that his 2/13/2001 e-mail constitutes concurrence. Would like to see more studies. Their interest is that whole system not be compromised.
204	01.02.14	Churchill, Sher	USDA FS	Saber, Nick	WAPA	Memo	Noting for record that 2/13/2001 e-mail constitutes WAPA's concurrence and support. Mr. Cisneros will continue to work with WAPA to provide flow studies.
205	01.02.15	Charters, Jim	WAPA	Churchill, Sher	USDA FS	Memo	WAPA response is one of approval advised based on information known. Any higher voltages will require more data for approval.

PR No.	Date	Author	Author Affiliation	Recipient	Recipient Affiliation	Doc Type	Description or Title
							They will get approval letter out via DOE process. Saber's e-mail was not approval.
206	01.03.08	Gollomp, Lawrence A.	DOE	Okamoto, Steve	USDA FS	Letter	DOE concurs and supports the need for the two lines.
207	01.04.01	Carson Planning	Carson NF			SOPA	April 2001 Schedule of Proposed Actions for Carson National Forest.
208	01.04.10	Haynes, Parker				Memo	Telephone record: updating him on projects; concentrating on T-P, but will start up on Ojo soon.
209	01.04.10	Kuwanwisiwma, Leigh J.	Hopi Tribe	Chavez, Martin	USDA FS	Letter	Thank you for project list. Generally defer consultation to Taos, Picuris and eight northern pueblos, but still want the list.
210	01.04.25	Churchill, Sher	USDA FS			Meeting Notes	Discussion on aesthetic and recreation setting effects and options; meanings of VQOs and ROS for alternatives (amendment required for PA?). Local recreation activities different from typical activities.
211	01.04.30	Hawley, Richard				Memo	Telephone record: concerned about Carson route.
212	01.05.01					Report	State of Wisconsin PSCW Docket No. 05-CE-113: an important issue before the people of Wisconsin (345 kV

Appendix. Project Record Index

PR No.	Date	Author	Author Affiliation	Recipient	Recipient Affiliation	Doc Type	Description or Title
							transmission line). [Report from Al Lewis to review]
213	01.05.09	Churchill, Sher	USDA FS	Files		Field Notes	Reviewed substation site; discovered a conservancy group had acquired land immediately east of substation; met with Ranger Roberto Martinez who had visual concerns and suggested another alternative west from Carson.
214	01.05.16	Kuykendall, Ben	USDA FS			Meeting Notes	Power ranger meeting on Ojo Line: option of moving existing corridor alternative to north side of U.S. 285. KCEC is considering a proposal that would include extending the 25 kV line from the microwave tower to T-P.
215	01.05.28	Churchill, Sher	USDA FS	Files		Meeting Notes	Meeting with John Fernandez, KCEC: discussed status of permissions for archaeological surveys and need for substation to be flagged for survey.
216	01.06.01					Report	Kit Carson Magnetic Field data for Tri-state G&T.
217	01.06.04	Churchill, Sher	USDA FS			Meeting Notes	Discussion with Larry Cisneros: No. Aqua sub line costs.

PR No.	Date	Author	Author Affiliation	Recipient	Recipient Affiliation	Doc Type	Description or Title
218	01.06.14	Dwyer, Tom	USDA FS	Churchill, Sher	USDA FS	Memo	Forest supervisor can issue a permit for up to 20 years, per Bob Suedkamp.
219	01.06.19	Corral, Patricia	USDA FS			Memo	Telephone conversation with Jan Biella from SHPO regarding T-P and Carson Schoolhouse on the Ojo line. Need photos with description and evaluate effects of project.
220	01.04.20	Churchill, Sher	USDA FS			Field Notes	Ojo trip looking at existing plies and visuals.
220	01.06.20	Churchill, Sher	USDA FS			Field Notes	“Susie’s Café extension” about 7.6 miles long (need description from KCEC); reviewed “existing corridor” west from Carson; alternative eliminated is from Las Cordovas to Ojo Caliente via existing corridor, but would require easement from Taos Pueblo, etc.

Appendix. Project Record Index

PR No.	Date	Author	Author Affiliation	Recipient	Recipient Affiliation	Doc Type	Description or Title
221	01.06.25	Lord, Andrew		Corral, Patricia	USDA FS	Letter	In response to 5/25/01 letter from Larry Cisneros, regarding Carson Schoolhouse (his dwelling) effects: larger poles would have negative effect and he's concerned about health effects. Attached 5 documents on health effects.
222	01.07.01	Carson Planning	USDA FS			SOPA	July 2001 Schedule of Proposed Actions for the Carson National Forest.
223	01.07.06	Churchill, Sher	USDA FS			Field Notes	TP connection about 7.6 miles.
224	01.07.17	Churchill, Sher	USDA FS			Memo	Mailing list and update card sent to those who participated in scoping.
225	01.07.19	Churchill, Sher	USDA FS			Meeting Notes	Susie's café extension will go on west side of Highway 285; KCEC needs to contract archaeological survey and scenic quality work.
226	01.07.26	Corral, Patricia	USDA FS			Field Notes	Objective to ensure that Martin has good visual sense of the alternatives, objectives, issues, etc. Discussed U.S. 285 routes, FR 557 route, forest plan direction, etc.
227	01.07.27	Churchill, Sher	USDA FS			Meeting Notes	KCEC is responsible for identifying and assessing route through Carson area; forest plan

PR No.	Date	Author	Author Affiliation	Recipient	Recipient Affiliation	Doc Type	Description or Title
							directs us to use existing corridors wherever possible; we will consider locating the extension 25kV line from Susie's Café area north.
228	01.07.31	Hawley, Tupper				Memo	Telephone record: whole Carson area has ruins; clarified proposal was on distribution line not Tri-state corridor.
229	01.08.02	Churchill, Sher	USDA FS			Memo	Discussion with Martin Chavez: plan field trip and tie into Carson Community Association meeting if possible; look at FR 557 alternative, north side of U.S. 285, and west and east side within U.S. 285 for Susie's Café extension.
230	01.08.29	Churchill, Sher	USDA FS			Memo	Discussion on landscape architect work to be done by contractor (additional alternatives).
231	01.09.01		USDA FS			Tribal list	
232	01.09.01		USDA FS			phone log	
233	01.09.01	KCEC	KCEC			Book/pub	"Getting Connected," vol. 3, issue 9, September 2001, mentions the two new proposals.
234	01.09.09	Churchill, Sher	USDA FS			Meeting	Aerial observations of alternative power line

Appendix. Project Record Index

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						Notes	routes; need to confirm length and condition and location of FR 557 route through draw.
235	01.09.20	Churchill, Sher	USDA FS			Field Notes	Review FR 557 alternative route (now the "285 P" alternative) for best location through drainage.
236	01.10.01	Carson Planning	Carson NF			SOPA	October 2001 Schedule of Proposed Actions for the Carson National Forest.
237	01.10.17	Churchill, Sher	USDA FS			Meeting Notes	Team meeting with Martin Chavez to approve issues and alternatives (A-E). He will decide on whether to include Alt. E later.
238	01.10.17	Corral, Patricia	USDA FS			Meeting Notes	Team meeting with Martin Chavez; KCEC needs to talk to landowners; use alternative segments rather than alternatives in EIS.
239	01.10.24	Taylor, Sam				Memo	Telephone record: ensure she knew about Susie's Café extension. She had no issues.
240	01.10.24	Lawrence, Bob				Memo	Telephone record: informed him of 11/3/01 meeting and about Susie's Café extension. He had no issues. Add Kit Keith to mailing list.
241	01.10.24	Churchill, Sher	USDA FS			Field Notes	Add to mailing list

PR No.	Date	Author	Author Affiliation	Recipient	Recipient Affiliation	Doc Type	Description or Title
242	01.11.03	Churchill, Sher	USDA FS			Meeting Notes	Carson Community Association meeting: issues are EMF effects on humans, plant and animal health; lack of consideration of alternative means of providing electricity (green, solar, wind, etc.); agreed to give them bimonthly updates. Attachments.
243	01.12.01	Kramer, Carveth	USDA FS	Seesholtz, David N	USDA FS	Memo	Seesholtz memo describing what EMF means.
244	02.01.01	Carson Planning	USDA FS			SOPA	January 2002 Schedule of Proposed Actions for the Carson National Forest.
245	02.03.22	Churchill, Sher	USDA FS			Field Notes	Reviewed alternative routes for soil conditions and roads in the area; mainly saw increased erosion, etc.
246	02.02.01	Carson Planning	USDA FS			SOPA	April 2002 Schedule of Proposed Actions for the Carson National Forest.
247	02.04.04	Granger, G.	USDA FS			Analysis	Ojo Caliente power line project comment content analysis.
247.1	02.06.01	NIEHS/NIH				EMF Report	Q&A's about EMF National Institutes of Health
247.2	02.05.17	Forest Supervisor	USDA FS	Tribes		Letter	Annual tribal consultation letter for 2002
248	02.07.01	Carson	USDA			SOPA	July 2002 Schedule of

Appendix. Project Record Index

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		Planning	FS				Proposed Actions for the Carson National Forest.
249	02.10.01	Carson Planning	USDA FS			SOPA	October 2002 Schedule of Proposed Actions for the Carson National Forest.
250	03.01.01	Carson Planning	USDA FS			SOPA	January 2003 Schedule of Proposed Actions for the Carson National Forest.
251	03.03.01	KCEC	KCEC			Notice	“Getting Connected,” March 2003
252	03.03.13	Kuykendall, Ben	USDA FS			Memo	Cultural resources not a significant issue.
253	03.04.01	Carson Planning	USDA FS			SOPA	April 2003 Schedule of Proposed Actions for the Carson National Forest.
254	03.04.25	Forest Supervisor	USDA FS			Report	Carson National Forest Wide Roads Analysis
255	03.05.07	Forest Supervisor	USDA FS			Letter	Update on project.
255.1	03.05.16	Carpenter	USDA FS	File		Field notes	Overview project and alternatives to bring team members up to date
256	03.05.27	Cisneros	KCEC			Letter	Outages for 2002 and 2001.
257	03.05.27	Forest Supervisor	USDA FS			Memo	Approval of alternatives.
258	03.06.30	Federal Register	U.S.			NOI	Revised NOI for DEIS

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259	03.07.01	Carson Planning	USDA FS			SOPA	July 2003 Schedule of Proposed Actions for the Carson National Forest.
260	03.07.01	Christeen Spies				Letter	Add to mailing list
261	03.07.01	Forest Supervisor	USDA FS			MIS Report	Carson National Forest Management Indicator Species Assessment
262	03.07.06	Forest Guardians				Letter	Add to mailing list
263	03.08.01	KCEC				Notice	“Getting Connected,” August 2003
264	03.08.01	Kuykendall, Ben	USDA FS	Sam DesGeorges	BLM	Memo	Project Coordination
265	03.08.04	Forest Supervisor	USDA FS		FWS	Letter	T&E consultation. Request updated list of species.
266	03.08.05	Johnson/Williams	USDA FS			Report	Heritage Report
266.1	03.08.11		FWS		USDA FS	Letter	Consultation # 2-22-03-I-625 List of Federal listed species for Taos Co.
267	03.08.14	Kuykendall, Ben	USDA FS			Meeting Notes	Project costs burial vs above ground phone conversation RUS with Dennis Rankin Washington, DC.
268	03.08.28	Taos News				Article	KCEC asks for support, power vs blackouts.
269	03.09.04	Santa Fe New Mexican				Article	Birds of Prey Protection
270	03.09.15	Kuykendall, Ben	USDA FS			Report	Wildlife Report with supporting attachments

Appendix. Project Record Index

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							and references
271	03.09.22	Carpenter, Jack	USDA FS			Report	Roads Analysis Report
272	03.09.23	Carpenter	USDA FS			Report	Fire Report
273	03.09.23	Carpenter, Jack	USDA FS			Report	Vegetation Report
274	03.09.23	Carpenter/Dwyer	USDA FS			Report	Visual/Recreation Report
275	03.09.23	Seesholtz/Carpenter	USDA FS			Report	Social and Economic Report includes Public Health and Safety
276	03.09.23	Carpenter/Kuykendall	USDA FS			Report	Soil and Water Report
277	04.01.01	Carson Planning	USDA FS			SOPA	January 2004 Schedule of Proposed Actions for the Carson National Forest.
278	04.04.01	Carson Planning	USDA FS			SOPA	April 2004 Schedule of Proposed Actions for the Carson National Forest.
279	04.07.01	Carson Planning	USDA FS			SOPA	July 2004 Schedule of Proposed Actions for the Carson National Forest.