Tucson Electric Power Company
Sahuarita-Nogales Transmission Line
Final Environmental Impact Statement

January 2005

DOE/EIS – 0336
BLM Reference No. AZA 31746

SUMMARY

Office of Fossil Energy
U.S. Department of Energy
1000 Independence Avenue, S.W.
Washington, DC 20585

Cooperating Agencies:

U.S. Department of the Interior Bureau of Land Management

U.S. Department of Agriculture Forest Service

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COVER SHEET

***Responsible Agency*:** U.S. Department of Energy (DOE), Office of Fossil Energy (FE)

***Cooperating Agencies*:** U.S. Department of Agriculture Forest Service (USFS), U.S. Department of the Interior Bureau of Land Management (BLM)

***Title*:** Tucson Electric Power Company (TEP) Sahuarita–Nogales Transmission Line Final Environmental Impact Statement (EIS)

Location: Pima and Santa Cruz Counties, Arizona

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Abstract: A DOE Presidential Permit is required before anyone can construct, connect, operate, and maintain an electric transmission line across the U.S. border. On August 17, 2000, TEP applied to DOE/FE for a Presidential Permit to construct a double-circuit 345,000 volt (345-kV) electric transmission line to transmit 500 MW of electricity. The transmission line would begin south of Tucson, Arizona, in the vicinity of Sahuarita, cross the U.S.-Mexico border near Nogales, Arizona, and continue into Mexico. TEP anticipates using 400 MW of capability for transport of energy between the United States and Mexico. The proposed transmission line would also provide a redundant path for the energy that is currently transmitted over an existing 115-kV transmission line from Tucson to Nogales. The local Nogales utility, Citizens Communications, has committed to the purchase of 100 MW of transmission capacity to allow for future load growth.

The issuance of a Presidential Permit for this project would constitute a major Federal action within the meaning of the *National Environmental Policy Act*. Because the proposed transmission line would traverse lands managed by the BLM and the USFS, both the BLM and the USFS are cooperating agencies for this EIS. Additionally, because TEP would undertake construction at the international border, concurrence from the U.S. Section, International Boundary and Water Commission is required.

Three alternative transmission line corridors (the Western Corridor, Central Corridor, and Crossover Corridor) are analyzed in this EIS, as well as the "No Action" alternative. The Notice of Availability of the Draft EIS was published by the Environmental Protection Agency in the *Federal Register* on August 22, 2003 (68 FR 50768), which initiated a minimum 45-day comment period that ended on October 14, 2003. Volume II of this EIS contains transcripts from the public hearings, copies of all comments received, and the Federal agencies' responses. To the extent feasible, changes in the Final EIS are indicated by a double underline (for minor changes) and by a sidebar in the margin (for larger changes). The Final EIS will be used by DOE and the Federal agency officials to ensure that they have the information needed for informed decision- making. The decisions themselves will be issued subsequent to the Final EIS, in the form of a Record of Decision for each agency, or as a letter of concurrence.

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BACKGROUND

The Tucson Electric Power Company (TEP) Sahuarita-Nogales Transmission Line Environmental Impact Statement (EIS) assesses the potential environmental impacts associated with constructing and operating a 345,000-volt (345-kV) electric transmission line across the United States (U.S.)-Mexico border. As explained below, the proposed action involves the following Federal entities: the U.S. Department of Energy (DOE); the U.S. Department of Agriculture, U. S. Forest Service (USFS); the U.S. Department of the Interior, Bureau of Land Management (BLM); and the U.S. Section, International Boundary and Water Commission (USIBWC) [hereafter, the Federal entities will be collectively termed the "Federal agencies" in this EIS.]. This Final EIS reflects changes made to the Draft EIS. Changes are indicated by a double underline for minor changes and a sidebar in the margin for larger changes.

Under Executive Order (EO) 10485 (September 3, 1953), as amended by EO 12038 (February 3, 1978), no one may construct, connect, operate, or maintain facilities at the U.S. international border for the transmission of electric energy between the United States and a foreign country without first obtaining a Presidential Permit from the DOE. On August 17, 2000, TEP applied to DOE for a Presidential Permit to construct, connect, operate, and maintain a double-circuit, 345-kV alternating current (AC) electric transmission line across the U.S.-Mexico border. DOE determined that issuing a Presidential Permit to TEP for the proposed project would constitute a major Federal action that may have a significant impact on the environment within the meaning of the *National Environmental Policy Act* (NEPA), 42 United States Code (U.S.C.) §§ 4321 et seq. For this reason, DOE has prepared this EIS to evaluate potential environmental impacts from the proposed Federal action (granting a Presidential Permit for the proposed transmission facilities) and reasonable alternatives, including the No Action Alternative.

TEP's proposed transmission line would cross private land, state of Arizona land, up to 30 miles (48.3 km) of the Coronado National Forest administered by the USFS, approximately 1.25 mi (2.0 km) of Federal lands administered by BLM, and the international border. Therefore, in addition to the issuance of a Presidential Permit by DOE, the following actions must be taken by other Federal agencies before TEP can implement its proposal.

USFS. Because TEP's proposed alternative transmission line routes from Sahuarita to Nogales would cross National Forest System lands within the Coronado National Forest, the USFS must authorize TEP's occupancy and use of National Forest System lands, in accordance with the Federal Land Policy and Management Act (FLPMA) of 1976 (40 U.S.C. § 1761), to use or establish a utility corridor on National Forest System lands. TEP submitted an application for such authorization to USFS on April 20, 2000.

BLM. TEP's proposal would require approval of a right-of-way (ROW) grant by the BLM to allow project facilities to occupy a total of 1.25 mi (2.0 km) of Federal land under BLM jurisdiction. TEP submitted a ROW application to the BLM for the transmission line on March 20, 2001, and a separate application for fiber-optic facilities on April 14, 2003. BLM must review TEP's application to determine whether the proposed use of the ROW conforms with BLM's Resource Management Plan (BLM 1988) for the project area [43 CFR 1610.3-2(a)].

USIBWC. The USIBWC must concur with TEP's project plans to ensure that drainage and surface flows at the border remain within the limitations established in bilateral agreements between the U.S. and the Republic of Mexico, and that transboundary pollution would not be exacerbated by proposed project activities at and near the border.

The potential environmental impacts of the proposed actions of all four Federal agencies are evaluated in this EIS. In accordance with the Council on Environmental Quality (CEQ) regulations implementing NEPA, DOE has assumed the role of lead Federal agency for the NEPA review of TEP's proposal and

preparation of this EIS. Both the USFS and BLM are participating in this NEPA review process as cooperating agencies in order to fulfill their respective NEPA compliance requirements. DOE, USFS, and BLM will each independently issue a Record of Decision (ROD) that addresses the specific agency actions defined above and is based, among other things, on the impacts analysis and findings of this EIS. While USIBWC plans to use the findings of this EIS in its concurrence regarding the TEP proposal, it is not formally a cooperating agency and would not issue a ROD on its action. The Federal agencies can issue a ROD no sooner than 30 days after the Environmental Protection Agency (EPA) publishes a notice of availability in the *Federal Register*. DOE and BLM could issue their respective permits or ROW grants concurrently with their RODs. However, USFS regulations at 36 CFR 215 differ from the other two agencies in that they also provide for a 45-day administrative appeal period following issuance of a ROD. If an appeal or appeals are received, USFS must follow the 36 CFR 215 process and render a decision on the merit of the challenge. Until all appeals are resolved, the TEP proposal could not be implemented on National Forest System land.

The format and content of this EIS conforms to CEQ regulations and each agency's respective NEPA implementing regulations. DOE's NEPA regulations are codified at 10 CFR 1021, and BLM's are found in the BLM Manual and Handbook 1790-1 and Departmental Guidance (516 DM 1-7). The USFS relies upon CEQ regulations as primary direction for compliance with NEPA. Additionally, USFS regulations codified at 36 CFR 215 complement, but do not replace, CEQ regulations by providing a regulatory framework for compliance with NEPA and additional direction regarding public participation opportunities. The agency further interprets these regulations in its Directives System, Forest Service Manual 1950: *Environmental Policy and Procedures*, and Forest Service Handbook 1909.15, *Environmental Policy and Procedures Handbook*. These Directive System components establish policy and provide guidance for USFS NEPA practitioners and decision-makers.

PROPOSED ACTION AND ALTERNATIVES

This EIS addresses Federal actions that would individually result in an administrative decision of approval or disapproval of a TEP application, whether by permit, ROW grant, or other legally binding authorization. Although such administrative actions are not in themselves likely to impact the environment, they nevertheless *authorize implementation of an action or project* that could. In NEPA vernacular, these are referred to as "applicant-initiated" actions, and they actually become the "proposed action" or subject of the impacts analysis upon which an administrative decision is made.

Thus, approval of any of the Federal agency actions addressed in this EIS would authorize an applicant-initiated action—the TEP proposal—which has the potential for environmental impact. Because of this, the focus of the impacts analysis in this EIS is on all aspects of TEP's proposed action as well as reasonable alternative actions. The implementation of TEP's proposed action would be enabled by each agency's administrative approval of a TEP application.

In general, the following actions comprise TEP's proposal:

- Expand the South Substation at Sahuarita, Arizona
- Construct a double-circuit, 345-kV transmission line from Sahuarita, Arizona, to Nogales, Arizona, a distance of approximately 65 mi (104 km), including a fiber optics line for communications
- Construct a new Gateway Substation at Nogales, Arizona
- Construct a 115-kV transmission line from the new Gateway Substation to the existing Valencia Substation at Nogales, Arizona

- Add additional equipment to the existing Valencia Substation
- Construct temporary and permanent roads as necessary to access the transmission line corridor
- Construct relatively minor ancillary and support structures

More details of this proposal are as follows:

As shown on Figure S-1, TEP proposes to construct a double-circuit, 345-kV transmission line approximately 65 mi (104 km) in length. The proposed transmission line would originate at TEP's existing South Substation, which is located approximately 15 mi (24 km) south of Tucson in Sahuarita, Arizona, and 1.4 mi (2.2 km) east of Interstate 19 (I-19) in Pima County, Arizona. The South Substation would be expanded by an estimated 1.3 acres (0.53 ha) to add a switching device that would connect to the proposed transmission line by moving the fenceline 100-ft (30-m) to the east. From the South Substation, the proposed transmission line would run south of Tucson, Arizona, to a new Gateway Substation outside Nogales, Arizona in Santa Cruz County. The new Gateway Substation would be constructed within a developed industrial park an estimated 0.5 mi (0.8 km) east of the Coronado National Forest boundary. Three alternative transmission line corridors (the Western Corridor, Central Corridor, and Crossover Corridor) are analyzed in this EIS, as shown on Figure S-2.

From the Gateway Substation, the proposed 345-kV line would continue across the U.S.-Mexico border and interconnect with the Mexico electric grid. The specific actions that would be taken to connect TEP's 345-kV line to the Mexican electric grid are not known. TEP has indicated that further consultation between TEP and the Comisión Federal de Electricidad (CFE, the national electric utility of Mexico), is dependent upon TEP receiving a Presidential Permit for the proposed project. Nonetheless, it is reasonably foreseeable that a transmission line would need to be built from the existing Santa Ana Substation in Mexico, which is located approximately 65 miles (105 km) southwest of Nogales, to connect with TEP's proposed 345-kV line that would terminate across the U.S.-Mexican border. The specific routing of such a transmission line has not yet been determined. CFE and TEP would jointly determine what entity is responsible for designing and constructing the portion of the connecting transmission line in Mexico. The most likely entity to be responsible for the construction in Mexico is CFE, although it is possible that TEP may construct a portion of the transmission line in Mexico. It is also possible that CFE could construct a new substation in the Nogales, Sonora area that would serve as the connecting point to TEP's proposed 345-kV line. However, even in that event, a transmission line between the existing Santa Ana Substation and such a new substation would still be required, as described above, in order to connect TEP's 345-kV line with the Mexican electric grid.

The proposed line in the U.S. could both export electricity to, and import electricity from, Mexico. The double-circuit transmission line would consist of 12 transmission line wires, or conductors, and two neutral ground wires that would provide both lightning protection and fiber optic communications, on a single set of support structures. The primary structures to be used are the self-weathering steel single poles, or monopoles, depicted in Figure S-3. Dulled, galvanized steel lattice towers, depicted in Figure S-4, would be used in specific locations for engineering reasons or to minimize overall environmental impacts (for example, impacts to soils or archaeological sites). In addition, TEP proposes to build a 115-kV transmission line to interconnect its proposed Gateway Substation with the electric distribution system that serves Nogales, Arizona, and the greater Santa Cruz Valley Service Area through the existing Valencia Substation (see Figure S-5).

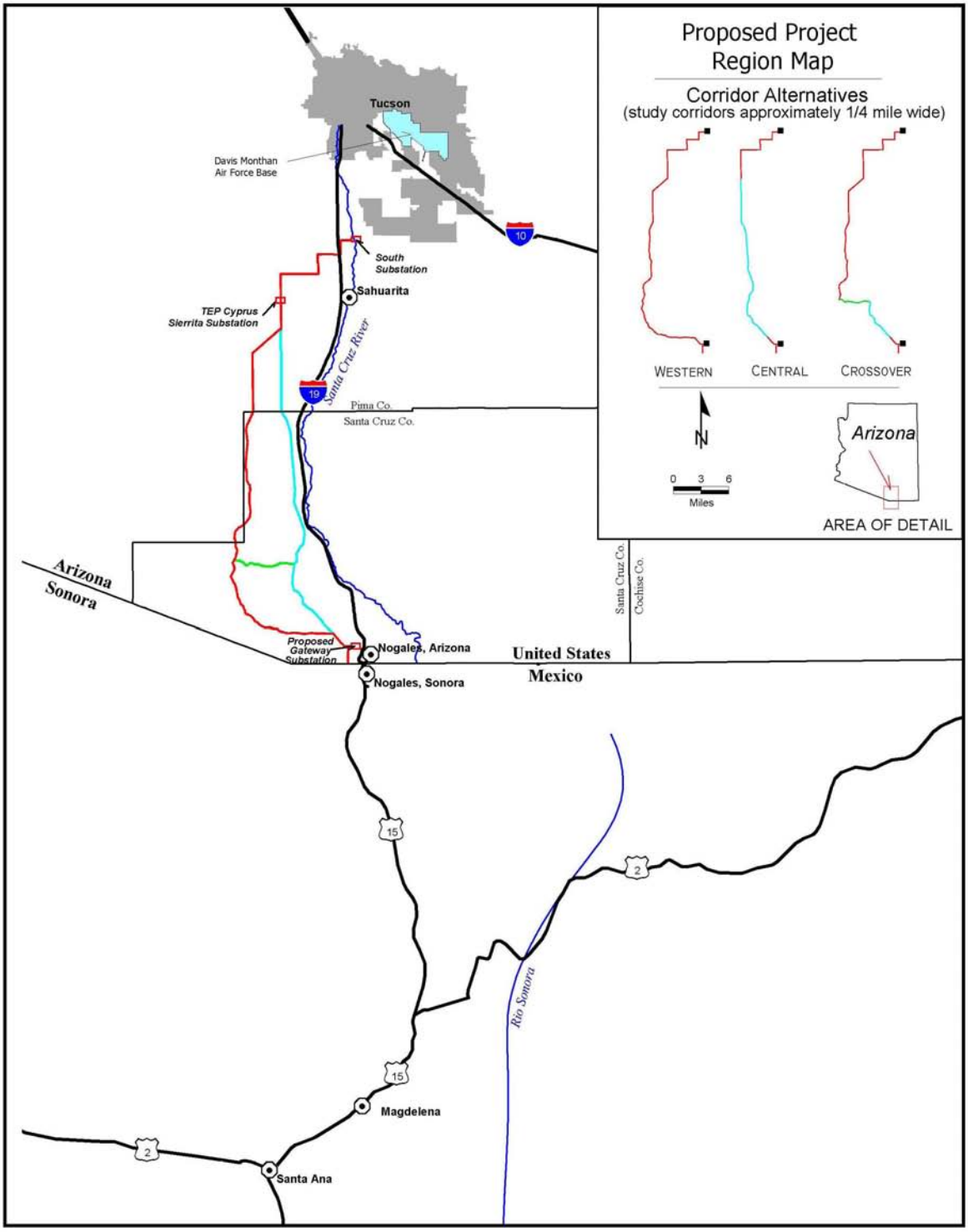

Figure S–1. Proposed Project Region Map.

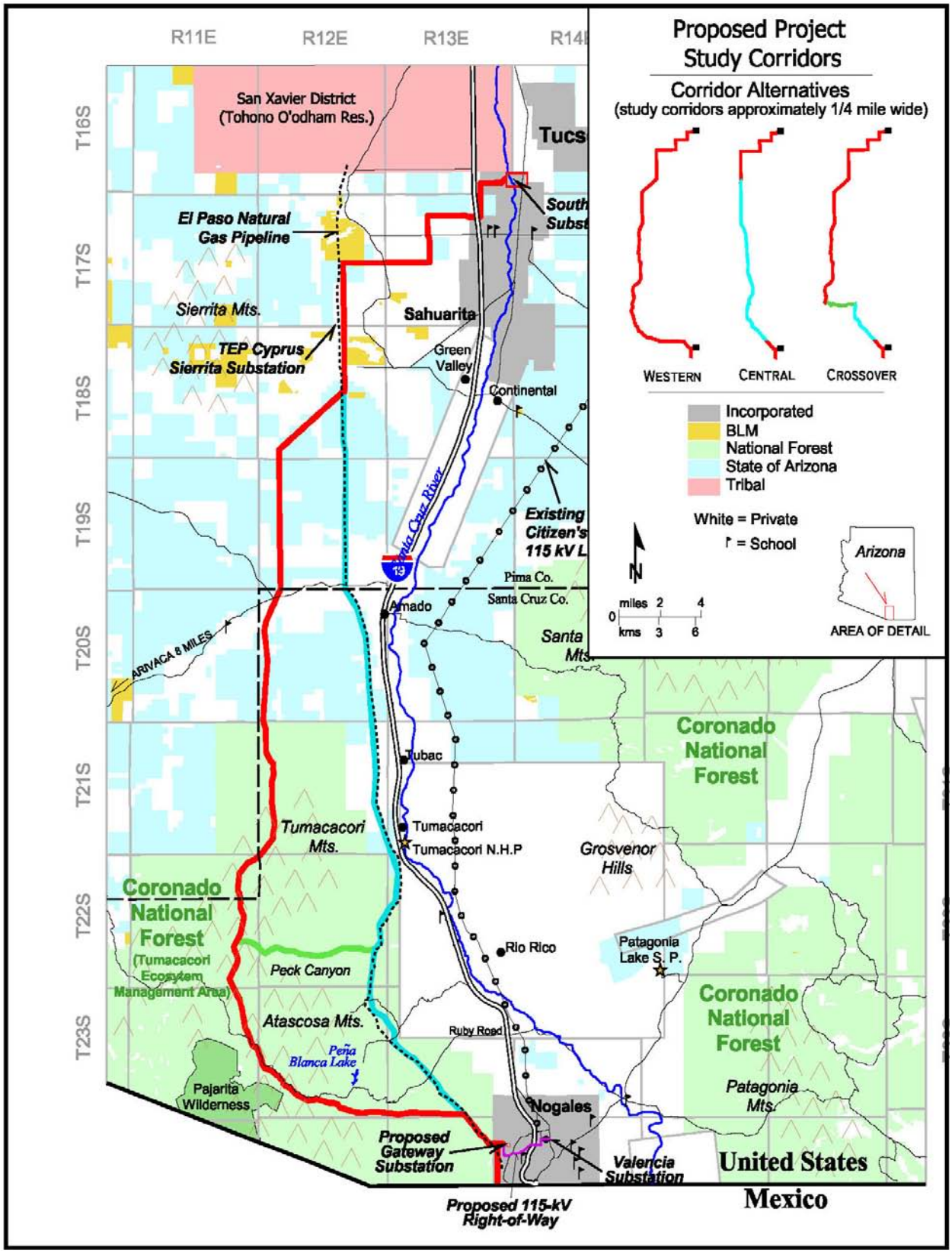

Figure S–2. Proposed Project Study Corridors.

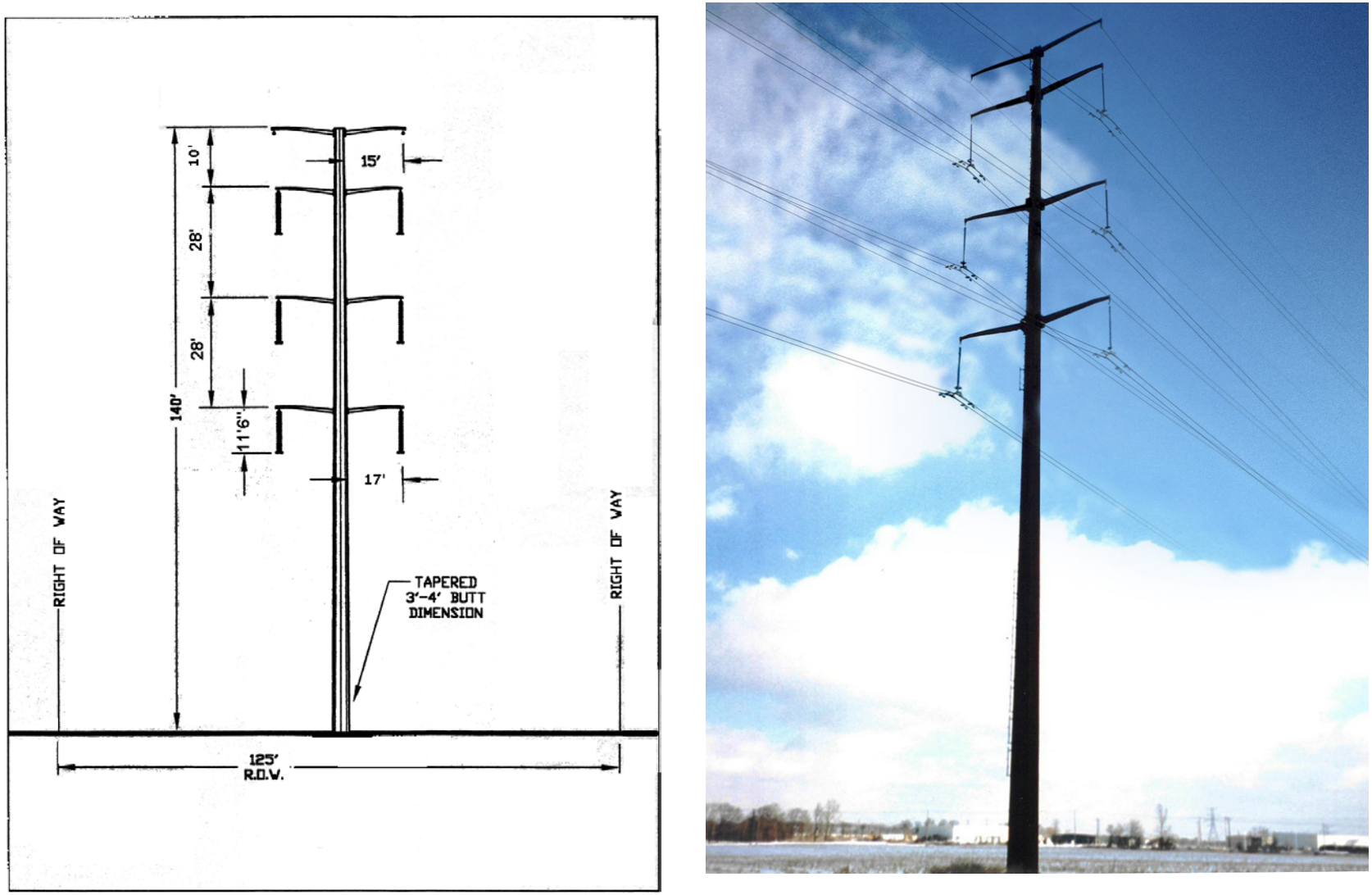

Figure S–3. Monopole Transmission Line Structure Drawing and Photo.

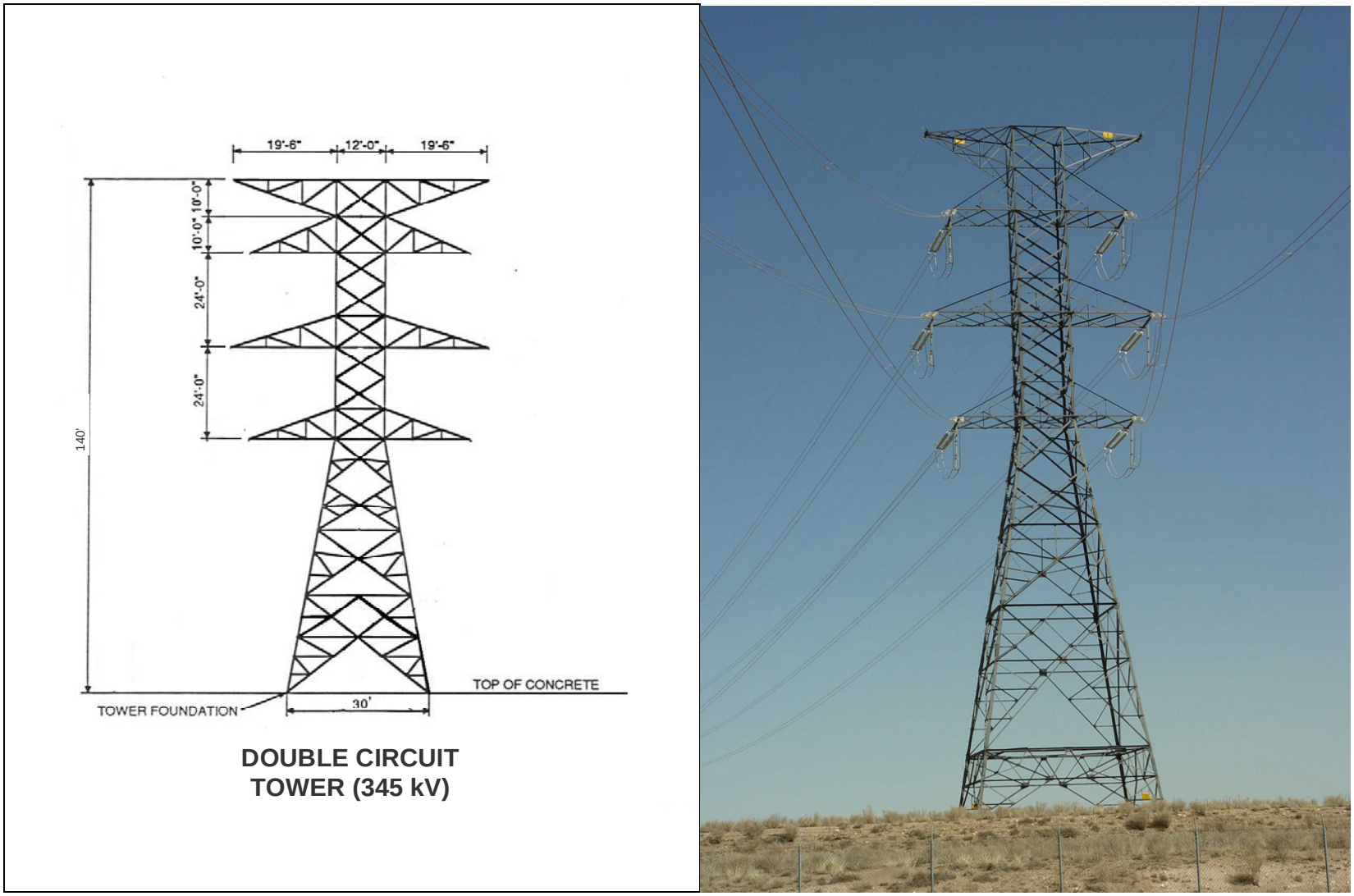

Figure S–4. Lattice Tower Transmission Line Structure Drawing and Photo.

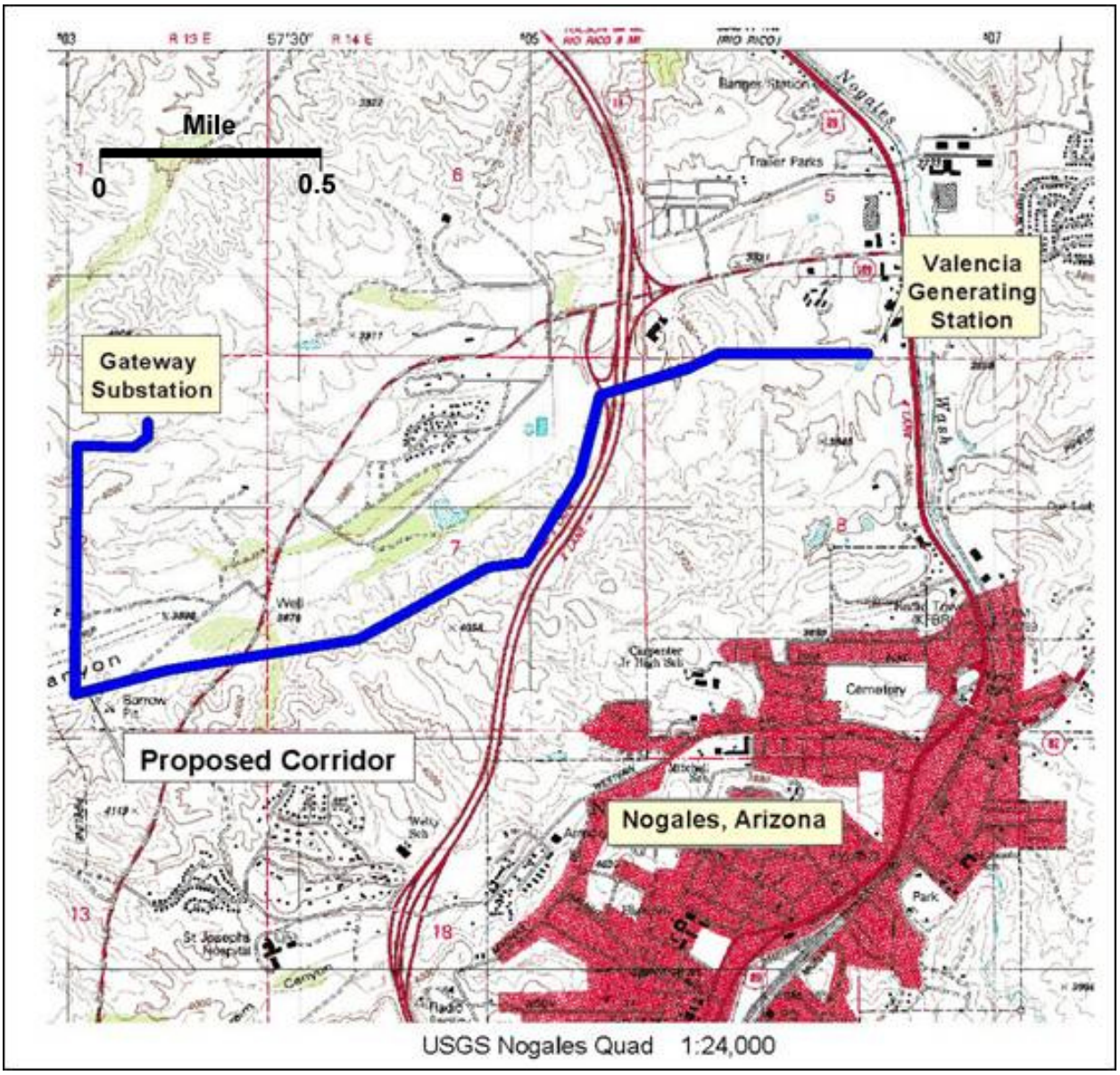

Figure S-5. Gateway to Valencia 115-kV Transmission Line.

The primary support structures to be used for the 115-kV transmission line would be the self-weathering steel single poles depicted in Figure S–3. The existing electric distribution system was previously owned and operated by Citizens Communications Company (Citizens), formerly named Citizens Utilities, and is currently owned and operated by UniSource, the new parent company of TEP and Citizens. TEP would also install additional equipment at the existing Valencia Substation, but would not expand the facility beyond the existing footprint. This proposed 115-kV line would cross neither the U.S.-Mexico border nor any Federal lands. Accordingly, the Federal agencies have no apparent jurisdiction over its path. This EIS does, however, present the potential environmental impacts of this line as a reasonably foreseeable connected action because the impacts of the 115-kV line from the Gateway Substation to the Valencia Substation would not occur if it were not for the proposed 345-kV line, which does require Federal approvals.

There is an existing El Paso Natural Gas Company (EPNG) buried pipeline within the project area, and segments of each of TEP's three proposed corridors either cross the pipeline ROW, run immediately adjacent to the pipeline ROW, or are roughly parallel to the pipeline ROW within a distance of approximately 0.5 mi (0.8 km). This EIS uses the term "follows or crosses" to describe the relationship between each corridor and the EPNG pipeline ROW.

DOE. DOE's proposed action is to approve an application by TEP for a Presidential Permit to allow construction, operation, maintenance, and connection of transmission lines and associated facilities for the export and/or import of electricity across the international border with Mexico.

USFS. The USFS's proposed action is to authorize TEP to use National Forest System lands in the Tumacacori Ecosystem Management Area (EMA) of the Coronado National Forest for placement, operation, and maintenance of the proposed 345-kV electrical transmission line, access roads, fiber optics lines, and specific support facilities. TEP's land use requirements in the EMA would differ among the alternative corridor routes, ranging from approximately 15 mi (24 km) to nearly 30 mi (48 km).

BLM. The BLM's proposed action is to authorize two ROWs on public lands under its jurisdiction: one for 1.25 mi (2.0 km) of the transmission line, and the other for 0.25 mi (0.39 km) of fiber-optic facilities.

USIBWC. The USIBWC's proposed action is to concur on TEP's proposal relative to activities that will occur at and near the international border with Mexico.

ALTERNATIVES. This EIS evaluates in detail three alternative corridors for the transmission line: the Western Corridor, Central Corridor, and Crossover Corridor. Each of these routes is described below. The EIS also analyzes a no action alternative. A comparison of the proposed alternatives is presented in Table S-1 at the end of this summary.

Western Corridor. The Western Corridor is the western-most alternative connecting the South Substation in Sahuarita to the U.S.-Mexico border. The Western Corridor extends for an estimated 65.7 mi (105 km), from the South Substation to the U.S.-Mexico border, including 9.3 mi (15.0 km) that follows or crosses the El Paso EPNG pipeline ROW. The Western Corridor crosses 29.5 mi (47.5 km) of USFS land and 1.25 mi (2.0 km) of BLM land. The Western Corridor would require an estimated 429 support structures (monopoles or lattice towers), including an estimated 191 within the Coronado National Forest and 8 on BLM land. Table S-1 lists the estimated areas of land that would be occupied by structures and structure construction sites. TEP would use existing utility maintenance roads, ranch access roads, and, where no access currently exists, new access ways. Approximately 20 mi (32 km) of new temporary roads would be built for construction of the Western Corridor on the Coronado National Forest; spur roads off existing access roads to adjacent TEP transmission lines would provide project access on BLM land.

Transmission line tensioning and pulling and fiber-optic splicing sites would also temporarily disturb land. These sites would range in area from 0.5 to 1.5 acres (0.2 to 0.6 ha). There would be an estimated 12 sites outside of National Forest System lands occupying a total of 18 acres (7 ha), and an estimated 14 sites on the Coronado National Forest occupying a total of 10.5 acres (4.2 ha). The total new temporary area of disturbance on the Coronado National Forest during construction of the Western Corridor would be an estimated 197 acres (79.7 ha).

Following construction, TEP would close roads not required for project maintenance and would limit access to maintenance roads, in accordance with agreements with land owners or managers (for example, BLM or USFS). Road density in the Tumacacori Ecosystem Management Area is not expected to change if TEP's proposal is implemented. TEP would coordinate with USFS (Nogales District Ranger) to identify 1.0 miles (1.6 km) of road closures on existing classified roads for each mile (km) of road TEP would utilize during construction and maintenance operations. The maintenance access required by TEP would be limited to roads leading to selected structures. There would not be a single cleared ROW leading to the U.S.-Mexico border. Transmission line tensioning and pulling sites, fiber-optic splicing sites, and construction yard areas would be cleared within 6 months of the project becoming fully operational and the areas would be restored in accordance with agreements with land owners or managers.

The Western Corridor, together with the Central and Crossover Corridors (described below), exits the TEP South Substation located within the incorporated area of the Town of Sahuarita and proceeds westerly for 1.0 mi (1.6 km) before turning south for 1.5 mi (2.4 km). The corridor turns west across I-19 and continues through Pima County to the southwest, crossing an estimated 1.25 mi (2.0 km) of Federal lands managed by BLM parallel to two existing TEP transmission lines (138-kV and 345-kV). All corridors turn south and follow on the east side of the EPNG pipeline ROW for an estimated 5.8 mi (9.3 km), passing just east of the existing TEP Cyprus Sierrita Substation.

The Western and Crossover Corridors continue south past the Cyprus Sierrita Substation, then separate from the Central Corridor, continuing southwest and south and enter Santa Cruz County after approximately 10 mi (16 km). The Western and Crossover Corridors enter the Coronado National Forest 6.0 mi (9.7 km) south of the Santa Cruz County line. Where the Crossover Corridor turns east at Peck Canyon, the Western Corridor continues south along the west side of the Tumacacori and Atascosa Mountains, then meets and runs along the south side of Ruby Road as it turns gradually east, north of the Pajarita Wilderness. The Western Corridor continues south of Ruby Road then meets the EPNG gas pipeline ROW and the Central and Crossover Corridors.

The Western Corridor, together with the Central and Crossover Corridors, continues through National Forest System land, paralleling the EPNG pipeline ROW to the southeast for several miles to the Coronado National Forest boundary. The proposed corridors exit the National Forest onto private land and proceed 0.5 mi (0.8 km) east to the proposed Gateway Substation. From the Gateway Substation, the corridors return to the west through private land then turn south to parallel the Coronado National Forest boundary. The corridors meet the U.S.-Mexico border approximately 0.62 mi (1.0 km) west of Arizona State Highway 189 in Nogales, Arizona. Portions of the Western Corridor route crossing the Coronado National Forest are not consistent with management direction in the governing Forest Plan. The Forest Plan would be amended to establish a new utility corridor, establish utility corridor width, and change visual quality objectives as fully described in Section 2.1.1 of the Final EIS.

Central Corridor. The Central Corridor overlaps the northern portion of the Western Corridor from the South Substation in Sahuarita for approximately 18 mi (29 km), then continues south parallel to the EPNG pipeline ROW, connecting Sahuarita to the U.S.-Mexico border. The Central Corridor extends for an estimated 57.1 mi (91.9 km), including an estimated 43.2 mi (69.5 km) that follows or crosses the EPNG pipeline ROW. The estimated length of the Central Corridor within the Coronado National Forest

is 15.1 mi (24.8 km). The estimated length of the Central Corridor on lands managed by BLM is 1.25 mi (2.0 km).

The Central Corridor would require an estimated 373 support structures, including 102 within the Coronado National Forest and 8 on BLM land. Table S–1 lists the estimated areas of land that would be displaced by structures and structure construction sites. TEP would use existing access where feasible as described for the Western Corridor. An estimated 13.8 mi (22.2 km) of temporary new roads would be built for construction of the Central Corridor on the Coronado National Forest; spur roads off existing access roads to adjacent TEP transmission lines would provide project access on BLM land. Transmission line tensioning and pulling and fiber-optic splicing sites would also temporarily disturb land. These sites would range in area from 0.5 to 1.5 acres (0.2 to 0.6 ha). There would be an estimated 14 sites outside of National Forest System lands occupying a total of 21 acres (8.5 ha), and an estimated 7 sites on the Coronado National Forest occupying a total of 3.3 acres (1.3 ha). The total new temporary area of disturbance on the Coronado National Forest during construction of the Central Corridor would be an estimated 105 acres (42.5 ha).

The Central Corridor follows the same route as the Western and Crossover Corridors from the South Substation in Sahuarita to approximately 3 mi (4.8 km) south of the existing TEP Cyprus Sierrita Substation. Refer to the previous discussion of the Western Corridor for a description of this common segment. The Central Corridor separates from the Western and Crossover Corridors south of the TEP Cyprus Sierrita Substation, continuing to follow or cross the EPNG pipeline ROW to the south.

The Central Corridor approaches to within approximately 1.0 mi (1.6 km) west of I-19, passing the towns of Amado, Tubac, and Tumacacori. The Central Corridor continues approximately 2.0 mi (3.2 km) south of Tumacacori then enters the Coronado National Forest, following the EPNG pipeline ROW. Within the Coronado National Forest, two optional sub-routes are addressed: (1) a route that avoids a 1.9-mi (3.1-km) stretch of the EPNG pipeline ROW that is also designated as an inventoried roadless area (IRA); and (2) a route that follows the EPNG pipeline ROW in the Coronado National Forest. The Draft EIS did not include both optional routes (i.e., did not include Option 2) because there was a perceived need to avoid that portion of the existing EPNG pipeline ROW that is designated as an IRA. However, based on public comments, the Federal agencies decided that a route following the EPNG pipeline ROW would be a reasonable option for the transmission lines through the Coronado National Forest. Such a route would allow the transmission lines to be constructed and operated in an area that is currently designated as a utility corridor in the governing Forest Plan. Additionally, an optional route within the existing EPNG pipeline ROW would not require creation of a new utility corridor and would give the USFS greater flexibility in managing the 1.9-mile (3.1-km) stretch of land that is not currently designated as a utility corridor. The Central Corridor passes along the eastern edge of the Tumacacori and Atascosa Mountains, crosses Ruby Road, and reaches a point northwest of the proposed Gateway Substation where it rejoins the Western Corridor (see Figure S–2).

The Central Corridor is identical to the Western Corridor from the point where they join in the Coronado National Forest to the Gateway Substation and the U.S.-Mexico border. Refer to the previous discussion of the Western Corridor for a description of this common segment.

Portions of the Central Corridor (both Option 1 and Option 2) crossing the Coronado National Forest are not consistent with management direction in the governing Forest Plan. The Forest Plan would be amended to establish a new utility corridor, establish utility corridor width, and change visual quality objectives as fully described in Section 2.1.2.

Crossover Corridor. The Crossover Corridor overlaps the northern portion of the Western Corridor from the South Substation in Sahuarita into the Coronado National Forest, then turn east through Peck Canyon for an estimated 7 mi (11.3 km) to meet up with the Central Corridor. The Crossover Corridor is identical

to the Central Corridor from the point they rejoin in the Coronado National Forest to the proposed Gateway Substation and the U.S.-Mexico border. Refer to previous discussion of the Western Corridor for a discussion of this common segment. The Crossover Corridor extends for an estimated 65.2 mi (105 km), from the South Substation to the U.S.-Mexico border, including an estimated 17 mi (27.4 km) that follows or crosses the EPNG pipeline ROW (with the same two options for the 1.9 mi (3.1 km) stretch that is designated as an IRA). The estimated length of the Crossover Corridor within the Coronado National Forest is 29.3 mi (47.2 km). The estimated length of the Crossover Corridor on lands managed by BLM is 1.25 mi (2.0 km).

The Crossover Corridor would require an estimated 431 support structures, including 196 within the Coronado National Forest and 8 on BLM land. Table S–1 lists the estimated areas of land that would be displaced by structures and structure construction sites. TEP would use existing access where feasible as described for the Western Corridor. An estimated 20.7 mi (33.3 km) of temporary new roads would be built for construction of the Crossover Corridor on the Coronado National Forest; spur roads off existing access roads to adjacent TEP transmission lines would provide project access on BLM land. Transmission line tensioning and pulling and fiber-optic splicing sites would also temporarily disturb land. These sites would range in area from 0.5 to 1.5 acres (0.2 to 0.6 ha). There would be an estimated 12 sites outside of National Forest System lands occupying a total of 18 acres (7 ha), and an estimated 12 sites on the Coronado National Forest occupying a total of 7.6 acres (3.1 ha). The total new temporary area of disturbance on the Coronado National Forest during construction of the Crossover Corridor would be an estimated 238 acres (96.3 ha).

Portions of the Crossover Corridor (both Option 1 and Option 2) crossing the Coronado National Forest are not consistent with management direction in the governing Forest Plan. The Forest Plan would be amended to establish a new utility corridor, establish utility corridor width, and change visual quality objectives as fully described in Section 2.1.3.

No Action Alternative. CEQ regulations require that an agency "include the alternative of no action" as one of the alternatives it considers (40 CFR 1502.14[d]). In the context of this EIS, "no action" means that TEP's proposed transmission line would not be built. For DOE and the cooperating agencies, "no action" would be achieved by any one of the Federal agencies declining to grant TEP its permission to build in its respective jurisdiction. Thus, in the case of DOE, "no action" means denying the Presidential Permit. For USFS, "no action" means denying the authorization. Because the action alternatives would require amendment of the Forest Plan, "no action" is further defined to mean that the Forest Plan, including the Transportation System and Utilities Corridor Map, would remain unchanged. Without authorization and associated Forest Plan amendments, the 345-kV transmission line and associated structures would not be constructed on National Forest System lands. Management of lands and resources in the Tumacacori Ecosystem Management Area would progress as expected under current management direction. For BLM, "no action" means denying access to BLM-managed Federal lands. For USIBWC, "no action" means denying permission to cross the international border. Each agency makes its own decision independently, so that it is possible that one or more agencies could grant permission for the proposal while another could deny permission. Thus, if any agency denied permission for the proposed transmission line, it would not be built.

PURPOSE AND NEED

TEP. TEP needs the respective permits and approvals from DOE, USFS, BLM, and USIBWC in order to proceed with its proposed project and to comply with the terms of the Arizona Corporation

Commission's[1] (ACC's) orders, which mandate the construction of a second 115-kV transmission line to Nogales, Arizona and grant a Certificate of Environmental Compatibility (CEC) to construct a new 345-kV transmission line to interconnect with the CFE transmission system at the U.S.-Mexico border.

DOE. The purpose and need for DOE action is to determine whether it is in the public interest to grant or deny a Presidential Permit to TEP for the construction, operation, maintenance, and connection of the proposed 345-kV transmission line that would cross the U.S. international border. DOE published a notice of receipt of the Application for a Presidential Permit in the *Federal Register* on September 20, 2000 (65 FR 56875). DOE's action is in response to the applicant's request for a Presidential Permit. Like all Federal agencies, DOE must comply with NEPA and, in this instance, has agreed to be the lead Federal agency for NEPA compliance.

In determining whether a proposed action is in the public interest, DOE considers the impact of the proposed project on the environment and on the reliability of the U.S. electric power supply system. DOE also must obtain the concurrences of the Departments of State and Defense before it may grant a Presidential Permit. If DOE determines that granting a Presidential Permit is in the public interest, the information contained in the EIS will provide a basis upon which DOE decides which alternative(s) and mitigation measures, if any, are appropriate for inclusion as conditions of the permit. In a process that is separate from NEPA, DOE will determine whether the proposed project will adversely impact the reliability of the U.S. electric system. If DOE were to approve TEP's request for a Presidential Permit, before TEP could export any electric energy to Mexico over the proposed facilities, TEP must apply for and obtain export authorization from DOE under section 202(e) of the Federal Power Act (16 U.S.C. §824a(e)). Before authorizing exports to Mexico over the proposed 345-kV facilities, DOE must ensure that the export will not impair sufficiency of electric supply within the United States and will not impede, or tend to impede, the coordinated use of the regional transmission system. Issuance of a Presidential Permit indicates only that DOE has no objection to the project, but does not mandate that the project be completed. DOE may grant a Presidential Permit for one or more of the alternative corridors. In the event DOE denies a permit, TEP's transmission lines would not be allowed to cross the border into Mexico, although the transmission lines, or some other version of the project, could otherwise still be built within the United States if BLM and USFS were to approve the project.

USFS. The USFS purpose and need for action is mandated by its statutory responsibility under the FLPMA, which requires that it consider applications for use of National Forest System lands for purposes that are in the public interest, such as utility corridors, and that are identified as appropriate in the governing land and resource management plan. The FLPMA provides for the Secretary of Agriculture to issue, renew, or grant authorizations to occupy, use, or traverse National Forest System lands for the generation, transmission, and distribution of electrical power (Title 43, Chapter 35, Subchapter V, Section 1761).

Similarly, the purpose and need for USFS action on the proposed amendments to the Land and Resource Management Plan for the Coronado National Forest (1986, as amended) (hereafter, Forest Plan) derives from statutory requirements that " …the Forest Supervisor … ensure that, subject to valid existing rights, all …instruments for occupancy and use … are consistent with the [forest] plan" (36 CFR 219.10(e). To authorize TEP to occupy and use National Forest System lands for a 345-kV electrical transmission line, the USFS must change incompatible management direction in the Forest Plan using the amendment process defined in the Forest Service Manual 1920 and Forest Service Handbook 1909.12 and must

[1] The ACC is the state agency responsible for regulating Arizona's electric utilities and for assuring the citizens of the state a safe and reliable power system. As such, the ACC is responsible for approving proposals for siting electricity transmission lines within the state.

follow "appropriate public notification and satisfactory completion of NEPA procedures." The decision by the USFS to approve or deny Forest Plan amendments associated with each of the routing alternatives in this EIS would be based, in part, on the findings of the impact analyses reported in this EIS.

The USFS decision to approve TEP's application and authorize the requested use will be based, in part, on the results of this NEPA review process (i.e., the findings of the impacts analyses reported in this EIS) and further, on the NFMA determination of the consistency of the proposed use with the parameters specified in the Forest Plan. The USFS may deny authorization for special uses for a number of different reasons, such as follows: "the proposed use would be inconsistent or incompatible with the purpose(s) for which the lands are managed, or with other uses," or the proposed use "would not be in the public interest" (36 CFR 251.4).

An amendment to the Forest Plan for the Coronado National Forest would be needed for any of the three action alternatives. The amendment process would have to be complete before implementation of the proposed project. Appendix H describes the amendment process and requirements.

BLM. The purpose and need for BLM action is to determine whether or not to approve an electrical transmission line ROW and a fiber optic ROW in accordance with the FLPMA. Because each of the corridor alternatives crosses Federal lands managed by BLM, development of the proposed transmission line would require BLM approving two separate ROW grants, one for the transmission line and one for the fiber optics line. TEP applied to BLM on March 20, 2001, for approval to construct a double circuit 345-kV transmission line across 1.25 mi (2.0 km) of Federal lands managed by BLM approximately 5 mi (8 km) west of Sahuarita, and submitted its application to BLM for the proposed fiber optic facilities on April 14, 2003. The fiber optic permit application is for an undefined use outside of TEP internal use, and would be renegotiated if the use changes. In processing the applications, BLM must consider land status, affected resources, resource values, environmental conditions, and the concerns of various interested parties in accordance with the BLM Manual and Handbook 1790-1 and Departmental Guidance (516 DM 1-7). BLM must conform to the existing BLM Resource Management Plan (BLM 1988) that designates land uses and other special uses. BLM must complete an administrative NEPA review process prior to implementing a decision documented in the ROD with regard to approval or denial of the ROW grant(s).

USIBWC. The purpose and need for USIBWC action is to review plans for construction of the proposed project where it would cross the border between the United States and Mexico, and to assess whether the effects of the proposed project would be consistent with existing bilateral arrangements between the two countries or would obscure or otherwise impact the international border. Specific USIBWC concerns about the proposed project include evaluating whether there would be adverse impacts on the visibility and permanent placement of the international boundary monuments and markers, whether project-associated structures could limit access to the international boundary monuments and markers, whether the present drainage patterns to and from Mexico would be affected, and whether potential transboundary pollution problems associated with the proposed project are properly addressed to insure that none occur in either country. USIBWC will not approve any construction in the United States that increases, concentrates, or relocates overland drainage flows into either the United States or Mexico. Surface drainage must be handled so that there is no increase of volume, peak runoffs, or flow concentration across the border in either direction (USIBWC 2003). Prior to construction of the selected corridor, TEP would provide to USIBWC, for its approval, copies of any hydrological or hydraulic studies and site-specific drawings for work proposed in the vicinity of the U.S.-Mexico border. This would include review of any structures proposed to be constructed in any drainage courses that cross the border. USIBWC is not a cooperating agency in preparation of this EIS, but will use information in this EIS in conjunction with review of project studies and plans to prepare a letter of concurrence, if appropriate, to the project proponents (in this case, TEP).

THE FEDERAL AGENCIES' PREFERRED ALTERNATIVES

NEPA requires the identification of the agency's preferred alternative or alternatives in a Draft EIS if one or more exists, or, if one does not yet exist at the draft stage, in the Final EIS (40 CFR Part 1502.14). In the Draft EIS, DOE identified the Western Corridor as its preferred alternative. It did so for three reasons: First, the Western Corridor was TEP's preferred route. Second, this is consistent with ACC Decision 64356, in which the ACC granted TEP a CEC to construct the proposed transmission line along the preferred Western Corridor, which is also consistent with the Line Siting Committee's recommendation (see Section 1.2.2 of the EIS). Third, DOE hoped to focus public comment on the Western Corridor in an effort to discern public reaction to that choice versus the other alternatives. The remaining Federal agencies did not have preferred alternatives when the Draft EIS was issued, but elected instead to designate their respective preferred alternatives in the Final EIS after all of the environmental information had been reviewed and evaluated.

Each Federal agency here has its own unique jurisdiction and responsibilities in making decisions with respect to TEP's proposal. These different perspectives are reflected in the agencies' statements of purpose and need set forth above. This explains why the preferred alternatives of the Federal agencies, discussed below, are not necessarily the same. If TEP ultimately does not receive the unanimous consent of all Federal agencies, the State of Arizona, and regulatory entities to build along the same corridor, this project would not be allowed to proceed as proposed. The Federal agencies' preferred alternatives are as follows:

DOE's Preferred Alternative. The CEQ's regulations for implementing NEPA require a Federal agency to identify its preferred alternative in the Draft EIS if it has one at that time or, if one does not exist at the Draft stage, to identify its preferred alternative in the Final EIS, 40 CFR § 1502.14(e). DOE designated the Western Corridor as its preferred alternative in the Draft EIS for three reasons. First, it was the corridor designated by the State of Arizona for TEP's transmission line. Second, it was TEP's preferred route. Third, DOE believed that designating a preferred alternative in the Draft would stimulate and focus public comment on the alternatives set forth in the Draft EIS.

Since the Draft EIS was published several events have occurred that bear on DOE's designation of the Western Corridor as its preferred alternative. First, the USFS has designated the Central Corridor as its preferred alternative. Second, while the ACC's original decision designating the Western Corridor for TEP's project still stands, the ACC re-opened the siting proceeding to consider new evidence, including the analyses presented in this Final EIS. Third, DOE has received numerous comments both for and against the Western and Central Corridors, and has developed additional environmental analysis with respect to all of the alternative corridors.

In order to meet the regulatory requirements that it designate a preferred alternative, DOE has decided to continue to designate the Western Corridor, again because it reflects the State of Arizona's present choice, and continues to be TEP's preference. This being said, it is important to understand that the NEPA analysis suggests to DOE that all of the analyzed corridors appear to be acceptable from DOE's perspective, and that DOE could approve any or all of them in its Record of Decision (ROD).

Given the foregoing, it is important that the inference not be drawn from DOE's designation of the Western Corridor that DOE and the USFS disagree with respect to the suitability of the Central Corridor for this project. Indeed, DOE recognizes that the Central Corridor appears to have the fewest environmental impacts of all the corridors. DOE has designated the Western Corridor for the reasons explained above.

USFS' Preferred Alternative. The USFS did not identify a preferred alternative in the Draft EIS because key pieces of analysis were not yet available at the time the Draft EIS was published. Following publication of the Draft EIS, the needed analyses became available and were reviewed. Based on this review, the USFS has identified the following preferred alternative:

> Central Corridor (Option 1): issue an authorization that allows TEP to construct, operate, and maintain a 345-kV electrical transmission line across National Forest System lands of the Tumacacori Ecosystem Management Area in the route described in this EIS as Central Corridor Option 1; and approve associated Forest Plan amendments to designate new utility corridor, establish corridor width, and change visual quality objectives (see Appendix H for details associated with the USFS Forest Plan Amendments).

BLM's Preferred Alternative. The BLM decision regarding this EIS is to determine whether or not to approve an electrical transmission line ROW and a fiber optic ROW in accordance with the FLPMA. The BLM's preference is to grant such ROWs. With respect to transmission line routing, each transmission line alternative would cross Federal lands managed by the BLM along the same route. As such, there would be no difference among the alternative routes with respect to the land managed by the BLM. Because the BLM decision would not affect any route ultimately selected (if any), the BLM does not need to identify a preferred routing alternative.

USIBWC's Preferred Alternative. The USIBWC decision regarding this EIS is to assess whether the effects of the proposed project would be consistent with existing bilateral arrangements between the U.S. and Mexico or would obscure or otherwise impact the international border. The USIBWC's preference is to allow the proposed project to cross the U.S.-Mexico border. With respect to transmission line routing, each transmission line alternative would cross the U.S.-Mexico border along the same route. As such, there would be no difference among the alternative routes with respect to the USIBWC decision. Because the USIBWC decision would not affect any route ultimately selected (if any), the USIBWC does not need to identify a preferred routing alternative.

PUBLIC PARTICIPATION

Public participation in the EIS process generally includes two formal opportunities for input: (1) a public scoping period, where interested or potentially affected agencies, organizations, tribes, and members of the public are invited to comment on the appropriate scope or content of the EIS, through comment submittal and public hearings; and (2) the Draft EIS comment period, where interested or potentially affected agencies, tribes, organizations, and members of the public are invited to comment on the document and participate in public hearings. Comments received outside of these two formal comment periods are still considered, to the extent practicable. In addition to these two periods of public participation, the USFS offers a final opportunity for public involvement in the NEPA process through an administrative appeal period. This period extends 45 days beyond the date of publication of its ROD, and no extensions are made for the submittal of comments.

The "Notice of Intent to Prepare an Environmental Impact Statement (EIS) and to Conduct Public Scoping Meetings and Notice of Floodplain and Wetlands Involvement" for the proposed project was published in the *Federal Register* (66 FR 35950) on July 10, 2001. Announcements were also placed in local newspapers. A fact sheet translated into Spanish has been provided on the proposed project website maintained for DOE (www.ttclient.com/TEP). Public scoping hearings were held by DOE on July 30, 2001, at the Rancho Resort in Sahuarita, Arizona, and on July 31, 2001, at the Rio Rico Resort in Rio Rico, Arizona. Both oral and written comments were invited and received at these hearings. A total of 65 individuals presented formal oral comments at the two public scoping hearings. Written scoping comments were also solicited in the announcements. The public comment period was initially to have closed on August 9, 2001, but, in response to requests from the public, it was extended until August 31,

2001. The Draft EIS documented the scoping comments that were received and discussed their disposition. That information can also be found in Section 1.6.2 of the Final EIS.

Following public scoping, the Federal agencies prepared the Draft EIS, the next step in the NEPA process. The Draft EIS describes, analyzes, and compares the potential environmental impacts of the alternatives that could be chosen to accomplish the purpose and need to which the agency is responding. It also provides information on the methodologies and assumptions used for the analyses. If one or more preferred alternative(s) exists at this stage of the NEPA process, they are identified in the Draft EIS. DOE published its Draft EIS on August 27, 2003. Copies of the Draft EIS were sent to interested parties (see Chapter 15) and filed with the U.S. Environmental Protection Agency (EPA).

The Notice of Availability of the Draft EIS was published by the EPA in the *Federal Register* on August 22, 2003 (68 FR 50768), which initiated a 53-day comment period that ended on October 14, 2003. The comment period exceeded the requirement set forth by CEQ regulations (40 CFR 1506.10[c]) for a Draft EIS public comment period of at least 45 days. Although the official public comment period for comments on the Draft EIS closed on October 14, 2003, the Federal agencies continued to accept and consider comments after the close of the public comment period.

During the comment period, public hearings were held in Green Valley, Arizona on September 25, 2003 and in Nogales, Arizona on September 26, 2003. Notification of the public hearings was accomplished through a variety of media. The time and location of the hearings were posted in DOE's August 27, 2003, notice in the *Federal Register* (68 FR 51569) and on DOE's project website at www.ttclients.com/TEP. In addition, announcements were placed in newspapers and read on local radio stations in Tucson, Green Valley, and Nogales, Arizona.

At each hearing, DOE received oral and written comments on the Draft EIS. In addition, the public was encouraged to provide comments via a toll-free comment line, U.S. mail, fax, e-mail or on the internet through the DOE website. The Federal agencies have considered and responded in this Final EIS to all of the comments received. Volume II of this EIS, the Comment-Response Document, describes the public comment process in detail and contains transcripts from the public hearings, copies of all comments received, and the Federal agencies' responses.

Major Comments Received on the Draft Environmental Impact Statement

Approximately 7,300 discrete comments on the Draft EIS were received during the comment period. Of these, approximately 5,500 comments resulted from e-mail campaigns. The major comments received on the Draft EIS included the following:

- Objection to the proposed project because of the potential impacts to visual and recreational resources.
- Question of the need for a 345-kV transmission line. Also, some commentors expressed the opinion that the Draft EIS did not evaluate the range of reasonable alternatives, including a 115-kV line and a local power plant in Nogales.
- Concern over the effect the proposed project would have on electricity rates.
- Support for the No Action Alternative.
- Failure to address potential impacts on private property. Specifically, commentors questioned the impact of the proposed project on property values.

- Potential impacts associated with flooding. Specifically, commentors stated that the 500-year flood event should be evaluated in the EIS.

- Violation of the Forest Plan for the Coronado National Forest. Specifically, commentors questioned impacts associated with roads, the USFS Scenery Management System Objectives, and the USFS Recreation Opportunity Spectrum.

All of the comments identified above, as well as all other comments received, are responded to in detail in Chapter 2 of the Comment-Response Document (Volume II of this EIS). The major changes are discussed in the next section.

Changes from the Draft Environmental Impact Statement

The Federal agencies have changed the Draft EIS in response to comments or to reflect new information. A brief discussion of the more significant changes is provided below.

Purpose and Need, Range of Reasonable Alternatives, and Background Information. Chapters 1 and 2 were reorganized and augmented to clarify the roles of each Federal agency in the review of TEP's proposed project, and to describe the range of reasonable alternatives that a Federal agency is required to evaluate for an applicant-initiated project, such as TEP's proposed project. The Federal agencies also included additional background information on the origin of TEP's proposal and on the NEPA process.

Connecting 115-kV Transmission Line in Nogales, Arizona. The Federal agencies revised the EIS to evaluate TEP's proposed 115-kV transmission line between the proposed Gateway Substation and the existing Valencia Substation in Nogales, Arizona. The construction of this 115-kV transmission line is an action that is connected to construction of the proposed 345-kV transmission line. Chapter 2 has been revised to describe the proposed 115-kV transmission line, Chapter 3 has been revised to describe the environment that would be affected by its construction and operation, and Chapter 4 has been revised to present the potential environmental effects from its construction and operation. Other sections of the EIS were revised as appropriate to reflect the proposed 115-kV transmission line. A Biological Assessment for this 115-kV transmission line was added as Appendix K.

Additional Alternatives Considered but Eliminated from Detailed Study in the Final EIS. Five new alternatives are briefly considered in the Final EIS because they were raised in the public hearings and in the written comments on the Draft EIS, but were not addressed in the Draft EIS. As discussed in Section 2.1.5 of the Final EIS, these alternatives have been considered but were determined to be unreasonable and were eliminated from further analysis: (1) upgrading existing transmission lines; (2) conservation of electricity; (3) underground construction of the 345-kV line in lieu of aboveground support structures; (4) construction of a 115-kV line in lieu of the proposed 345-kV line; and (5) an optional route for the Western and Crossover Corridors that avoids the Caterpillar Facility. In addition, Section 2.1.5 of the Final EIS has been amended to add a description of the potential environmental impacts that could be associated with a new power generating facility.

Optional Sub-Routes Added for the Central Corridor and the Crossover Corridor. Within one stretch of the Coronado National Forest, an optional sub-route for the Central Corridor and the Crossover Corridor was added to the analysis. The Draft EIS only included a route (Option 1) that circumvented the IRA because there was a perceived need to avoid that portion of the existing EPNG pipeline ROW that is also designated as an IRA. However, based on public comments, the Federal agencies decided that a sub-route following the EPNG pipeline ROW would be a reasonable option for the transmission lines through the Coronado National Forest. Therefore, the new Option 2 follows the EPNG pipeline ROW and does not circumvent the 1.9-mi (3.1-km) stretch of the EPNG pipeline ROW that is also designated as an IRA.

Cumulative Impacts. The Federal agencies revised Chapter 5, Cumulative Impacts, in the Final EIS to better assess cumulative impacts, including those from reasonably foreseeable actions. Table 5.4-1 was added to the Final EIS to provide a summary comparison of the cumulative impacts by resource area and identify any differences in cumulative impacts for the Western, Central, and Crossover Corridors. The revisions to Chapter 5 provide additional information on new power plants in Mexico and southern Arizona in the vicinity of the proposed project, and air quality impacts in the U.S.-Mexico border region.

Safety. Section 4.10, Human Health and Environment, of the Final EIS has been revised to include a discussion of the safety considerations of locating a 345-kV transmission line in the vicinity of the natural gas pipeline.

Biological Resources. The Federal agencies revised Sections 3.3 and 4.3, Biological Resources, in the Final EIS to reflect revisions to the Biological Assessments, USFS Management Indicator Species Report, and Migratory Bird Treaty Act Report prepared for the proposed project. In addition, information regarding newly-designated critical habitat for the Mexican spotted owl is provided in the Final EIS.

Native American Consultations. The Federal agencies revised Sections 3.4.2 and 4.4.2, Native American Concerns, in the Final EIS to better reflect the results of Native American consultations on the proposed project.

500-year Floodplain/Wetlands Assessment. The Federal agencies revised the Floodplain/Wetlands Assessment in Appendix C, and the related discussion and analysis in Sections 3.7 and 4.7, Water Resources, of the Final EIS to identify and evaluate impacts to the 500-year floodplain. This change was based on a determination that the South Substation (which would be expanded as part of the proposed project) would be a critical facility.

Forest Plan Amendment Appendix. A new appendix (Appendix H) was added to identify the requirements of the NFMA and the amendments to the Coronado Forest Plan that would be necessary prior to implementation of the various project alternatives.

USFS Visual Impacts Appendix. A new appendix (Appendix I) was created to provide additional information on visual impacts.

ACC Appendix. A new appendix (Appendix J) was created to provide information regarding the ACC Orders that provide the framework for the proposed action and the alternatives in this EIS.

There were also minor technical changes and clarifications made throughout the TEP EIS. None of the changes had a major effect on the comparative evaluation of the alternatives or the conclusions that can be drawn from the EIS.

Comparison of Potential Environmental Impacts Among Alternatives

The resource areas evaluated for potential impacts are:

- Land use
- Recreation
- Visual resources
- Biological resources

- Cultural resources
- Socioeconomics
- Geology and soils
- Water resources
- Air quality
- Noise
- Human health and environment
- Infrastructure
- Transportation
- Minority and low-income populations (environmental justice)
- Cumulative impacts

The following discussion emphasizes the environmental implications of choosing among alternatives, organized by resource area. Where impacts are similar among the Western, Central, and Crossover Corridors, these alternatives are referred to collectively as the action alternatives (as compared to the No Action Alternative). Impacts during construction (approximately 12 to 18 months) and operation of the project are considered. This discussion is followed by Table S–1, which provides a more quantitative look at the differences among alternatives. Discussions below for the Central and Crossover Corridor are based on detailed analysis of Option 1, the subroute that avoids the Inventoried Roadless Area in the Coronado National Forest. For most resource areas (visual resources, socioeconomics, water resources, air quality, noise, human health, infrastructure, and environmental justice), no potential for differences in impacts between Options 1 and 2 has been identified. Differences between the subroutes are described in the table for those resource areas for which there is a potential for the choice of subroute to affect impacts (land use and recreation, biological resources, cultural resources, geology and soils, and transportation). In general, the No Action Alternative has the least impact on the environment as it does not involve ground disturbing activities or introduction of a transmission line into the visual landscape.

Land Use. The Central Corridor is shorter than the Western and Crossover Corridors. The Western and Crossover Corridors each have a longer segment on the Coronado National Forest than the Central Corridor. All three corridors are identical with respect to BLM land and cross the U.S.-Mexico border in the same location.

Temporary land use impacts would occur as a result of support structure construction areas, staging areas, and temporary access roads that would be re-vegetated in accordance with agreements with land owners and managers, and closed following construction. Besides physically changing the use of the land either temporarily or permanently, land use changes can impact all other resource areas as described below. Monopoles, which would be the primary support structure used by TEP, require a smaller area of disturbance (25 ft^2 [2.3 m^2]) than lattice tower structures (3,600 ft^2 [334 m^2]), and lattice towers require more ongoing access for maintenance. The temporary area of new disturbance on the Coronado National Forest would be greatest for the Crossover Corridor, followed by the Western Corridor and the Central Corridor. The total land area occupied by the final footprint of the towers for the entire corridor is less

than 0.3 acres (0.12 ha) for each action alternative. In addition, access roads would be required to some support structures.

Management direction in the Forest Plan is not consistent with some aspects of each of the routing corridors discussed in this EIS. Therefore, one or more Forest Plan amendments, including amendments to change land use allocations by establishing a new utility corridor, are associated with each of the alternative routing corridors as described in Sections 2.1.1, 2.1.2, and 2.1.3 of the Final EIS.

Because the Central Corridor has the longest segment that follows or crosses an existing EPNG pipeline ROW, fewer new access roads would be required than for the other alternatives, although considerable upgrade would be required for some existing pipeline ROW access roads. On BLM land, the project is adjacent to existing transmission lines within a utility corridor. Outside the Coronado National Forest, each proposed corridor is compatible with current land use and land use plans.

Recreation. Activities in the project area include hiking, biking, birding, photography, rock climbing, horseback riding and off-road vehicle use. These activities are mostly concentrated within portions of the Coronado National Forest, and along the east side of the Tumacacori Mountains where the Central Corridor follows outside of the Coronado National Forest boundary. Off-road vehicle use occurs more broadly throughout the project area. The primary impact to these activities would be a change in the visual setting where recreation occurs. None of the three corridors are visible from Peña Blanca Lake on the Coronado National Forest, a popular location for recreation.

DOE, in consultation with USFS, performed a USFS Recreation Opportunity Spectrum (ROS) analysis for the proposed project on national forest land evaluating the project's impact on seven setting indicators (characteristics) established by USFS that contribute to a recreation experience. All alternative corridors would negatively impact ROS settings. The Central Corridor has the least impact on ROS settings, mainly because it would minimize the total mileage on National Forest System lands. The Western and Crossover Corridors have higher total mileage on the Coronada National Forest, and therefore have greater overall impacts to ROS settings on the Coronado National Forest.

Visual. Visual impacts would occur from the introduction of steel support structures, access roads, and transmission line wires into the landscape. Structures would be primarily 140-ft (43-m) high self-weathering monopoles, similar in color to wood utility poles. With the exception of a reduction in existing High Scenic Integrity (degree of intactness and wholeness of the landscape) associated with the Western and Crossover Corridors near the Pima and Santa Cruz County line, the existing Moderate to Low Scenic Integrity would not be reduced for the area crossed by each corridor outside of the Coronado National Forest, including the BLM land. The Central Corridor has the longest length outside of the Coronado National Forest, and would be visible to more residents than the other corridors given its closer proximity to the towns of Amado, Tubac, and Tumacacori.

On the Coronado National Forest, per analysis using the USFS Scenery Management System (SMS), the area of land that would have reduced Scenic Integrity as a result of construction and operation of the Western or Crossover Corridors is approximately double the area of reduced Scenic Integrity for the Central Corridor. The Western Corridor would be in wide-open view from a longer stretch of Concern Level 1 (primary) travelways on and nearby the Coronado National Forest than the Central or Crossover Corridors would be. While siting the Western Corridor transmission line immediately adjacent to portions of Ruby Road would have a maximum visual impact along Ruby Road, it would protect the viewshed to the south (towards the Pajarita Wilderness) for the public (including photographers) and would eliminate the need for highly visible access roads in this portion of the Western Corridor.

The Central Corridor would minimize the total mileage on National Forest System land resulting in reduced Scenic Integrity of approximately 9,668 acres (3,912 ha) on National Forest System land. The

Western and Crossover Corridors would have higher total mileage on National Forest System lands than the Central Corridor, and the Western and Crossover Corridors would result in approximately 18,511 to 18,736 acres (7,491 to 7,582 ha) of reduced Scenic Integrity on National Forest System lands. Accordingly, the Western and Crossover Corridors would have greater overall visual impact on the Coronado National Forest than the Central Corridor.

Biological Resources. There is a potential for impacting habitat of existing native plant communities located within the ROW and new access road areas during construction. Clearing would be limited to areas required for access roads and structures. Because the proposed project would be in an arid area, where vegetation recovers very slowly, disturbances due to construction could have long-term impacts.

The Western Corridor has the highest potential for adverse effects to special status species. All three proposed corridors cross Federally designated Critical Habitat for the Mexican spotted owl. There are approximately 54,881 acres (22,210 ha) of designated Critical Habit within the Coronado National Forest. The corridors include the current range and habitat types for 7 to 10 species listed under the ESA. The Federally listed endangered Pima pineapple cactus is known to occur in each of the three proposed corridors. Additional species-specific surveys would be conducted for the selected corridor before construction activities begin. DOE has initiated consultation under Section 7 (a)(2) of the ESA with the U.S. Fish and Wildlife Service (USFWS). The formal consultation process between DOE, USFS, BLM, and USFWS began when DOE tendered its biological assessments of the alternatives to USFWS. To date, the USFWS has issued a Biological Opinion for the Western Corridor concurring with the analysis in the Biological Assessment (see Appendix D), which concluded that the proposed action may affect special status species, but is not likely to have adverse effects.

Cultural Resources. The Federal agencies have initiated consultation under Section 106 of the NHPA with the State Historic Preservation Officer (SHPO) and Native American tribes. The Federal agencies are preparing a Programmatic Agreement that will guide the treatment of cultural resources under provisions of Section 106 of the NHPA. The Arizona SHPO and the Advisory Council on Historic Preservation are expected to participate in the Agreement; Native American tribes will be invited to participate. Although only a small percentage of each corridor has been surveyed, multiple prehistoric and historic archaeological sites have been identified within each alternative. The highest density of cultural resource sites is anticipated along the Central Corridor segment near the Santa Cruz River. The impacts could include direct disturbance by construction activities, and the alteration of the landscape.

Prior to ground-disturbing activities in any approved corridor, a complete on-the-ground inventory would be conducted by professional archaeologists. Efforts to identify cultural resources would also include historical document research and continued consultation with Native American tribes regarding potential traditional cultural properties and sacred sites. Identified cultural resources would be evaluated in terms of National Register eligibility criteria and potential project effects in consultation with all parties who are participants in the Programmatic Agreement. Cultural resource sites identified during pre-construction inventory would be avoided to the extent possible.

DOE initiated Government-to-government consultation with the tribal governments of the 12 Native American tribes that have traditional ties to the area: Ak-Chin Indian Community, Fort Sill Apache Tribe, Gila River Indian Community, Hopi Tribe, Mescalero Apache Tribe, Pascua Yaqui Tribe, Salt River Pima-Maricopa Indian Community, San Carlos Apache Tribe, Tohono O'Odham Nation, White Mountain Apache Tribe, Yavapai Apache Nation, and Pueblo of Zuni. Consultation has included information-sharing meetings with DOE and its representatives, and site visits arranged at the tribes' requests. The initial tribal consultations were for the Western, Central, and Eastern Corridors, originally proposed by TEP.

Representatives of several tribes have stated that they are opposed to the project, but they would prefer that the project be constructed along the Central Corridor, if it is to be built at all. The Hopi Tribe has stated objection to the Central Corridor based on the probable greater density of archaeological sites in that alternative. No specific traditional cultural properties have been identified along any of the alternatives to date. During meetings and field trips tribal representatives from the Tohono O'Odham Nation, Gila River Indian Community, Salt River Pima Maricopa and Ak-Chin Indian Communities have stated objections to the Crossover Corridor because it is in largely undisturbed territory.

Socioeconomics. The construction costs of each of the three action alternatives are roughly similar, approximately $70 million plus or minus $7 million. The construction of any of the three proposed corridors would create approximately 30 direct (construction) jobs, and approximately 31 indirect (service-related) jobs, which would benefit Santa Cruz and Pima Counties. No influx of population or stress to community services would be expected from project construction. No socioeconomic impacts would be expected from project operation because most jobs created would be filled by current residents.

During the public scoping process for the Draft EIS, several commentors expressed concern that existence of the proposed transmission line would negatively impact real property values. In this context, any decrease in property values would be perception-based impact, that is, an impact that does not depend on actual physical environmental impacts resulting directly from the proposed project, but rather upon the subjective perceptions of prospective purchasers in the real estate market at any given time. Courts have long recognized that such subjective, psychological factors are not readily translatable into quantifiable impacts. See, for example, *Hanly v. Kleindienst*, 471 F.2d 823, 833 n.10 (2d Cir. 1972), *cert. denied*, 412 U.S. 908, (1973). People do not act consistently in accordance with negative perceptions, and one person's negative perception might be another's positive. Also, perceptions of value may change over time, and perceptions of value are affected by a host of other factors that have nothing to do with the proposed project. Accordingly, any connection between public perception of a risk to property values and future behavior would be uncertain or speculative at best, and therefore would not inform decision making.

There have been studies of the impact of transmission lines and property values in other geographic areas. See, for example, discussion of these studies in the *Environmental Impact Statement for Schultz-Hanford Area Transmission Line Project* (DOE 2002). Based on these studies, DOE can conclude only that, at worst, it is possible that there might be a small negative economic impact of short duration to some properties from the project, and that the impact on value would be highly variable, individualized, and unpredictable. The studies at most conclude that other factors, such as general location, size of property, and supply and demand factors, are far more important criteria in determining the value of residential real estate.

Accordingly, while DOE recognizes that a given property owner's value could be affected by the project, DOE has not attempted to quantify theoretical public perceptions of property values should the proposed project be built.

Geology and Soils. The construction of any of the three proposed corridors would not impact geologic resource availability or mine tailing piles west of Interstate 19 in the northern portion of the project. Slope stability analysis for potential tower locations in mountainous areas would prevent slope failure. Low to moderate seismic risk would be considered in structure design. Direct embedment pole construction techniques (requiring excavation) would be used in unconsolidated soils, while rock bolted bases would be used in areas of relatively intact bedrock near the ground surface. Best Management Practices (BMPs) to minimize soil and water impacts would be developed in coordination with USFS, BLM, and Arizona Department of Environmental Quality (ADEQ) before construction, and would be implemented for the entire corridor selected.

All three proposed corridors cross small areas of soils considered to be prime farmland when irrigated.

Water Resources. No adverse impacts to surface water or groundwater resources are expected from any of the three action alternatives or the no action alternative. Each of the three proposed corridors would span across a number of drainages and washes, and TEP would avoid placing structures in and near these areas where feasible.

Some corridor access roads would be within 100-year floodplains and the South Substation expansion is conservatively assumed to be in the 500-year floodplain of the Santa Cruz River and could result in increases in flood elevation, potentially leading to an increase in downstream flood loss and a long-term negative impact on lives and property. Impacts resulting from pole placement and construction of laydown areas would be negligible. Impacts to floodplains would be avoided to the extent possible by siting access roads and laydown areas outside floodplains, spanning floodplains where feasible and floodproofing measures at the South Substation. The Western and Crossover Corridors would have the greatest potential to impact floodplains in the project area.

There may be small areas of wetlands within the proposed corridors that are associated with manmade stockponds and impoundments. TEP would site the transmission line to avoid such areas. None of the corridors cross any eligible or designated Wild and Scenic Rivers.

Restrictions on refueling locations would protect groundwater from contamination from fuel, lubricants and other fluids during construction. BMPs would be implemented along the length of the line for erosion control.

Air Quality. There are no significant differences in air quality impacts from any of the three action alternatives or the no action alternative. Temporary, localized fugitive dust emission impacts from construction activities would occur. Impacts from operation and maintenance activities would be limited to dust from occasional access by TEP. A conformity review of the proposed project (required under Section 176[c] of the *Clean Air Act*) was conducted in accordance with EPA and DOE guidance (DOE 2000). The review shows that construction project emissions of PM_{10} (particulate matter with an aerodynamic diameter less than or equal to 10 microns) and CO (carbon monoxide) for each alternative are below regulatory thresholds and would not constitute a regionally significant action.

Noise. There are no significant differences in noise impacts from any of the three action alternatives or the no action alternative. Noise levels would increase above background during construction of any action alternative. Temporary construction noise increases would primarily impact residents in Sahuarita and Nogales for all three corridors, and also Amado, Tubac, and Tumacacori for the Central Corridor. Temporary construction noise would also impact recreationalists, especially in more remote areas of the Western and Crossover Corridors. Long-term noise from the corona effect on transmission lines would generally be lost in background noise. Gateway and South Substations operational noise would be near background levels for the nearest receptors.

Human Health and Environment. Long term electric and magnetic field (EMF) exposure at the nearest residences, schools, and commercial establishments would be well below average daily exposure to maximum magnetic fields (0.8 milligauss) from some common household appliances. There would be no health effects from this exposure. Though each proposed corridor passes primarily through undeveloped land, the Central Corridor would have the highest number of houses in close proximity to the transmission line. The project would be designed to minimize EMF and prevent electrical field effects. A minimum distance of 100 ft (30 m) would be maintained between any of the proposed transmission line structures and the edge of the existing EPNG pipeline ROW.

Infrastructure. There are no significant differences in infrastructure impacts from any of the three action alternatives. The proposed project would increase electric transmission facilities to Nogales, Arizona and Mexico, but would not otherwise affect existing infrastructure. Minimal municipal solid waste generated during construction and operation would be taken to appropriate landfill facilities. No hazardous waste would be generated from substation operation.

Transportation. Project access would be on existing utility maintenance roads, ranch access roads and trails, and new access ways where no access currently exists. Because the Central Corridor has the longest segment following the EPNG pipeline ROW, fewer temporary new access roads would be required than for the other alternatives, although considerable upgrade would be required for existing pipeline ROW access roads. Access to the proposed project on BLM land would be the same for all three action alternatives, on existing access from Mission Road to TEP's current transmission lines, with new spur roads to the proposed project. Short-term traffic disruptions on major roads such as I-19 or Ruby Road could occur during construction.

On the Coronado National Forest, the Crossover Corridor passes through an IRA, although no roads would be constructed or reconstructed in that IRA. (This is because helicopters would be used to insert structures as needed for the Crossover Corridor.) TEP would build more miles of temporary new roads for the Western or Crossover Corridors than for the Central Corridor. In addition, more areas on existing roads would require minor repairs for the Western and Crossover Corridors than for the Central Corridor. Under Option 2, some upgrades to existing roads would be required to access the 1.9 mi (3.1 km) IRA. By siting the Western Corridor immediately adjacent to Ruby Road for approximately 4 mi (6 km), the need for new project access and ongoing maintenance access for this segment would be reduced. There would be no net increase in roads in the Coronado National Forest.

Environmental Justice. Neither the three action alternatives nor the No Action Alternative would cause disproportionately high and adverse impacts to the minority or low-income populations. No means were identified for minority or low-income populations to be disproportionately affected from impacts to any of the resource areas.

Cumulative Impacts. This EIS includes analysis of cumulative impacts, as required under NEPA, that could occur as a result of the potential impacts of TEP's proposed project when added to impacts from other past, present, and reasonably foreseeable future actions. The potential effects are evaluated both for the period of project construction (anticipated to be 12 to 18 months), and for the post-construction (operation) period of the project. The region of influence (ROI) varies for each resource area, primarily depending on the distance a potential effect can reach.

The following actions have been evaluated as reasonably foreseeable and are included in the analysis of cumulative impacts: industrial development; other activities under special use permits on the Coronado National Forest, and more generally defined possible actions in the project area such as residential development, increased operations of the U.S. Border Patrol, ongoing activity of undocumented immigrants near the U.S.-Mexico border, and local initiatives to protect biological resources, such as are found in the Sonoran Desert Conservation Plan.

The cumulative impacts from the combination of TEP's proposed project and other past, present, and reasonably foreseeable actions could affect land use (including recreation), visual resources, biological resources, cultural resources, socioeconomic resources, geology and soils, water resources, air quality, noise, human health and environment, and transportation. These potential cumulative impacts are primarily related to long-term development of land that is currently undisturbed or used for other activities such as ranching and recreation. In the short term, if multiple projects are under construction simultaneously, an increased amount of land could be used temporarily for construction lay down yards and staging areas, and an increased amount of airborne dust could be generated. The cumulative change in

land use could affect natural habitats, special status species, and cultural resources, and could lead to an increase in soil erosion and local water use. The cumulative impacts to human health and environment could be an increase in background EMF exposure to residents in the immediate vicinity of overlapping transmission line projects. No long-term cumulative human health impacts are expected to occur. No means were identified for disproportionately high and adverse impacts to minority or low-income populations, and TEP's proposed project would not contribute cumulatively to any environmental justice impacts.

MITIGATION

TEP's Standard Mitigation Practices are documented in TEP's Environmental Protection Provisions application to the ACC. Additional mitigation, if required, would be in agreements, permits, or ROW grants from land owners or managers (for example, in the Plan of Development agreement with BLM), in stipulations by the ACC, and in the USFWS Biological Opinion. Mitigation measures that are part of TEP's proposed action include confining construction and maintenance activities to predefined limits, siting structures and access roads to minimize impacts, and performing restoration and clean-up following construction in accordance with requirements of land owners or managers.

Table S–1. Summary Comparison of Potential Environmental Effects of Alternatives.

Resource	Western Corridor	Central Corridor	Crossover Corridor	No Action Alternative
Land Use				No impacts to existing land use.
Length	Estimated 65.7 mi (106 km)	Estimated 57.1 mi (91.9 km)	Estimated 65.2 mi (105 km)	
Length on CNF	Estimated 29.5 mi (47.5 km)	Estimated 15.1 mi (24.3 km)	Estimated 29.3 mi (47.2 km)	
Length on BLM	Estimated 1.25 mi (2.01 km)	Estimated 1.25 mi (2.01 km)	Estimated 1.25 mi (2.01 km)	
	Note that the Western and Crossover Corridors are identical outside of the Coronado National Forest (CNF).		Note that the Western and Crossover Corridors are identical outside of the CNF.	
Corridor length that follows or crosses the El Paso Natural Gas Company (EPNG) pipeline	Estimated 9.3 mi (15 km)	Estimated 43 mi (69 km) for Option 1 Estimated 45 mi (72 km) for Option 2	Estimated 17 mi (27 km) for Option 1 Estimated 19 mi (31 km) for Option 2	
Number of support structures (poles and towers):				
Total	Estimated 429	Estimated 373	Estimated 431	
On CNF	Estimated 191	Estimated 102	Estimated 196	
On BLM	Estimated 8	Estimated 8	Estimated 8	
Permanent area occupied by transmission line structures:				
Total	0.25 acres (0.10 ha)	0.21 acres (0.08 ha)	0.25 acres (0.10 ha)	
On CNF	0.11 acres (0.04 ha)	0.06 acres (0.02 ha)	0.11 acres (0.04 ha)	
On BLM	0.005 acres. (0.002 ha)	0.005 acres (0.002 ha)	0.005 acres (0.002 ha)	

Table S–1. Summary Comparison of Potential Environmental Effects of Alternatives *(continued).*

Resource	Western Corridor	Central Corridor	Crossover Corridor	No Action Alternative
Land Use *(continued)*				
Permanent area occupied by substations and fiber-optic regeneration station	19.8 acres (8 ha)	19.8 acres (8 ha)	19.8 acres (8 ha)	
On the CNF: New permanent disturbance	Estimated 29 acres (12 ha)	Estimated 23 acres (9.3 ha)	Estimated 36 acres (15 ha)	
New temporary disturbance	Estimated 197 acres (79.7 ha)	Estimated 105 acres (42.5 ha)	Estimated 238 acres (96.3 ha)	
	The Western Corridor passes primarily through undeveloped land with few residences (five houses approximately 1,000 ft [305 m] from the centerline west of Sahuarita).	In addition to the residences near the Western Corridor, the Central Corridor centerline passes approximately 1,000 ft [305 m] from eight residences in the vicinity of Tubac, more than the Western or Crossover Corridors. The Central Corridor has the shortest segment on the CNF.	The Crossover Corridor passes primarily through undeveloped land with few residences (same as the Western Corridor, five houses approximately 1,000 ft [305 m] from the centerline west of Sahuarita). The Crossover Corridor passes through an inventoried roadless area (IRA) within Peck Canyon. TEP plans to use helicopter access in this area, and would not build or upgrade any roads in the IRA.	
Compatibility with land use plans	Per Appendix H, a *Coronado National Forest Land and Resource Management Plan* (Forest Plan) amendment would be required to implement any of the three corridors on the CNF. To bring the Western Corridor, Crossover Corridor (Options 1 and 2), and the Central Corridor (Options 1 and 2) into compliance with the *Coronado National Forest Land and Resource Management Plan* (Forest Plan), the Forest Plan Transportation System and Utilities Corridor Map would be modified to include a new utility corridor. The width of this new utility corridor would be approximately 660 ft (201 meters) on either side of the centerline, or approximately ¼-mi (0.40 km). Outside of national forest land, all corridors are compatible with current land use and land use plans. TEP does not anticipate any ground disturbance in the reserved lands (120 ft [36.6 m] total) along the U.S.-Mexico border.			

Table S–1. Summary Comparison of Potential Environmental Effects of Alternatives *(continued)*.

Resource	Western Corridor	Central Corridor	Crossover Corridor	No Action Alternative
Recreation	Recreation activities in the vicinity of the proposed project would primarily be impacted by a change in the visual setting of the recreation.			No change in impacts to existing recreational resources. Current recreation activities including hiking, biking, birding, photography, rock climbing, horseback riding, and off-road vehicle use would be expected to continue.
CNF Recreation Opportunity Spectrum (ROS) Areas Crossed	Total: 29.5 mi (47.5km) In order from most to least developed: Roaded Natural: 1.7 mi (2.7 km) Roaded Modified: 7.0 mi (11 km) Semi-Primitive Motorized: 21 mi (34 km) Semi-Primitive Non-Motorized: none (but passes within 0.25 mi of an area)	Total : 15.1. mi (24.3 km) In order from most to least developed: Roaded Natural: 1.1 mi (1.8 km) Roaded Modified: none Semi-Primitive Motorized: 14 mi (23 km) for Option 1; 12 mi (19 km) for Option 2 Semi-Primitive Non-Motorized: none for Option 1 (but passes within 0.25 mi of an area); 1.9 mi (3.1 km) for Option 2	Total 29.3 mi (47.2 km) In order from most to least developed: Roaded Natural: 1.2 mi (1.9 km) Roaded Modified: none Semi-Primitive Motorized: 25 mi (41 km) for Option 1; 23 mi (37 km) for Option 2 Semi-Primitive Non-Motorized: 3.3 mi (5.3 km) for Option 1; 5.2 mi (8.4 km) for Option 2	
ROS Area Classification	For each ROS area classification USFS has established the limits of acceptable change to certain setting indicators, classifying the changes as "fully compatible or normal," or "inconsistent" or "unacceptable". The setting indicators within each area would be impacted as follows: For Access, Social Encounters, Visitor Impacts, and Visitor Management, all alternatives would be compatible with all ROS area classifications. For Facilities and Site Management, most of the length of all three corridors would be inconsistent with all ROS area classifications. For Naturalness and Remoteness, impacts would be as follows:			

Table S–1. Summary Comparison of Potential Environmental Effects of Alternatives *(continued)*.

Resource	Western Corridor	Central Corridor	Crossover Corridor	No Action Alternative
Recreation *(continued)*	The Western Corridor would have an unacceptable impact on Naturalness where it runs adjacent to Ruby Road for approximately 4 mi (6 km) southwest of the Atascosa Mountains. Most of the Western Corridor would be inconsistent with Remoteness. The length of the Western Corridor on the CNF (29.5 mi [47.5 km], similar to the Crossover Corridor) affects the extent of potential recreation impacts on the CNF.	The Central Corridor would have an unacceptable impact on Naturalness where it crosses Ruby Road, in the same location as the Crossover Corridor. Most of the Central Corridor would be inconsistent with Remoteness. The length of the Central Corridor on the CNF (15.1 mi [24.3 km], approximately half the length of the other alternatives on the CNF) affects the extent of potential recreation impacts on the CNF. Options 1 and 2 would have similar impacts to ROS.	The Crossover Corridor would have an unacceptable impact on Naturalness within Peck Canyon and where it crosses Ruby Road, in the same location as the Central Corridor. The Crossover Corridor would also have a higher impact on Remoteness than the other alternatives, as approximately 3 mi (5 km) of the Crossover Corridor at Peck Canyon would have unacceptable impacts on Remoteness. The length of the Crossover Corridor on the CNF (29.3 mi [47.2 km], similar to the Western Corridor) affects the extent of potential recreation impacts on the CNF. Options 1 and 2 would have similar impacts to ROS.	
Impacts outside the CNF	Potential impacts on recreation activities would be similar to those within the CNF but would be lower given less recreational use of the Western Corridor outside the CNF.	Potential impacts on recreation activities would be similar to those within the CNF, as the Central Corridor crosses recreational trails where it parallels just outside the CNF boundary for approximately 7 mi (11 km) east of the Tumacacori Mountains.	Potential impacts on recreation activities would be similar to those within the CNF but would be lower given less recreational use of the Crossover Corridor outside the CNF.	

Table S–1. Summary Comparison of Potential Environmental Effects of Alternatives *(continued)*.

Resource	Western Corridor	Central Corridor	Crossover Corridor	No Action Alternative
Visual Resources	Visual impacts would occur from the introduction of steel support structures, access roads, and transmission line wires into the landscape. Structures would be primarily 140-ft (43-m) high self-weathering monopoles, similar in color to wood utility poles.			The existing landscape and Scenic Integrity would continue, subject to visual impacts from any potential development in the project area.
Outside the CNF	The Western Corridor passes through areas of existing development near Sahuarita and Nogales, and is shielded from Interstate 19 (I-19) outside these areas by mine tailing piles and natural terrain, passing through primarily undeveloped land. With the exception of a reduction in Scenic Integrity from High to Moderate/Low near the Pima and Santa Cruz county line, the existing Moderate to Low Scenic Integrity would not change.	The Central Corridor passes through areas of existing development near Sahuarita and Nogales, and passes a number of towns along I-19 including Amado, Tubac, and Tumacacori. The Central Corridor would be visible from more residences than Western although some potential views would be blocked by terrain. The existing Moderate to Low Scenic Integrity would not change.	The Crossover Corridor passes through areas of existing development near Sahuarita and Nogales, and is shielded from I-19 outside these areas by mine tailing piles and natural terrain, passing through primarily undeveloped land. With the exception of a reduction in Scenic Integrity from High to Moderate/Low near the Pima and Santa Cruz county line, the existing Moderate to Low Scenic Integrity would not change.	
Substations	The South Substation expansion would have minimal visual impact given that similar equipment already exists onsite. There would be little visual change introduced by construction of the new Gateway Substation because of existing industrial development in the area.			
On the CNF	Crosses approximately 30 mi (48 km) of mostly Scenic Class 1 and 2 areas, of high public value, and would be most visible from roadways in an approximately 4-mi (6-km) stretch in the immediate foreground of Ruby Road southwest of the Atascosa Mountains.	Crosses approximately 15 mi (24 km) of mostly Scenic Class 2 areas, of high public value but below Scenic Class 1. The primary visual impact of the Central Corridor when viewed from roadways would be at the crossing of Ruby Road, with two structures in the foreground. There would be no differences in visual impacts for Options 1 and 2.	Crosses approximately 30 mi (48 km) of mostly Scenic Class 1 and 2 areas, of high public value. The primary visual impact of the Crossover Corridor when viewed from roadways would be at the crossing of Ruby Road, with two structures in the foreground. There would be no differences in visual impacts for Options 1 and 2.	
	Is mostly blocked by terrain from I-19 and the eastern portion of Ruby Road.	Is mostly blocked by terrain from I-19, and is only visible from Ruby Road at the crossing area.	Is mostly blocked by terrain from I-19, and is only visible from Ruby Road at the crossing area.	

Table S–1. Summary Comparison of Potential Environmental Effects of Alternatives *(continued).*

Resource	Western Corridor	Central Corridor	Crossover Corridor	No Action Alternative
Visual Resources *(continued)*	The existing Scenic Integrity of Peña Blanca Lake Recreation Area and the Pajarita Wilderness would not change.			
Scenic Integrity Changes	From: High/Very High To: Moderate/Low	From: Very High To: Moderate/Low	From: Very High To: Moderate/Low	
On the CNF	13, 870 acres (5,613 ha)	8,992 acres (3,639 ha)	18,060 acres (7,307 ha)	
Total Reduced Scenic Integrity On the CNF	From: High To: Very Low 4,641 acres (1,878 ha) 18,511 acres (7,491 ha)	From: High To: Very Low 676 acres (274 ha) 9,668 acres (3,912 ha)	From: High To: Very Low 676 acres (274 ha) 18,736 acres (7,582 ha)	
Biological Resources	Because the proposed project would be in an arid area, where vegetation recovers very slowly, disturbances due to construction could have long-term impacts. Habitat fragmentation would be least for the Central Corridor because it follows an existing utility corridor to the greatest extent and would require the least clearing of vegetation.			No impacts to biological resources associated with the project.
Vegetation communities potentially disturbed:		Options 1 and 2 would have similar impacts.	Options 1 and 2 would have similar impacts.	
Arizona Upland/Sonoran Desertscrub	Entire Corridor 119 acres (48 ha) CNF 0 acres BLM 0 acres Other Land Ownership 119 acres (48 ha)	Entire Corridor 119 acres (48 ha) CNF 0 acres BLM 0 acres Other Land Ownership 119 acres (48 ha)	Entire Corridor 119 acres (48 ha) CNF 0 acres BLM 0 acres Other Land Ownership 119 acres (48 ha)	

Table S–1. Summary Comparison of Potential Environmental Effects of Alternatives *(continued).*

Resource	Western Corridor	Central Corridor	Crossover Corridor	No Action Alternative
Biological Resources *(continued)*				
Semidesert grassland	Entire Corridor 165 acres (67 ha) CNF 102 acres (41 ha) BLM 8 acres (3.2 ha) Other Land Ownership 55 acres (22 ha)	Entire Corridor 109 acres (44 ha) CNF 67 acres (27 ha) BLM 8 acres (3.2 ha) Other Land Ownership 34 acres (14 ha)	Entire Corridor 97 acres (39 ha) CNF 66 acres (27 ha) BLM 8 acres (3.2 ha) Other Land Ownership 23 acres (9.3 ha)	
Madrean Evergreen Woodland	Entire Corridor 95 acres (38 ha) CNF 95 acres (38 ha) BLM 0 acres Other Land Ownership 0 acres	Entire Corridor 38 acres (15 ha) CNF 38 acres (15 ha) BLM 0 acres Other Land Ownership 0 acres	Entire Corridor 72 acres (29 ha) CNF 72 acres (29 ha) BLM 0 acres Other Land Ownership 0 acres	
Sonoran Riparian Deciduous Forest	Entire Corridor 0.14 acres (0.06 ha) CNF 0 acres BLM 0 acres Other Land Ownership 0 acres	Entire Corridor 0 acres CNF 0 acres BLM 0 acres Other Land Ownership 0 acres	Entire Corridor 0 acres CNF 0 acres BLM 0 acres Other Land Ownership 0 acres	
Special status species	Both within and outside the CNF, there is a potential to impact habitat during construction of existing native plant communities located within the ROW and areas of new access roads. Biological Assessments (BAs) on federally listed species and reports on USFS Management Indicator Species (MIS) and Migratory Bird Treaty Act (MBTA) species were completed to evaluate impacts to species and their habitats and identify potential adverse effects for special status species that occur, or may occur, within each corridor. All three proposed corridors cross Federally designated Critical Habitat for the Mexican spotted owl. There are approximately 54,881 acres (22,210 ha) of designated Critical Habit within the Coronado National Forest. The federally listed endangered Pima pineapple cactus is known to occur in each corridor. Additional species-specific surveys are recommended in some cases. For the Central and Crossover Corridors, no differences have been identified between Options 1 and 2.			

Table S–1. Summary Comparison of Potential Environmental Effects of Alternatives *(continued)*.

Resource	Western Corridor	Central Corridor	Crossover Corridor	No Action Alternative
Biological Resources *(continued)*	Includes habitat for the following 10 federally listed species: cactus ferruginous pygmy-owl, Chiricahua leopard frog, Gila topminnow, jaguar, lesser long-nosed bat, Mexican gray wolf, Mexican spotted owl, Pima pineapple cactus, Sonora chub, and southwestern willow flycatcher.	Includes habitat for the following 7 federally listed species: cactus ferruginous pygmy-owl, Gila topminnow, jaguar, lesser long-nosed bat, Mexican gray wolf, Mexican spotted owl, and Pima pineapple cactus.	Includes habitat for the following 9 federally listed species: cactus ferruginous pygmy-owl, Chiricahua leopard frog, Gila topminnow, jaguar, lesser long-nosed bat, Mexican gray wolf, Mexican spotted owl, Pima pineapple cactus, and southwestern willow flycatcher.	
Potential Adverse Effects to:	58 special status species	50 special status species	55 special status species	
Cultural Resources	Cultural resource sites identified during pre-construction inventory would be avoided to the extent possible.			No archaeological and historical sites would be disturbed under this alternative. No additional archaeological surveys or Native American consultation would be undertaken in a systematic study of these areas in the foreseeable future.
	Twenty-two previously identified archeological and historic sites have been documented. A low density of cultural resource sites ise expected along a majority of the route.	Six previously identified archeological and historic sites have been documented. However, due to proximity to the Santa Cruz River, a higher density of cultural resource sites is expected along the Central Corridor. No difference in site density is expected between Option 1 and 2.	Twenty-seven previously identified archeological and historic sites have been documented. A low density of cultural resource sites is expected along a majority of the route, except along Peck Canyon, which is more likely to contain a high density of sites. No difference in site density is expected between Option 1 and 2.	
Native American	Tribal representatives have expressed opposition to all three proposed corridors.			

Table S–1. Summary Comparison of Potential Environmental Effects of Alternatives *(continued)*.

Resource	Western Corridor	Central Corridor	Crossover Corridor	No Action Alternative
Cultural Resources *(continued)*				
Consultations	Several tribes (Tohono O'Odham Nation, Gila River Indian Community, Ak-Chin Indian Community, Salt River Pima Maricopa Indian Community, the Pascua Yaqui Tribe, and the Hopi Tribe) have stated that they value the landscape through which the Western Corridor passes and have expressed opposition to this corridor.	Several tribes (Ak-Chin Indian Community, Tohono O'Odham Nation, Gila River Indian Community, Salt River Pima Maricopa Indian Community and the Pascua Yaqui Tribe) stated that they would prefer that the project be constructed along the Central Corridor, if it was built at all. They view the Central Corridor as an already-disturbed area. None of the tribes wished to express approval of the project overall when stating this preference. The Hopi Tribe has expressed opposition to the Central Corridor because of the expected high density of important archaeological sites there.	Several tribes (Tohono O'Odham Nation and the Hopi Tribe) expressed specific opposition to this alternative during the public comment period on the Draft EIS. This corridor passes through portions of the landscape that have been identified as valued by several tribes. Tribal concerns have been stated regarding the unique portion of the Crossover Corridor.	Several tribes (Tohono O'Odham Nation and the Hopi Tribe) expressed specific support for this alternative during the public comment period on the Draft EIS.
Socioeconomics	Socioeconomic impacts would be similar for all corridors and corridor options. The proposed project would result in the creation of approximately 30 direct (construction) jobs, and approximately 31 indirect (service-related) jobs during construction. No influx of population or stress to community services would be expected because most of the jobs created would be filled by current residents. No adverse socioeconomic impacts would be expected from project operation.			No socioeconomic impacts associated with the project. Current socioeconomic trends would continue.

Table S–1. Summary Comparison of Potential Environmental Effects of Alternatives *(continued)*.

Resource	Western Corridor	Central Corridor	Crossover Corridor	No Action Alternative
Geology and Soils	No impact to geologic resource availability or mine tailings areas expected. The placement of poles and access roads would require some disturbance and removal of near-surface material. (See Land Use for estimates of areas disturbed). Structures on relatively intact shallow bedrock would be installed by rock bolting. Foundations for structures on unconsolidated alluvium probably would require direct embedment poles, requiring excavation of a large pit. Construction in alluvium containing large cobbles would require use of lean-concrete slurry for backfill of the pit because soils with large cobbles are difficult to compact adequately. Potential for ground failure exists in mountainous areas. Slope stability analysis for potential tower locations in mountainous areas would prevent slope failure. Low to moderate seismic risk would be considered in structure design.			No geologic or soils impacts associated with the project.
	There are limited areas of alluvium where direct embedment poles would be required, but steep terrain in the southern portion of the corridor increases potential for ground failure.	There are extensive areas of cobbly alluvium where direct embedment poles would be required, but relatively low relief reduces potential for ground failure. There are no meaningful differences in geology and soils between the Option 1 and 2 sub-routes.	There are limited areas of alluvium where direct embedment poles would be required, but rock bolting probably would be feasible in the unique portion of the Crossover Corridor. However, steep terrain in this section increases potential for ground failure. There are no meaningful differences in geology and soils between the Option 1 and 2 sub-routes	
New roads on unconsolidated alluvium	Road construction on unconsolidated alluvium could cause soil erosion and compaction.			
On the CNF	Estimated 9 miles (15 km) of roads on unconsolidated alluvium.	Estimated 12 miles (19 km) of roads on unconsolidated alluvium.	Estimated 10 miles (16 km) of roads on unconsolidated alluvium.	
Prime farmland soils	All three proposed corridors cross soils considered to be prime farmland when irrigated. These soils would be spanned where feasible, and the total prime farmland soil converted to pole foundations would be less than 0.25 acres (0.1 ha).			

Table S–1. Summary Comparison of Potential Environmental Effects of Alternatives *(continued)*.

Resource	Western Corridor	Central Corridor	Crossover Corridor	No Action Alternative
Water Resources	No adverse impacts to groundwater or limited surface water resources. Construction activity that takes place within a jurisdictional water requires a Section 404 Permit from the U.S. Army Corps of Engineers (USACE); TEP would complete consultation with USACE for an applicability determination upon final selection of an alternative. For all alternatives, an estimated 1 acre-foot (1,233.5 cubic meter) of groundwater would be used during construction.			No water resource impacts associated with the project. Current water resource patterns would continue.
Floodplain Area Disturbed	Estimated 1.97 acres (0.80 ha) of 100-year floodplain, including the expansion of the South Substation, pole construction and laydown areas, and access roads.	Estimated 1.58 acres (0.64 ha) of 100-year floodplain, including the expansion of the South Substation, pole construction and laydown areas, and access roads.	Estimated 1.97 acres (0.80 ha) of 100-year floodplain including, the expansion of the South Substation, pole construction and laydown areas, and access roads. (same as Western Corridor).	
Large washes crossed	15	14	15	
Structures within a wash	1 in Sopori Wash, outside the normal flow line.	1 in Sopori Wash, outside the normal flow line.	1 in Sopori Wash, outside the normal flow line. Also 2 in the bottom of Peck Canyon.	
Air Quality Construction	Temporary, localized fugitive dust emission impacts from construction activities would occur. A conformity review of the proposed project (required under Section 176[c] of the *Clean Air Act*) was conducted in accordance with EPA and DOE guidance. The review shows that the maximum year of construction project emissions of PM_{10} and CO for each alternative would be below the regulatory thresholds and below the regionally significant action level for carbon monoxide (CO). Specific results are as follows:			No impacts to air resources associated with the project. Current air quality trends would continue. Nogales, Arizona, within the proposed project vicinity, is not in attainment with the EPA's National Ambient Air Quality Standard (NAAQS) for PM_{10}.
PM_{10} in Nogales Non-attainment area	62 tons per year (tpy) (56 metric tpy[mtpy])	73 tpy (66 mtpy)	73 tpy (66 mtpy)	No PM_{10} emissions associated with the proposed project.
PM_{10} regulatory threshold	100 tpy (91 mtpy)	100 tpy (91 mtpy)	100 tpy (91 mtpy)	

Table S–1. Summary Comparison of Potential Environmental Effects of Alternatives *(continued).*

Resource	Western Corridor	Central Corridor	Crossover Corridor	No Action Alternative
Air Quality *(continued)*				
PM_{10} regionally significant action level	None	None	None	None
CO in Tucson Maintenance area	24.2 tpy (21.9 mtpy)	24.2 tpy (21.9 mtpy)	24.2 tpy (21.9 mtpy)	No CO emissions associated with the proposed project.
CO regulatory threshold	100 tpy (91 mtpy)	100 tpy (91 mtpy)	100 tpy (91 mtpy)	
CO regionally significant action level	11,866 tpy (10,765 mtpy)	11,866 tpy (10,765 mtpy)	11,866 tpy (10,765 mtpy)	
Operation	Impacts from operation and maintenance activities would be limited to dust from occasional access by TEP. Corona effects would generate less than 1 part per billion of ozone.			
Noise				
Construction	The primary effect of noise would be annoyance to the residents nearest to the ROW (see Land Use above) during construction and would be short-term.			No noise impacts would be associated with the project. Current noise patterns would continue, with background noise levels ranging from 30 to 60 decibels, depending on proximity to development and roads.
	Temporary construction noise increases would primarily impact residents in Sahuarita and Nogales and recreationalists.	Temporary construction noise increases would primarily impact residents in Sahuarita, Amado, Tubac, Tumacacori, and Nogales, and recreationalists.	Temporary construction noise increases would primarily impact residents in Sahuarita and Nogales and recreationalists (same as Western Corridor).	
Operation	Long-term noise from corona effect on transmission lines would generally be lost in background noise (ranging from 30 to 60 decibels, depending on proximity to residential areas and roads). Gateway and South Substations operational noise would be near background levels for the nearest receptors. (There are no residences within 0.5 mi [0.8 km] of either substation).			

Table S–1. Summary Comparison of Potential Environmental Effects of Alternatives *(continued)*.

Resource	Western Corridor	Central Corridor	Crossover Corridor	No Action Alternative
Human Health and Environment	EMF exposure at the nearest residences, schools, and commercial establishments would be well below 0.8 milligauss, the average daily exposure to maximum magnetic fields from some common household appliances. EMF exposure at the nearest residences (listed previously under Land Use) would be less than 10 percent of EMF exposure from common household appliances, and would decrease further at the nearest schools and commercial establishments. No health effects would be expected from this exposure. Corona effects (audible noise, radio and television interference, visible light, and photochemical reactions) would be minimal and would be mitigated using proper line design.			No EMF effects associated with the project. EMF exposure from existing transmission lines and household appliances would continue.
Infrastructure	The proposed project would increase electric transmission facilities, but would not otherwise affect existing infrastructure. Minimal municipal solid waste generated during construction and operation would be taken to appropriate landfill facilities. No hazardous waste would be generated from substation operation. Powerline reliability would increase.			No change to existing infrastructure. The unreliability of electricity in Nogales, Arizona would continue unless other transmission lines or power plants are built in the Nogales area.
Transportation	Short-term traffic disruptions on major roads such as Ruby Road could occur during construction. Where no access currently exists, new access ways would be required in coordination with land owners and managers, as follows:			Current traffic patterns and growth of wildcat (unauthorized) roads on the CNF would be expected to continue.
New roads (estimated)	No change to existing road density on the CNF. TEP would close 1.0 mi (1.6 km) of existing classified road for every 1.0 mi (1.6 km) of proposed new road to be used in the operation or long-term maintenance. Existing roads would be used for construction and maintenance access to the extent possible.	Same as Western, except that fewer new access roads would be required because a longer segment follows an existing utility (gas pipeline) ROW.	Same as Western.	
On CNF	20 mi (32 km)	14 mi (22 km) for Option 1. For Option 2, an additional 0.2 mi (0.34 km) of new roads would be built in an inventoried roadless area.	21 mi (33 km) for Option 1. For Option 2, an additional 0.2 mi (0.34 km) of new roads would be built in an inventoried roadless area.	
On BLM	0.9 mi (1.4 km)	Same as Western.	Same as Western.	

Table S–1. Summary Comparison of Potential Environmental Effects of Alternatives *(continued).*

Resource	Western Corridor	Central Corridor	Crossover Corridor	No Action Alternative
Transportation (*continued*)				
Road Repairs and Upgrades	Spot repairs would be made to existing roads as needed.	Same as Western, except that extensive upgrades to existing pipeline access roads would be required.	Same as Western.	
On CNF	An estimated 95 locations on existing roads would require minor repairs or improvements.	An estimated 15 locations on existing roads would require minor repairs or improvements.	An estimated 98 locations on existing roads would require minor repairs or improvements.	
Helicopter Use	Helicopters would be used for stringing conductors, but are not expected to be used to bring in structures.	Same as Western.	Helicopters would be used for stringing conductors and to bring an estimated 20 to 25 structures to the Peck Canyon area.	
Traffic	Short-term traffic disruptions could occur during construction, particularly where a corridor crosses a major road such as Arivaca Road.			
Permanent Changes to Road System	Roads not required for long-term maintenance would be closed in coordination with land managers and owners.	Same as Western.	Same as Western.	
On CNF	No net increase in road density. Roads not required for long-term maintenance would be closed, and the sites would be restored. For every mile of new road required for operation and maintenance of the project, TEP would close a mile of existing classified road. Roads required to remain open for project maintenance would be administratively closed, with restricted access.	Same as Western.	Same as Western.	

Table S–1. Summary Comparison of Potential Environmental Effects of Alternatives *(continued)*.

Resource	Western Corridor	Central Corridor	Crossover Corridor	No Action Alternative
Transportation (*continued*)				
On BLM	0.9 mi (1.4 km) of additional roads	Same as Western.	Same as Western.	
Environmental Justice	No disproportionately high and adverse impact to the minority or low-income populations.			Existing conditions would continue. No disproportionately high and adverse impact to the minority or low-income populations.

BA = Biological Assessment
BLM = Bureau of Land Management
CO = Carbon monoxide
CNF = Coronado National Forest
EMF = Electric and magnetic field
EPNG = El Paso Natural Gas Company
EPA = U.S. Environmental Protection Agency
ESA = *Endangered Species Act*
IRA = inventoried roadless area
MBTA = *Migratory Bird Treaty Act*
MIS = Management Indicator Species
PM_{10} = particulate matter with an aerodynamic diameter less than or equal to 10 microns
ROS = Recreation Opportunity Spectrum
ROW = right-of-way
TCP = Traditional Cultural Property
TEP = Tucson Electric Power Company
USFS = U.S. Forest Service

The data presented in this Table for both the Crossover Corridor and the Central Corridor are based on Option 1, the sub-route that avoids the 1.9 mi (3.1 km) stretch of the existing utility corridor that is designated as an IRA. Any potential differences between the sub-routes are noted. For most resource areas (visual, socioeconomics, water, air quality, noise, human health, infrastructure, and environmental justice), no potential for differences in impacts between Options 1 and 2 has been identified.

Next Steps

This Final EIS identifies each agency's preferred alternative. It does not, however, contain the final decisions by those agencies. A Federal agency must wait a minimum of 30 days following EPA's publishing of a Notice of Availability of the Final EIS in the *Federal Register* to make its final decision (40 CFR 1506.10). Each agency's final decision is set forth in a separate formal document. For this project to go forward as proposed, DOE would have to issue a ROD granting a Presidential Permit. Similarly, a ROD issued by the USFS would authorize the occupancy and use of specified National Forest System lands for development of a 345-kV electrical transmission line and concurrently adopt associated Forest Plan amendments. BLM would issue a ROD granting a ROW permit. USIBWC would issue a letter to TEP stating its concurrence in the EIS and supporting project studies and plans.

A ROD accomplishes several things in addition to describing the agency's decision. First, it identifies all of the alternatives that the agency considered. Second, it identifies which of the alternatives the agency considers environmentally preferable, i.e., which alternative has the least negative environmental impact, or, to put it another way, which would best protect the environment. Thirdly, it articulates the other factors that the agency considered in making its decision. Factors agencies consider in making their decisions include, but are not limited to, environmental, economic and technical considerations, the agency's mission, and the imperatives of national policy. Finally, the ROD describes whether all practicable means to avoid or minimize (i.e., mitigate) impacts are to be undertaken, and if they are not, explains why not.

NEPA does not dictate that an agency must select the most environmentally preferable alternative. As long as an agency has taken a hard look at the environmental impacts of the range of reasonable alternatives, it is free to decide among them, regardless of the environmental consequences, or even to decide that all of the action alternatives are acceptable. The purpose of the NEPA process is to ensure that accurate environmental studies are performed; that they are done with public involvement; and that public officials make decisions based on an understanding of the potential environmental consequences.

Each Federal agency here has its own unique jurisdiction and responsibilities in making decisions with respect to TEP's proposal. These different perspectives are reflected in the agencies' statements of purpose and need. This explains why the preferred alternatives of the Federal agencies are not necessarily the same. If TEP ultimately does not receive the unanimous consent of all Federal agencies, the State of Arizona, and regulatory entities to build along the same corridor, this project would not be allowed to proceed as proposed.