EXHIBIT B

EXHIBIT B – ENVIRONMENTAL STUDIES

As stated in Exhibit B of Exhibit 1 to the Rules of Practice and Procedure Before Power Plant and Transmission Line Siting Committee:

"Attach any environmental studies which applicant has made or obtained in connection with the proposed site(s) or route(s). If an environmental report has been prepared for any federal agency or if a federal agency has prepared an environmental statement pursuant to Section 102 of the National Environmental Policy Act, a copy shall be included as part of this exhibit."

The following documents are the environmental studies conducted to date for the CEC Transmission Facilities.

Exhibit B-1	Environmental Planning Process for Nogales Interconnection Project
Exhibit B-1(a)	Draft Environmental Assessment in Support of a Presidential Permit – Nogales Interconnection Project ("PP EA")
Exhibit B-1(b)	Nogales Interconnection Project Draft Environmental Assessment ("DOE Draft EA")
Exhibit B-2	Environmental Planning Process for Nogales Tap to Kantor Upgrade Project
Exhibit B-2(a)	Pima Pineapple Cactus Survey for the Nogales Tap to Kantor Upgrade Project
Exhibit B-2(b)	Clean Water Act Section 404 Preliminary Jurisdictional Delineation and Clean Water Act Compliance Permit Coverage for Nogales Tap to Kantor Upgrade Project

Pursuant to Footnote 1 of Exhibit 1 to the Rules of Practice and Procedure Before Power Plant and Line Siting Committee, Applicants refer the Committee to the following exhibits for further detailed environmental inventories, studies, and assessments as they relate to the CEC Transmission Facilities:

- Exhibit C: Areas of Biological Wealth
- Exhibit D: Biological Resources

- Exhibit E: Scenic Areas, Historical Sites and Structures, and Archaeological Sites
- Exhibit F: Recreational Purposes and Aspects
- Exhibit H: Land Use
- Exhibit I: Anticipated Noise and Interference with Communication Signals

Exhibit B-1 – Environmental Planning Process for Nogales Interconnection Project

I. ENVIRONMENTAL STUDIES

The environmental studies for the Nogales Interconnection Project began in 2015 and were completed in 2017, and included land use, visual resources, biological resources, and cultural resources analyses. The environmental planning process completed for the Nogales Interconnection Project is described below.

A. Presidential Permit EA Environmental Planning and Public Involvement Process

Nogales Transmission developed a comprehensive planning process to identify environmentally compatible routes for the Nogales Interconnection Project. Generally, the environmental planning process involved identifying the study area and route segments, soliciting public feedback, and environmental analyses. In support of the study and permitting associated with a Presidential Permit application for the Nogales Interconnection Project, Nogales Transmission prepared a draft environmental assessment ("PP EA," attached as Exhibit B-1(a)) to help with the study and permitting associated with the application. The study area for the PP EA included a wide range of reasonable and feasible routes between the initial project endpoints: the U.S.-Mexico border crossing area, the proposed Gateway Substation, and the existing Valencia Substation.

Following the definition of the study area, Nogales Transmission presented a route, previously approved in 2001 by the ACC, to landowners at a February 5, 2015 public open house meeting (see Figure 2-2 of the PP EA, attached as Exhibit B-1(a)) to introduce the project, answer questions, gather input, and collect comments. Nogales Transmission also hosted a separate roundtable discussion with government agencies and non-governmental organizations on February 5, 2015. Based on feedback received during the open house and roundtable discussion, Nogales Transmission added new route segments that increased corridor sharing or addressed specific landowner concerns. The new route segments and the previously approved 2001 route were presented at a September 17, 2015 agency and NGO meeting (Exhibit B-1(a), Figure 2-3). After the meeting, Nogales Transmission provided a site visit to interested parties. Based on comments received at the agency meeting and continued outreach with

landowners, additional route segments were included for analysis in the PP EA (Exhibit B-1(a), Figure 2-4).

The public open house, agency and NGO meetings, and site tour constitute key elements of the comprehensive public involvement program Nogales Transmission implemented to disseminate information and receive feedback on the project. Nogales Transmission has also employed a project website to educate interested parties and solicit comments, which includes FAQs, a fact sheet, project maps, and copies of the informational posters presented at meetings (Exhibit J-2), as well as copies of permitting documents. Nogales Transmission's public outreach also includes a dedicated e-mail account for the project to which interested parties may send feedback at any time.

Throughout the PP EA process, Nogales Transmission consulted federal agencies (Department of Energy ("DOE"), U.S. Forest Service, U.S. Border Patrol, International Boundary and Water Commission, U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service); tribes and tribal groups (Tohono O'odham Nation, Pascua Yaqui Tribe); state agencies (Arizona Game and Fish Department, State Historic Preservation Office, Arizona Department of Transportation); local utilities (UniSource Energy Services); and interest groups (*e.g.*, Sky Island Alliance, Sierra Club – Grand Canyon Chapter, Friends of Santa Cruz River, Center for Biological Diversity). Nogales Transmission incorporated feedback received from all stakeholders as it completed environmental studies, including land use, visual, biological, and cultural resources analyses, for consideration in the siting of the Nogales Interconnection Project.

In addition to analyses of the larger study area, Nogales Transmission examined existing environmental conditions, potential environmental consequences resulting from the project, and mitigation measures to address any impacts on an approximately 250-foot-wide area centered on the route segments and the proposed Gateway Substation area. At the conclusion of the PP EA study process, Nogales Transmission concluded that the project would not significantly adversely affect environmental resources. For example, the project would:

- have minimal long-term direct and indirect impacts to existing land uses and land cover;
- not cross through designated or proposed critical wildlife habitat; and
- create only minimal habitat fragmentation because most of the route segments follow existing transmission corridors and adjacent roadways.

Based on the results of the PP EA and input from the various stakeholders, agencies, and the public, Nogales Transmission proposed four alternative routes for the project in its Presidential Permit application, each selected with the goal of following existing infrastructure and developed corridors where possible and working with landowners and stakeholders to minimize potential impacts.

As part of an interconnection study triggered by the project, UNSE conducted a detailed engineering analysis that determined that Valencia Substation could not accommodate an additional circuit, and connecting the project there would require a complete rebuild of the Valencia Substation on a larger footprint at a cost of approximately $15 million. The detailed analysis revealed that UNSE would avoid approximately $11 million in costs if the configuration of the Nogales Interconnection Project was amended to connect to the UNSE system at the planned Gateway Substation rather than at the existing Valencia Substation. Nogales Transmission amended its Presidential Permit application to reflect this electrical reconfiguration in order to make the project more cost-effective. The reconfiguration further allowed the project to avoid any environmental impacts associated with a Valencia Substation expansion. This electrical reconfiguration did not materially affect the analysis of the environmental impacts of the route segments and Gateway Substation area contained in the PP EA.

B. DOE Draft EA Environmental Planning and Public Involvement Process

Nogales Transmission provided the PP EA study information to the DOE to assist in the preparation of the DOE Draft EA, attached as Exhibit B-1(b)), prepared in compliance with NEPA and the DOE's implementing regulations pursuant to 10 CFR Part 1021.[1] The DOE Draft EA, which considers the environmental impacts of the Nogales Interconnection Project, incorporated the electrical reconfiguration in its analyses.

The analysis areas for the DOE Draft EA were established to provide a broad enough geographic context to describe the impacts of the project. The analysis area covered a one-mile buffer zone of the centerline of each of the alternative routes for all studies relating to geology and soils, vegetation, wildlife, water resources and quality, noise, and infrastructure. Larger analysis areas were used to study land use and recreation (Santa Cruz County) and visual resources (five-mile buffer of the centerline of the alternative routes). Impacts to radio, television and cellular

[1] The International Boundary and Water Commission, U.S. Section, U.S. Forest Service, and Staff of the Arizona Corporation Commission participated as cooperating agencies for purposes of this study.

communication were studied within a 1,500-foot buffer of the centerline of the alternative routes. In addition to these studies, the DOE Draft EA incorporates consultations with federal and state agencies and tribes. Comments on the DOE Draft EA will be accepted through August 3, 2017.

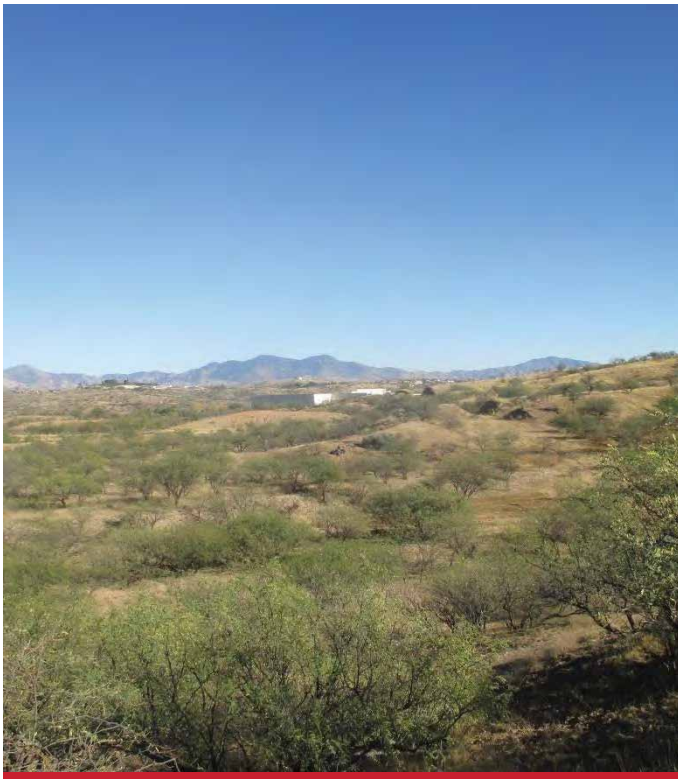
Based on the impacts and cumulative impacts results reported in the DOE Draft EA, Applicants anticipate that a Finding of No Significant Impact will be issued. For example, the Nogales Interconnection Project is not anticipated to create significant impacts to wetland resources or floodplains. Specific to wildlife, the DOE Draft EA concluded that the project is not anticipated to change wildlife distribution or impact wildlife corridors, will not cross through designated or proposed critical wildlife habitat, and will not adversely affect the only federally-listed wildlife species known to occur in the area (the lesser long-nosed bat), or cause significant habitat loss to state-protected wildlife species in the vicinity (the yellow-nosed cotton rat). Similarly, the DOE Draft EA concluded that the project will not impact rare or sensitive vegetation communities and is not likely to result in a trend toward federal listing or loss of population viability of state-protected plants. The DOE Draft EA concludes that the project is anticipated to be consistent with applicable land use policies plans.

II. CEC APPLICATION ALTERNATIVE ROUTE SELECTION

As discussed in Exhibit J-2, Applicants have continued to engage with the public and recently held open house meetings in June 2017 to share information about the Nogales Interconnection Project as well as the Nogales Tap to Kantor Upgrade Project.

For this Application, Applicants ultimately selected a preferred route and three alternative routes based on the results of the PP EA (Exhibit B-1(a)) and DOE Draft EA (Exhibit B-1(b)), public and agency input, engineering and technical considerations, and cost.

Exhibit B-1(a) – Draft Environmental Assessment in Support of a Presidential Permit – Nogales Interconnection Project ("PP EA")



Environmental Assessment in Support of a Presidential Permit

Nogales Interconnection Project

Hunt Power

Nogales, Santa Cruz County, Arizona

April 4, 2016

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1 Introduction

1.1 Project Overview

The Nogales Interconnection Project (Project) is being developed by Nogales Transmission, L.L.C., a subsidiary of Hunt Power, L.P (Applicant). The Project is a proposed 300 megawatt (MW) direct current (DC) interconnection, commonly known as a DC tie that would allow for an asynchronous interconnection between the electric grid in southern Arizona and the electric grid in the northwestern region of Mexico. The project will be constructed in two phases. The first phase of the Project will include the components listed below and the converter capacity will be 150 MW. The second phase, to be constructed at a time that has not yet been determined, will expand the HVDC converter capacity to 300 MW within the proposed Gateway Substation.

The Project would consist of three components:

1. A new 10- to 15-acre Gateway Substation, potentially located on land currently owned by Tucson Electric Power (TEP), where DC tie equipment for both phases would be located;
2. A new, approximately 3-mile, 138 kilovolt (kV) transmission line segment originating at the existing UniSource Energy Services (UES) Valencia Substation in Nogales, Arizona, and extending west and south to the new Gateway Substation; and
3. A new, approximately 2-mile, 230 kV transmission line segment extending south from the new Gateway Substation and across the United States-Mexico border to interconnect with a transmission line to be constructed in Mexico.

Nogales Transmission, L.L.C., will require a Presidential Permit from the Department of Energy for the border crossing as well as a Certificate of Environmental Compatibility (CEC) from the Arizona Corporation Commission (ACC) for construction of the transmission lines.

1.2 Purpose and Need

Federal regulations implementing the National Environmental Policy Act (NEPA) require an environmental assessment on any action at any time in order to assist agency planning and decision making.

1.2.1 Federal Agency Purpose and Need

The purpose and need for the DOE action is to determine whether it is in the public interest to grant or deny a Presidential Permit to Nogales Transmission for the construction, operation, maintenance, and connection of the proposed asynchronous interconnection transmission line that would cross the US international border. Like all federal agencies, DOE must comply with NEPA when it evaluates a proposal for federal action that may affect the environment. The NEPA process is intended to help decision makers understand the environmental consequences of their actions.

1.2.2 Applicant's Purpose and Need

The proposed Project consists of the new Gateway Substation located on a 10- to 15-acre parcel of land approximately three miles from the existing Valencia Substation in Nogales, Arizona; the new 3-mile, 138-kV transmission line segment originating at the Valencia Substation and extending west and south to the new Gateway Substation; and the new 2-mile, 230-kV transmission line segment extending south from the new Gateway Substation and across the US-Mexico border to interconnect with a transmission line to be constructed in Mexico. The new Gateway Substation will be approximately two miles north of the border between the United States and Mexico. The proposed Project is being developed to allow transfers of capacity and energy between the US and Mexico to serve load and enhance reliable operations of the transmission grid. The HVDC interconnection facilities initially will be 150 MW, but will be capable of being expanded to 300 MW.

The proposed Project would be available to provide reliability support to both the US and Mexico electric transmission grids. The Project would facilitate the creation of a power market to trade electricity between the US and Mexico, thus promoting a more liquid market in electricity, providing the opportunity for reduced prices to electric consumers in the region, and improving the region's ability to meet future electric capacity and energy requirements.

1.3 Benefits to the Region

The Project would support the reliability of the regional electrical grid by providing bidirectional power flow and voltage support. It would also provide emergency assistance, as needed, for the electric system both north and south of the border. Nogales is at the end of the Western Electricity Coordinating Council (WECC) grid and relies on the approximately 55-mile-long, 138 kV Vail to Valencia transmission line for its power supply. The addition of the proposed Gateway Substation and the connection to the electrical grid in Sonora, Mexico, would provide an additional source of energy for the city of Nogales in the event of a transmission line outage or other problem on the WECC system.

Benefits of the Project would include:

- providing access to other electricity sources and ancillary services, such as voltage support to each side of the border
- enabling transmission-owning utilities on both sides of the border to support each other in times of emergency
- enabling cost savings through firm and non-firm energy transactions, as well as through diversity of peak demand patterns
- providing access to an additional energy market that may allow TEP, UES, and the Mexican utility to pass along the benefits of reduced costs to retail customers
- creating regional economic development opportunities (In addition to temporary construction and supply chain jobs, the Project would create a more robust electric grid to support the region's business growth.)

1.4 Public Involvement

To engage landowners, the Applicant invited the public to attend an open house meeting on February 5, 2015. The goal of the open house was to introduce the Project, answer questions, gather input, and collect comments. Additionally, an agency and stakeholder meeting was held on September 17, 2015. The Applicant invited representatives from 20 different agencies, tribes, and nongovernmental organizations.

The Applicant gathered comments and feedback from attendees, which helped the Applicant understand local community concerns and preferences. After the agency meeting, the Applicant provided a site visit to interested parties.

Comments received during the public open house and agency meetings influenced the Project's environmental review. They are summarized below:

- Structures should not be permitted in the Roosevelt Easement (a 60-foot strip of land parallel and adjacent to the United States-Mexico border, reserved to ensure its integrity by two Presidential Proclamations in 1897 and 1907), and any transmission or associated infrastructure should not be a tool for illegal activity (e.g., anti-climb poles should be used).
- While some views were expressed about possible increased access to public lands, the U.S. Border Patrol indicated that a road could be useful for their operations without increasing illegal activity.
- Concern was expressed about impacts to game species, not just threatened and endangered species.
- Concern was expressed about transmission poles being in Arizona Department of Transportation (ADOT) right-of-way (ROW) and crossing State Route (SR) 189.
- Transmission line routing preferences were stated (e.g., farther from the U.S. Forest Service [USFS] boundary).
- It was indicated that industrial development is planned near the USFS boundary.
- Questions were asked about Mexican partners, agreements, and flow of power to and from Mexico.

The Project website contains a fact sheet, frequently asked questions, and a Project map: https://www.huntpower.com/nogalesdctie.aspx.

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2 Proposed Action and Alternatives Analysis

As described in Section 1.1, the Project would consist of three components:

- A new 10- to 15-acre Gateway Substation;
- A new, approximately 3-mile, 138 kV transmission line segment from the existing UES Valencia Substation in Nogales, Arizona to the new Gateway Substation; and
- A new, approximately 2-mile, 230 kV transmission line segment from the new Gateway Substation to a transmission line to be constructed in Mexico.

This section describes the alternatives that were developed for the proposed action.

2.1 Siting Philosophy and Planning

The Project's route segment development was guided by a strategy of minimizing impacts by following existing infrastructure and developed corridors wherever possible. This approach included:

- working within or next to existing corridors and previously disturbed areas (e.g., transmission lines, roads, etc.)
- working with stakeholders to understand and avoid or minimize impacts to sensitive areas
- integrating information from existing federal and state energy and land use planning efforts
- developing responsible routes and route alternatives informed by:
    - public input
    - industry experience
    - local utility companies
    - federal, state, and local agencies
- selecting a preferred route based on landowner cooperation/agreements that will be subject to approval by the ACC pursuant to a request for a CEC for the lines.

2.1.1 Study Area Identification

The Study Area includes the Project endpoints (United States-Mexico border crossing area, proposed Gateway Substation, and existing Valencia Substation) and major routing opportunity features between the endpoints. The northern boundary minimizes potential impacts on residences, and the western boundary was chosen to avoid directly affecting the Coronado National Forest (Figure 2-1).

2.1.2 Route Segment Identification

The Applicant presented a route, previously approved in 2001 by the ACC, to landowners at the February 2015 open house (Figure 2-2). Based on feedback received during the open house, the Applicant added new Route Segments. These segments increased corridor sharing or addressed specific landowner concerns. The new route segments and the previously approved 2001 route were presented to agencies at the September 2015 meeting (Figure 2-3). Based on comments received at the agency meeting and continued outreach with landowners, additional Route Segments were included for analysis (Figure 2-4).

2.1.3 Border Crossing

The route would cross the international border at 31° 19' 57.844" North, 110° 58' 35.908" West (Figure 2-5), which is west of the Mariposa Port of Entry.

2.1.4 Preferred Route

While the Applicant is not identifying a preferred route at this time, the Applicant expects to identify a preferred route in its application submittal to the ACC.

2.2 Proposed Action Description

2.2.1 Transmission Line

The typical structure type would be a steel, single pole structure.

The Applicant anticipates that the Project would be located on new ROW that is approximately 150 feet wide. A wider ROW may be needed if areas require longer spans of conductor for the Project, angle and corner structures, or guyed structures as well as where special design requirements are dictated by topography. Generally, structures would be spaced approximately 600 to 1,000 feet apart, with shorter or longer spans as necessary. Table 2-1 provides details for the 138 kV structures, and Table 2-2 provides details for the 230 kV structures.

Table 2-1. Single/Double-Circuit 138 kV Structure

Structure Attribute	Description
Type of structure	Tubular steel pole
Approximate structure height	75−110 feet
Approximate structure spacing	600−1,000 feet
Anticipated number of structures per mile	5−9 structures (depending on terrain and other factors)
Anticipated ROW width	Up to 150 feet

Figure 2-1. Study Area

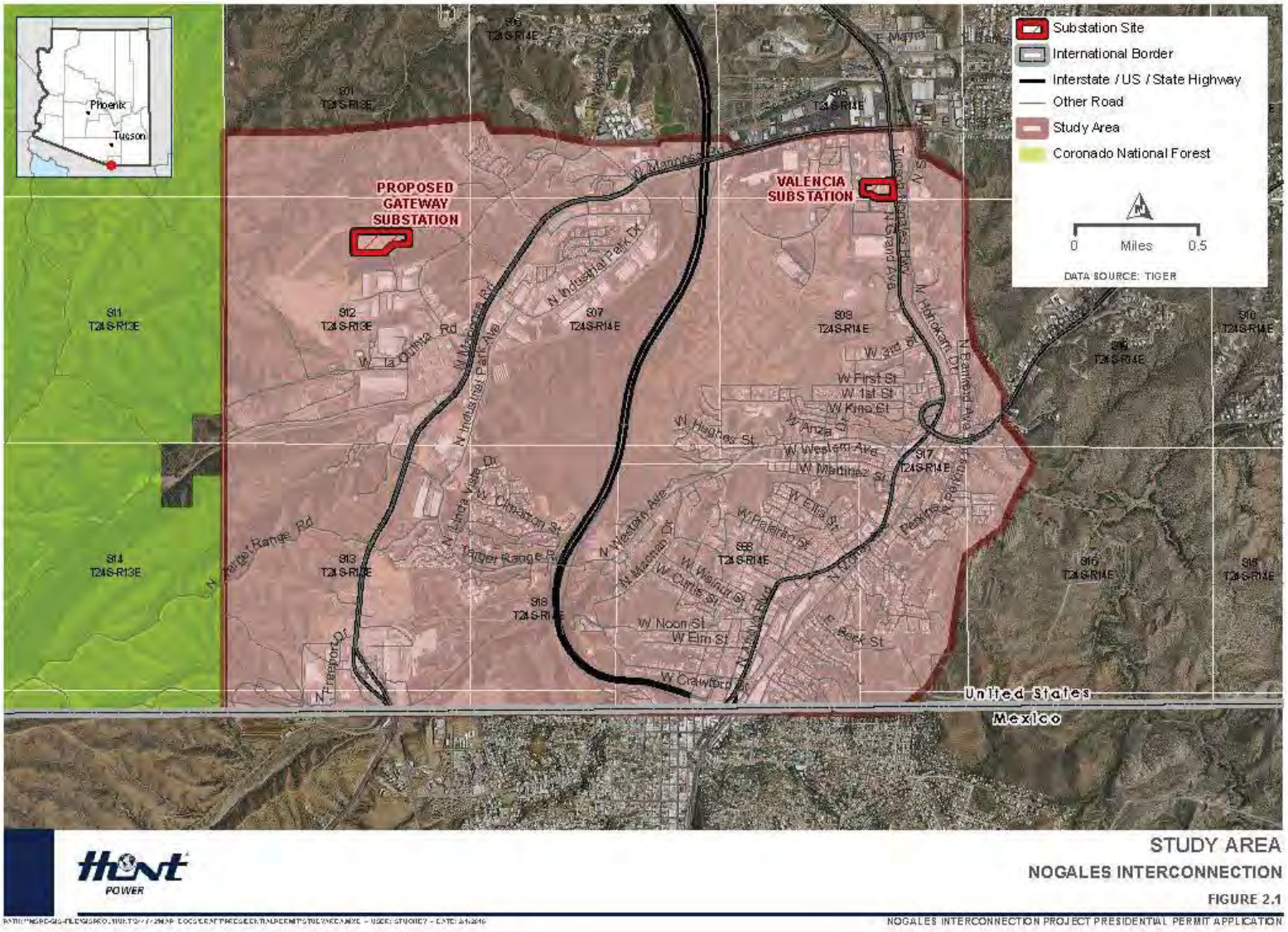


Figure 2-2. February Open House Routes

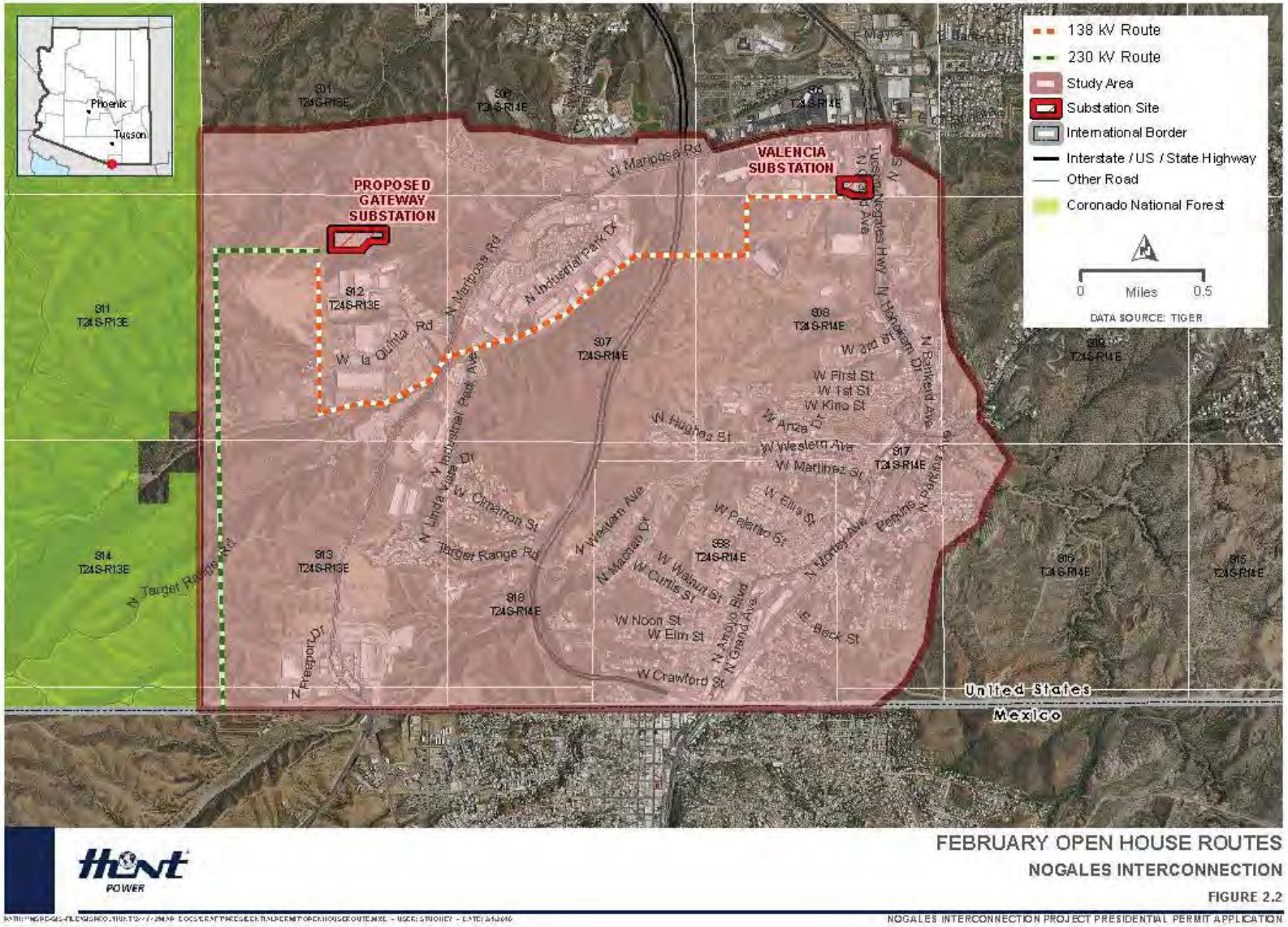


Figure 2-3. Route Segments – September 2015

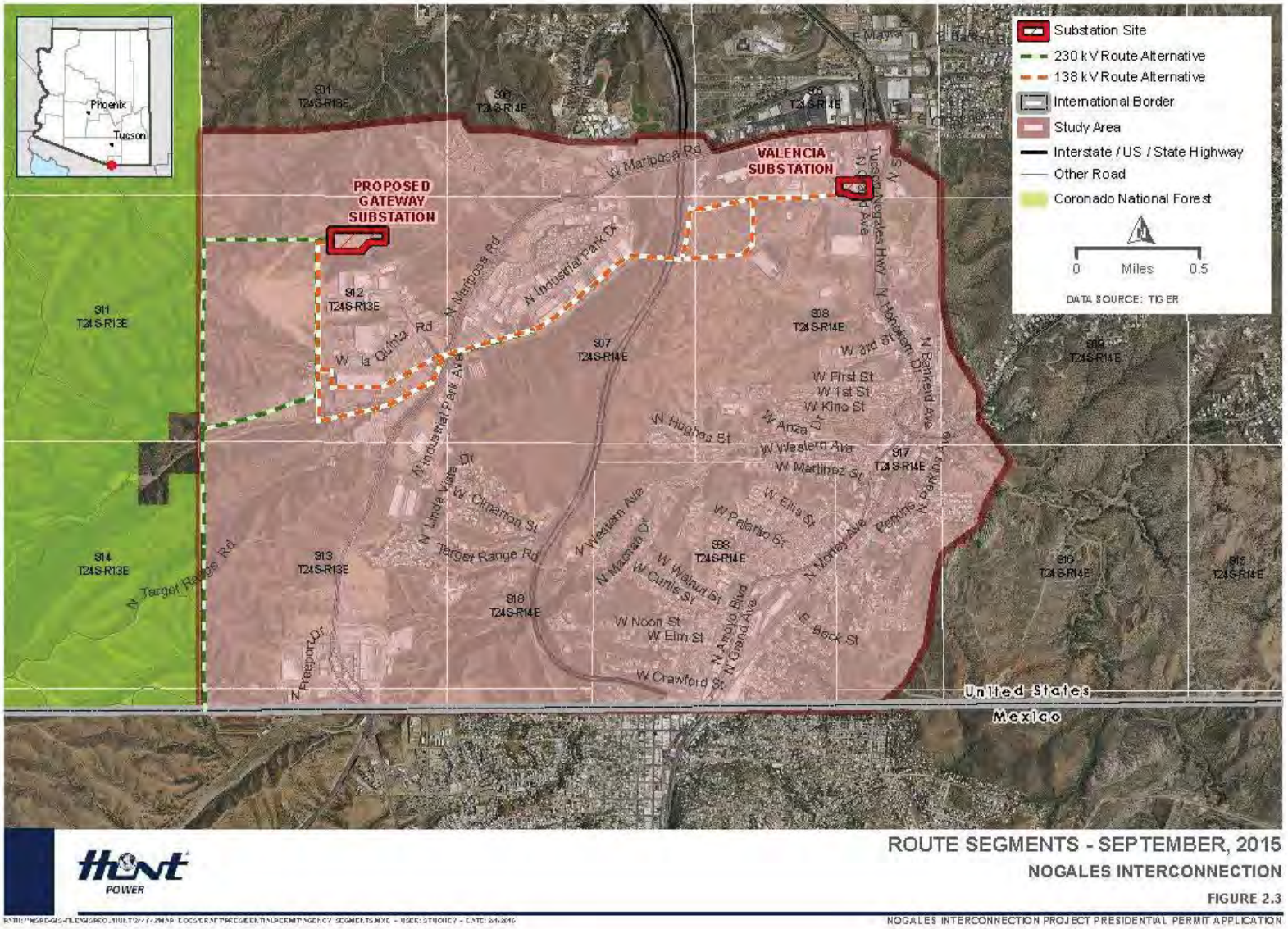


Figure 2-4. Route Segments – October 2015

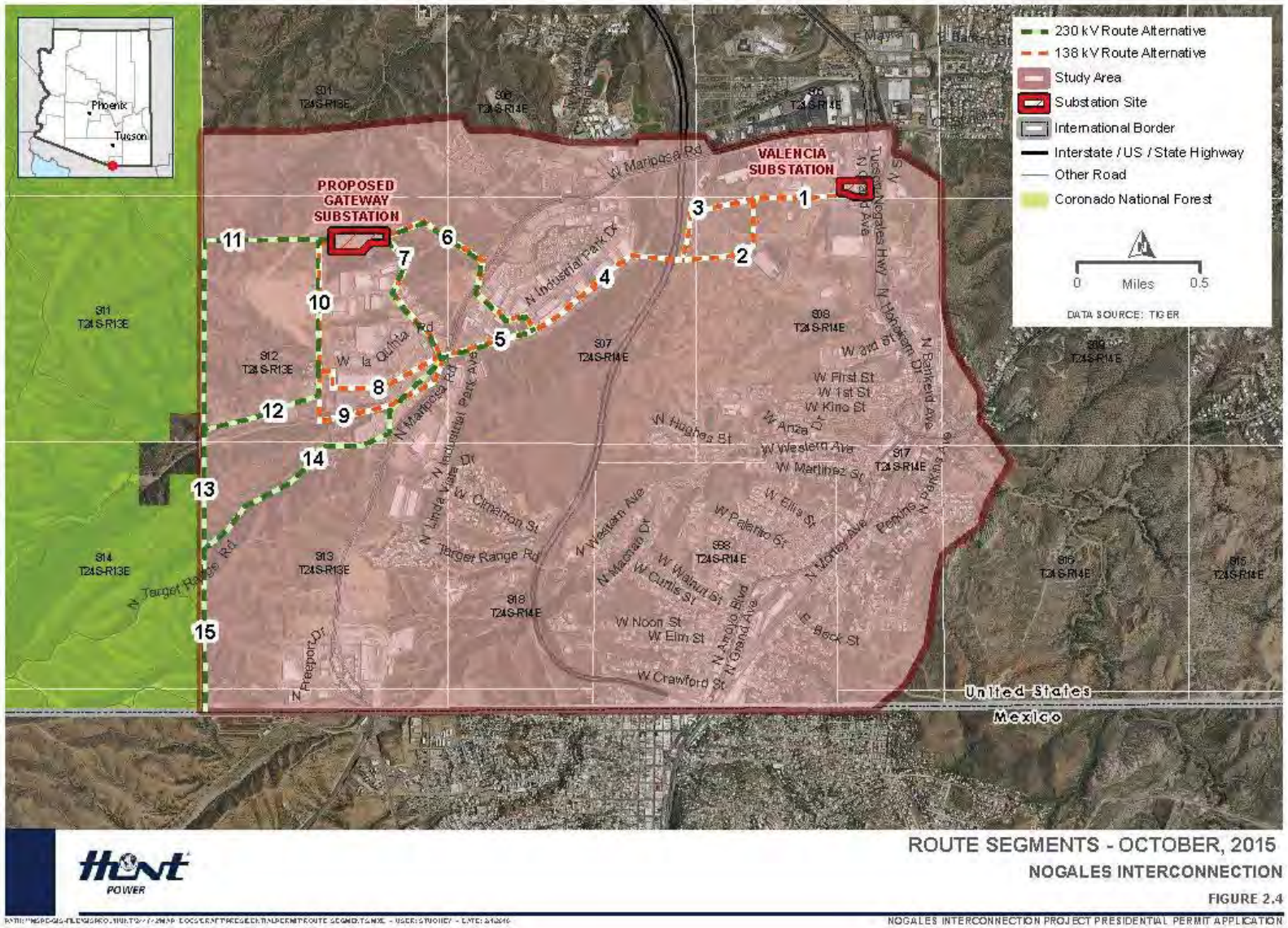


Figure 2-5. International Border Crossing

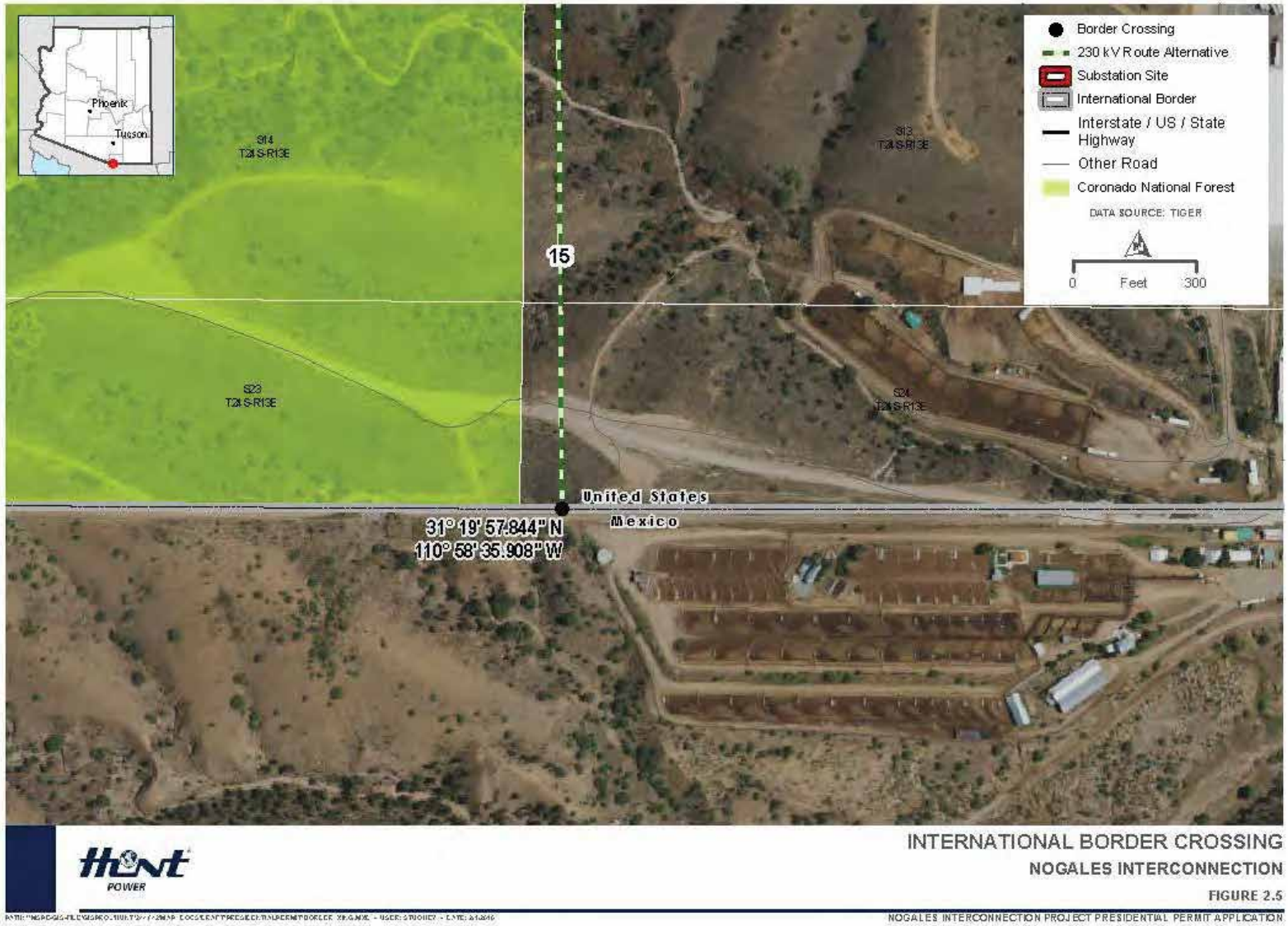


Table 2-2. Single/Double-Circuit 230kV Structure

Structure Attribute	Description
Type of structure	Tubular steel pole
Approximate structure height	95–115 feet
Approximate structure spacing	600–1,000 feet
Anticipated number of structures per mile	5−9 structures (depending on terrain and other factors)
Anticipated ROW width	150 feet

Figure 2-6 and Figure 2-7 show sample images of the structures.

2.2.2 Right-of-way and Easements

This Project would generally require a new, 150-foot-wide ROW to accommodate the transmission line. Nogales Transmission, L.L.C. would acquire easement rights across certain parcels to accommodate the facilities. The land evaluation and acquisition process would include title examination, initial landowner contacts, environmental and non-environmental survey, document preparation, and purchase. Each of these activities, particularly as it applies to easements for high-voltage transmission line facilities, is described in more detail below.

The first step in the ROW process would be to identify persons and entities that may have a legal interest in the real estate upon which the facilities would be built. To compile this list, a ROW agent or other representative engaged by the Applicant would complete a public records search of land included in the Project to determine the property's legal description and the owner(s) of record as well as to gather information regarding easements, liens, restriction, encumbrances, and other conditions of record, as needed.

After owners are identified, a ROW representative would contact each property owner or the property owner's representative. The ROW agent would explain the need for the transmission facilities and how the Project may affect each parcel. The ROW agent would also obtain information about specific construction concerns from the landowner.

The next step in the acquisition process would be evaluation of the specific parcel. For this work, the ROW agent may request Right of Entry (ROE) permission from the landowner for survey crews to enter the property to conduct preliminary survey work. ROE permission may also be requested to take soil borings to assess the soil conditions and determine appropriate foundation design. Surveys would be conducted to locate the ROW, natural features, human-made features, and associated elevations for use during the line's detailed engineering. The soil analysis would be performed by an experienced geotechnical testing laboratory.

Figure 2-6. Single and Double-Circuit 138kV Tower – Typical Configurations

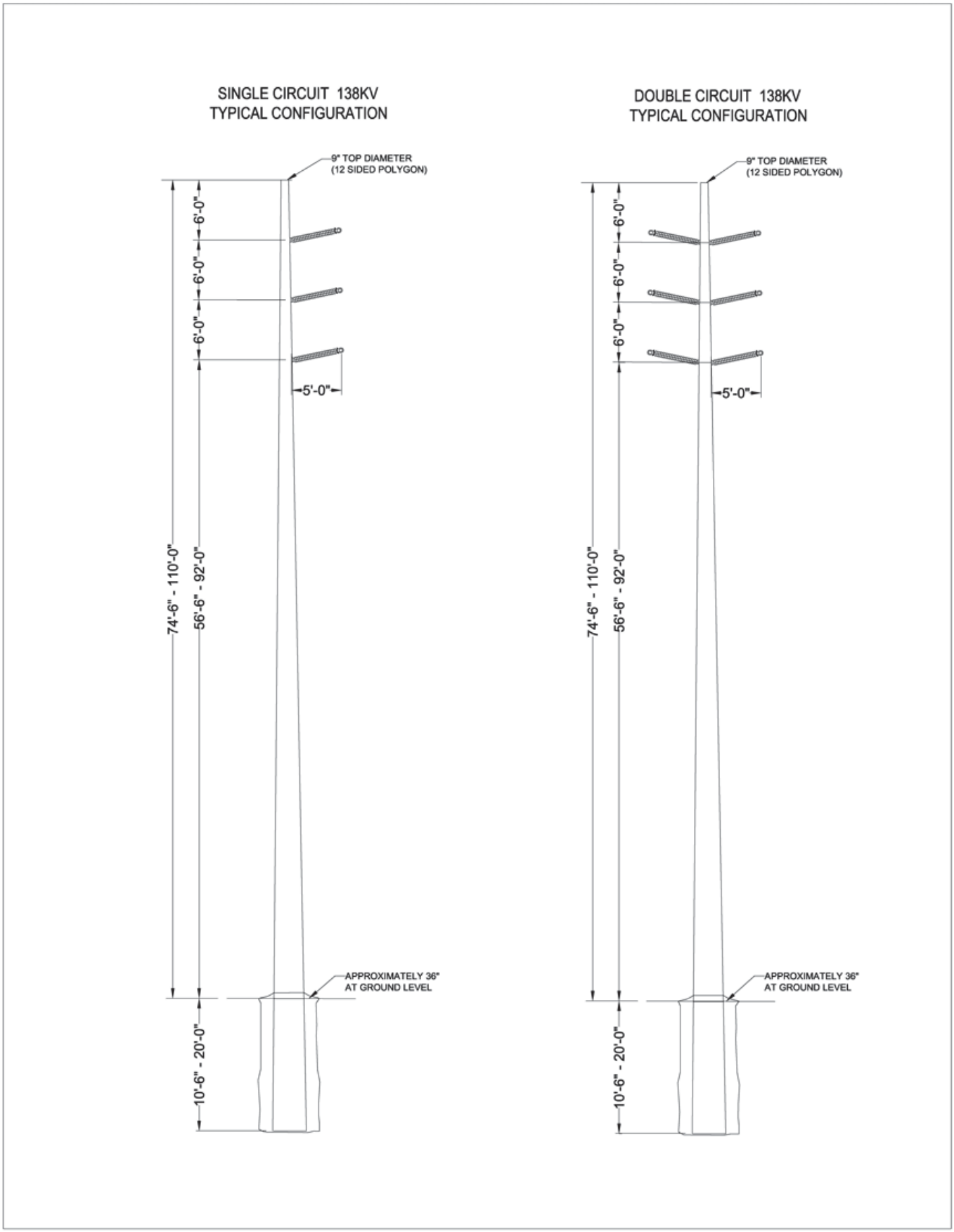
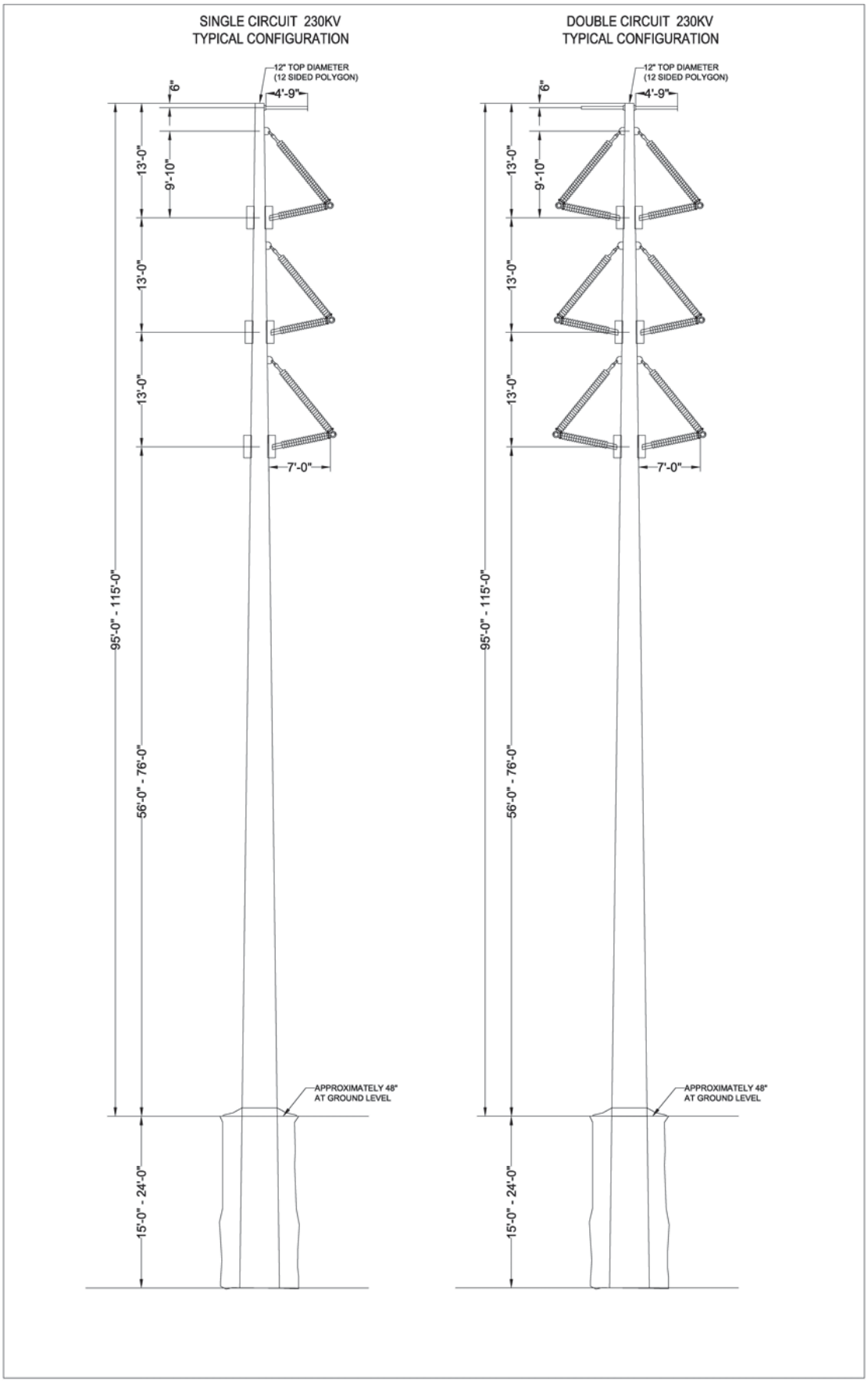


Figure 2-7. Single and Double-Circuit 230kV Tower – Typical Configurations



During the evaluation process, the location of the proposed transmission line may be staked with the property owner's permission. This means that the survey crew would locate the proposed placement of each structure on the ground and place a surveyor's stake to mark the structures' anticipated location. By doing this, the ROW agent could show the landowner where the structure(s) are anticipated to be located on the property. The ROW agent may also delineate the boundaries of the easement area required for the line's safe operation.

Prior to making offers for use of property, land value data would be collected. Based on the impact of the easement to the market value of each parcel, a fair market value offer would be developed. The ROW agent would contact the property owner to present the offer for the easement and discuss the amount of compensation for the rights to build, operate, and maintain the transmission facilities within the easement area, with reasonable access to the easement area. The ROW agent would also provide maps of the transmission line easement or site and maps showing the landowner's parcel. The landowner would be allowed a reasonable amount of time to consider the offer and to present any material that the owner believes is relevant to determining the property's value and the value of the easement.

In most cases, ROW agents are able to work with landowners to address their concerns and an agreement is reached for the utility's purchase of land rights in the form of an easement. The ROW agent would prepare the easements, obtain signatures, and record the documents required to complete each transaction. As part of the ROW acquisition process, the ROW agent would discuss the construction schedule and construction requirements with the owner of each parcel. For safe construction of the transmission line, special consideration may be needed for fences. Fences may need to be moved, and temporary or permanent gates may need to be installed. In each case, the ROW agent and construction personnel would coordinate these processes with the landowner.

2.2.3 Staging Areas

Construction materials would be hauled either directly from the local highway to structure sites or would be brought first to material staging areas and then to the structure sites. The transmission line components—including the conductor and hardware—normally are brought to the temporary staging areas on flatbed trucks. These materials are stored until needed and then loaded on flatbed trailers or trucks for delivery to the structure site where they are unloaded for installation. Staging areas would be identified and used during construction. Fugitive dust emissions at the staging areas would be mitigated by application of water sprays or other control measures as appropriate.

2.2.4 Access Roads

Five types of access would be used for the proposed transmission line: existing paved roads, existing dirt roads that would not require improvements, existing dirt roads that may require improvements, new bladed access roads, and overland access. The ROW would be accessed using existing roads and trails to the extent practicable. These existing roads and trails would be used in their present condition without improvements, unless improvements are needed or are deemed to be in the best interest of the Project and for future use. In areas where

improvements are required, roads and trails would be graded to provide a smooth travel surface.

Where existing roads and trails can be used to access the ROW, only spur roads or trails to each structure site would be required. Access on the ROW, other than in specific areas, would require a road graded to a width of up to 12 feet. Typically, new roads would go directly from structure to structure, except on hillsides, ridgebacks, rock outcrop areas, wash crossings, treed areas, or in areas where sensitive environmental resources should be avoided. In such cases, the road would follow suitable topography from structure to structure and would be built in areas that generally cause the least overall disturbance. Any access road improvements made outside the ROW would be coordinated with landowners, and any required permits or agreements would be acquired prior to construction.

New roads that must be graded for access in steep terrain (side-hill roads) would most likely exceed the 12-foot width of disturbance because of cut and fill conditions; however, the travel surface width would not exceed 12 feet.

Fugitive dust emissions from construction or use of access roads would be mitigated by application of water sprays or other control measures, as appropriate.

2.2.5 Construction Activities

Once land access is granted, preparation of the ROW for construction would begin in coordination with landowners. Underground utilities would be identified and located in cooperation with local utility companies to minimize conflicts with existing utilities along the route. Preparation for construction would begin with developing access to each structure site from existing roads. A reasonably level access path would be needed to provide for safe passage of construction equipment. At structure locations, a stable working surface free of tripping hazards would be needed for installation of foundations and guy anchors, as well as assembling and erecting structures.

2.2.5.1 Vegetation Removal

The Arizona Native Plant Law (NPL) protects many of Arizona's plants from removal and destruction (Arizona Department of Agriculture, Protected Native Plants). Plants protected by the Arizona NPL that are found in the Project area may include cactus, yucca, agave, mesquite, ocotillo, and beargrass. The Applicant will obtain the required permits if relocation of any vegetation subject to the NPL is required. (https://agriculture.az.gov/native-plant-procedures)

Much of the Project area is made up of shrub and grassland species that would not require removal. If needed, larger woody vegetation found in the ROW that is not subject to the NPL would be cut at or slightly above the ground surface. Rootstock would be left in place to stabilize existing soils.

2.2.5.2 Right-of-way Access and Construction Preparation

If temporary removal or relocation of fences is necessary, the contractor will coordinate with the landowner.

Transmission line structures generally are designed for installation at existing grades. However, if vehicles or installation equipment cannot safely access or operate near the structure, minor grading of the immediate terrain would be performed to provide a reasonably level working surface for construction and maintenance of the structure.

Construction equipment would be inspected frequently to ensure hydraulic systems and oil pans are in good condition and free of leaks. Portable spill containment materials would be required for each piece of construction equipment with the potential to discharge a significant amount of oil into the environment. Operators would be present at the nozzle at all times when refueling. In the event of a spill, the source of the spill would be identified and contained as quickly and safely as possible upon discovery. The spill and contaminated soils would be managed in accordance with all applicable federal, state, and local requirements. An emergency response contractor would be secured, if necessary, to further contain and clean up a severe spill.

In the event that protected species or cultural and historical artifacts are encountered during construction activities, Project management personnel would consult with regulatory authorities regarding appropriate construction procedures and mitigation measures, which would be determined through applicable regulatory procedures.

2.2.5.3 Structure Site Preparation

A stable working surface is required at structure locations. Structures would be assembled and erected on site. Where reinforced concrete foundations are required, large rubber-tired or track-mounted auger equipment would be used to excavate a circular hole of the appropriate diameter and depth. A temporary or permanent casing may be used to stabilize the excavation if required. Excavated material would be spread evenly around the structure base to promote site drainage. Reinforcing steel and anchor bolts would be set in position. Ready-mixed concrete would then be placed in the excavation. Concrete truck wash water would be discharged only in specially designated upland disposal areas or at the concrete batch plant.

During final restoration, ground contours would be restored to approximate pre-construction contours prior to revegetation with native species.

Fugitive dust emissions at the staging areas would be mitigated by application of water sprays or other control measures, as appropriate.

2.2.5.4 Wire Stringing

The wire stringing process would start in a set-up area prepared to accommodate the stringing equipment and materials, normally located adjacent to major angle points or near mid-span on the ROW centerline. The rope machine, conductor wire trailers, and tensioner would be located at the wire stringing set-up areas. This phase of construction would occur after the structures have been erected and insulators and stringing blocks (also called dollies or sheaves) have been installed. Stringing blocks are a type of pulley that attaches to the insulator assembly and temporarily supports a pulling rope, a wire rope or hard line, and ultimately the conductor as it is being strung between structures.

The process would start as the crew pulls a rope from one setup area to the next. The rope may be pulled down the ROW with wide-track or rubber-tired equipment, or strung by helicopter. After the rope has been strung through all the structures for all phases within the stringing

interval, the ropes would be used to pull a hard line through the dollies from one setup area to the next. A hard line set-up would be located at the opposite end of the interval from the wire stringing setup area.

Each hard line would then be attached to the conductor with an anti-rotation device and an attachment called a sock, which would be pulled back through the dollies to the end of the interval. Crew members would monitor the progress of stringing to ensure the sock does not get hung up in the dollies. One phase at a time, the conductor wire bundles would be pulled to the appropriate tension. Once all the phases have been tensioned, they would be clipped into place using permanent attachment hardware at each structure.

2.2.5.5 Water Crossings

It is anticipated that the final route will be adjacent to and will cross segments of perennial and intermittent streams. The most effective means to minimize impacts on streams during construction is to span them by placing structures above the normal high water level. The Applicant would avoid crossing waterways with construction equipment wherever practical by accessing the site from opposite sides. In areas where construction occurs close to waterways, appropriate measures would be employed to minimize soil erosion and prevent sedimentation of the waterways. The Applicant would ensure that equipment fueling and lubricating occurs at a reasonable distance from the waterways.

2.2.6 Restoration and Maintenance

Post-construction reclamation activities would include removing and disposing of debris, removing all temporary structures (including staging areas), and employing appropriate erosion control measures. Areas disturbed by construction activities would be reseeded with vegetation similar to what was removed.

Restoration and reclamation procedures following completion of repair work would be similar to those prescribed during construction.

Damage repair may require the same types of equipment used during construction, including power augers for hole boring, backhoes for excavation, and/or concrete trucks and cranes for structure erection. Other required equipment may include power tensioners; pullers; wire trailers; crawler tractors; and trucks and pickups for hauling materials, tools, and workers. Any necessary temporary staging areas outside the ROW would require authorization from the applicable landowner(s). Site and access road disturbances, such as ruts created during damage repair operations, would be restored to a satisfactory condition using rehabilitation procedures.

If during transmission line maintenance and monitoring it is determined that new or reconstruction activities should be implemented, the Applicant would notify the property owners and/or other regulatory agencies and obtain proper approvals, as necessary.

Dust control during maintenance of the transmission line would be managed the same as during construction.

2.2.7 Gateway Substation and DC Interconnection

The new 10- to 15-acre, 300 MW Gateway Substation and DC interconnection would potentially be built on land owned by TEP. The City of Nogales previously issued a conditional use permit allowing development of a substation at this location. The Applicant will need to pursue a new conditional use permit for the Project.

The Gateway Substation will be built in phases. Initial construction will be 150 MW with future expansion to 300 MW. The second 150 MW would be constructed within the existing property boundary.

2.2.7.1 Substation Construction

The substation would be constructed in compliance with applicable requirements of the National Electric Safety Code (NESC), Occupational Safety and Health Act, and state and local regulations. Designs would be completed by professional engineers with relevant experience. Contractors would be committed to safe working practices. The substation facilities would be designed to allow future maintenance with minimal impact on transmission system operation and the necessary clearance from energized equipment to ensure safety.

Standard construction and mitigation practices developed from experience with past projects as well as industry-specific best management practices (BMPs) would be employed. BMPs for the Project would be based on the specific construction design, prohibitions, maintenance guidelines, inspection procedures, and other activities involved in constructing the substation facilities. As an example, the construction schedule may be modified to incorporate a BMP that would minimize impacts during migratory bird season. As another example, in areas where construction would occur close to waterways, BMPs would be employed to prevent soil erosion and ensure that equipment fuel and lubricants do not enter the waterway.

2.2.7.2 Substation Restoration and Maintenance

Upon completion of construction activities, the Applicant would restore the remainder of the site. Post construction reclamation activities would include removing and disposing of debris, removing all temporary structures (including staging areas), and employing appropriate erosion control measures. If areas outside the substation site are disturbed by construction activities, they would be reseeded with vegetation similar to what was removed, except for vegetation that might violate height restrictions to prevent interference with the substation and the transmission lines entering the substation.

The substation and DC tie equipment would be patrolled on a routine basis. In addition, the equipment would be monitored by operations personnel. In the event of an emergency, a trained maintenance crew would immediately be dispatched to the substation to investigate and identify needed repairs and cleanup.

2.3 No-Action Alternative

Under the No-Action Alternative, the Applicant would not build the transmission line or Gateway Substation. However, the reliability concerns that prompted the need for the proposed action would remain.

2.4 Alternatives Considered but Not Further Evaluated

All alternatives under consideration are being evaluated.

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3 Affected Environment, Environmental Consequences, and Mitigation Measures

This chapter discusses existing environmental conditions, potential environmental consequences resulting from the proposed action, and mitigation measures to address such impacts. In this chapter, the term Route Corridor refers to an approximately 250-foot-wide area centered on the Route Segments and the Gateway Substation area. The Route Corridor was the area investigated for environmental impacts, and falls within the larger Study Area discussed in the previous chapters. The width of the Route Corridor was selected to provide flexibility for siting the final alignment and associated ROW. The ROW used to calculate temporary impacts in this chapter is 150 feet wide. Impacts for the existing Valencia Substation are not described in detail in this chapter because it is already in place. Until a preferred route is selected and engineering is completed, it is assumed that staging areas and other temporary construction areas will be constrained to the ROW or substation site.

3.1 Land Use and Zoning

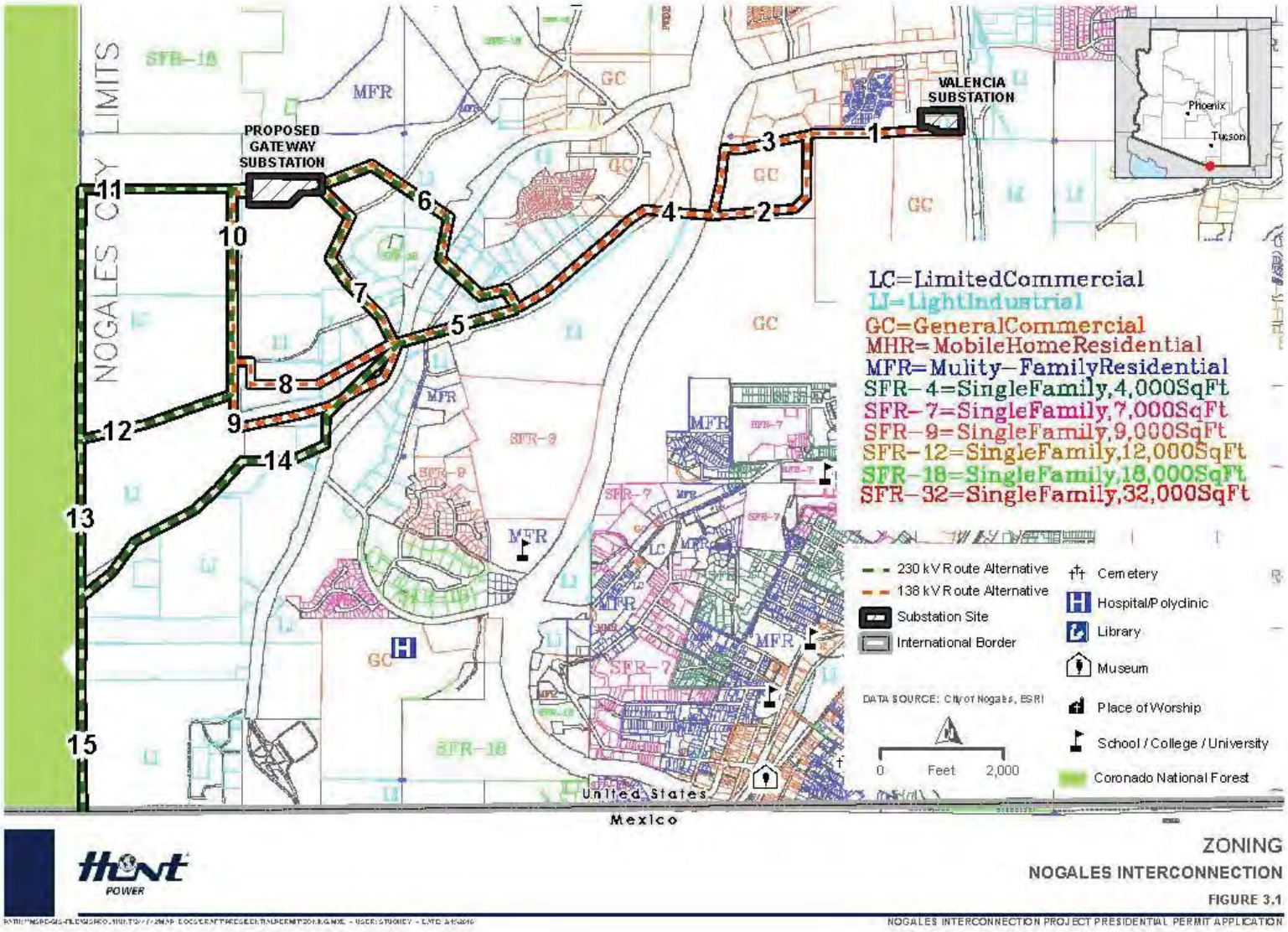
This section discusses existing land use and land cover in the Route Corridor and identifies local ordinances applicable to the proposed action. Data from the City of Nogales and the National Land Cover Database (NLCD) were used to determine existing conditions in the Route Corridor.

3.1.1 Affected Environment

Land use in the Route Corridor is a mix of general commercial, light industrial, and multifamily residential (Figure 3-1). The portion of the Route Corridor east of I-19 is primarily zoned for general commercial use, with the exception of one multifamily residential development on the southwestern side of Mariposa Road and Mastick Way, approximately 100 feet north of Route Segment 1. The area south of the residential development is an existing utility corridor. The land immediately west of I-19 is also zoned for general commercial use and then transitions to light industrial for the remainder of the Route Corridor. The westernmost portion of the Route Corridor is adjacent and runs parallel to the City of Nogales border with the Coronado National Forest. Because most land in the Route Corridor is undeveloped, the Project would avoid direct conflicts with residences, educational facilities, houses of worship, and other sensitive land uses. This includes Route Segments that run adjacent to medium- and high-intensity developed areas, such as Route Segments 1, 2, 4, 5, 6, and 8.

A 60-foot-wide strip of land parallel and adjacent to the United States-Mexico border, known as the Roosevelt Easement, was reserved to ensure its integrity by two Presidential Proclamations signed by President William McKinley and President Theodore Roosevelt in 1897 and 1907, respectively. The proposed action will preserve the integrity of this land, by not siting structures within the easement.

Figure 3-1. Zoning



The NLCD provides information on land cover types nationwide using a 16-category classification system. Using this database, the primary land cover types in the Route Corridor were identified (Figure 3-2). As summarized in Table 3-1, most land cover in the Route Corridor (72 percent) is classified as "shrub/scrub," indicating that the area is dominated by shrubs less than five meters tall.

Table 3-1. Land Cover Types in Route Corridor

Cover Type	Acreage	Percentage of Route Corridor
Developed, open space	33.2	10.9
Developed, low intensity	19.3	6.4
Developed, medium intensity	12.4	4.0
Developed, high intensity	13.3	4.4
Barren land (rock/sand/clay)	6.3	2.0
Shrub/scrub	220.2	72.2
Total	**304.9**	**99.9**[a]

Source: National Land Cover Database (2011)
[a] Because of rounding, total does not add up to 100.

Permitted land uses in the Route Corridor are regulated at the local level by City of Nogales zoning regulations. As specified in the City's Zoning Code, utility structures and facilities related to the transmission of power or communications are considered permitted conditional uses and must be approved by the City's Planning and Zoning Commission. The City of Nogales previously issued a conditional use permit (CUP) approving development of a substation at the site of the proposed Gateway Substation. The CUP has since expired and will need to be re-applied for.

3.1.2 Environmental Consequences

3.1.2.1 Temporary Impacts

During construction, the proposed action would have short-term direct and indirect impacts on land uses. The proposed action could disrupt residential, recreational, or commercial uses in areas along the ROW as a result of delivery of construction materials and workers in the area.

Temporary impacts to land cover could include temporary conversion of shrub/scrub land cover to grassland or barren land within the ROW.

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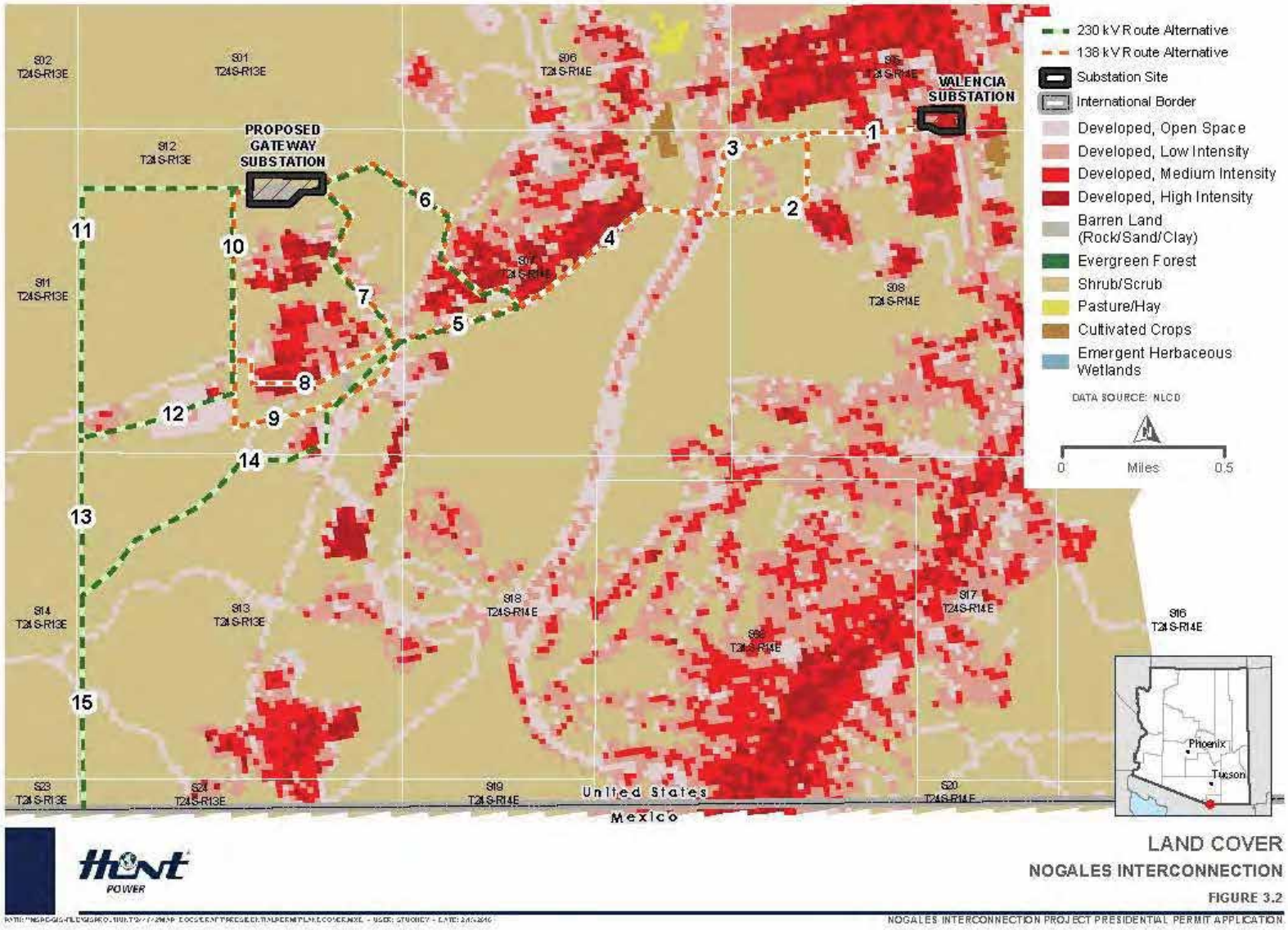
Figure 3-2. Land Cover



3.1.2.2 Permanent Impacts

The proposed action would have minimal, long-term, direct and indirect impacts on existing land uses. The transmission line ROW and substation required for the proposed action will remove 94 to 116 acres of land from future potential building sites because no buildings would be permitted in the transmission line ROW; however, non-structure uses such as parking would still be permitted in the ROW.

Permanent impacts to land cover from the proposed action would be minimal. From 6.6 to 8.4 acres of Shrub/scrub land cover would be converted to developed land at structure locations and access roads. The substation site will be converted from barren land to developed land. Depending on the final layout, the future substation expansion may require additional grading. This would occur immediately adjacent to the site within the existing property boundary. Any additional graded area would be converted to developed land.

3.1.3 Mitigation Measures

The following mitigation measures would be implemented to reduce the effects on land use from the proposed action:

- To minimize temporary impacts, construction would be limited to the ROW, existing access roads, and any necessary temporary construction easements (TCEs) obtained from adjacent landowners. TCEs would be located within the 250-foot-wide Route Corridor. Furthermore, in the event any new access roads are required, they would use the minimum area necessary and would be located to minimize impacts on adjacent land uses.
- The Applicant would notify affected landowners and recreational users by posting signs in areas requiring temporary closure for construction, minimize noxious weeds by cleaning seeds from ground-disturbing equipment, and repair any damage caused during construction to help reduce potential nuisance impacts to adjacent land uses.
- The proposed action would parallel existing utilities and roadways to the extent practicable to minimize fragmentation of land cover types and impacts to potential building sites.

3.2 Geology and Soils

This section describes the geologic and soil conditions in the Route Corridor and vicinity and the potential impacts of the proposed action on those resources.

3.2.1 Affected Environment

3.2.1.1 Geology

The Route Corridor falls within the Mexican Highland Section of the Basin and Range physiographic province of the Intermontane Plateaus (U.S. Department of Agriculture [USDA] Natural Resources Conservation Service [NRCS] 2015a). This province is characterized by elongated northwest-to-southeast trending mountain ranges divided by broad, smooth, alluvial valleys (USDA

NRCS 2015a).

Elevation within the Project limits ranges from approximately 3,765 feet above mean sea level (amsl; near the Valencia Substation) to 4,239 feet amsl (near the United States-Mexico border). The terrain in the Route Corridor is characterized by an extensive pattern of short, dissected ridges and draws formed along longer ridges descending from nearby mountains.

Most of the Route Corridor is covered by deep alluvium (carried by rivers and streams) from adjacent mountains. The younger deposits consist of alluvial derived sediments transported from mountains to rivers, streams, washes, and floodplains. The older deposits consist of alluvial and aeolian (wind-deposited) derived sediments found in valleys and at the base of mountains.

3.2.1.2 Geological Resources

The Santa Cruz Valley is rich in geological resources, including copper, molybdenum, and gold. According to the Arizona Geological Survey, no major mines, including major coal, oil, or gas resources, exist in the immediate Route Corridor. A sand and gravel mining operation is located southwest of the proposed Gateway Substation.

3.2.1.3 Geological Hazards

Potential geologic hazards that could affect the proposed action include faults and seismic activity, subsidence, slumping, landslides, and debris flows.

Potentially active faults are scattered throughout southeastern and central Arizona with the nearest being approximately 10 miles to the north. All of the potentially active faults in the Route Corridor have had little historical activity, low slip rates, and long intervals between ruptures. Because of these conditions, the U.S. Geological Survey (USGS) considers Santa Cruz County to be at low to moderate risk for earthquakes.

Land subsidence—attributable to groundwater withdrawal in alluvial basins—is a process of compression and subsequent consolidation of the alluvial sediments. Through geologic time, groundwater levels in the alluvial basin material were at or near the ground surface or at elevations controlled by rivers and drainage systems traversing the basins. Human activities have affected, and are continuing to affect, groundwater levels in many of these basins. Groundwater pumping, primarily for agricultural, industrial, and municipal uses, has depleted stored groundwater in many areas. Over time, and given the correct geological conditions, subsidence can lead to earth fissure. The nearest documented subsidence area is in Green Valley, Arizona, approximately 35 miles north of the Route Corridor (Arizona Department of Water Resources [ADWR] 2015). No earth fissures have been documented in the Route Corridor (Arizona Geological Survey 2015).

Generally, any steep slope is susceptible to slumping or landslides given the right conditions. Flash floods are relatively common during Arizona's monsoon season. These floods and their potential debris flows can occur in any of the many washes crossing the Route Corridor. However, most slopes in the Route Corridor are relatively short and gentle, and not highly susceptible to failure during heavy rains.

3.2.1.4 Soils

Seven soil types occur in the Route Corridor, as described in Table 3-2. Substrates in the Route Corridor are primarily well-drained, gravelly sandy loams to very gravelly sandy clay loams on slopes.

NRCS administers the Farmland Protection Policy Act of 1981 (7 United States Code [USC] Chapter 73 §§ 4201–4209). Certain soil types are considered prime farmland and are protected under the Act. There is no farmland within the Route Corridor.

Table 3-2. Soils Map Units in the Route Corridor

Soil Type	Description
Caralampi gravelly sandy loam	Well-drained, gravelly to very gravelly sandy loam soils typically found on slopes of 10 to 40 percent. Soils are derived from old alluvium and are in a medium runoff class. Not prime farmland.
Coromo soils	Well-drained, gravelly sandy loam soils typically found in floodplains with slopes of 0 to 5 percent. Soils are derived from mixed recent alluvium and are in a low runoff class. Prime farmland if irrigated.
Grabe-Comoro complex	Well-drained loam to sandy loam soils typically found in floodplains with slopes of 0 to 5 percent. Soils are derived from mixed recent alluvium and are in a low runoff class. Prime farmland if irrigated.
Grabe soils	Well-drained loam to sandy loam soils with a 0 to 1 percent slope. These soils are typically found in floodplains and have a low runoff class. Prime farmland if irrigated.
Rock outcrop-Lithic Haplustolls association	Soils found on summits, flanks, and side slopes of hills and mountains with 15 to 60 percent slopes. Not prime farmland
White House-Caralampi complex	Well-drained, gravelly to very gravelly sandy loam and gravelly to very gravelly sandy clay loam. Slopes are typically 20 to 35 percent and are in a medium runoff class. Not prime farmland.
Source: U.S. Department of Agriculture Natural Resources Conservation Service (2015b)	

3.2.2 Environmental Consequences

3.2.2.1 Geology and Soils

The risk of seismic activity is low to moderate given the area's history and the location of active faults. Although significant damage potential from seismic activity is anticipated to be low, the proposed action's design would take local seismic risk into consideration to mitigate any potential damage.

Flash floods are possible along any of the washes in the Route Corridor. Mariposa Wash, the largest wash in the Route Corridor, is adjacent to Route Segments 4, 5, and 9 and is most susceptible to flash floods. Observations during a field visit conducted by HDR on September 17, 2015 indicated that the wash was approximately 4 feet deep in some places, suggesting that a relatively large volume of water can flow through the generally dry wash.

Potential for slope failure, slumping, and landslides is low, considering the area's topography of generally gently rolling hills.

3.2.2.2 Temporary Impacts

The proposed action would result in temporary direct impacts to geologic materials and soils in the ROW and at the Gateway substation. The soil surface will be disturbed by heavy equipment traffic in the ROW, foundation construction at the new Gateway substation, and sidecasting of transmission structure foundation spoil material. Clearing vegetation in the ROW (where necessary) would decrease vegetation cover and increase the potential for erosion. The total area affected by these temporary impacts on the transmission line ROW and substation will range from 94 to 116 acres.

3.2.2.3 Permanent Impacts

The proposed action would result in permanent direct impacts to geologic materials and soils caused by the placement of transmission line structures (e.g., pole foundations) and permanent access roads. Geologic materials and soil would be permanently displaced for structure foundations, generally up to 6 feet diameter per structure, ranging from 297 to 679 cubic feet per structure. The excavated soil would be sidecast around the new pole foundation so as not to change the existing topography and drainage. Increased soil compaction would occur as a result of heavy construction equipment needed to install the transmission line structures and build the Gateway Substation. Soils and geologic materials in the ROW would also be affected by grading the proposed two-track dirt access road, which would range from 6.6 to 8.4 acres. The Gateway substation site has already been graded. However, depending on the final layout, the future substation expansion may require additional grading. This would occur immediately adjacent to the site within the existing property boundary.

3.2.3 Mitigation Measures

The following mitigation measures would be implemented to reduce the effects on geology and soils from the proposed action:

- The contractor would prepare a Notice of Intent (NOI) for coverage under the Arizona Pollution Discharge Elimination System (APDES) General Permit (and, when issued, the Multi-Sector General Permit [MSGP]) for submittal to the Arizona Department of Environmental Quality (ADEQ), and develop a Stormwater Pollution Prevention Plan (SWPPP). At the end of construction and restoration, the contractor would prepare a Notice of Termination (NOT) for submittal to the ADEQ.
- To the extent practicable, soil disturbance and excavation activities in steep slope areas would be avoided.
- Sediment and erosion control plans would be developed that specify the types of BMPs to apply. Depending on the site, BMPs may include installation of silt fence, straw bales, or ditch blocks and/or covering bare soils with mulch, plastic sheeting, or fiber rolls to protect drainageways and streams from sediment runoff.
- Erosion control measures would be inspected during construction, especially during significant rainfalls.

- Where rutting occurs, the Applicant would repair the surface and restore ground vegetation upon completion of work in a given area.
- Disturbed areas not otherwise stabilized would be revegetated once construction is complete, to the extent possible. Seed mixes would be specified based on site characteristics and in accordance with regulatory requirements.
- The introduction and establishment of noxious weeds would be minimized by prompt revegetation of disturbed areas using regional genotype native species, where appropriate, or using seed based on landowner agreements.
- The Applicant would notify the contractor of the presence of a well approximately 40 feet east of Route Segment 7, or approximately 120 feet southeast of the intersection of Mariposa Ranch and La Quinta Roads. The well would be noted on construction maps and, if necessary, marked in the field during construction.

3.3 Vegetation

This section describes the vegetation in the Route Corridor and vicinity and the potential impacts of the proposed action on those resources.

3.3.1 Affected Environment

Three main types of vegetation communities are found in the Route Corridor: Madrean Evergreen Woodland, Apacherian-Chihuahuan Mesquite Upland Scrub, and Apacherian-Chihuahuan Piedmont Semidesert Grassland and Steppe (Arizona Game and Fish Department [AGFD] 2015). Madrean Evergreen Woodland has 25 to 40 percent shrub or tree land coverage and is dominated by Emory oak (*Quercus emoryi*) and/or other evergreen oaks (*Quercus* species [sp.]). Apacherian-Chihuahuan Mesquite Upland Scrub has 10 to 15 percent shrub or tree land coverage, and Apacherian-Chihuahuan Piedmont Semidesert Grassland and Steppe has less than 10 to 15 percent shrub or tree land coverage (Malusa 2015). Less disturbed land is located in the westernmost section of the Route Corridor, where many of the 230 kV alternatives are located. The 138 kV alternatives and substations are in more developed areas.

A diverse community of trees, shrubs, succulents, forbs, and grasses is found in these vegetation communities. A greater density and diversity of plant species is found along the natural drainages. Common trees, shrubs, and succulents include seed juniper (*Juniperus monocarpa*), alligator juniper (*Juniperus deppeana*), Mexican pinyon (*Pinus cembroides*), mesquite (*Prosopis* sp.), acacia (*Acacia* sp.), desert broom (*Baccharis sarothroides*), beargrass (*Nolina* sp.), ocotillo (*Fouquieria splendens*), agave (*Agave* sp.), yucca (*Yucca* sp.), sotol (*Dasylirion* sp.), prickly pear (*Opuntia* sp.), and various other cacti. Common native grasses include grama (*Bouteloua* sp.), tobosa (*Pleuraphis* sp.), muhly (*Muhlenbergia* sp.), and threeawn (*Aristida* sp.) (Brown 1994). Invasive grasses known to occur in the area include Lehman's lovegrass (*Eragrostis lehmanniana*), Johnson grass (*Sorghum halepense*), buffelgrass (*Pennisetum ciliare*), and Bermudagrass (*Cynodon dactylon*).

The landscape in the western section of the Route Corridor has almost undisturbed natural habitat, with some evidence of grazing and development, as opposed to the eastern section where

development has replaced or affected the habitat and weedy plant species are dominant. Mariposa Wash, a major ephemeral wash, traverses the middle of the Route Corridor in a southwest-to-northeast direction. Vegetation along the wash is also associated with a disturbed landscape, and the dominant vegetation includes desert broom, mesquite, acacia, and various grass species.

The Arizona NPL (Arizona Revised Statutes [ARS] §§ 3-901 et seq.) protects many of Arizona's plants from removal and destruction (Arizona Department of Agriculture 2015). Plants protected by the Arizona NPL that are found in the Route Corridor include cacti, yucca, agave, mesquite, and beargrass. The AGFD online environmental review tool (Project ID: HGIS-02011; accessed on August 18, 2015) also lists the following special status plant species that have been documented within 3 miles of the Route Corridor:

- large-flowered blue star (*Amsonia grandi lora*)
- Santa Cruz beehive cactus (*Coryphantha recurvata*)
- Pima pineapple cactus (*Coryphantha scheerie var robustispina*)
- supine bean (*Macroptilium supinum*)

These special status plant species are regulated at differing levels based on status and/or land ownership. All but the large-flowered blue star are protected by the Arizona NPL. The Pima pineapple cactus is also protected as a federally listed endangered species. The large-flowered blue star is a USFS sensitive species and a U.S. Fish and Wildlife Service (USFWS) species of concern. However, since the proposed action would not be on USFS or other federal land, this species does not trigger any regulatory requirements related to the Project.

Species-specific plant surveys were conducted on November 30 and December 1, 2015, for the Pima pineapple cactus, Santa Cruz beehive cactus, supine bean, and agaves. Agaves were surveyed because of their potential as a forage resource for the lesser long-nosed bat (*eptonycteris curasoae yerbabuenae*), an endangered species. Surveys were performed in those portions of the Route Corridor where ROE was granted, accounting for 74.8 percent of the Route Corridor. Survey of the remaining ROW will be completed as soon after the ACC has selected an approved route and prior to any construction disturbance to determine whether any special status plants species are present and could be affected by the Project.

Fifty-three plants were recorded during the plant surveys: 27 agaves, 25 Santa Cruz beehive cacti, and one potential supine bean. No Pima pineapple cacti were documented. Forty-eight of the documented plants were recorded in the southwestern section of the Route Corridor. The biological field report (Appendix A) can be referenced for a more thorough discussion of biological field surveys. Special status plant species identified within the 250-foot-wide survey corridor are summarized by Route Segment in Table 3-3.

Table 3-3. Special Status Plant Species Results

Route Segment	Number Identified within Route Segment		
	Agave[1]	Supine Bean	Santa Cruz Beehive Cactus
1, 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, and 14	0	0	0
2	5	0	0
11	2	1	0
15	22	0	25

Note: Segments 6, 7, 8, 9, 10, 11, 13, and 14 were partially surveyed. Overall, 74.8% of the Route Corridor has been surveyed.

[1]**Agave is not special status, but was surveyed because it is forage for lesser long-nosed bat, an endangered species.**

3.3.2 Environmental Consequences

Habitat fragmentation occurs when large sections of undeveloped land are divided into smaller sections. The environmental consequences of habitat fragmentation have been well-documented in scientific literature. Habitat fragmentation creates smaller sections of land that result in “edge effects.” Edge effects can create opportunities for introduced, invasive, or opportunistic species to replace other naturally occurring species in an ecosystem.

New permanent access roads as a result of the proposed action could contribute to habitat fragmentation and potentially lead to the creation of illegal trails and paths by off-road vehicles.

Introduced, invasive, or opportunistic species such as desert broom or invasive grasses may become more prevalent in the less-developed parts of the proposed action after construction. However, because much of the proposed action avoids large sections of undeveloped lands by following existing transmission corridors and adjacent roadways, habitat fragmentation will be minimal. Habitat fragmentation may occur in the western portions of the proposed action where Segments 11, 13, and 15 cross undeveloped lands.

3.3.2.1 Temporary Impacts

Temporary loss of vegetation would occur in areas where construction equipment and activities would trample plants. The area temporarily affected by the transmission line ROW would range from 83 to 105 acres. Vegetation removal and ground disturbance, particularly in the western section of the proposed action, may contribute to the introduction or spread of invasive species from contaminated equipment moving within the ROW.

This may also occur as a result of disturbed soils providing more favorable conditions for aggressive invasive plants. Additionally, depending on the final locations of the transmission line structures and permanent and temporary access roads, protected native plants may require removal and relocation. If protected native plants within the ROW would be affected by the proposed action, Arizona Department of Agriculture notification would be required 60 days prior to plant removal.

The substation site has already been graded and contains no vegetation. However, depending on the final layout, the future substation expansion may require additional grading. This would occur immediately adjacent to the site within the existing property boundary.

3.3.2.2 Permanent Impacts

Permanent loss of vegetation as a result of the proposed action would include vegetation removal where transmission line structures and permanent access roads would be placed. The permanent area affected would range from 6.6 to 8.4 acres. The substation site has already been graded and contains no vegetation. However, depending on the final layout, the future substation expansion may require additional grading. This would occur immediately adjacent to the site within the existing property boundary.

3.3.3 Mitigation Measures

The following mitigation measures would be implemented to reduce the effects on vegetation from the proposed action:

- Existing roads and paths would be used to the extent possible to minimize habitat fragmentation.
- Native plants protected by the Arizona NPL would be avoided to the extent possible during construction.
- Protected native plants within the ROW that cannot be avoided by construction activities would be relocated near their original locations to the extent possible.
- Disturbed soils (except permanent access roads and in the stabilized areas of the Gateway Substation) that would not be landscaped or otherwise permanently stabilized by construction would be seeded using species native to the Project vicinity to the extent possible. The AGFD would be consulted on native seed mixes.
- To prevent the introduction of invasive species seeds, the contractor would inspect all earthmoving and hauling equipment at the equipment storage facility; the equipment would be washed prior to entering the construction site.

To prevent invasive species seeds from leaving the site, the contractor would inspect all construction equipment and remove all attached plant/vegetation and soil/mud debris prior to leaving the construction site.

3.4 Water Resources

This section describes the water resources in the Route Corridor and vicinity and the potential impacts of the proposed action on those resources.

3.4.1 Affected Environment

3.4.1.1 Streams

Locations of streams were identified using the USGS National Hydrography Dataset (NHD) and through Geographic Information System (GIS)-based interpretation of aerial photography and topographic contours. Streams in the Route Corridor consist of small, dry, ephemeral drainages and intermittent washes characteristic of the region's semiarid climate and landscape. These drainage features are generally dry for long periods but may flow during high-intensity, short-duration, summer thunderstorms, and during less intense, longer duration, winter storms. Streambeds tend to be very permeable, and substantial water is lost to the subsurface as flow moves downstream.

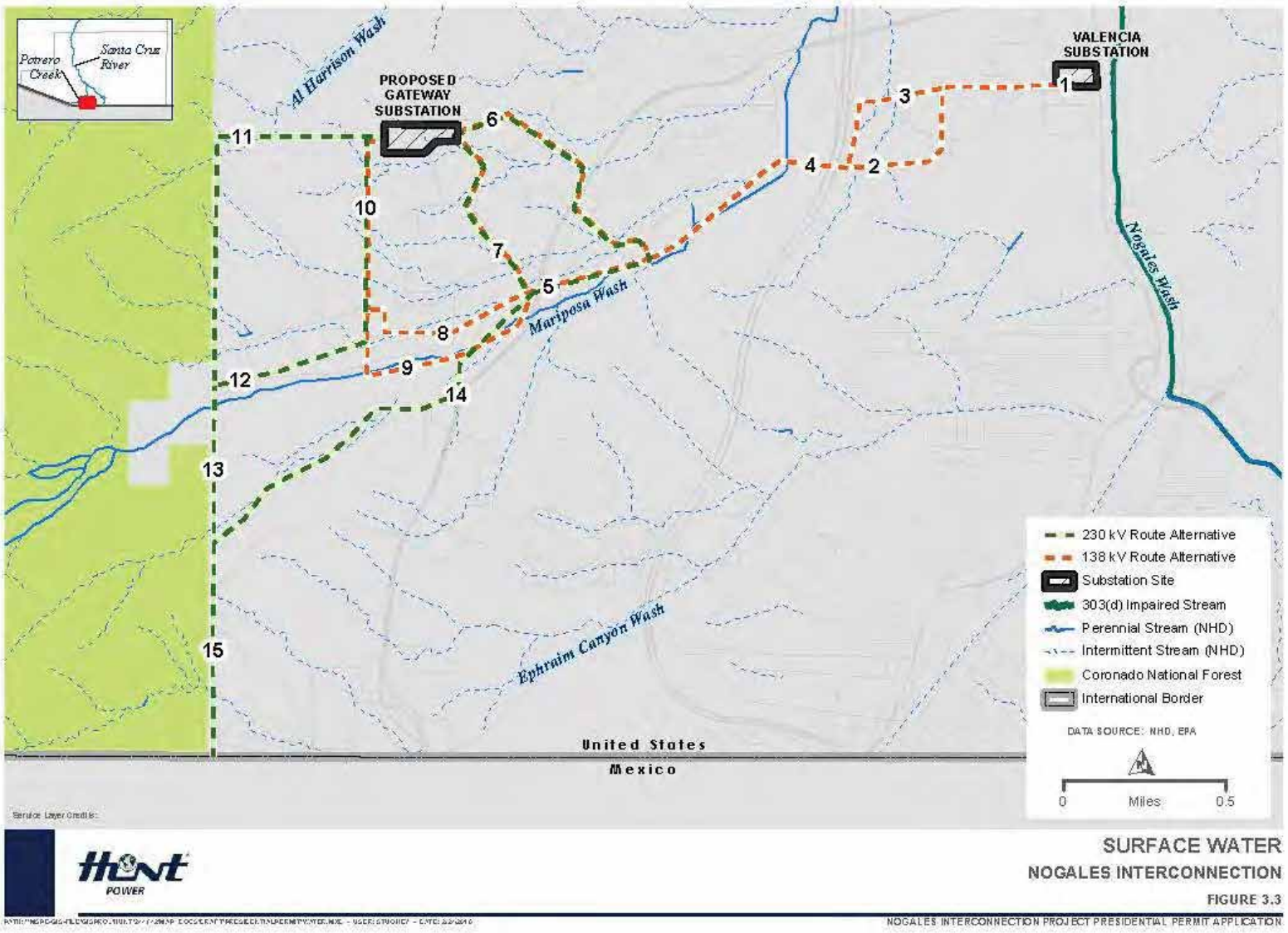
All streams in the Route Corridor are in the Nogales Wash watershed (12th level Hydrologic Unit Code 150503010309) and are tributaries of the Mariposa Wash, Al Harrison Wash, and Ephraim Canyon Wash subwatersheds. Their collective hydrologic contribution to Nogales Wash is expected to be minor at the watershed-level scale; however, periodic high water and sediment deposition events are likely to occur in Mariposa Wash during seasonal rainfall.

Nogales Wash is a Section 303(d) listed impaired waterbody (AZ15050301-011) monitored by ADEQ for ammonia, chlorine, dissolved copper, and *Escherichia coli*. Water quality in the wash is heavily influenced by rain events and subsequent urban runoff from the cities of Sonora, Mexico and Nogales, Arizona.

The streams in the Route Corridor, when flowing, are tributaries of Nogales Wash, a tributary of Potrero Creek, which flows into the Santa Cruz River (Figure 3-3). The U.S. Army Corps of Engineers (USACE) has defined a reach of the Santa Cruz River, starting near Tubac, Arizona and flowing north, as a traditional navigable water (TNW), subject to USACE's jurisdiction under authority of Section 404 of the Clean Water Act of 1972 (CWA; as amended) and Section 10 of the Rivers and Harbors Act of 1899.

This TNW is approximately 22.8 miles away by stream channel from the Route Corridor. Consequently, a USACE determination of jurisdiction would be necessary to evaluate whether a significant nexus exists between the Route Corridor drainages and the TNW or other regulated wetlands in the region. While drainages and wetlands would be avoided by spanning over them, a Nationwide Permit 12 (utility line crossings) would be required if they were determined to have Section 404/Section 10 jurisdiction.

Figure 3-3. Surface Water



3.4.1.2 Wetlands and Floodplains

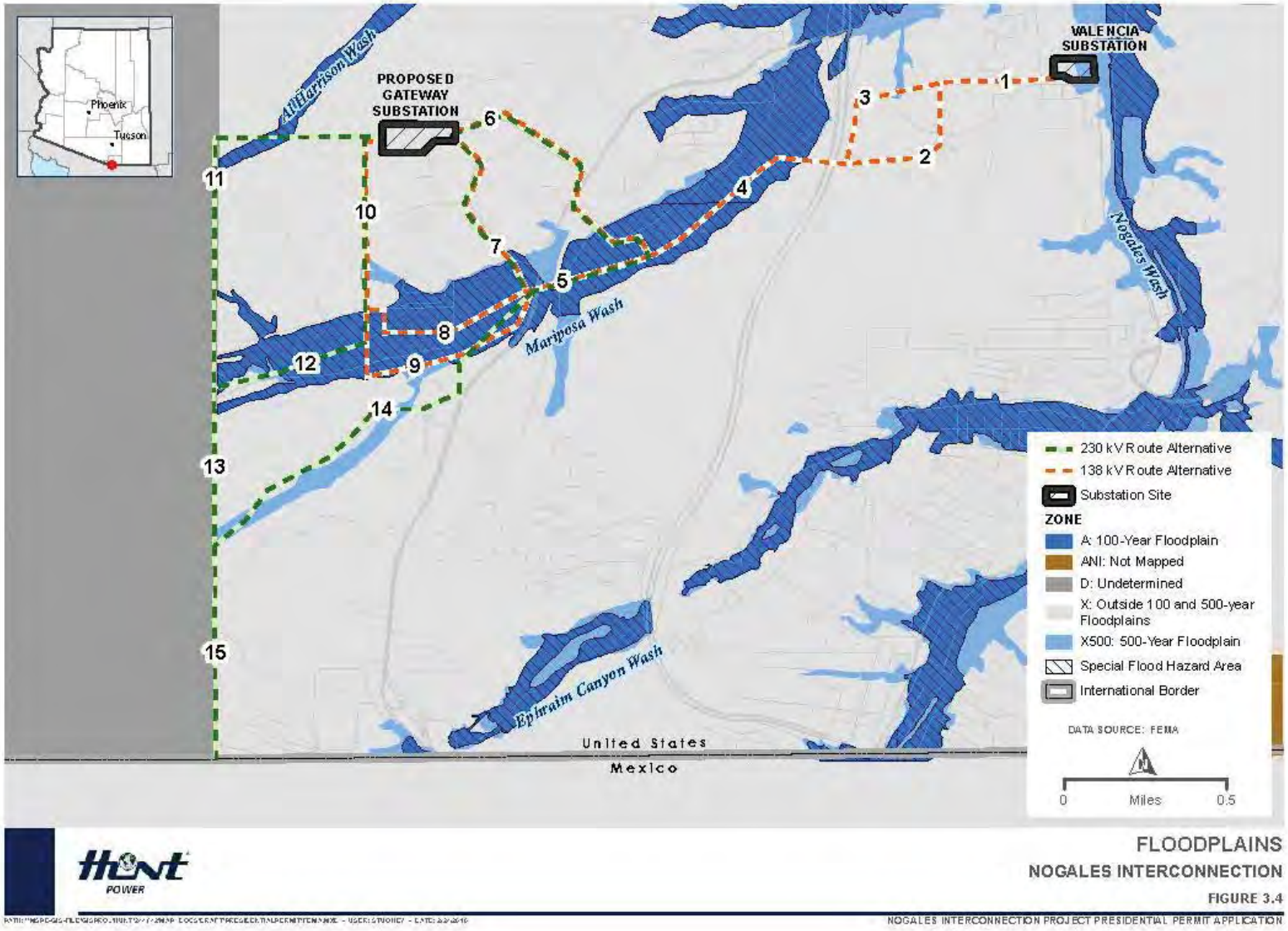
Readily available aerial photographs, natural resource mapping, and existing documentation were reviewed to determine the presence or absence of wetlands in the Route Corridor. No wetlands were identified during the off-site review and no evidence of wetlands based on vegetation, soils, or wetland hydrology was observed by biologists during field surveys.

Flood zones are areas that the Federal Emergency Management Agency (FEMA) has defined according to varying levels of flood risk. Encroachment on flood zones can reduce the normal overflow storage and conveyance area, resulting in backing up floodwaters that can affect adjacent areas by displacing floodwaters into areas not typically subject to flooding. Executive Order (EO) 11988, Floodplain Management, directs federal agencies, and the activities undertaken or authorized by them, to reduce the risk of flood loss and minimize flood impacts on human safety, health, and welfare.

Review of FEMA floodplain maps indicates that there are flood zones associated with the Mariposa and Al Harrison Washes in the Route Corridor (Figure 3-4). Portions of both drainages are considered high-risk areas (Zones “A” and “AE”), which are defined as areas with a 1 percent annual chance of flooding. Moderate- to low-risk areas (Zone “X500”) are also present for Mariposa Wash. Base flood elevations are available for Mariposa Wash; no elevations are published for Al Harrison Wash. Both 100- and 500-year flooding limits for Mariposa Wash overlap the Route Corridor, while only 100-year flood limits for Al Harrison Wash are in the Route Corridor.

In addition to the mapped floodplains, unmapped floodplains associated with smaller ephemeral and intermittent streams may exist in the Route Corridor. These unmapped floodplains are generally small and are immediately adjacent to each stream. Inundation of these floodplains is typically associated with large rainstorms. Because each stream’s drainage basin is small, rainstorms that cause flooding are localized to the immediate area around the streams. Flooding adjacent to these streams would likely be of short duration because of the high permeability of the streambed material.

Figure 3-4. Floodplains



3.4.1.3 Groundwater

The proposed action is entirely within the Upper Santa Cruz and Avra Basin Sole Source Aquifer. Three wells are within the Route Corridor: one is privately owned and the other two are publicly owned (by the City of Nogales and ADOT). Because of the depths of the aquifer and these wells (Table 3-4), no impacts resulting from the proposed action are anticipated.

Table 3-4. Wells in the Route Corridor

Route Segment	Number of Wells	Distance from Route Segment	Description
1	0	Not applicable	Not applicable
2	0	Not applicable	Not applicable
3	0	Not applicable	Not applicable
4	1	Approximately 230 feet from the Route Corridor; 70 feet deep	Exploration (owned by ADOT)
5	1	Approximately 250 feet from the Route Corridor; 500 feet deep	Groundwater
6	0	Not applicable	Not applicable
7	1	Approximately 40 feet from the Route Corridor; 360 feet deep	Groundwater
8	0	Not applicable	Not applicable
9	0	Not applicable	Not applicable
10	1	Approximately 230 feet from the Route Corridor; 600 feet deep	Groundwater
11	1	—	Nonservice
12	0	Not applicable	Not applicable
13	0	Not applicable	Not applicable
14	2	Approximately 235 feet from Route Corridor; no depths reported	Special designation/ cathodic (rust) protection
15	0	Not applicable	Not applicable

3.4.2 Environmental Consequences

3.4.2.1 Streams

emporary mpacts

No Project-related impacts on intermittent or ephemeral streams are expected. The proposed action's design would avoid these resources by siting structures outside of drainages and by spanning the transmission line over washes. Mariposa Wash, a narrow, deeply incised wash, can be easily spanned by the proposed transmission line. Similarly, the ephemeral tributaries of the Mariposa and Al Harrison Washes are also narrow, linear features that would be avoided.

As individual features, none of the ephemeral drainages or their subbasins contributes more than a small, incremental volume of water to Nogales Wash during large rainfalls. As such, the water quality of Nogales Wash is not expected to change as a result of the proposed action. Soil disturbance during construction will temporarily increase erosion potential that could affect streams and drainage features. The Applicant would consult with ADEQ to determine whether a Section 401 State Water Quality Certification is necessary to ensure that the proposed action would not adversely affect Nogales Wash and its water quality improvement plan.

Permanent mpacts

No Project-related permanent impacts on streams are expected.

3.4.2.2 Wetlands and Floodplains

emporary mpacts

Because no wetlands were identified in the Route Corridor, no temporary impacts to wetlands are anticipated.

The proposed action is not anticipated to adversely affect natural and beneficial floodplain values or pose a significant risk. Regulated floodways would be avoided by siting structures outside of high-risk areas and by spanning the transmission line over washes. Impacts or encroachment on moderate- to low-risk areas associated with Mariposa Wash are unavoidable given the extent of flood-prone areas. Erosion potential will temporarily increase during construction of the proposed action, which could affect regulated floodplains.

Permanent mpacts

Because no wetlands were identified in the Route Corridor, no permanent impacts to wetlands are anticipated.

Permanent impacts to floodplains for transmission structure foundations would range from 0 to 85 square feet in Zone X500 floodplains and 198 to 509 square feet in Zone A floodplains. These impacts, while permanent, would not be significant, based on the size of the area that would be affected by the proposed action compared with the area available in the existing floodplains to accommodate flood flows.

3.4.2.3 Groundwater

emporary mpacts

No temporary impacts of any kind are anticipated to the sole source aquifer for the following reasons, described by proposed action feature:

- Access road
    - A two-track dirt road would be constructed parallel to the proposed transmission line to access and maintain the proposed Project. This road would not increase impermeable surfaces in the Route Corridor and would not impair aquifer recharge.
- Transmission line
    - Water supply wells range from 360 to 600 feet deep, and would not be impacted (Table 3-4).
    - The transmission lines would require between five and nine structures per mile. Generally, the impervious surface created by these structures would be up to 6 feet diameter each, resulting in between 650 and 1,498 square feet of total additional impermeable surface for all transmission structures.

Permanent mpacts

No permanent impacts are anticipated from the proposed action.

3.4.3 Mitigation Measures

The following mitigation measures would be implemented to reduce the effects on water resources from the proposed action:

- The proposed action design would avoid streams to the extent possible.
- A SWPPP would be prepared to comply with the APDES 2013 Construction General Permit.
- BMPs, which may include the use of temporary and permanent erosion control measures, would be identified in the SWPPP and would be implemented to minimize erosion and sedimentation.
- Standard spill-prevention measures would be implemented during construction. Spill clean-up equipment (e.g., oil-absorbent pads, dirt-moving equipment, etc.) would be available on-site during construction.
- The proposed action design would comply with the requirements and procedures for development within mapped flood-prone areas of Santa Cruz County and the City of Nogales, Arizona.
- The proposed action design would maintain existing hydrologic connectivity within all drainage features that are crossed.

- ≠ The proposed action would allow federal, state, and local government access to flood-prone areas for inspection, maintenance, flood fighting, major repairs, and data gathering.
- ≠ Gateway Substation
    - o The facility would be designed to minimize the risk and impacts of oil spills, and minimal oil storage would occur on site.
    - o Where equipment is filled with oil, appropriate spill containment will be provided.
    - o The ground level of the substation would be graded to direct the flow of water runoff and/or minimize run-on of stormwater. The yard would be covered with a layer of gravel to reduce stormwater erosion.
    - o Where necessary, stormwater measures, such as retention or detention ponds and/or perimeter ditches, would be designed and constructed to control runoff.

3.5 Wildlife

This section describes the wildlife resources in the Route Corridor and vicinity and the potential impacts of the proposed action on those resources.

3.5.1 Affected Environment

A wide variety of mammals, birds, reptiles, and amphibians are likely to use the Route Corridor throughout the year or during different times of the year. Common mammals likely to use the Route Corridor include white-tailed deer (*Odocoileus virginianus couesi*), black-tailed jackrabbit (*epus cali ornicus*), cottontail rabbit (*Sylvilagus* sp.), javelina (*ayassu ta acu*), coyote (*Canis latrans*), skunk (*Mephitis mephitis*), raccoon (*Procyon lotor*), bobcat (*yn ru us*), gray fox (*rocyon cinereoargenteus*), big brown bat (*Eptesicus uscus*), and fringed myotis (*Myotis thysanodes*). Common birds include mourning dove (*enaida macroura*), white-winged dove (*enaida asiatica*), common raven (*Corvus cora*), turkey vulture (*Cathartes aura*), and Gambel's quail (*Callipepla gambelii*). Common reptiles include the ornate tree lizard (*rosaurus ornatus*), Clark's spiny lizard (*Sceloporus clar ii*), gophersnake (*Pituophis cateni er*), common kingsnake (*ampropeltis getula*), and western diamond-backed rattlesnake (*Crotalus atro*). Amphibians include Couch's spadefoot (*Scaphiopus couchii*), Mexican spadefoot (*Spea multiplicata*), and the lowland leopard frog (*ana yavapaiensis*). White-tailed deer, black-tailed jackrabbit, cottontail rabbit, and numerous species of birds were observed during field surveys.

Wildlife is likely to be found in greater abundance in the western section of the Route Corridor, where the greatest extent of natural habitat is located; however, wildlife would also use vegetated lands found throughout the Route Corridor.

The nearest perennial body of water is Nogales Wash, approximately 600 feet east of the Valencia Substation, and numerous ephemeral washes are in the Route Corridor. A retention basin with standing water was observed during biological field surveys on December 1, 2015. Xeroriparian vegetation along these water sources and ephemeral drainages is likely to attract a wide diversity of wildlife, and the drainages serve as wildlife movement corridors.

There is no designated or proposed critical wildlife habitat within the Study Area. Designated critical habitat for the Mexican spotted owl is adjacent to the Study Area on National Forest lands; however, there will be no impacts on this designated critical habitat or the species as a result of the Project.

3.5.1.1 Endangered, Threatened, and Candidate Species

The Endangered Species Act (ESA) protects species that are in danger of becoming extinct and the habitats they live in. The USFWS Environmental Conservation Online System – Information for Planning and Conservation (ECOS-IPaC) system was used to investigate endangered, threatened, and candidate species that may be found in the Route Corridor (Project Code: XJACG-X2GJB-FF7CN-JFOU3-JCWZH4; accessed on August 18, 2015). The results are in Table 3-5. The AGFD online environmental review tool (Project ID: HGIS-02011; accessed on August 18, 2015) was also used to investigate documented endangered, threatened, and candidate species within 3 miles of the Project vicinity as well as other special status species.

Table 3-5 lists endangered, threatened, candidate, and species of concern and their likelihood of occurrence in the Route Corridor.

Table 3-5. Special Status Species Identified by the ECOS-IPaC System & AGFD Online Environmental Review Tool

Common Name Scientific Name	Federal Status	Habitat	Likelihood of Occurrence in Route Corridor
Mammals			
Jaguar *Panthera onca*	Endangered	Found in Sonoran desertscrub up through subalpine conifer forest Elevation: 1,600–9,000 feet (USFWS 2015)	Not likely to occur; this species may pass through the Route Corridor but would avoid the area if developed
Lesser long-nosed bat (LLNB) *Leptonycteris curasoae yerbabuenae*	Endangered	Desert scrub habitat with agave and columnar cacti present as food plants Elevation: 1,600–7,500 feet (USFWS 2015)	May occur; this species may pass through the Route Corridor during migration in the fall and spring; it feeds on pollen of columnar cacti and agaves when they are in bloom
Mexican gray wolf *Canis lupus baileyi*	Endangered, experimental nonessential population	Chaparral, woodland, and forested areas; may cross desert areas Elevation: 4,000–12,000 feet (USFWS 2015)	Not likely to occur; Project is in 10(j)[a] area; this species could pass through the Route Corridor but would likely avoid the area if developed
Ocelot *Leopardus pardalis*	Endangered	Variable, including thorn scrub, semiarid woodland, tropical deciduous and semideciduous forest, subtropical forest, lowland rainforest, palm savanna, and seasonally flooded savanna woodland; in Arizona, most recent (since 2009) detections have occurred in Madrean evergreen woodland Elevation: generally <4,000 feet (AGFD 2010; USFWS 2015)	Not likely to occur; this species may pass through the Route Corridor, but would likely avoid the area if developed
Sonoran pronghorn *Antilocarpa americana*	Endangered, experimental nonessential population	Broad intermountain alluvial valleys with creosote-bursage and palo verde-mixed cacti associations Elevation: 400–1,600 feet	Not likely to occur; Project is in 10(j)[a] area; no suitable habitat within the Route Corridor

Common Name Scientific Name	Federal Status	Habitat	Likelihood of Occurrence in Route Corridor
sonoriensis		(AGFD 2002a)	
Birds			
Gray hawk *uteo pla iatus*	Species of Concern	Riparian woodlands with large trees (cottonwoods), usually near mesquite forests Elevation: not listed (AGFD 2013a)	Not likely to occur; no suitable habitat within the Route Corridor
Mexican spotted owl *tri occidentalis lucida*	Threatened	Nests in canyons and dense forests with multilayered foliage structure Elevation: 4,100–9,000 feet (USFWS 2015)	Not likely to occur; designated critical habitat is adjacent to the Route Corridor on National Forest lands; no suitable habitat within the Route Corridor
Southwestern willow flycatcher *mpidona traillii e timus*	Endangered	Cottonwood/willow and tamarisk vegetation communities along rivers and streams Elevation: <8,500 feet (USFWS 2015)	Not likely to occur; no suitable habitat within the Route Corridor
Sprague's pipet *Anthus spra ueii*	Candidate	Strong preference for native grasslands with vegetation of intermediate height and lacking woody shrubs Elevation: <5,000 feet (USFWS 2015)	Not likely to occur; no suitable habitat within the Route Corridor
Yellow-billed cuckoo *Coccy us americanus*	Threatened	Large blocks of riparian woodlands (cottonwood, willow, or tamarisk galleries) Elevation: <6,500 feet (USFWS 2015)	Not likely to occur; no suitable habitat within the Route Corridor
Reptiles			
Giant spotted whiptail *Aspidoscelis sticto ramma*	Species of Concern	Riparian habitat dominated by sycamore, cottonwood, ash, and various grasses and forbs Elevation: sea level–4,500 feet (AGFD 2013b)	Not likely to occur; no suitable habitat within the Route Corridor
Northern Mexican gartersnake *hamnophis e ues me alops*	Threatened	Cienegas, livestock tanks, large-river riparian woodlands and forests, streamside gallery forests Elevation: 3,000–5,000 feet (AGFD 2012; USFWS 2015)	Not likely to occur; no suitable habitat within the Route Corridor
Amphibians			
Arizona treefrog *yla ri htorum*	Candidate	Habitat with water within Madrean oak woodlands, savannah, pine-oak woodlands, and mixed conifer forests Elevation: 5,000–8,500 feet (USFWS 2015)	Not likely to occur; no suitable aquatic habitat within the Route Corridor
Chiricahua leopard frog *ana chiricahuensis*	Threatened	Restricted to springs, livestock tanks, and streams in upper portion of watersheds that are free from non-native predators or where marginal habitat for non-native predators exists Elevation: 3,281–8,890 feet (USFWS 2015)	Not likely to occur; no suitable aquatic habitat within the Route Corridor
Fish			
Desert sucker *Catostomus clar ii*	Species of Concern	Rapids and flowing pools of streams and rivers; adults live in stream and river pools Elevation: 480–8,840 feet (AGFD 2002b)	Not likely to occur; no suitable aquatic habitat within the Route Corridor

Common Name Scientific Name	Federal Status	Habitat	Likelihood of Occurrence in Route Corridor
Gila longfin dace *A osia chryso aster chryso aster*	Species of Concern	Wide ranging from intermittent hot low-desert streams to clear and cool brooks at higher elevations; usually occupy relatively small streams Elevation: <4,900 feet (AGFD 1997)	Not likely to occur; no suitable aquatic habitat within the Route Corridor
Gila topminnow *Poeciliopsis occidentalis*	Endangered	Small streams, springs, and cienegas; vegetated shallows Elevation: <4,500 feet (USFWS 2015)	Not likely to occur; no suitable aquatic habitat within the Route Corridor
Snails			
Huachuca springsnail *Pyr ulopsis thompsoni*	Candidate	Aquatic areas, small springs with vegetation and slow to moderate flow Elevation: 4,500–7,200 feet (USFWS 2015)	Not likely to occur; no suitable aquatic habitat within the Route Corridor
Insects			
Stephan's riffle beetle *eterelmis stephani*	Candidate	Free-flowing springs and seeps, commonly referred to as rheocrenes Elevation: 5,100–6,600 feet (USFWS 2015)	Not likely to occur; no suitable aquatic habitat within the Route Corridor

[a] A 10(j) area is an area where experimental populations of endangered or threatened species are introduced into the wild in a location that is geographically isolated from nonintroduced populations (National Marine Fisheries Service 2015).

The lesser long-nosed bat (LLNB), an endangered species, is anticipated to occur in the Route Corridor. The LLNB occurs seasonally in Arizona from April to September in desert scrub and grassland/oak transition habitat where it feeds on nectar and pollen from the flowers of columnar cacti and agave (AGFD 2011). Because the LLNB feeds on the nectar of agave plants, the Project has the potential to affect the bat's forage species. The habitat found in the western section of the Route Corridor is suitable for LLNB and may be a resource for this species.

3.5.2 Environmental Consequences

3.5.2.1 Temporary Impacts

All migratory birds are protected by the Migratory Bird Treaty Act (MBTA). This includes all common songbirds, waterfowl, shorebirds, hawks, owls, eagles, ravens, crows, native doves, swifts, martins, swallows, and others (Federal Highway Administration 2001). The migratory bird breeding season for most birds in southern Arizona is from February through August. If construction on this Project would occur during the migratory bird breeding season, breeding birds may be affected by construction activities. This would be limited to direct impacts to birds nesting in the proposed action ROW or on temporary access roads. In addition, construction activity and noise may temporarily disturb or displace animals that live in and use the habitat in the ROW.

3.5.2.2 Permanent Impacts

General impacts on wildlife as a result of the proposed action would include the permanent reduction of cover, nesting areas, and food resources caused by habitat loss, fragmentation, and human disturbance. These impacts would be minimal as a result of the placement of transmission structures and would primarily occur as a result of the construction of access roads and ROW clearing. Long-term impacts may also include transmission line collisions by flying birds and bird electrocutions.

The proposed action may affect the LLNB; however, given the small number of agaves that would be affected by the proposed action and the number of available agaves in the surrounding habitat, this effect is not likely to be adverse. The number of agaves that would be affected by the proposed action, and that are likely to flower in any season, is small. If agaves cannot be avoided by the proposed action, the USFWS will need to be consulted to gain their concurrence with this determination.

3.5.3 Mitigation Measures

The following mitigation measures would be implemented to reduce the effects on wildlife from the proposed action:

- ≠ To reduce the risk of electrocution to birds, industry standards to prevent electrocution would be implemented, if warranted.
- ≠ If vegetation removal occurs during the bird breeding season (February 1 to August 31), a qualified biologist would survey the area prior to vegetation removal. If active nests are found, those nests would be avoided until the young leave the nest.

3.6 Cultural Resources

This section describes the cultural resources in the Route Corridor and vicinity and the potential impacts of the proposed action on those resources.

Because the Project requires a Presidential Permit, it is an undertaking that must comply with Section 106 of the National Historic Preservation Act (NHPA), as amended (54 USC §§ 300101 et seq.), and its implementing regulations (36 Code of Federal Regulations [CFR] Part 800).

Section 106 requires federal agencies to take into account the effects of their undertakings on historic properties and to afford the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment. Historic properties are prehistoric, historic, and traditional cultural resources listed or eligible for listing in the National Register of Historic Places (National Register).

The NHPA and its implementing regulations provide the process and guidelines for historic property evaluations. To be determined eligible for inclusion in the National Register, properties must be important in American history, architecture, archaeology, engineering, or culture. They also must possess integrity of location, design, setting, materials, workmanship, feeling, and association and meet at least one of the following four criteria:

Criterion A: are associated with events that have made a significant contribution to the broad patterns of our history

Criterion B: are associated with the lives of persons significant in our past

Criterion C: embody the distinctive characteristics of a type, period, or method of construction; or represent the work of a master; or possess high artistic values; or represent a significant distinguishable entity whose components may lack individual distinction

Criterion D: have yielded, or may be likely to yield, information important in prehistory or history

Properties can be of local, state, or national importance. Typically, historic properties are at least 50 years old, but younger properties can be considered for listing if they are of exceptional importance.

Traditional cultural properties (TCPs) are a special type of property that can be human-modified locations on the landscape or naturally-occurring phenomena that are ascribed spiritual or traditional cultural importance. Because TCPs sometimes retain sacred and sensitive qualities to living communities, they may not be discussed or detailed to individuals outside those communities or made available to the public. The nature and significance of many of these properties may need to be kept confidential. Consultation with Native American tribes and other traditional communities will help to identify any TCPs in the Route Corridor.

3.6.1 Affected Environment

3.6.1.1 Records Review

Prior to conducting fieldwork, archival records were reviewed for information on past projects and known cultural resources in the area. Site and project records were requested from AZSITE, Arizona's statewide cultural resources database housed at the Arizona State Museum (ASM), and from the Coronado National Forest.

In addition, historic maps such as General Land Office plats and aerial photographs were examined to identify historical period land uses of the area. The purpose of the records review was to determine which, if any, portions of the Route Corridor had been previously investigated for cultural resources, to identify documented sites within and near the Route Corridor, and to generate expectations about the types and frequencies of cultural resources that might be encountered during field survey. The records check covered a 0.5-mile area around the alternative corridors.

A few research projects conducted in the 1940s and 1950s provided initial insights on prehistoric and protohistoric settlement in the Nogales area. This research included surveys performed by the University of Arizona within the Santa Cruz River valley, from the headwaters east of Nogales north toward Tucson (Danson 1946; Frick 1954), and work by the Amerind Foundation (DiPeso 1953) at the Palo Parado Site (San Cayetano), approximately 20 miles north of Nogales. Most work in the area, however, has been driven by cultural resource compliance projects.

The records check indicated the ADOT ROWs within the Route Corridor had been adequately surveyed for cultural resources; therefore, no new survey within the ADOT ROW was required for the Project. For the most part, land adjacent to the ADOT ROWs within the Route Corridor had not been investigated for cultural resources.

The records check revealed that 28 archaeological surveys have taken place and 10 sites have been recorded within 0.5 mile of the Project alignments. A map showing site locations is provided in Appendix B. A number of linear surveys intersected the Project alignments west of I-19; however, most of the Route Corridor had not been previously investigated (Carpenter 1995; Lascaux 1998; Lindemuth et al. 2010; Petersen 2008). The portion of the Route Corridor east of I-19 had been covered almost in its entirety by a survey performed for a private development project (Stephen 2001). The previously recorded sites include five prehistoric artifact scatters, rock piles, a circa 1916 National Guard encampment, a historic period residence, and a railroad.

The review of previous research projects suggested prehistoric and historic archaeological sites would be encountered during the survey. Three of the previously recorded sites are within the alignment corridors.

In 2001, URS Corporation (URS) surveyed 63 acres for the proposed Gateway Substation and documented two prehistoric sites: AZ EE:9:223(ASM) and AZ EE:9:224(ASM) (Bauer and Rogge 2001). Site AZ EE:9:223(ASM) was a prehistoric artifact scatter. The site's surface assemblage totaled 41 artifacts, which included nine cores and tested cobbles, five expedient scrapers or possibly utilized flakes, and debitage representing various stages of reduction. URS noted that the site was situated on shallow bedrock and concluded there was little potential for buried cultural deposits. Therefore, URS recommended the site as not eligible for listing on the National Register because of limited information potential. The proposed Gateway Substation platform was subsequently graded and the site is no longer evident.

Site AZ EE:9:224(ASM) is a prehistoric artifact scatter located east of the graded platform of the proposed Gateway Substation and remains intact. URS documented 40 artifacts at the site, which included five cores and tested cobbles, one or two utilized flakes, and debitage representing various stages of reduction. Because the site is situated on shallow bedrock, URS noted that there is little to no potential for buried deposits. Therefore, URS recommended the site as not eligible for listing on the National Register.

In 2001, Professional Archaeological Services and Technologies (PAST) surveyed a 130-acre parcel on the eastern side of I-19 for a private development project (Stephen 2001). The survey covered most of the alignment corridors between I-19 and the Valencia Substation.

PAST recorded one site adjacent to the proposed alignment, AZ EE:9:225(ASM). The site consists of five rock piles, each approximately 1.5 meters in diameter. One chipped stone flake was noted nearby, but lacked a clear association. PAST recommended the site as not eligible for listing in the National Register because of its limited data potential and questionable temporal origins.

Because of the age of most of the prior surveys, and for consistency, the alignment corridors were surveyed in full regardless of prior coverage. The one exception was the ADOT I-19 and SR 189 ROW, which had adequate coverage (Brodbeck and Marsich 2015; Bruder 1992; Grebinger 1971; Lite 1996; Lite et al. 1996; Roth 1992; Stephen 2005; Stone 1995; Walsh 2006,

2008). No sites were identified in the ADOT ROW within the transmission line alignment corridors during the surveys.

3.6.1.2 Field Survey

Following the records review, a pedestrian survey was performed to identify cultural resources within the Project alternatives. The survey covered 206.7 acres of private land. The remaining 69.6 acres in Route Segments 10, 11, 13 and 14 were not surveyed because ROE had not been obtained from landowners. The I-19 and SR 189 ROWs were not surveyed because current data were available from ADOT. Unsurveyed areas, other than the ADOT ROW, will be surveyed by qualified archaeologists after a route is approved by the ACC and prior to construction disturbance to determine whether historical properties are present that could be affected by the Project.

The survey documented two previously recorded sites, AZ EE:9:224(ASM) and AZ EE:9:225(ASM) (see Section 3.6.1.1). No new archaeological sites were identified. Furthermore, no historical built environment resources, such as historic buildings, structures, or districts, were identified.

AZ EE:9:224(ASM) is a prehistoric artifact scatter situated on the toe slope of a ridge just above an east-west trending drainage. The site is on rocky terrain with little to no potential for subsurface remains. The surface assemblage includes approximately 40 artifacts within an 80 by 45 meter area. Artifact types include cores, tested cobbles, utilized flakes, and debitage representing various stages of reduction. No diagnostic artifacts were observed. Given the low number of artifacts and absence of buried cultural deposits, the site is unlikely to yield important information, and no unique aspects of the site warrant preservation. The site was, therefore, determined not eligible for listing on the National Register because of its lack of information potential.

AZ EE:9:225(ASM) is a set of rock piles situated on a gently sloping, south-facing ridge line. At the time of the survey, the site was covered by a thick stand of Russian thistle, which made observations difficult. The site consists of five rock piles within an approximately 20 by 15 meter area. All five rock piles were approximately 1.5 meters in diameter and were composed primarily of rocks averaging about 10 to15 centimeters in size.

A single, tertiary, limestone flake was the only artifact found at the site. The age of the rock piles is unclear. The site was determined not eligible for listing on the National Register because of its limited data potential.

3.6.2 Environmental Consequences

3.6.2.1 Temporary Impacts

Based on the work to date, no known historic properties would be directly or indirectly affected by the proposed action. However, the survey is incomplete because ROE to some of the private land was not granted by the landowners. Unsurveyed portions of the proposed action's footprint, other than the ADOT ROW, will be surveyed by qualified archaeologists prior to construction disturbance to determine whether historical properties are present that could be affected by the proposed action.

Native American tribes were invited to participate in a pre-application meeting and provide comment on the proposed action. The DOE will conduct formal government to government consultation during their Environmental Assessment (EA) process (Section 106).

3.6.2.2 Permanent Impacts

As stated above, no known historic properties would be directly or indirectly affected by the proposed action. However, the survey is incomplete because ROE to some of the private land was not granted by the landowners.

3.6.3 Mitigation Measures

Currently, no historic properties have been identified that would be affected by the proposed action; therefore, no mitigation measures would be required. However, portions of the proposed action could not be surveyed because private landowners have not given ROE permission. The unsurveyed portions of the ROW, other than the ADOT ROW, will be surveyed by qualified archaeologists as soon after the ACC has selected an approved route and prior to any construction disturbance to determine whether historical properties are present that could be affected by the proposed action. Mitigation measures will be developed to address any additional affected significant historic properties discovered by the survey.

3.7 Visual Quality

This section describes the visual quality of the Route Corridor. A desktop study was conducted to establish and describe the landscape character. A combination of Google Earth review and GIS data research was used to identify vegetation, landforms, and land use to gain an understanding of the current Route Corridor landscape.

3.7.1 Affected Environment

3.7.1.1 Landscape

The Route Corridor topography is rolling terrain, heavily creased with ridges and washes, the largest being Mariposa Wash. The topography of the corridor ranges from 3,765 to 4,239 feet amsl. To the east and west, there are background mountain views of the Huachuca and Patagonia Mountains and Tumacacori Mountains, respectively. The biotic community is Semidesert Grassland and Madrean Evergreen Woodland, where the dominant native plants are mesquite trees (*Prosopis elutina*), desert broom (*accharis sarothroides*), and grasses.

3.7.1.2 Human Settlement

The Route Corridor traverses areas of developed and undeveloped land. For the approximate middle third of the corridor length, the corridor traverses industrial development, where most of the buildings are large, corrugated metal structures. On the southern side of this area is Mariposa Wash, a sparsely vegetated ephemeral wash.

The eastern third of the corridor traverses undeveloped land behind retail areas that line SR 189 for approximately two-thirds of a mile. The western third of the corridor traverses mostly undeveloped land, west and south to the Mexican border.

Beginning approximately 0.5 mile south of the portion of corridor between the Valencia and Gateway Substations are residential neighborhoods. The dense, downtown portion of the City of Nogales is approximately 1.5 miles southeast of the proposed corridor.

The existing Valencia Substation on the eastern end of the corridor is next to I-19 in an area of office and industrial buildings. On the western side of I-19, adjacent to the substation, are large power lines. The Mexico-to-Tucson segment of the Union Pacific Railroad parallels the eastern side of I-19. The proposed Gateway Substation location is an existing graded site used for storing construction materials, behind industrial parcels. A large parcel of land south and west of the substation has been heavily disturbed by mining operations.

3.7.1.3 Transportation

The Route Corridor, for the most part, does not parallel transportation corridors. It crosses both I-19 and SR 189 and two smaller local roads. Existing small power lines occur along these highways and local roads.

3.7.1.4 Recreation Areas

The Pajarito Wilderness area is the closest designated recreation area and is more than 10 miles west of the Route Corridor, inside the Coronado National Forest. No designated trails are in or near the Route Corridor.

Route Segments 11, 13, and 15 follow the border of the Coronado National Forest. Dirt roads and trails enter and exit the forest at this boundary, under the proposed power line alignment.

3.7.1.5 Historical Structures

No historical structures are within a viewable distance of the proposed action. However, the survey is incomplete because ROE to some of the private land was not granted by the landowners. The unsurveyed portions of the proposed action, other than the ADOT ROW, will be surveyed as soon after the ACC has selected an approved route and prior to any construction disturbance to determine whether historical structures are present that could be affected by the proposed action.

3.7.2 Environmental Consequences

The proposed action would extend for approximately 5 miles through undeveloped desert west of Nogales and adjacent to developed parcels in northern Nogales. The structures would be 75 and 110 feet tall between the Valencia and Gateway Substations, a distance of approximately 3 miles, and spaced 600 to 1,000 feet apart. From the Gateway Substation to the Mexican border, a distance of approximately 2 miles, the structures would be up to 115 feet tall and spaced 600 to 1,000 feet apart. Route Segments 11, 13, and 15 parallel the border of the Coronado National Forest, making them the most sensitive from a visual perspective when viewed from roads and trails heading west into the forest.

3.7.2.1 Landscape

Visual impacts and overall changes in aesthetics would vary depending on the terrain, vegetative cover, viewer's distance from the proposed action, and viewer's sensitivity. Because of the rolling terrain, as a viewer gets farther from the proposed action, visibility may be limited by changes in topography and natural or human-made objects.

3.7.2.2 Human Settlement

The visual impacts would vary greatly depending on the distance between the viewer and the proposed action, as well as the intervening terrain between the viewer and the proposed action. For viewers in industrial and retail areas, the power lines would be an additional vertical element in the landscape. Workers and clientele that patronize these retail areas would typically make frequent but short buying trips during business hours. They generally have low to moderate sensitivity to change. Residents would be the most sensitive viewers because they would spend the most time within view of Project elements. A multifamily residential development is approximately 100 feet north of Segment 1 of the Route Corridor, which coincides with an existing utility line. Additional residential neighborhoods can be found approximately 0.5 mile south of the corridor. Views of the proposed action from these residences would be interrupted by the rolling terrain.

3.7.2.3 Transportation

For viewers on the highways and local roads near the proposed action, the power lines would be an additional vertical element in the landscape. Motorists and truck drivers would largely travel perpendicular to the proposed action and their exposure would be regular and short-term. These viewers generally have low sensitivity to change.

3.7.2.4 Recreation Areas

Viewers in the Pajarito Wilderness area would not likely experience visual impact from the proposed action given the distance between the recreation area and the proposed action, as well as intervening vegetation and terrain.

People driving or walking into or out of the eastern border of the Coronado National Forest would have their views interrupted by the power lines. When facing east, the power lines would have the city and I-19 in the background and thus would appear as an additional urban element. Facing west, into the forest, the view of the power lines would be against undeveloped desert and would be an urban intrusion into the landscape.

3.7.2.5 Historical Structures

Because no historical structures are near the proposed action, visual impacts on historical structures are not expected; however, a final determination will be made prior to construction when ROE is gained to unsurveyed areas.

3.7.3 Mitigation Measures

Transmission lines and associated structures are normally experienced as negatively affecting landscape aesthetics. They often introduce an industrial aspect to the landscape. They are large and often highly visible structures (given their length and height) and can potentially affect many viewer groups.

The following mitigation measures would be implemented to reduce the effects on visual quality from the proposed action:

- Temporary access roads and staging areas would be revegetated following construction.
- Construction waste would be removed on a regular schedule to minimize short-term visual impacts.
- The Applicant would work with the Coronado National Forest to site poles in the least intrusive locations possible.
- Transmission lines would parallel existing ROWs, to the extent practicable.
- Towers and structures would have a nonreflective finish.
- Structures would utilize self weathering material to blend with or complement the surrounding landscape.

3.8 Socioeconomics and Environmental Justice

This section discusses the socioeconomics within the Route Corridor and identifies the potential effects the proposed action may have on the existing socioeconomic environment. Data from the U.S. Census Bureau's American Community Survey were used to determine existing socioeconomic conditions in the Route Corridor.

3.8.1 Affected Environment

The total population in the Route Corridor is 8,742, which accounts for approximately 42 percent of the total population in Nogales. The Route Corridor population is predominantly white (74.9 percent), with 94 percent of the total population Hispanic or Latino. Approximately 32 percent of all individuals in the Route Corridor are below the poverty level, slightly lower than the rate of 35 percent in Nogales. Residents in the two census tracts that occur in the Study Area have median household incomes of $34,297 and $26,216, which is consistent with the Nogales median household income of $26,333.

The largest share of the labor force, both in the Route Corridor and in Nogales, works in sales and office occupations. The top industry in the Route Corridor is retail trade (19.4 percent of total employment) followed by education services, health care, and social assistance (14.9 percent) and arts, entertainment, recreation, and accommodation (13 percent). According to recent data from the Bureau of Labor Statistics, the unemployment rate in Nogales is 10.6 percent (June 2015).

3.8.2 Environmental Consequences

The proposed action is not expected to negatively affect socioeconomic conditions in the Route Corridor. While Route Segment 1 would run adjacent to one multifamily residential development, no residences would be displaced.

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, requires that federal agencies consider and address disproportionately high and adverse environmental effects of proposed federal projects on the health and environment of minority and low-income populations to the greatest extent practicable by law. The proposed action is not anticipated to adversely impact any environmental justice populations.

3.8.2.1 Temporary Impacts

Construction of the proposed action would create approximately 200 human-months of labor over a 12- to 14-month duration based on a 60-hour work week. If local contractors are used for portions of the construction, total wages and salaries paid to contractors and workers would contribute to the total personal income of the region.

3.8.2.2 Permanent Impacts

The proposed action is anticipated to provide an additional source of electricity to Nogales.

Additional income would be generated by the circulation of dollars paid out by the Applicant as business expenditures and state and local taxes. The economy would also benefit from property taxes on the transmission line and associated facilities paid by the Applicant.

3.8.3 Mitigation Measures

No negative impacts on socioeconomic conditions are anticipated. Therefore, no mitigation measures are required.

3.9 Noise

This section describes noise sources in the Route Corridor and vicinity and the potential noise impacts of the proposed action.

3.9.1 Affected Environment

The State of Arizona does not regulate environmental noise from stationary sources such as substations and transmission lines. The City of Nogales, Arizona regulates environmental noise through its noise ordinance (Nogales Code of Ordinances, Chapter 12, Article 3 Noise, Sections 12-56 to 12-63). The ordinance identifies maximum allowable noise levels (L_{max}) at the property line of the noise receiver.

The ordinance contains different L_{max} limits for daytime and nighttime, and also for different receiving land uses. The ordinance states that it is primarily (but not exclusively) intended to be applied to vehicles and stereos in vehicles. It also states that noise sources regulated by other state or federal regulatory programs are exempt from the ordinance.

The Applicant assumes that the Nogales noise ordinance is applicable to the substation. Table 3-6 identifies the maximum allowable noise levels at receiving land uses (Section 12-59, Nogales noise ordinance).

Table 3-6. Maximum Allowable Noise Levels for Continuous Noise Sources

Property Type	6 a.m. to 10 p.m. (dBA)[a]	10 p.m. to 6 a.m. (dBA)
Hospital	60	50
Residential	65	55
Commercial	70	60
Industrial	85	70

Notes: dBA = A-weighted decibels
[a] Noise level in decibels on A-weighted scale, "slow" setting, L_{max} reading.

The Gateway substation site and the surrounding land are zoned light industrial. The nearest residential land use is a mobile trailer park, located approximately 2,700 feet east of the Gateway substation property line. Maximum allowable Project-related noise at that distance (and location) is 65 A-weighted decibels (dBA) and 55 dBA during daytime and nighttime, respectively (Table 3-6). The nearest industrial property line is located approximately 330 feet south of the Gateway substation. Maximum allowable Project-related noise at that distance (and location) is 85 dBA and 70 dBA during daytime and nighttime, respectively (Table 3-6).

3.9.2 Environmental Consequences

3.9.2.1 Temporary Impacts

Temporary impacts would primarily consist of noise from activities related to the construction of the proposed action.

3.9.2.2 Permanent Impacts

Project-related noise sources would include the transmission lines (corona noise) and stationary sources at the substation (primarily the transformers). Corona noise can occur during very high humidity conditions and is sometimes audible as a crackling or sizzling sound. These conditions are expected to occur rarely given the geographic location of the proposed action in a dry, desert-like climate.

The primary noise sources at the proposed Gateway substation are: converter transformers, air-cooled liquid cooling towers that include fans, and valve enclosures that house water-cooled thyristors. Transformer noise is expected to occur continuously while the transformers are in use.

3.9.3 Mitigation Measures

The following mitigation measures would be implemented to reduce the effects of noise from the proposed action:

- the substation equipment would be designed so that the maximum noise level would be 75 dBA at three meters (approximately 10 feet) away from individual pieces of equipment and 65 dBA at the fence line.
- this design goal would result in compliance with the maximum allowable noise limits in the Nogales noise ordinance.

3.10 Electric and Magnetic Fields

This section describes electric and magnetic fields (EMF) and stray voltage, which are phenomena associated with electrical energy sources. It also describes how these phenomena are related to human health.

3.10.1 Affected Environment

EMF is produced by power lines, and these fields would induce voltages and currents on nearby conductive objects. Electric fields are produced whenever a conductor is connected to a source of electrical voltage such as plugging a lamp into a wall outlet in a home. When the lamp is plugged in, a voltage is induced in the cord to the lamp, which creates an electric field around the cord. Magnetic fields are produced whenever an electrical current flows in a conductor. In the lamp example, if the lamp is turned on, allowing electricity to flow to the lamp, a magnetic field is created around the lamp cord in addition to the electric field. These fields exist around overhead and underground power lines, house wiring, computers, power tools, appliances, and anything that carries or uses electricity. Table 3-7 demonstrates examples of EMF levels from various electrical sources.

Table 3-7. EMF Strength of Various Electrical Sources at Various Distances

EMF Source[a]	Distance (feet)	Strength (mG)	Distance (feet)	Strength (mG)	Distance (feet)	Strength (mG)
Microwave oven	0.5	200	1.0	4	4.0	2
Vacuum cleaner	0.5	300	1.0	60	4.0	1
Hair dryer	0.5	300	1.0	1	4.0	0
Electric shaver	0.5	100	1.0	20	4.0	0
138 kV transmission line, vertical[b]	0	40	50	11	300	0.4
230 kV transmission line, vertical[b]	0	57.5	50	19.5	300	0.8

Notes: EMF = electric and magnetic field, kV = kilovolt, mG = milliGauss
[a] Appliance magnetic field strengths are median values in mG for typical 60 hertz electrical current (National Institute of Environmental Health Sciences 1999)
[b] 138 kV and 230 kV power line ROW is up to 150 feet wide; 0-foot values represent a location directly below the lines at the lowest point of sag.

Both current and voltage are required to transmit electrical energy over a transmission line. The current (a flow of electrical charge measured in amperes) creates a magnetic field. This can fluctuate with the amount of line loading at any given time.

The voltage (force or pressure that causes the current to flow measured in units of volts or thousand volts) creates an electric field. Though an electric field is present anytime a line is energized, even from one end, the magnetic field exists only when electricity flows. It is general practice to consider both fields together as EMF values when assessing the amount of effect at the outer edge of a transmission line's ROW. EMF decreases in strength with increased distance from the source. In addition, electric fields are further weakened by obstacles such as walls, roofs, trees, and vegetation.

However, magnetic fields are not easily shielded by most materials and are primarily reduced in strength by distance alone. The EMF values associated with this Project are expected to be comparable to other 138 or 230 kV transmission lines in the state and are expected to be within generally accepted standards at the edge of the proposed ROW.

3.10.2 Environmental Consequences

3.10.2.1 Temporary Impacts

No direct or indirect effects attributable to EMF from the proposed action are expected.

3.10.2.2 Permanent Impacts

No direct or indirect effects attributable to EMF from the proposed action are expected.

3.10.3 Mitigation Measures

The proposed action will be designed to meet prudent avoidance guidance, so no mitigation measures are proposed for EMF.

3.11 Radio, Television and Cellular Telephone

This section describes the radio, television, and cellular telephone infrastructure within the Study Area and the potential impacts of the proposed action on that infrastructure.

Communication tower data was obtained from the Federal Communications Commission (FCC) and spatially analyzed in GIS to determine direct and indirect impacts.

3.11.1 Affected Environment

Communications technologies identified within the Study Area can be divided into two broad categories: omnidirectional and unidirectional signals. Omnidirectional refers to those antennae that are able to transmit or receive signals in any direction; unidirectional refers to those antennae that are able to transmit or receive signals in one direction. Microwave signals are unidirectional and all others (e.g., radio, television, communications, and cellular phone) are omnidirectional.

3.11.1.1 Omnidirectional Signals

Generally, transmission lines do not cause interference with omnidirectional radio, television, or other communication antenna reception. While it is rare in everyday operations, four potential interference sources do exist: gap discharges, corona discharges, shadowing effects, and reflection effects.

Gap discharge interference is the most commonly noticed form of transmission line interference with omnidirectional signals. Gap discharges may occur on transmission and distribution lines where small gaps (i.e., spaces) develop between mechanically connected metal parts. As sparks discharge across a gap, they create the potential for electrical noise, which can occur with any electrical line voltage. The degree of interference depends on the quality and strength of the transmitted communication signal, the quality of the antenna system, and the distance between the receiver and the electrical line. Gap discharges typically are not a design issue, but tend to be associated with equipment maintenance, occurring at areas where gaps have formed due to broken or ill fitted hardware (e.g., clamps, insulators, and brackets). Because gap discharges are a hardware issue, they can be repaired when they occur.

While gap discharges and their effects can happen on any electrical line, they typically occur on lower voltage distribution lines. The gap discharge potential of larger transmission lines, like those for this Project, tends to be minimized because there are fewer structures and a higher mechanical load on hardware.

Corona discharges can generate radio frequency electrical interference. Corona discharges are a potential issue with all transmission lines. They are caused when localized electric fields near an energized conductor produce small electric discharges ionizing nearby air. Most often, the reasons for corona discharge are related to irregularities on conductors, including scratches or nicks, dust buildup, or water drops. The air ionization caused by corona discharges results in energy loss and generates audible noise, radio noise, light, heat, and small amounts of ozone. The energy loss from corona discharges is minimized through the design process by selecting conductors properly sized for the operating voltage of the line. In the case of the Project, a three-conductor bundle in a delta arrangement was selected largely for this purpose. The potential for radio and television signal interference due to corona discharges relates to the magnitude of the transmission line-induced radio frequency noise compared to the strength of the broadcast signals. Because radio frequency noise, like electric and magnetic fields, becomes significantly weaker with distance from the transmission line conductors, very few practical interference problems occur with existing transmission lines. In most cases, the strength of the radio or television broadcast signal within a broadcaster’s primary coverage area is great enough to prevent interference.

Shadowing and reflection effects typically are associated with large structures (e.g., high buildings) that may cause reception problems by disturbing broadcast links and leading to poor radio and television reception. Although the occurrence is rare, a transmission structure or the conductor can create a shadow on adjoining properties that obstructs or reduces the transmitted signal. Structures may cause a reflection or scattering of the signal. Reflected signals from a structure result in the original signal breaking into two or more signals.

Multipath reflection or scattering interference can be caused by the combination of a signal that travels directly to the receiver and a signal reflected from the structure that travels a slightly longer distance, and thus may be received slightly later by the receiver. If one signal arrives with significant delay relative to the other, the picture quality of both analog and digital television broadcast signals may be impacted. With analog broadcasts, a second image may appear on the receiver's screen and displace the other. This type of reception interference is known as ghosting or delayed image. With digital broadcasts, the picture can become pixelated or freeze and become unstable. The most significant factors affecting the potential for signal shadow and multipath reflection are structure height above the surrounding landscape and the presence of large flat metallic facades. Potential shadow and reflection effects from the Project would be minimized because the structures will be placed 600 to 1,000 feet apart. Due to the large spaces between individual structures, the Project's structures would not create one large obstacle and broadcast signals would travel between the structures, minimizing the likelihood of shadowing and reflection effects.

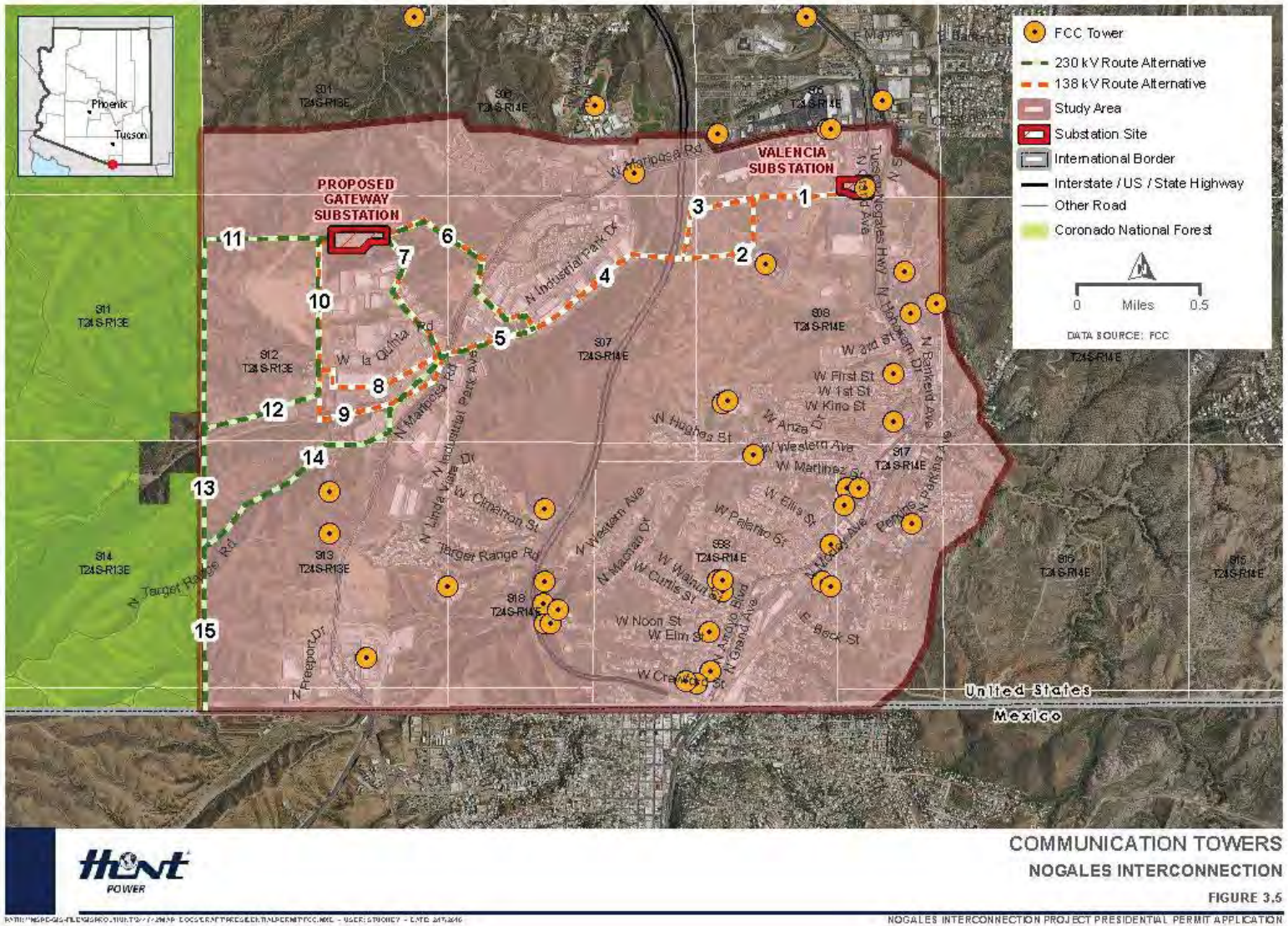
3.11.1.2 Microwave (Unidirectional) Signals

Microwave antennae are operated as high-frequency, unidirectional, point-to-point systems and depend on line-of-sight between antenna receivers. These systems are unlikely to be adversely affected by electrical noise, but could be affected by infrastructure located directly between two microwave signal points.

3.11.1.3 Existing Tower Locations

Communication tower locations were identified by accessing the FCC database (FCC 2012). Based on the data available, two towers are within 500 feet of a Route Segment; there are no communication towers within the Route Corridors. See Figure 3-5 for the locations of communication towers.

Figure 3-5. Communication Towers



3.11.2 Environmental Consequences

The Applicant is not aware of any complaints related to radio or television interference resulting from the operation of existing transmission lines located near the proposed action, and does not expect that such interference will be an issue. In addition, there are no communication towers located in the Route Corridor; therefore, construction of the Project will not directly affect any communication towers.

No indirect impacts on omnidirectional communications are anticipated as the transmission line hardware will be designed to reduce gap and corona discharges. The transmission line will be properly maintained to minimize gap and corona discharges.

Interference from transmission line corona discharges associated with the proposed action could occur for an amplitude modulation (AM) radio station within its primary coverage area, where good reception existed before the proposed action was built. That situation is unlikely, however, because AM radio frequency interference typically occurs immediately under a transmission line and dissipates rapidly with increasing distance from the line.

Frequency modulation (FM) radio receivers usually do not pick up interference from transmission lines because:

- Corona-generated radio frequency noise currents decrease in magnitude with increasing frequency and are quite small in the FM broadcast band (88-108 Megahertz)
- The interference rejection properties inherent in FM radio systems make them virtually immune to amplitude type disturbances.

Television reception could be impacted by the structures or transmission line conductors. The large size of these transmission line components might cause a shadowing effect that could cause reception interferences.

In addition, corona-generated radio frequency noise and transmission line structure placement could cause interference with television broadcast signals. Because digital reception is, in most cases, considerably more tolerant of noise and somewhat less resistant to multipath reflections (i.e., reflections from structures) than analog broadcasts, interference is not anticipated. However, if the noise level or reflections are great enough, they will impact digital television reception.

Due to the higher frequencies of television broadcast signals (i.e., 54 Megahertz and above), a transmission line seldom causes reception problems within a station's primary coverage area. In the rare situation where the construction of the proposed action would cause interference within a television station's primary coverage area, the Applicant would work with the affected viewers to correct the problem. Usually any reception problem can be corrected with the addition of an outside antenna.

Radio frequency noise is not an issue for cellular phones because it is almost non-existent in the frequency range for cellular-type phones, and the technology used by cellular phones is superior to that used in two-way mobile radio units.

3.11.3 Mitigation Measures

The following mitigation measures would be implemented to reduce the effects on radio, television, and cell phone service from the proposed action:

- If television or radio interference is caused by the operation of the proposed action in those areas where good reception was available prior to construction of the proposed action, the Applicant will inspect and repair loose or damaged hardware in the transmission line.
- If interference from corona discharges does occur for an AM radio station within a station's primary coverage area with good reception before the proposed action was built, satisfactory reception could be obtained by appropriate modification of the receiving antenna system.
- A two-way mobile radio located immediately adjacent to and behind a large metallic structure (e.g., a steel transmission line structure) may experience interference because of the signal blocking effects of the structure. Moving either mobile unit by less than 50 feet so the metallic structure is no longer immediately between the two units should restore communications.
- If television interference is caused by the operation of the proposed action, the Applicant will inspect and repair any loose or damaged hardware in the transmission line.
- If necessary, the Applicant will work with tower operators to resolve any issues directly related to the proposed action.

3.12 Transportation

This section describes transportation infrastructure in the Route Corridor and the potential impacts of the proposed action on this infrastructure.

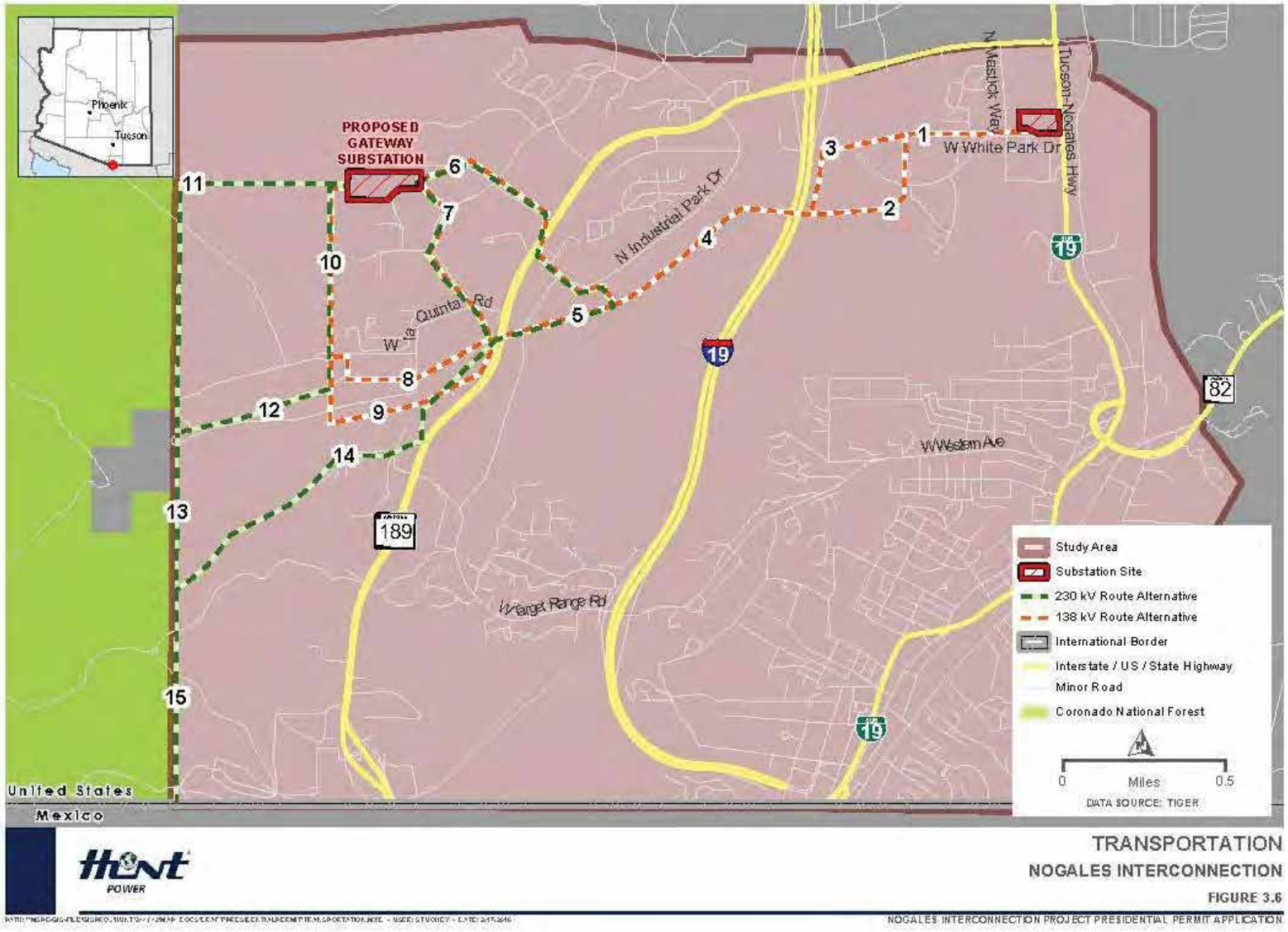
3.12.1 Affected Environment

Three major roadways are in the Route Corridor: I-19, Grand Avenue (also known as Business I-19 or the Tucson–Nogales Highway), and SR 189/Mariposa Road (Figure 3-6).

The major roadways in the Route Corridor serve one of the ten busiest cargo ports along the United States-Mexico border. They handle nearly half of all agricultural commodities entering the United States from Mexico, and between 1.2 and 1.8 million privately owned vehicles pass through the area annually (ADOT 2008).

I-19 is a designated section of the CANAMEX Corridor, which connects Mexico, the United States, and Canada. Through the 1995 National Highway Systems Designation Act, Congress established CANAMEX as a "High Priority Corridor," with a "goal of stimulating investment and economic growth in the region and enhancing safety and efficiency in the corridor" (CANAMEX Corridor Coalition 2015). SR 189 and Grand Avenue provide access from the Mexican border to Nogales, Arizona and direct connections to I-19. All three roadways pass through or near the Route Corridor in a north-south alignment.

Figure 3-6. Transportation



Four minor roads in the Route Corridor serve industrial and commercial developments in Nogales: West White Park Drive and North Mastick Way, both adjacent to the Valencia Substation; North Industrial Park Avenue, adjacent and parallel to SR 189; and West La Quinta Road, also adjacent to SR 189. Gravel roads and trails are found along the hills in the western portion of the Route Corridor, including roads for patrolling the United States-Mexico border.

Average annual traffic counts for I-19 and SR 189, the two major roads that would be crossed by the proposed transmission lines, are provided in Table 3-8.

Table 3-8. Major Roadway Traffic Volumes

Roadway	Average Annual Daily Traffic Volume
Interstate 19 (from Western Avenue to State Route 189 interchange)	11,060
State Route 189 (from Target Range Road to Industrial Park Drive)	14,902
Source: Arizona Department of Transportation (2014)	

3.12.2 Environmental Consequences

3.12.2.1 Temporary Impacts

Temporary effects on transportation and traffic would occur during construction of the proposed action. Given the presence of the additional construction-related traffic, heavier-than-usual traffic and short delays may be experienced. The temporary traffic effects would occur primarily on the four local, minor roads and two of the major roads: Grand Avenue and SR 189 (Figure 3-6).

Most of the effects would result from construction crews, equipment, and haul trucks using the roadways to access the proposed action, where construction would occur along new unpaved access roads. In locations where the unpaved construction access road would intersect existing paved roads, steel or gravel pads (track-outs) would be installed to prevent soils on construction equipment from collecting on the paved roadway. The new unpaved access road may be permanent in undeveloped parcels where existing roads are not available for operation and maintenance of the proposed action.

Minor traffic delays resulting from stringing lines across I-19 and SR 189 may occur but would occur only once at each location. The method of stringing lines across the roadways has yet to be determined.

Effects on traffic are anticipated to be greatest along SR 189 because this roadway is a primary access route to most of the Project site. However, given the large industrial presence and existing high volume of truck traffic along SR 189, the additional effects from construction traffic are anticipated to be minor. Encroachment permits from ADOT are required for lines crossing SR 189 and I-19, and utility permits may be needed to cross city roads and streets.

3.12.2.2 Permanent Impacts

No permanent impacts to transportation systems are anticipated.

3.12.3 Mitigation Measures

The Applicant would consult with ADOT and the City of Nogales and obtain any required permits prior to construction.

Impacts on the existing transportation network are anticipated to be minimal as a result of construction, operation, and maintenance of the proposed action; therefore, no additional mitigation measures are proposed.

3.13 Air Quality

This section describes existing air quality conditions in Nogales, potential air quality impacts of the proposed action, and mitigation measures to minimize such impacts.

3.13.1 Affected Environment

Air quality is measured primarily by concentrations of six criteria pollutants within a region. The six criteria air pollutants are subject to National Ambient Air Quality Standards (NAAQS) developed by the Environmental Protection Agency's (EPA) Office of Air Quality Planning and Standards, and were chosen because they are the predominant air pollutants of concern for the environment and public health.

The criteria pollutants are ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), lead (Pb), sulfur dioxide (SO_2), and particulate matter (PM), which includes two subcategories: particles less than 10 microns in diameter (PM_{10}) and particles less than 2.5 microns in diameter ($PM_{2.5}$). The NAAQS (40 CFR 50) are summarized in Table 3-9. Arizona has adopted the NAAQS into its rules, except that some of the more recent NAAQS are not yet included in the Arizona rules.

Nogales is in the Nogales Planning Area, which is designated as a nonattainment area (NAA) for the 24-hour PM_{10} NAAQS. The NAA and City of Nogales boundaries are shown in Figure 3-7. Figure 3-8 shows the trend of measured PM_{10} concentrations at the Nogales U.S. Post Office, at 300 North Morley Avenue (U.S. Environmental Protection Agency 2015). While a significant improvement is evidenced by reduced PM_{10} levels in recent years, the latest 3-year average, 24-hour design concentration (average of the second highest values across the 3 years) is still above the 24-hour NAAQS of 150 micrograms per cubic meter ($\mu g/m^3$).

The same area shown in Figure 3-7 as an NAA for PM_{10} is also an NAA for the $PM_{2.5}$ NAAQS. However, on January 7, 2013, EPA published in the *Federal Register* a final rule designating the Nogales Planning Area as being in attainment for the $PM_{2.5}$ NAAQS. While this indicates the 24-hour and annual NAAQS for $PM_{2.5}$ are now being met in the area, EPA still lists the official status as $PM_{2.5}$ "nonattainment" and will continue this official designation until such time as EPA approves the state-submitted $PM_{2.5}$ maintenance plan for the area. Figure 3-7 shows the past 10-year trend of $PM_{2.5}$ concentrations, indicating that in recent years air quality has improved to better than the levels of the 24-hour and annual $PM_{2.5}$ NAAQS (EPA 2015).

No monitoring data are available for the remaining criteria pollutants in EPA's database. However, it is expected that concentrations of these pollutants in the Route Corridor are significantly lower than the NAAQS levels, given the lack of substantial emissions sources of these pollutants or their precursors in and near the Route Corridor.

Table 3-9. National Ambient Air Quality Standards

Pollutant	Averaging Time	Primary Standard	Secondary Standard
Carbon monoxide (CO)	8-hour[a]	9 ppm (10 mg/m^3)	None
	1-hour[a]	35 ppm (40 mg/m^3)	None
Lead (Pb)	Rolling 3-month average	0.15 µg/m^3	Same as primary
Nitrogen dioxide (NO_2)	Annual (arithmetic mean)	0.053 ppm (100 µg/m^3)	Same as primary
	1-hour[b]	0.100 ppm (188 µg/m^3)	Same as primary
Particulate matter (PM_{10})	24-hour[c]	150 µg/m^3	Same as primary
Particulate matter ($PM_{2.5}$)	Annual (arithmetic mean)[d]	12.0 µg/m^3	Same as primary
	24-hour[e]	35 µg/m^3	Same as primary
Ozone (O_3)	8-hour[f]	0.070 ppm (2015 standard)	Same as primary
Sulfur dioxide (SO_2)	Annual (arithmetic mean)[g]	0.03 ppm	None
	24-hour[a,g]	0.14 ppm	None
	3-hour[a]	None	0.5 ppm (1,300 µg/m^3)
	1-hour[h]	0.075 ppm (196 µg/m^3)	Same as primary

Source: 40 CFR 50

Notes: mg/m^3 = milligrams per cubic meter, ppb = parts per billion, ppm = parts per million

[a] Not to be exceeded more than once per year.

b Standard is attained when the 3-year average of the eighth-highest daily maximum 1-hour average NO2 concentration does not exceed 0.100 ppm (100 ppb).

[c] Not to be exceeded more than once per year on average over three years.

[d] To attain this standard, the 3-year average at any monitor must not exceed 12.0 µg/m^3.

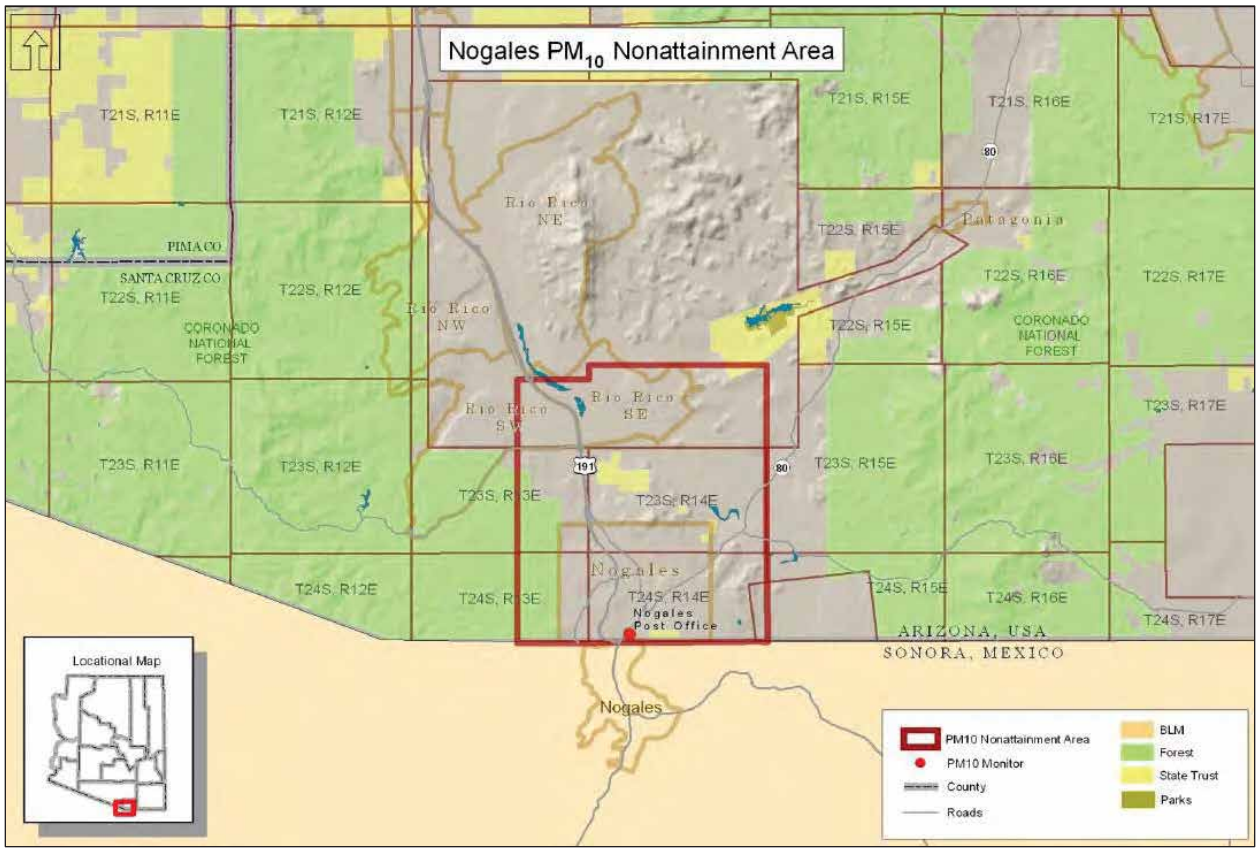
e To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 µg/m3 (effective December 17, 2006).

f To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average O3 concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm (effective May 27, 2008).

f To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm. The 1997 standard—and the implementation rules for that standard—will remain in place for implementation purposes as EPA undertakes rulemaking to address the transition from the 1997 O3 standard (0.08 ppm) to the 2008 O3 standard (0.075 ppm).

g The annual and 24-hour SO2 NAAQS will be revoked as of 1 year after the effective date of designations for the newer 1-hour SO2 NAAQS, which EPA must complete by July 2, 2016. h Standard is attained when the 3-year average of the fourth-highest daily maximum 1-hour average NO2 concentration does not exceed 0.100 ppm (100 ppb).

Figure 3-7. City of Nogales and Nogales PM10 NAA (Nogales Planning Area)



Source: Arizona Department of Environmental Quality (2012)

Figure 3-8. Most Recent 10-year Trend of PM10 Concentrations in Nogales

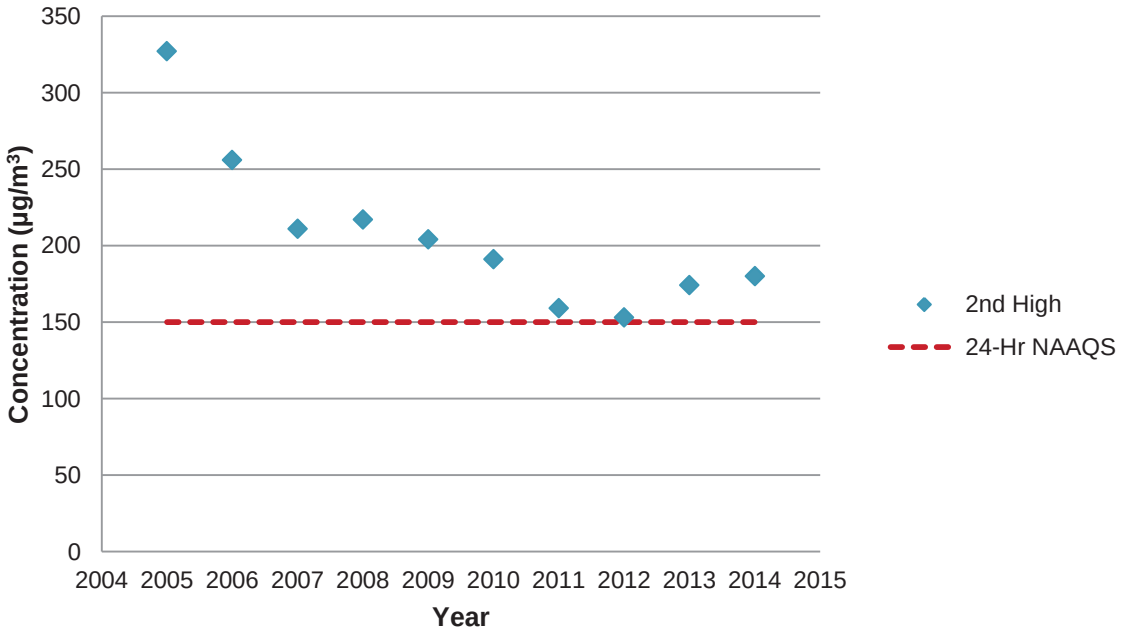
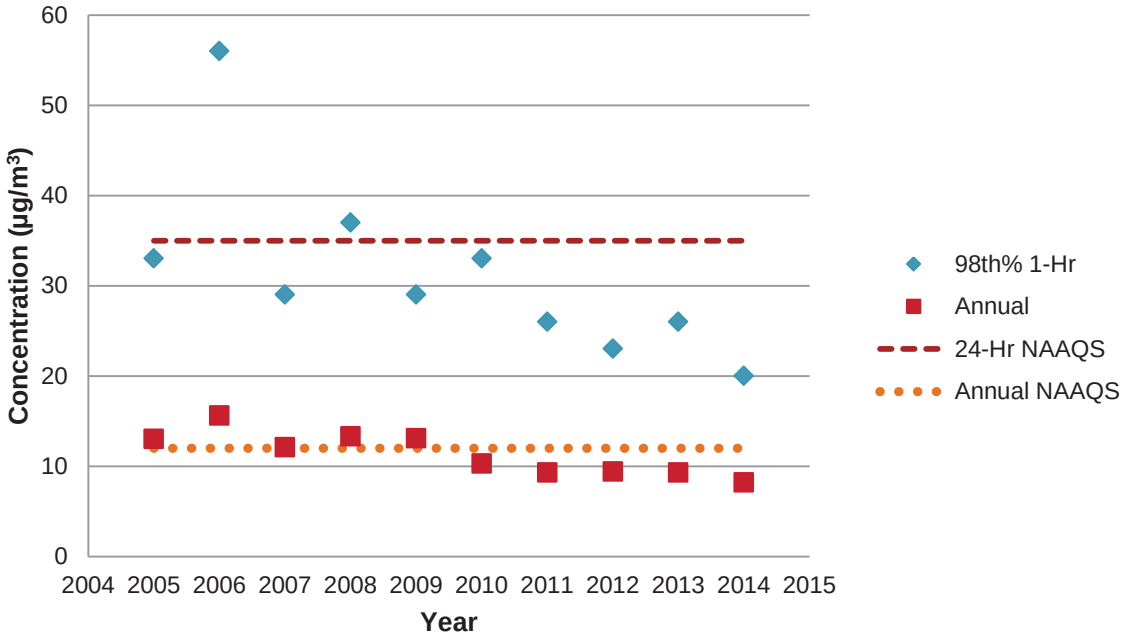


Figure 3-9. Most Recent 10-year Trend of PM2.5 Concentrations in Nogales



3.13.2 Environmental Consequences

Implementation of the proposed action could affect air quality in two phases: 1) during construction and 2) during operation of the power line. The assessment of air quality impacts in this document is qualitative for both of these phases, given the very low levels of expected impacts, except that estimates of construction PM_{10} and $PM_{2.5}$ emissions are provided to assess the potential applicability of federal General Conformity requirements under 40 CFR 93, Subpart B.

3.13.2.1 Temporary Impacts

Emissions from construction activities associated with the proposed action would include exhaust emissions from heavy equipment, including trucks, backhoes, cranes, etc. and fugitive dust emissions from construction equipment operating over unpaved areas.

Diesel-powered on-road trucks and construction equipment are now required to use ultra-low sulfur diesel fuel, containing less than 15 parts per million (ppm) of sulfur, by weight. This minimizes potential emissions of both SO_2 and PM from equipment exhausts. In addition, the use of ultra-low sulfur diesel fuel has allowed the implementation of selective catalytic reduction systems on newer construction equipment and on-road trucks, thus contributing to a nationwide decease in such emissions from both on- and non-road vehicles.

Construction of the proposed action would require relatively small parcels for transmission tower foundations/supports along the selected transmission line corridor, along with a substation facility. Therefore, a relatively small amount of excavation and other earthmoving activities would be needed. Mitigation of fugitive dust from these activities would be implemented as described in the mitigation measures section below.

For purposes of General Conformity rules (40 CFR 93, Subpart B), it is necessary to assess emission quantities of PM_{10} and $PM_{2.5}$ to compare them against the General Conformity applicability emissions thresholds of 40 CFR 93, Subpart B, § 93.153, Applicability. For direct emissions of both PM_{10} and $PM_{2.5}$, the applicability threshold is 100 tons/year. For $PM_{2.5}$ emissions, there are also General Conformity thresholds for indirect or precursor pollutants, including SO_2 and NO_2, which are set at 100 tons/year each. Because only small amounts of exhaust emissions of these precursor pollutants would occur during the construction phase, this assessment focuses on the potentially greater amounts of fugitive dust (as PM_{10} or $PM_{2.5}$) emissions that could be caused by construction.

Estimated emissions of PM_{10} and $PM_{2.5}$ for construction activities are based on EPA Publication AP-42, Section 13.2.3, which provides a gross emission factor (uncontrolled) for Heavy Construction Operations of 1.2 tons/acre/month for total PM. To estimate PM_{10} and $PM_{2.5}$, the estimation uses particle size multipliers derived from the "k" coefficients for unpaved roads in AP-42 Section 13.2.2, Table 13.2.2-2.

The total estimated area affected by construction, for the proposed action, would be approximately 94 to 116 acres, assuming all of the ROW and substation land would be disturbed (a very conservative estimate). The duration of construction is estimated at six months. Assuming a fixed proportion of the 94 to 116 acres is disturbed each month gives a total of 15.7 to 19.3 acres disturbed per month. Based on the above data and references, the estimated emissions of total PM, PM_{10}, and $PM_{2.5}$ for the 6-month duration of construction is estimated as shown in Table 3-10. Similarly, the expansion of the Gateway Substation from 150 MW to 300 MW would occur over a shorter than 6-month duration in a separate future construction phase.

The total emissions of PM_{10} and of $PM_{2.5}$ would be below the applicable General Conformity *de i i is* threshold of 100 tons/year for each particle size. Therefore, General Conformity requirements do not apply to this Project. Furthermore, recommended dust mitigation measures (Section 3.13.3) are expected to reduce emissions of fugitive dust by 50 percent or more, thus keeping emissions even lower than the uncontrolled values estimated here.

Table 3-10. Estimated PM, PM_{10}, and $PM_{2.5}$ Emissions

Particle Size	Size Multiplier	Emissions Factor (tons/acre/ month)	Distribution Area (acres/ month)	Emissions (tons/month)	Emissions (tons/year)
PM	1	1.2	15.7-19.3	18.84 – 23.16	113.04 – 166.75
PM10	0.306	0.367	15.7 – 19.3	5.76 – 7.08	34.56 – 42.48
PM2.5	0.031	0.037	15.7 – 19.3	0.58 – 0.71	3.48 – 4.26

3.13.2.2 Permanent Impacts

Operation of the proposed transmission line is not expected to result in any additional generation-related emissions in the air quality of Nogales. No fossil-fueled, electric generating plants exist in Nogales that would potentially run at a higher rate because of the availability of the proposed transmission line.

If electric generating plants outside of the Nogales NAA would run more frequently because of availability of the transmission line, it is presumed that they would operate within their permitted emission limitations and would not contribute to adverse air quality conditions in their local areas.

The new substation may create additional operational emissions of air pollutants. The substation would use some circuit breakers containing sulfur hexafluoride, a compound regulated as a greenhouse gas (GHG). GHG emissions and impacts are addressed in Section 3.14.

3.13.3 Mitigation Measures

While fugitive dust emissions of PM_{10} and $PM_{2.5}$ attributable to construction are estimated to be below the General Conformity *de i i is* levels, as shown in the prior section, ADEQ rules require that fugitive emissions be minimized under Article 6 – Emissions from New and Existing Nonpoint Sources.

At a minimum, the following two rule sections of this article appear to apply to potential fugitive dust emissions that could result from construction of the proposed Project:

- R18-2-606. Material Handling
  No person shall cause, suffer, allow or permit crushing, screening, handling, transporting or conveying of materials or other operations likely to result in significant amounts of airborne dust without taking reasonable precautions, such as the use of spray bars, wetting agents, dust suppressants, covering the load, and hoods to prevent excessive amounts of particulate matter from becoming airborne.
- R18-2-614. Evaluation of Nonpoint Source Emissions
  Opacity of an emission from any nonpoint source shall not be greater than 40% measured according to the 40 CFR 60, Appendix A, Reference Method 9. An open fire permitted under R18-2-602 or regulated under Article 15 is exempt from this requirement.

Given the above requirements and the PM_{10} nonattainment conditions in the Route Corridor, notwithstanding the fact that estimated PM_{10} emissions are below the General Conformity *de i i is* threshold, the construction-related fugitive dust emissions would be mitigated by application of water sprays and/or other control measures as appropriate to minimize such emissions.

3.14 Greenhouse Gases

This section describes greenhouse gases and the potential impacts of the proposed action on those greenhouse gases.

For the purposes of assessing existing conditions and potential impacts of GHG emissions from the proposed Project, the study area is the whole planet. Because the Project is quite small in its potential effects on the global scale, this section provides only a qualitative assessment of the potential for GHG emissions if the Project is implemented.

3.14.1 Affected Environment

GHG emissions and their global atmospheric concentrations have been generally increasing since the beginning of the industrial age. EPA has defined several gaseous compounds or groups of compounds for regulation as GHGs: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and various fluoride gases, including sulfur hexafluoride (SF_6).

Each GHG is assigned a "global warming potential" (GWP), which is an estimate of its relative effectiveness in contributing to the greenhouse effect, in comparison to CO_2. The current GWP for the above gases as listed in EPA rules (40 CFR 98) is provided in Table 3-11. Note that the GWP values are not inherent properties of the gases but, rather, are estimates of how much warming a given gas would cause, on an equivalent mass basis compared with CO_2, at a 100-year time horizon. The GWP estimates must account for atmospheric physics and chemistry in how the gas is consumed by various processes over a 100-year time horizon and how other GHGs compete for absorption of the same longwave radiation that causes the greenhouse effect. This requires extensive modeling of the anticipated behavior of each gas in the environment, so that substantial uncertainty exists in these values. Therefore, the estimates of GWP have been changed over time as scientists gain new understanding of chemical processes.

Table 3-11. Global Warming Potentials of Common Greenhouse Gases

Compound	Global Warming Potential
Carbon dioxide (CO_2)	1
Methane (CH_4)	25
Nitrous oxide (N_2O)	298
Sulfur hexafluoride (SF_6)	22,800
Source: 40 CFR 98, Subpart A, Table A-1, as of December 8, 2015	

3.14.2 Environmental Consequences

Implementation of the proposed action could affect GHG emissions in two phases: 1) during construction and 2) during operation of the power line. The assessment of GHG emissions in this document is qualitative for both of these phases, given the relatively low levels of expected emissions in comparison with state, national, or global GHG emissions.

3.14.2.1 Temporary Impacts

GHG emissions from construction activities associated with the proposed action would include combustion exhaust emissions (mainly CO_2) from heavy equipment, including trucks, backhoes, cranes, etc. as well as transport of materials and workers to and from the site. From a life-cycle perspective, GHG emissions would also result from mining and production of the raw materials used in Project construction, including concrete, steel, copper, and aluminum.

3.14.2.2 Permanent Impacts

Direct emissions of GHGs attributable to operation of the proposed action would primarily result from fuel combustion for maintenance vehicles.

Another small source of direct GHG emissions would be from any SF_6 lost from circuit breakers expected to be used for the substation. The total SF_6 amount contained in the circuit breakers of the expanded 300 MW substation is expected to be 900 pounds. Two white papers (Bessede et al. n.d.; U.S. Environmental Protection Agency n.d.) estimated leakage rates for modern circuit breakers manufactured after 2000 at less than 0.5 percent per year. Assuming 900 pounds of SF_6 in the circuit breakers, this would be 4.5 pound/year of SF_6. Multiplying by the GWP factor above would give total annual CO_2-equivalent emissions of 102,600 pounds, or 51.3 tons/year.

This is a miniscule amount compared with statewide, nationwide, or global GHG emissions, which are estimated in the tens of billions of tons per year.

Indirect GHG emissions from operation of the Project could result if the Project allows transfer of power across the United States-Mexico border that would not be generated except for the Project. Some of this power could be renewable, and some could be from fossil-fuel or nuclear power generating facilities. However, because the Project is not being built to support a new power generating facility, this is expected to be a relatively small amount of power, given the primary purpose of the Project is grid reliability.

3.14.3 Mitigation Measures

Given the relatively small scope of the proposed action, there are no opportunities for large GHG emission reductions. However, in the construction phase, GHG emissions would be minimized by shutting off equipment that is idling in between performing useful work.

4 Cumulative Impacts

In addition to analyzing the individual impacts of a proposed action, the federal environmental review process requires consideration of the cumulative environmental impacts of multiple projects within an area. In conformance with NEPA requirements, this section discusses the cumulative significance of past, present, and reasonably anticipated future projects on the environment in conjunction with the proposed Project.

4.1 Regulatory Requirement

The Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA defines cumulative impacts as:

- The impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of which agency (that is, federal or non-federal) or person undertakes such other actions (40 CFR 1508.7).
- Cumulative impacts are considered direct effects, which are “caused by the action and occur at the same time and place” (40 CFR 1508.8).

4.1.1 Analysis Method

This cumulative impacts review was developed in consultation with federal, state, and local agencies responsible for various environmental resources within the CEC Approved Corridor, and is limited to those resources the agencies identified as being of concern and potentially requiring mitigation measures. This type of screening ensures that the analysis focuses on critical resources. The cumulative impacts analysis is based on existing conditions of the critical environmental resources in the Route Corridor.

4.1.2 Valued Environmental Components

Valued environmental components (VECs) are those components of the environment for which there is regulatory or public concern. VECs include the social, cultural, technical, economic, and natural components of the environment. This section follows two principles identified by CEQ when considering VECs: 1) focus only on the effects and resources within the context of the proposed action and 2) present a concise list of issues that have relevance to anticipated effects of the proposed action. Based on this guidance, the resources examined in this chapter were reviewed to determine which constituted VECs may be affected by cumulative actions. The factors used to decide which resources to review are listed below:

- Land Use and Zoning- No further consideration required.
- Geology and Soils - Further consideration of direct impacts will be determined as additional information is gathered during geotechnical investigations of the selected route and structure locations are determined.

- Vegetation – Further consideration will be required as species surveys are completed after a preferred route is identified and land access is acquired. Based on species identified in surveyed areas to date, additional rare plants may be present in unsurveyed areas that should be considered during final design.
- Water Resources – Further consideration will be required because there is anticipated potential structure placement in the floodplains.
- Wildlife - Further consideration will be required because of the potential for bird strikes and to address any regional activities that may affect special status species habitat potentially impacted by the proposed action.
- Cultural Resources - Will be determined upon completion of the cultural resources survey after a preferred route is identified and ROE is acquired. Based on surveys completed to date, no historical properties have been identified.
- Visual Quality – Further consideration will be required. Visual impacts and overall changes in aesthetics would vary depending on the terrain, topography, and vegetative cover of the landscape. Views of the Project could not be avoided completely given the Project's size and the open landscape in some parts of the Route Corridor.
- Socioeconomics and Environmental Justice – No further consideration will be required.
- Noise – No further consideration will be required.
- EMFs – No further consideration will be required.
- Radio, Television and Cellular Telephone - No further consideration will be required because transmission lines rarely result in any adverse impacts, and in the rare case that there are adverse impacts, they can be mitigated readily by tightening loose hardware or upgrading receiving antennae.
- Transportation - No further consideration will be required because of the high capacity of the existing roadway system and likelihood of mitigating any impact from construction of the proposed action.
- Air Quality – No further consideration will be required. During the construction period, vehicle emissions and fugitive dust from earth moving would be caused by construction equipment. The resulting emissions would be low and temporary, with concentrations likely not exceeding state and federal standards.
- Greenhouse Gases – No further consideration will be required.

4.1.2.1 Temporal and Spatial Boundaries

The temporal boundary is the design life of the proposed action's facilities. Spatial boundaries are based on the Route Corridor, but may vary somewhat depending on the resource at issue. The analysis was conducted considering other linear projects (e.g., pipelines, roads, and transmission lines) within a reasonable distance from the proposed Project. This approach was taken because these projects would affect the same or similar resources as those affected by the proposed action.

4.1.2.2 Reasonably Foreseeable Future Activities

Potentially relevant projects, plans, and programs that have or could occur during the same time as construction of the proposed action were identified by contacting local authorities, county agencies, and state agencies within the cumulative effect analysis area and requesting information on past, present, and proposed future land alteration and development activities.

Regulations and case law provide direction as to what constitutes a reasonably foreseeable action that should be included in a cumulative impacts review. Reasonably foreseeable activities include activities that are not speculative and that constitute an independent utility or function.

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No reasonably foreseeable Projects were identified in the area. The proposed action would not interfere with any known pipelines, other transmission facilities, or electrical generation facilities, nor would any significant cumulative affects result.

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ADOT reviewed the plans for the proposed action, considered in the context of future transportation facilities and existing facility improvements. The State Route 189, International Border to Grand Avenue project is identifying alternatives for SR 189 between the point of entry and Grand Avenue, a distance of approximately 3 miles, to increase roadway capacity and improve access control along SR 189. The proposed action is necessary to address current and forecast growth in traffic (especially truck, commercial vehicle, and bus traffic) related to the recent expansion of the Mariposa point of entry (completed in late 2014), the designation of the SR 189 corridor as the southernmost segment of the proposed new Interstate 11 corridor within the CANAMEX International Trade Zone, and anticipated industrial development expansion along the SR 189 corridor.

Otherwise, transportation projects near the proposed action generally consist of routine roadway maintenance activities such as road and highway resurfacing, asphalt surface treatment, bridge repair, bituminous overlay, milling and overlay, concrete paving, railroad crossings, and pedestrian bike trail improvements.

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Reasonably foreseeable development includes new industrial warehouses and commercial properties similar to what can currently be found in the area.

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Based on discussions with U.S. Border Patrol during a meeting on September 17, 2015, they indicated they may use any new access roads developed by the Project for border patrol operations.

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The City of Nogales and the Santa Cruz County Flood Control District are in the early stages of developing a floodplain master plan to control flooding in areas around the Ephraim, Nogales, and Mariposa Washes. These plans, while not yet funded, include proposed impoundments and flood control activities in the Study Area, and at least one preliminary impoundment may be crossed by the Route Corridor.

4.1.3 Cumulative Impacts Assessment

The assessment of potential impacts is possible through the use of an interaction matrix based on the identified relevant activities. An interaction matrix not only lists activities and environmental effects, but also incorporates an association between cause and effect using evaluation criteria (CEQ 1997).

Table 4-1 contains a general description of potential cumulative impacts for the VECs identified above and further evaluated as part of the cumulative impacts assessment. As previously noted, cumulative impacts result from spatial (i.e., geographic) and temporal (i.e., time) crowding of environmental impacts. Table 4-1 lists impact criteria that reflect common categories cited in CEQ's *sideri g lati e e ts der t e ati al ir e tal li t* (1997). The cause-and-effect pathway criteria shown in Table 4-1 are used to evaluate potential interactions of past, present, and reasonably foreseeable activities listed in the table, which lead to potential cumulative impacts. Table 4-1 also suggests the types of mitigation measures that could be employed to mitigate cumulative effects, if they are determined to exist.

Table 4-1. Potential Cumulative Impacts

Resource	Project impact	Reasonably Foreseeable Activities	Cumulative impacts	Potential Mitigation Measures
Geology and Soils	Soil compaction on access roads and structure installation on shrub type landscape	Non-operations uses of access roads by U.S. Border Patrol	Increased soil compaction on access roads and adjacent lands	Paralleling existing linear utility corridors, transportation facilities, or developed areas with compatible land uses to minimize number of affected locations and to focus similar activities in one area
Vegetation	Removal of vegetation, fragmentation of plant communities	Non-operations uses of access roads by U.S. Border Patrol	Damage to vegetation on adjacent lands, weed introduction	Restore ROW with native vegetation and provide signage to discourage off-road use
Water Resources	Sedimentation, turbidity, and runoff; floodplains	Non-operations uses of access roads by U.S. Border Patrol, changes to floodplain boundaries and impoundments for flood control	Increased erosion and potential sedimentation in floodplains and waterways	Comply with all state and federal regulations regarding protection of water resources, restore vegetation in ROW, discourage off-road use with signage

Resource	Project impact	Reasonably Foreseeable Activities	Cumulative impacts	Potential Mitigation Measures
		projects		
Visual Resources	Introduce structures to shrub-type landscape	Previous power lines, pipelines, roadway infrastructure, energy corridors, and land uses	Additional visual intrusion on undeveloped areas	Paralleling existing linear utility corridors, transportation facilities, or developed areas with compatible land uses to minimize number of affected locations and to focus similar activities in one area

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5 Environmental Consultation, Review, and Permit Requirements

This section summarizes the federal, state, and local regulations affecting the permitting process and the required environmental documentation for the Project.

5.1 Federal Process

The Department of Energy (DOE) is the lead federal agency for the Project. Pursuant to EO 10485 of 1953, as amended by EO 12038 and 10 CFR § 205.320, a Presidential Permit is required for the Project since it will cross the international boundary between Arizona and Sonora, Mexico. In accordance with EO 12038, DOE must determine whether issuance of a Presidential Permit for the construction, operation, maintenance, or connection of facilities for the transmission of electric energy between the United States and a foreign country is consistent with the public interest. The Project must also obtain favorable recommendations from the Secretary of State and the Secretary of Defense (EO 10485 § 1). Prior to issuance of a Presidential Permit, if the project constitutes a Major Federal Action, it must be reviewed by DOE pursuant to NEPA. NEPA requires federal agencies to consider the environmental impacts and reasonable alternatives to Major Federal Actions. An Environmental Assessment (EA) will be prepared in compliance with NEPA and DOE's implementing regulations pursuant to 10 CFR Part 1021.

The following provides a summary of the federal environmental review process under DOE regulations:

- develop and publish the Draft EA
- solicit comments from the public and agencies on the Draft EA
- develop and publish the Final EA
- issue Finding of No Significant Impact (FONSI) on potential environmental impacts of the Project and identify mitigation measures to minimize these impacts
- issue Presidential Permit

Table 5-1 provides a summary of Federal permits and clearances that must be adhered to by the Project.

Table 5-1. Federal Permits and Clearances

Approval Agency	Permit, License, Approval, Compliance, or Review	Regulatory Requirement	Notes
Department of Energy (DOE)	Presidential Permit	Executive Order (EO) 10485 of 1953, as amended by EO 12038, and 10 Code of Federal Regulations (CFR) § 205.320	A Presidential Permit is required for a utility to cross an international border.
	Environmental Assessment (EA) and Record of Decision (ROD)	National Environmental Policy Act (NEPA)	
	Clean Air Act	42 USC §§ 7401 et seq.	The Clean Air Act is the comprehensive federal law that regulates air emissions from stationary and mobile sources.
	Noise Control Act of 1972	42 USC §§ 4901 et seq.	The noise Control Act of 1972 is a federal law regulating noise pollution with the intent of protecting human health.
	Environmental Justice	EO 12898	EO 12898 states that federal agencies must identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations.
	Cultural Class I and III Surveys, Compliance with Section 110	National Historic Preservation Act (NHPA), §110; EO 11593	Section 110 of NHPA requires that all federal agencies assume responsibility for the preservation of historic properties that are owned or controlled by that agency.
	Compliance with Section 106	NHPA, §106 (36 CFR 800)	As part of the NEPA review the Project must comply with Section 106 of NHPA. Section 106 requires federal agencies to take into account the effects of their undertakings on historic properties, and afford the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment.
	Compliance with EO 13112; invasive species	64 Federal Register 6183 February 8, 1999	Requires agencies, to the extent practicable and permitted by law, to prevent the introduction of invasive species; to provide for their control; and to minimize the economic, ecological, and human health impacts that invasive species cause.

Approval Agency	Permit, License, Approval, Compliance, or Review	Regulatory Requirement	Notes
Federal Aviation Administration (FAA)	Obstruction standards, Hazards to air navigation	49 U.S. Code (USC) § 44718 and Title 14 CFR § 77	The FAA requires that projects located near regulated airports evaluate their potential to obstruct air traffic. FAA must receive prior notification regarding construction of a structure.
Federal Communications Commission (FCC)	FCC Rules and Regulations compliance	47 CFR § 15.25	FCC regulations require that transmission lines be operated so that radio and television reception are not seriously degraded or repeatedly interrupted.
U.S. Army Corps of Engineers (USACE)	Clean Water Act (CWA), Section 404 permit	CWA § 404	USACE regulates discharges of dredge or fill material into waters of the U.S. under Section 404 of the CWA.
U.S. Fish and Wildlife Service (USFWS)	Biological Opinion/Incidental Take Permit	Endangered Species Act (ESA) Section 7 Consultation, Biological Assessment (BA)	The Project must comply with the ESA (16 USC §§1531–1534) and assess potential impacts of the Project on protected species.
	Compliance with the Bald and Golden Eagle Protection Act (BGEPA)	16 USC §§ 668-668c	USFWS oversees compliance with BGEPA which prohibits anyone from “taking” birds, nests, or eggs without a permit from the Secretary of the Interior.
	Compliance with the Migratory Bird Treaty Act (MBTA)	MBTA (16 USC §§ 703-712)	The statute makes it unlawful to pursue, hunt, take, capture, kill, or sell birds listed as migratory birds without a waiver.
International Boundary and Water Commission (IBWC) Boundary and Realty Office (BRO)	License to construct facilities on IBWC right-of-way (ROW)	Multiple treaties and minutes between the United States and Mexico.	Required for any work that will take place on IBWC ROW.

5.2 State Process

In 1971, the Arizona Legislature required that the ACC establish a power plant and line siting committee. The Arizona Power Plant and Transmission Line Siting Committee (Committee) provides a single, independent forum to evaluate applications to build power plants (of 100 megawatts or more) or transmission projects (of 115,000 volts or more) in the state.

All environmental studies and public participation activity results for this Project would be compiled, formatted, and incorporated into a CEC application pursuant to the requirements of ARS §§ 40-360 et seq. and ACC Rules of Practice and Procedure R14-3-219.

The application must be accompanied by information regarding the proposed type of facilities and description of the siting area, including the affected areas of jurisdiction and estimated costs associated with the proposed facilities.

An application fee is also required by ARS §§ 40-360.09. Within 10 days after having received an application, the Siting Committee would provide public notice as to the time and place of the hearing. Typically, the applicant prepares and distributes the notice and places signs at the project site. The hearings must be held (started) no less than 30 days and no more than 60 days after the date of notice.

The Siting Committee bases its review of the CEC application on the following nine factors:

- existing state, local government, and private development plans
- biological resources
- noise emission levels and interference with communication signals
- recreational aspects
- existing scenic and cultural aspects
- total environment of the area
- technical practicability with achieving proposed objective, and previous experience with available equipment and methods
- estimated costs associated with the proposed project and the Siting Committee's recommendation, if different than proposed project
- any additional factors (e.g., public and/or political)

The procedures for the Committee's activities are set forth in law and administrative regulations. After an application to build a power plant or transmission line is filed with the ACC, copies are sent to all members of the Committee. The chairman of the Committee sets a hearing date and provides public notice of the hearing date and location. Any member of the public can attend the hearing. The hearing will include testimony and exhibits from the applicant as well as testimony and exhibits from any groups or individuals who are granted party, or intervener, status. There is cross-examination of the witnesses by the parties. The Committee members also ask questions of the witnesses and may ask for additional information.

After all the information is before the Committee, members will discuss the matter and take a vote on whether to grant or deny a "Certificate of Environmental Compatibility," which is a formal document that is necessary before the power plant or transmission line can be built. If granted, the CEC is then forwarded to the ACC for review and action. If denied, the applicant may request that the ACC rehear the matter.

Table 5-2 provides a summary of state permits and clearances that must be adhered to by the Project.

Table 5-2. State Permits and Clearances

Approval Agency	Permit, License, Approval, Compliance, or Review	Regulatory Requirement	Notes
Arizona Corporation Commission (ACC)	Certificate of Environmental Compatibility (CEC)	Arizona Revised Statutes (ARS) Title 40, Chapter 2, Article 6.2 (§§ 40-360 through 40360.13), ACC Rules of Practice and Procedure Revised Statutes	This is required for transmission lines greater than two poles and greater than 115kiloVolts (kV).
Arizona Department of Environmental Quality (ADEQ)	Arizona Pollutant Discharge Elimination System (APDES) Stormwater permit	National Pollution Discharge Elimination System (NPDES) Clean Water Act (CWA) § 402, ARS § 490255; Arizona Administrative Code (AAC) Title 18, Chapter 11	The Environmental Protection Agency (EPA) delegates implementation of the NPDES permit program to state authorities. ADEQ implements the NPDES permit program through the APDES Stormwater Permit Program, which requires that construction activities that disturb 1 or more acres develop a Storm Water Pollution Prevention Plan (SWPPP) for the project in accordance with NPDES requirements.
	State Water Quality Certification for construction across water resources	CWA § 401	This is required for fill placed into Waters of the U.S. Application takes place concurrently with USACE 404 permit application.
	Dust Control Plan	AAC Title 18, Chapter 2, Article 6	The Project will be required to include dust mitigation measures during construction.
	Hazardous Waste Generator Registration	Hazardous Waste Control Act of 1972. Title 18, Chapter 8	This is required for generation, storage, and tracking disposal of hazardous waste during Project construction and operation.
Arizona Department of Agriculture	Application for Arizona Protected Native Plants and Wood Removal	ARS Article 11 (§§ R3-3-110- through R3-3-1111, Appendix A); ARS – Native Plant Law	This is required for displacement or removal of any protected native plant species.
Arizona Department of Transportation (ADOT)	Crossing or encroachment into state highway rights-of-way (ROW); permit for use of highway ROW	ARS § 28-7053, AAC §§ R17-3-501 through 509	This is required for encroachment onto state managed transportation ROW.
	Permit to Cross Federal Aid Highway	23 CFR § 645.213	Crossings of a federal highway require a use and occupancy permit.
Arizona Game and Fish Department (AGFD)	Coordination with U.S. Fish and Wildlife Service (USFWS)/U.S. Army Corps of Engineers (USACE) to minimize disturbance to or loss of special status wildlife species habitat; handling permit.	U.S. Fish and Wildlife Coordination Act; Threatened and endangered species review	This is performed in concurrence with Endangered Species Act (ESA) coordination.

5.3 Local Permits

The City of Nogales and Santa Cruz County hold jurisdiction over various aspects of the Project. Table 5-3 provides a summary of local permits and clearances that must be adhered to by the Project. The full extent of permitting will not be known until after a pre-application conference with the City of Nogales.

Table 5-3. Local Permits and Clearances

Approval Agency	Permit, License, Approval, Compliance, or Review	Regulatory Requirement	Notes
Santa Cruz County	Right-of-way use permit; Dust control plan; Earth-moving permit; Grading permit	County Code	Multiple County land use permits will be required for construction.
County Floodplain Department	Floodplain Use Permit	County Code as directed by the Federal Emergency Management Agency (FEMA) National Flood Insurance Program (NFIP).	Required for development in flood-prone areas as defined by FEMA.
County Air Quality District	Fugitive Dust Control Permit	Management of particulates generated by construction at the site is required; primarily typical best management practices (BMPs) are employed and would be documented in the permit application.	The Project will be required to include dust mitigation measures during construction.
City of Nogales, Arizona	Right of Way Permit	Local ordinance	The Project will be required to comply with local ordinances during construction and operation.
	General Plan Amendment	Arizona State Statutes	
	Zoning approval	Local ordinance	
	Conditional Use Permit	Local ordinance	
	Building Permit	Local ordinance	

6 Persons, Tribes, and Agencies Consulted

6.1 Federal Agencies

Federal agencies consulted for the Project include:

- USFS
- U.S. Border Patrol
- International Boundary and Water Commission (IBWC)
- DOE
- USACE
- USFWS

6.2 Tribes and Tribal Groups

Tribes and tribal organizations consulted for the Project include:

- Tohono O'odham Nation
- Pascua Yaqui Tribe

6.3 State Agencies and Officials

State agencies consulted for the Project include:

- AGFD
- State Historic Preservation Office
- ADOT

6.4 Local Utilities

Local utilities consulted for the Project include:

- UniSource Energy Services

6.5 Interest Groups

Interest groups consulted for the Project include:

- Sky Island Alliance
- Friends of the Tumacacori Highlands
- Sierra Club – Grand Canyon Chapter
- Friends of Santa Cruz River

- Center for Biological Diversity
- The Nature Conservancy
- Arizona Wilderness Coalition
- Tucson Audubon Society
- Coalition for Sonoran Desert Protection

7 Glossary and Acronyms/Abbreviations

10(j) area	an area where experimental populations of endangered or threatened species are introduced into the wild in a location that is geographically isolated from nonintroduced populations
AAC	Arizona Administrative Code
ACC	Arizona Corporation Commission
ACHP	Advisory Council on Historic Preservation
ADEQ	Arizona Department of Environmental Quality
ADOT	Arizona Department of Transportation
ADWR	Arizona Department of Water Resources
AGFD	Arizona Game and Fish Department
AM	amplitude modulation
amsl	above mean sea level
APDES	Arizona Pollution Discharge Elimination System
Applicant	Nogales Transmission, L.L.C.
ARS	Arizona Revised Statutes
ASM	Arizona State Museum
AZSITE	Arizona statewide cultural resources database
BA	Biological Assessment
bidirectional power flow	power flow in two opposite directions
BGEPA	Bald and Golden Eagle Protection Act
BMPs	best management practices
BRO	Boundary and Realty Office
Candidate/ Candidate species	species considered to be eligible for but not listed under the Endangered Species Act
CEC	Arizona Certificate of Environmental Compatibility
CEQ	Council on Environmental Quality
CH_4	methane
CO	carbon monoxide
CO_2	carbon dioxide

Committee/ Siting Committee	Arizona Power Plant and Transmission Line Siting Committee
compaction/soil compaction	when stress is applied to a soil that causes densification as air is removed from the soil
contractor	construction contractor
corona noise	noise caused by electrical discharge from high-voltage lines
CUP	Conditional Use Permit
current	a flow of electrical charge measured in amperes
CWA	Clean Water Act
dBA	A-weighted decibels, or loudness of sounds as perceived by the human ear
DC	direct current
DC interconnection	equipment that enables power to be transferred between the United States and Mexican power systems
DC tie	a common term for a direct current interconnection
DOE	U.S. Department of Energy
EA	Environmental Assessment
easement/ easement rights	legal permission to use someone else's land
ECOS-IPaC	U.S. Fish and Wildlife Service Environmental Conservation Online System – Information for Planning and Conservation system
EMF	electric and magnetic field
EO	Executive Order
EPA	U.S. Environmental Protection Agency
ephemeral stream	stream that flows only during or immediately after a rainstorm
ESA	Endangered Species Act
experimental nonessential population	population of a federally listed endangered species that has been reintroduced to an area but is not considered essential for overall survival of the species
FAA	Federal Aviation Administration
FCC	Federal Communications Commission
FEMA	Federal Emergency Management Agency
FM	frequency modulation
FONSI	Finding of No Significant Impact

fragmentation	the division of large sections of land into smaller sections
fugitive dust	dust generated from an open source rather than being discharged to the atmosphere in a confined flow stream
GHG	greenhouse gas
GWP	global warming potential
IBWC	International Boundary and Water Commission
HVDC	high-voltage direct current
intermittent stream	stream that flows only during certain times of the year from springs, runoff, or rain
kV	kilovolt
landowner	any property owner other than Nogales Transmission, L.L.C., or Tucson Electric Power
LLNB	lesser long-nosed bat (*e t teris ras ae*)
L_{max}	maximum allowable noise levels
MBTA	Migratory Bird Treaty Act
mG	milliGauss
MSGP	Multi-Sector General Permit
MVA	megavolt ampere
MW	megawatt
µg/m^3	micrograms per cubic meter
NAA	nonattainment area
NAAQS	National Ambient Air Quality Standards
National Register	National Register of Historic Places
NEPA	National Environmental Policy Act
NESC	National Electric Safety Code
NFIP	National Flood Insurance Program
NHD	National Hydrography Dataset
NHPA	National Historic Preservation Act
NLCD	National Land Cover Database
N_2O	nitrous oxide
NO_2	nitrogen dioxide
NOI	Notice of Intent

NOT	Notice of Termination
NPDES	National Pollutant Discharge Elimination System
NPL/Arizona National Plant Law	state law regulating the removal or transportation of protected native plants on both private and public lands
NRCS	Natural Resources Conservation Service
O_3	ozone
PAST	Professional Archaeological Services and Technologies
Pb	lead
PM	particulate matter
$PM_{2.5}$	particulate matter of particles less than 2.5 microns in diameter
PM_{10}	particulate matter of particles less than 10 microns in diameter
ppb	parts per billion
ppm	parts per million
prime farmland	land defined by the U.S. Department of Agriculture as having the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops
Project	Nogales Interconnection Project
revegetation	replanting native plants on ground disturbed by construction activities
ROD	Record of Decision
ROE	right-of-entry permission
Roosevelt Easement	a 60-foot-wide strip of land parallel and adjacent to the United States-Mexico border that was reserved to ensure its integrity by two Presidential Proclamations signed by President William McKinley and President Theodore Roosevelt in 1897 and 1907, respectively
Route Corridor	an approximately 250-foot-wide area centered on the Route Segments and the Gateway Substation area
ROW	right-of-way
sensitive species	species for which population viability is a concern
SF_6	sulfur hexaflouride
slip rate	rate at which two sides of a geologic fault are slipping relative to each other
slumping	mass movement of loosely consolidated sediments a short distance down slope
Species of Concern	species that are declining or appear to be in need of conservation
SO_2	sulfur dioxide

SR	State Route
staging area	area used for the storage of construction equipment and materials
stringing interval	Distance between pulling sites used during conductor stringing
Structure	transmission line structure or pole
Study Area	the area considered for location of Project facilities
subsidence	sinking or settling of the ground surface
SWPPP	Stormwater Pollution Prevention Plan
TCE	temporary construction easement
TCP	traditional cultural property
TEP	Tucson Electric Power
thyristors	a solid-state semiconductor device with four layers of alternating N- and P-type material; it acts exclusively as a bistable switch, conducting when the gate receives a current trigger, and continuing to conduct while the voltage across the device is not reversed (forward-biased)
TNW	traditional navigable water
UES	UniSource Energy Services
URS	URS Corporation
USACE	U.S. Army Corps of Engineers
USC	United States Code
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VEC	valued environmental component
voltage	force or pressure that causes the current to flow measured in units of volts or thousand volts
wash	intermittent streambed subject to flash flooding
WECC	Western Electricity Coordinating Council

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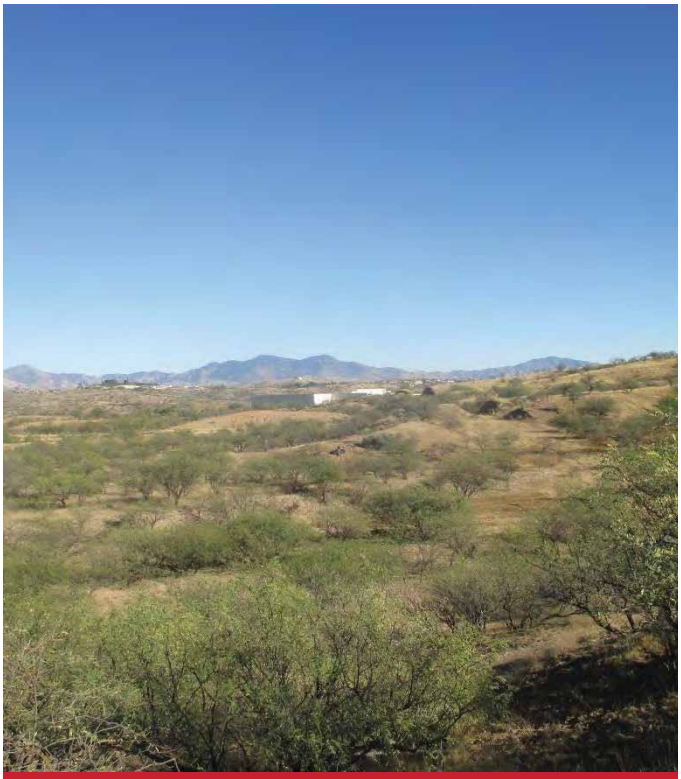
Appendix A: Biological Report



Biological Field Report for the Nogales Interconnection Project, Nogales, Santa Cruz County, Arizona

Nogales Interconnection Project

Hunt Power

Nogales, Santa Cruz County, Arizona

January 5, 2016

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Biological Field Report

Prepared for

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January 5, 2016

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Contents

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1 Project Summary

The Nogales Interconnection Project is a proposed 300 megawatt (MW) direct current (DC) interconnection, commonly known as a DC tie that would allow for an asynchronous interconnection between the electric grid in southern Arizona and the electric grid in the northwestern region of Mexico. The Project will be constructed in two phases. The first phase of the Project will include the components listed below and the converter capacity will be 150 MW. The second phase, to be constructed at a time that has not yet been determined, will expand the HVDC converter capacity to 300 MW within the proposed Gateway Substation.

The Project proposed by Hunt Power would support the reliability of the electrical system, including bidirectional power flow and voltage support, as well as emergency assistance, as needed, for the electric system both north and south of the U.S.-Mexico border. HDR was hired by Hunt Power to help with the study and permitting involved with the Nogales Interconnection Project. Part of that study included an assessment of biological resources in relation to the Project and applicable regulatory concerns in support of documentation to comply with the National Environmental Policy Act of 1969, as amended. Pre-field analysis revealed that the potential existed for four species of special concern to occur within the Project limits. A field survey was conducted on November 30 and December 1, 2015, to survey for the individual species that included the Pima pineapple cactus (*Coryphantha robustina* ssp. *robustina*), Santa Cruz beehive cactus (*Coryphantha recurvata*), supine bean (*Macroptilium supinum*), and agave species. Agave species were surveyed because of their potential as a forage resource for the lesser long-nosed bat (*Leptonycteris curasoae yerbabuenae*). During the field survey, Santa Cruz beehive cactus, agaves, and one potential supine bean were documented in the study area. No Pima pineapple cacti were found.

2 Introduction

The Nogales Interconnection Project has been proposed by Hunt Power to occur both north and west of the city of Nogales, Arizona. Nogales is a small city in southeastern Arizona and is the first populated area after crossing the U.S.-Mexico border on Interstate 19.

The Project would consist of three components:

1. A new 10- to 15-acre Gateway Substation, potentially located on land currently owned by Tucson Electric Power (TEP), where DC tie equipment for both phases would be located;
2. A new, approximately 3-mile, 138 kilovolt (kV) transmission line segment originating at UniSource Energy Services' Valencia Substation in Nogales, Arizona, and extending west and south to the new Gateway Substation

3. A new, approximately 2-mile, 230 kV transmission line segment extending south from the new Gateway Substation and across the U.S.-Mexico border to interconnect with a transmission line to be constructed by the Comisión Federal de Electricidad

Nogales is at the end of the Western Electricity Coordinating Council (WECC) grid and relies on the approximately 55-mile-long Vail to Valencia 138 kV transmission line for its power supply. The addition of the proposed Gateway Substation and connection to the electrical system in Sonora, Mexico, would provide an additional source of energy for the city of Nogales in the event of a transmission line outage or other problem on the WECC system (Hunt Power 2015).

A desktop study was initially conducted to determine the potential biological concerns in the study area. The U.S. Fish and Wildlife Service (USFWS) Environmental Online Conservation System (ECOS) – Information for Planning and Conservation (IPaC) system (Project Code: XJACG-X2GJB-FF7CN-JFOU3-JCWZH4; accessed on August 18, 2015) and the Arizona Game and Fish Department (AGFD) On-line Environmental Review Tool (Project ID: HGIS-02011; accessed on August 18, 2015) were used to identify plants, animals, and other environmental factors that may need special consideration in the study area. These tools identified numerous plants, animals, and environmental factors that could potentially occur in the study area. After analysis by an experienced HDR biologist, four species were identified with the potential to occur in the Project limits.

Biological field surveys were then performed in the study area to locate and document Pima pineapple cactus, Santa Cruz beehive cactus, supine bean, and agaves. Pima pineapple cactus, Santa Cruz beehive cactus, and supine bean have all been documented within 3 miles of the Project vicinity. The lesser long-nosed bat is an endangered species that uses agaves as a food source.

3 Regulatory Framework

3.1 Federal Endangered Species Act

The Endangered Species Act (ESA) of 1973 was enacted to provide a legal avenue to conserve endangered and threatened species and their habitat. It defines an endangered species as any species that is in danger of extinction throughout all or a significant portion of its range. The ESA makes it unlawful for anyone to “take” an endangered wildlife species; plants are protected under separate provisions of the ESA. To “take” means to “harass, harm, pursue, hunt, shoot, wound, trap, kill, capture, or collect, or attempt to engage in any such conduct.” To “harm” means actually killing or injuring wildlife and “may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering” (USFWS 2013a). Federally listed endangered plant species are provided protection on federal lands where it is illegal to collect or intentionally harm them; move them into, out of, or through the United States; involve in interstate or foreign commerce;

or damage, destroy, or move on private property in violation of any state law or regulation.

The lesser long-nosed bat and Pima pineapple cactus are listed as endangered under the ESA.

3.2 Migratory Bird Treaty Act

The Migratory Bird Treaty Act makes it illegal for anyone to pursue, hunt, take, capture, kill, attempt to take, capture or kill, possess, offer for sale, sell, offer to purchase, purchase, deliver for shipment, ship, cause to be shipped, deliver for transportation, transport, cause to be transported, carry, or cause to be carried by any means whatever, receive for shipment, transportation or carriage, or export, at any time, or in any manner, any migratory bird, or any part, nest, or egg of any such bird (USFWS 2015a).

The term “take” has a broad definition. Habitat destruction and alteration do not qualify as a “take” as long as these activities involve no loss to birds, eggs, or nests (Federal Highway Administration 2001). Birds protected under the Act include all common songbirds, waterfowl, shorebirds, hawks, owls, eagles, ravens, crows, native doves, swifts, martins, swallows, and others.

If construction on this Project occurs during the migratory bird breeding season, breeding birds may be affected by construction activities and measures to avoid a “take” would be required or a permit from USFWS may be necessary. The breeding season for most migratory birds in southern Arizona is from February through August.

3.3 Arizona Native Plant Law

Because so many rare and unusual native plants exist in Arizona, special protections for these plants are necessary. The Arizona Native Plant Law (NPL) protects many of Arizona’s native plants from indiscriminant removal and destruction (Arizona Department of Agriculture [ADA] 2015). All of Arizona’s native cacti, agaves, and many other desert native plants are protected by the Arizona NPL.

The Arizona NPL gives plants varying levels of protection based on their rarity or where they are found; sensitivity to environmental impacts; cultural, historical, and/or aesthetic value; and other factors that may affect a native plant. The Pima pineapple cactus and Santa Cruz beehive cactus are listed as highly safeguarded species by the Arizona NPL. Highly safeguarded plants are given exclusive protections. Permits for collecting or moving highly safeguarded native plants are issued only for scientific or impending destruction purposes (ADA 2015). This category includes those species of native plants and parts of plants, including the seeds and fruit, whose prospects for survival in Arizona are in jeopardy, or that are in danger of extinction throughout all or a significant portion of their ranges, and those native plants that are likely within the foreseeable future to become jeopardized or in danger of extinction throughout all or a significant portion of their ranges. This category also includes

those plants resident to Arizona and listed as endangered, threatened, or category 1 in the ESA (P.L. 93–205; 87 Stat. 884; 16 United States Code sections 1531 et seq.), as amended, and any regulations adopted under that act (Arizona State Legislature 3-903).

The supine bean is listed by the Arizona NPL as a salvage restricted plant. Salvage restricted plants require the use of salvage permits, tags, and seals before collection can occur. This category includes those native plants that are not included in the highly safeguarded category but are nevertheless subject to a high potential for damage by theft or vandalism.

4 Species Information

4.1 Pima pineapple cactus

The Pima pineapple cactus (PPC) species name, *robustispina*, is based on the species' stout and thick spines (Breslin et al. 2015). The PPC is a small hemispherical cactus measuring 4 to 18 inches tall and 3 to 7 inches in diameter that can grow singly or in clumps (USFWS 1993). The stem is large with pronounced tubercles (projections from the stem of the plant) that have grooves on the upper side. It usually grows as a solitary plant but often has clusters of smaller plants "pups" at the base of a larger plant. The spines occur in clusters, called areoles, located at the tip of each tubercle. Each areole has between 7 and 20 straw-colored radial spines and 1 to 4 (usually 1) pronounced central spines that are rigid and thick. Flowering appears to depend on monsoonal moisture and usually occurs in late June to as late as mid-August (Breslin et al. 2015). It produces yellow flowers during the summer monsoon (July and August) and is an obligate outcrosser, pollinated primarily by cactus bees (*Diadasia rinconis*) (Roller 1996; McDonald and McPherson 2005). Fruits are elongated greenish berries with a slimy internal liquid surrounding the seeds when fully ripe (Breslin et al. 2015).

The PPC occurs in Pima and Santa Cruz Counties, Arizona, and in north-central Sonora, Mexico (Baker and Butterworth 2013). Within Arizona, the range of the PPC extends from the Santa Rita Mountains west to the Baboquivari Mountains and north to Tucson (USFWS 2007). This cactus occurs at low densities in semi-desert grassland and Sonoran desert-scrub in flat areas on alluvial fans and hilltops (USFWS 1993). Occupied sites are characterized by silty to gravelly alluvial soils. Associated plant species include desert zinnia (*Zinnia acerosa*), snakeweed (*Gutierrezia sarothrae*), burroweed (*Isocoma tenuisecta*), buckwheat (*Eriogonum* spp.), white-thorn acacia (*Acacia constricta*), creosotebush (*Larrea tridentata*), chain-fruit cholla (*Cylinropuntia fulgida*), and velvet mesquite (*Prosopis velutina*) (USFWS 1993, 2007).

The primary threat to the subspecies is habitat loss resulting from residential and commercial development (USFWS 2007). Mining, agriculture, off-road recreation, and road construction have also contributed to losses. Up to 75 percent of the cactus' historical range has been altered by the introduction of nonnatives grasses

including Lehmann lovegrass (*Eragrostis lehmanniana*), Boer lovegrass (*E curvula*), and buffelgrass (*Pennisetum ciliare*), resulting in a regime of more frequent and intense fires as well as increased competition for resources such as light, nutrients, and water (Roller 1996; USFWS 1993, 2007).

Pima pineapple cactus (***Coryphantha robustispina* ssp. *robustispina***)

4.2 Santa Cruz beehive cactus

The Santa Cruz beehive cactus species name, *recurvata*, is based on this plant's distinctive downward-curving central spine. The Santa Cruz beehive cactus ranges from 4 to 8 inches high by 4 to 7 inches in diameter and is globular to cylindrical in shape (Breslin et al. 2015). It is a low-growing plant that starts as an individual stem and grows into large clumps up to 30 inches wide (Breslin et al. 2015). The spines are straw-colored or tan and turn gray in old age. Spines are located in clusters, called areoles, and have between 12 and 20 radial spines per areole, and 1 to 2 central spines that have a distinctive downward projection. Flowers are small for the overall size of the plant and range from 0.5 to 1 inch in length; flowering is triggered by monsoonal moisture. They appear in summer and are arranged in a ring around the upper portion of the stem. The fruit is a greenish, elongated berry about 0.5 inch long and 0.12 inch wide that ripens between November and January (Breslin et al. 2015).

The Santa Cruz beehive cactus is found in mountainous regions of Santa Cruz County, Arizona. This is the only place where this plant occurs in the United States,

but it does occur to the south into Sonora, Mexico (Breslin et al. 2015). It occurs on alluvial soils in valleys and foothills in desert grassland and oak woodland on rocky hillsides with good grass cover (AGFD 2001). Associated plant species include beargrass (*olina* sp.), side-oats grama (*outeloua curtipendula*), bluestem (*Andropogon* sp.), western coral bean (*Erythrina flabelliformis*), prickly pear (*puntia* sp.), hopbush (*Dodonaea viscosa*), and rainbow cactus (*Echinocereus rigidissimus*) (AGFD 2001).

Threats to the species include collection and degradation of habitat attributable to livestock grazing and road construction and maintenance (AGFD 2001).

Santa Cruz beehive cactus (***Coryphantha r ur ata***)

4.3 Supine bean

The supine bean is a perennial herb known to occur in grass woodlands in Santa Cruz and Pima Counties, Arizona; also, there are two historical records in Sonora and Nayarit, Mexico (Arizona Rare Plant Committee [ARPC] 2000; Toolin 1982). It has prostrate, creeping stems arising from an elliptical tuber that ranges in size from 3 to 14 cm (ARPC 2000). The leaves are opposite with 3 lanceolate leaflets that taper from the base to the tip; each leaflet ranges from 0.6 to 1.2 cm wide by 3 to 8 cm long. It has an unusual breeding syndrome of being able to produce flowers and seeds both above and below ground. Aboveground flowers are salmon-colored with keeled petals that are up to 11 mm long and born on an erect, unbranched inflorescence that originates at the base of the leaf petioles. Seed pods are 8 to

15 mm, oblong, and usually contain a single seed (ARPC 2000). Underground flowers are self-fertilizing, yellow with salmon coloration, and 5 to 6 mm long; they are born on branched inflorescences that grow under leaf litter or under rocks (ARPC 2000). The supine bean produces flowers and fruits after the onset of summer rains in July. The species is typically associated with grama grasses (*outeloua* spp.) (Desert Botanical Garden 1987; NatureServe 2015). According to the species information, this species is very difficult to see in the field unless they are flowering because the leaves are narrow and look similar to the inflorescences of grama grasses (NatureServe 2015).

The primary threat to this species is development and possibly overgrazing by cattle (NatureServe 2015).

Photograph taken by Sue Rutman (USFWS)

Supine bean (***a ropti iu supinu***)

4.4 Lesser long-nosed bat

The lesser long-nosed bat (LLNB) was listed as endangered in 1988 (USFWS 1988). In March 1997, the LLNB Recovery Plan was completed. In 2013, an initiation of status review to down-list the LLNB from endangered to threated was published in the *ederal egister* (USFWS 2013b). The species, however, remains listed as endangered. No critical habitat has been designated for this species.

The LLNB is a medium-sized bat with a wingspan of 14 to 16 inches and an average weight of 8 ounces. Their dense fur is a pale-gray above and brown below. Their

snout is elongated with a triangular nose-leaf. The LLNB has large eyes and small ears compared with other bats in Arizona (AGFD 2011).

Historically, the LLNB ranged from south-central and southeastern Arizona and southwestern New Mexico through the lowland deserts of Mexico and as far south as El Salvador. While their current range is similar, numbers of individuals have decreased dramatically. LLNBs arrive in Arizona from central Mexico in April and move from the southwestern part of the state to the southeastern part over the summer (USFWS 2015b). The species is found in southern Arizona from the Picacho Mountains southwest to the Agua Dulce Mountains and southeast to the Galiuro and Chiricahua Mountains. Fewer individuals are found outside of this range (AGFD 2011).

The LLNB seasonally occurs in Arizona from April to September in desertscrub and grassland/oak transition habitat where it feeds on nectar and pollen from the flowers of columnar cacti and agave. An LLNB female arrives in Arizona pregnant and joins a maternity colony with thousands of individuals. Each female births one pup in May; by July the young can fly. By the end of July the maternity colony breaks up and disperses. Males form separate and smaller colonies (AGFD 2011).

The LLNB typically feeds on columnar cacti during the early summer and agaves from late summer into early fall. From April through July, the LLNB can be found at elevations under 3,500 feet above mean sea level and from July through September their range increases to 5,500 feet above mean sea level to feed on agave until they fly south (AGFD 2011). Roost sites typically include caves, mines, and abandoned buildings (USFWS 2001).

Photograph taken by Merlin D. Tuttle (Bat Conservation International)

Lesser long-nosed bat (***ptony t ris urasoa y rbabu na***)

5 Study Area

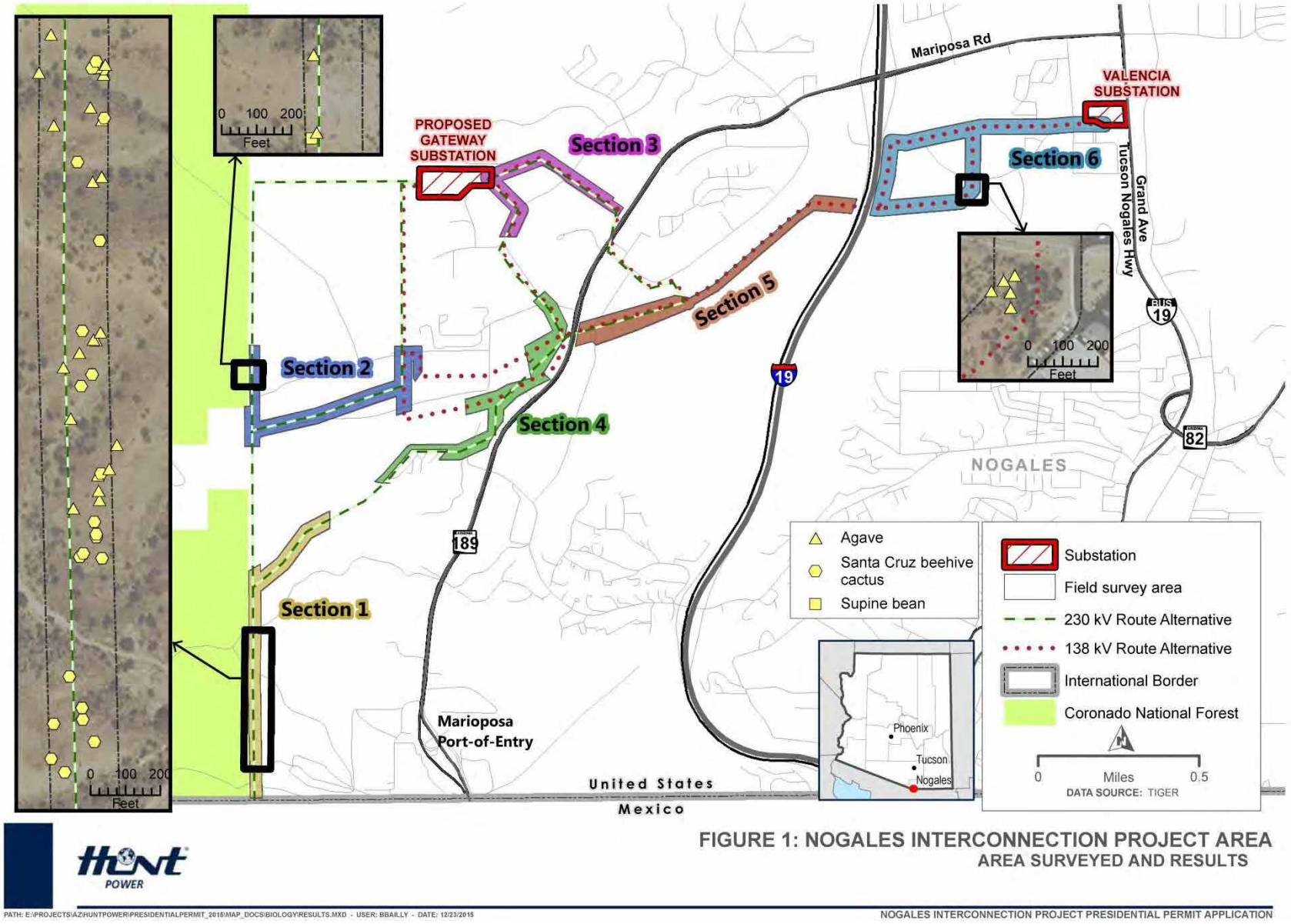
Three main types of vegetation communities are found in the Project area: Madrean Evergreen Woodland, Apacherian-Chihuahuan Mesquite Upland Scrub, and Apacherian-Chihuahuan Piedmont Semidesert Grassland and Steppe (AGFD 2015). Madrean Evergreen Woodland has 25 to 40 percent shrub or tree land coverage and is dominated by Emory oak (*uercus emoryi*) and/or other evergreen oaks (*uercus* sp.). Apacherian-Chihuahuan Mesquite Upland Scrub has 10 to 15 percent shrub or tree land coverage and Apacherian-Chihuahuan Piedmont Semidesert Grassland and Steppe has less than 10 to 15 percent shrub or tree land coverage (Malusa 2015). Less disturbed vegetation is in the westernmost section of the Project area where, generally, the 230 kV transmission line alternatives have been proposed. Vegetation along the 138 kV alternatives and substations has been disturbed by development.

A diverse community of trees, shrubs, succulents, forbs, and grasses is found in these vegetation communities. A greater density and increase in plant species composition is found along the ephemeral drainages. Common trees, shrubs, and succulents include one seed juniper (*uniperus monocarpa*), alligator juniper (*uniperus deppeana*), Mexican pinyon (*Pinus cembroides*), mesquite (*Prosopis* sp.), acacia (*Acacia* sp.), desert broom (*accharis sarothroides*), beargrass, ocotillo (*ou uieria splendens*), agave (*Agave* sp.), yucca (*ucca* sp.), sotol (*Dasylirion heeleri*), prickly pear, and various other cacti. Common native grasses include grama, tobosa (*Pleuraphis* sp.), muhly (*uhlenbergia* sp.), and threeawn (*Aristida* sp.) (Brown 1994). Invasive grasses observed in the area include Lehman's lovegrass (*Eragrostis lehmanniana*), Johnson grass (*orghum halepense*), buffelgrass, and Bermudagrass (*Cynodon dactylon*).

The Project area is shown in Figure 1. The landscape in the Project area varies from nearly undisturbed natural habitat to cleared parcels with warehouses. To describe the Project area more accurately, the Project area shown in Figure 1 has been divided into separate sections based on similar characteristics. Each section that was surveyed is highlighted on the figure.

Sections 1 and 2 border the Coronado National Forest. The landscape in section 1 is characterized by northeast-to-southwest trending dissected ridges with moderately steep slopes on a predominantly loose and rocky substrate. Ephemeral washes are between these ridges. The tree land coverage in this area is consistent with Apacherian-Chihuahuan Mesquite Upland Scrub and Apacherian-Chihuahuan Piedmont Semidesert Grassland and Steppe. Vegetation in this area includes oak trees growing among various species of grass. Succulents that are present include agave, sotol, beargrass, Santa Cruz beehive cactus, Arizona rainbow hedgehog cactus (*Echinocereus rigidissimus*), pancake pincushion cactus (*ammillaria heyderi* ssp. *macdougalii*), and barrel cactus (*erocactus* sp.). The ground surface in the eastern half of section 2 has been cleared or disturbed with some regrowth that is predominantly desert broom. Section 3 is similar to section 1 without as much elevation change.

Figure 1. Area surveyed and results



Madrean Evergreen Woodland (on left) transitioning to Apacherian-Chihuahuan Piedmont Semidesert Grassland and Steppe (on right); typical habitat found in section 1

Looking east from the top of a rocky hill across the Project area in section 2; vegetation in the Project area is predominantly desert broom

Moving east, the Project area becomes more developed. Warehouses and other cleared areas are along both sides of Mariposa Canyon Wash in section 4 and on the northwestern side of Mariposa Canyon Wash in section 5. Several concrete drainage aprons are in these two sections that allow runoff from surrounding areas to reach Mariposa Canyon Wash. A natural gas pipeline is present along a southeastern section of Mariposa Canyon Wash between North Mariposa Road and Interstate 19 in section 5.

Sections 4 and 5 also parallel Mariposa Canyon Wash. Vegetation along this wash and within sections 4 and 5 includes some trees, shrubs such as desert broom and acacia, and grasses that range from a dense land coverage to sparse with open, rocky soil.

Looking east at Mariposa Canyon Wash in section 5 of the Project area

Drainage apron leading to Mariposa Canyon Wash in section 5

Natural gas pipeline on the southeastern side of Mariposa Canyon Wash in section 5

Section 6 is in the northeastern section of the Project area. This area has some small, rolling hills and is dominated by grasses and shrubs on an open, gravelly soil. The dominant vegetation is mesquite, acacia, desert broom, and grasses. A small retention basin with water is west of the Valencia Substation.

Landscape in Section 6

Small retention basin west of the Valencia Substation in Project area

6 Methods

The Project area was surveyed on November 30 and December 1, 2015, for agaves, Pima pineapple cactus, Santa Cruz beehive cactus, and supine bean by two HDR biologists. Referring to Figure 1, the colored sections represent the 250-foot-wide corridors within which the proposed 230 kV and 138 kV line alternatives could be located and where biological surveys were performed.

Biological surveys were performed after dividing the 250-foot-wide survey area into four approximately 65-foot-wide transects. The 65-foot-wide transects were then walked in a zigzag pattern throughout the survey area with the purpose of searching for the study species. When a study species was found, the location and notes pertaining to the age, health, and number of young (if present) were recorded and a photograph was taken. A Trimble Nomad Global Positioning System device with ArcPad 10 software was used to record data. Photographs were taken with a digital camera and documented in a paper notebook.

7 Results

Figure 1 shows the locations of the study species documented during field surveys. A total of 53 plants were recorded during field surveys: 27 agaves, 25 Santa Cruz beehive cacti, and 1 potential supine bean. No Pima pineapple cacti were found. Referring to Figure 1, 45 points were recorded in section 1, 3 were recorded in section 2, and 5 were recorded in section 6. No study species were recorded in

sections 3, 4, or 5. The potential supine bean was recorded in section 2; however, species identification was not confirmed. The 5 points recorded in section 6 were a cluster of agaves adjacent to a Home Depot store.

Unconfirmed supine bean found in section 2

8 Conclusions

Protected native plants were documented within the study area. Most of the study species as well as the undisturbed and undeveloped habitat are in the southwestern section of the Project area. Depending on impacts to the study species, it may be necessary to consult with USFWS and notify ADA prior to Project construction. A Biological Assessment may be needed if impacts to agaves, a lesser-long-nosed bat forage species, were to occur as result of the Project.

Numerous other protected native plants including cacti, agaves, yuccas, and various trees were observed during field surveys and will require coordination with ADA if impacts to plants cannot be avoided.

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Attachment A - USFWS and AGFD Reports

My project

IPaC Trust Resource Report

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US Fish & Wildlife Service

IPaC Trust Resource Report

Project Description

NAME

My project

PROJECT CODE

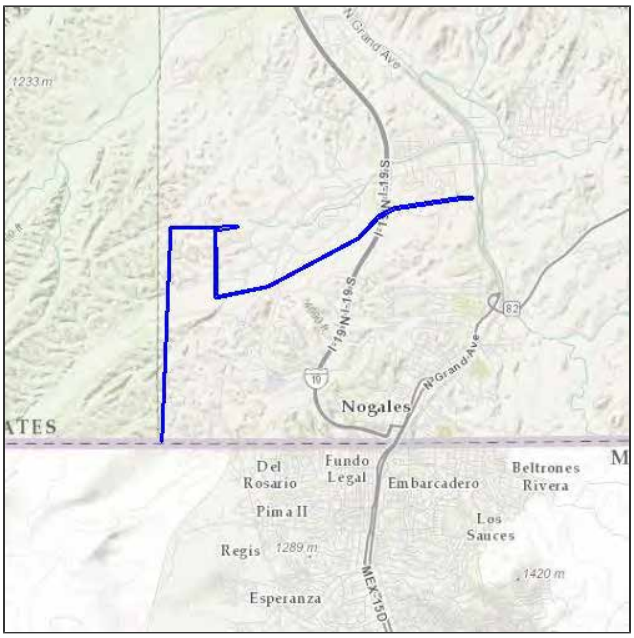
XJACG-X2GJB-FF7CN-JFOU3-JCWZH4

LOCATION

Santa Cruz County, Arizona

DESCRIPTION

No description provided



U.S. Fish & Wildlife Contact Information

Species in this report are managed by:

Arizona Ecological Services Field Office
2321 West Royal Palm Road, Suite 103
Phoenix, AZ 85021-4915
(602) 242-0210

Endangered Species

Proposed, candidate, threatened, and endangered species that are managed by the Endangered Species Program and should be considered as part of an effect analysis for this project.

This unofficial species list is for informational purposes only and does not fulfill the requirements under Section 7 of the Endangered Species Act, which states that Federal agencies are required to "request of the Secretary of Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action." This requirement applies to projects which are conducted, permitted or licensed by any Federal agency.

A letter from the local office and a species list which fulfills this requirement can be obtained by returning to this project on the IPaC website and requesting an Official Species List from the regulatory documents section.

Amphibians

Arizona Treefrog Hyla wrightorum — **Candidate**

CRITICAL HABITAT
No critical habitat has been designated for this species.

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=D03S

Chiricahua Leopard Frog Rana chiricahuensis — **Threatened**

CRITICAL HABITAT
There is **final** critical habitat designated for this species.

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=D02F

Birds

Southwestern Willow Flycatcher Empidonax traillii extimus — **Endangered**

CRITICAL HABITAT
There is **final** critical habitat designated for this species.

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B094

Sprague's Pipit Anthus spragueii — **Candidate**

CRITICAL HABITAT
No critical habitat has been designated for this species.

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0GD

Yellow-billed Cuckoo Coccyzus americanus — **Threatened**

CRITICAL HABITAT
There is **proposed** critical habitat designated for this species.

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B06R

Fishes

Gila Topminnow (incl. Yaqui) Poeciliopsis occidentalis **Endangered**

CRITICAL HABITAT
No critical habitat has been designated for this species.

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=E00C

Flowering Plants

Pima Pineapple Cactus Coryphantha scheeri var. robustispina **Endangered**

CRITICAL HABITAT
No critical habitat has been designated for this species.

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=Q27M

Insects

Stephan's Riffle Beetle Heterelmis stephani **Candidate**

CRITICAL HABITAT
No critical habitat has been designated for this species.

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=I0CB

Mammals

Jaguar Panthera onca **Endangered**

CRITICAL HABITAT
There is **final** critical habitat designated for this species.

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=A040

Lesser Long-nosed Bat Leptonycteris curasoae yerbabuenae **Endangered**

CRITICAL HABITAT
No critical habitat has been designated for this species.

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=A0AD

Ocelot Leopardus (=Felis) pardalis **Endangered**

CRITICAL HABITAT
No critical habitat has been designated for this species.

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=A084

Sonoran Pronghorn Antilocapra americana sonoriensis **Endangered**

CRITICAL HABITAT
No critical habitat has been designated for this species.

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=A009

Reptiles

Northern Mexican Gartersnake Thamnophis eques megalops **Threatened**

CRITICAL HABITAT
There is **proposed** critical habitat designated for this species.

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=C04Q

Snails

Huachuca Springsnail Pyrgulopsis thompsoni **Candidate**

CRITICAL HABITAT

No critical habitat has been designated for this species.

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=G05C

Critical Habitats

Potential effects to critical habitat(s) within the project area must be analyzed along with the endangered species themselves.

There is no critical habitat within this project area

Migratory Birds

Birds are protected by the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act.

Any activity which results in the take of migratory birds or eagles is prohibited unless authorized by the U.S. Fish and Wildlife Service (1). There are no provisions for allowing the take of migratory birds that are unintentionally killed or injured.

You are responsible for complying with the appropriate regulations for the protection of birds as part of this project. This involves analyzing potential impacts and implementing appropriate conservation measures for all project activities.

Baird's Sparrow Ammodramus bairdii — **Bird of conservation concern**
Season: Wintering
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B09B

Bell's Vireo Vireo bellii — **Bird of conservation concern**
Season: Breeding

Bendire's Thrasher Toxostoma bendirei — **Bird of conservation concern**
Year-round

Black-chinned Sparrow Spizella atrogularis — **Bird of conservation concern**
Season: Wintering

Black-throated Gray Warbler Dendroica nigrescens — **Bird of conservation concern**
Season: Breeding

Brewer's Sparrow Spizella breweri — **Bird of conservation concern**
Season: Wintering
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0HA

Burrowing Owl Athene cunicularia — **Bird of conservation concern**
Year-round

Canyon Towhee Pipilo fuscus — **Bird of conservation concern**
Year-round

Common Black-hawk Buteogallus anthracinus — **Bird of conservation concern**
Season: Breeding

Elegant Trogon Trogon elegans — **Bird of conservation concern**
Year-round

Elf Owl Micrathene whitneyi — **Bird of conservation concern**
Season: Breeding
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0GV

Gilded Flicker Colaptes chrysoides — **Bird of conservation concern**
Year-round
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0EG

Golden Eagle Aquila chrysaetos — **Bird of conservation concern**
Year-round
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0DV

Grasshopper Sparrow Ammodramus savannarum ammolegus — **Bird of conservation concern**
Year-round

Lark Bunting Calamospiza melanocorys — **Bird of conservation concern**
Season: Wintering

Loggerhead Shrike Lanius ludovicianus — **Bird of conservation concern**
Year-round
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0FY

Lucy's Warbler Vermivora luciae — **Bird of conservation concern**
Season: Breeding
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0DL

Mccown's Longspur Calcarius mccownii — **Bird of conservation concern**
Season: Wintering
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0HB

Mountain Plover Charadrius montanus — **Bird of conservation concern**
Season: Wintering
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B078

Northern Beardless-tyrannulet Camptostoma imberbe — **Bird of conservation concern**
Season: Breeding

Peregrine Falcon Falco peregrinus — **Bird of conservation concern**
Year-round
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0FU

Red-faced Warbler Cardellina rubrifrons — **Bird of conservation concern**
Season: Breeding

Rose-throated Becard Pachyramphus aglaiae — **Bird of conservation concern**
Season: Breeding

Rufous-winged Sparrow Aimophila carpalis — **Bird of conservation concern**
Year-round

Sonoran Yellow Warbler Dendroica petechia ssp. sonorana — **Bird of conservation concern**
Season: Breeding
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0F7

Sprague's Pipit Anthus spragueii — **Bird of conservation concern**
Season: Wintering
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0GD

Swainson's Hawk Buteo swainsoni — **Bird of conservation concern**
Season: Breeding
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B070

Varied Bunting Passerina versicolor — **Bird of conservation concern**
Season: Breeding

Williamson's Sapsucker Sphyrapicus thyroideus — **Bird of conservation concern**
Season: Wintering
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0FX

Phainopepla phainopepla nitens — **Bird of conservation concern**
Year-round
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0E6

Refuges

Any activity proposed on National Wildlife Refuge lands must undergo a 'Compatibility Determination' conducted by the Refuge. If your project overlaps or otherwise impacts a Refuge, please contact that Refuge to discuss the authorization process.

There are no refuges within this project area

Wetlands

Impacts to NWI wetlands and other aquatic habitats from your project may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal Statutes.

Project proponents should discuss the relationship of these requirements to their project with the Regulatory Program of the appropriate U.S. Army Corps of Engineers District.

DATA LIMITATIONS

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

DATA EXCLUSIONS

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

DATA PRECAUTIONS

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

There are no wetlands identified in this project area

Arizona Environmental Online Review Tool Report

Arizona Game and Fish Department Mission
To conserve Arizona's diverse wildlife resources and manage for safe, compatible outdoor recreation opportunities for current and future generations.

Project Name:

Hunt Power

Project Description:

The Nogales Interconnection Project (Project) is a proposed 150-megawatt (MW) direct current (DC) interconnection, commonly known as a DC tie, which will allow for an asynchronous interconnection between the electric grid in southern Arizona and the electric grid in the northwest region of Mexico. The Project will consist of three components: 1. A new 10-15 acre Gateway Substation on land currently owned by Tucson Electric Power (TEP), where DC tie equipment would be located. 2. A new, approximately 3-mile, 138-kilovolt (kV) transmission line segment originating at UniSource Energy Services' (UES') Valencia Substation in Nogales, AZ, and extending west and south to the new Gateway Substation. 3. A new, approximately 2-mile, 230-kilovolt (kV) transmission line segment extending south from the new Gateway Substation and across the U.S.-Mexico border to interconnect with a transmission line to be constructed by the Comisión Federal de Electricidad (CFE).

Project Type:

Energy Storage/Production/Transfer, Energy Transfer, Power line/electric line (new)

Contact Person:

Joseph Chernek

Organization:

HDR Engineering

On Behalf Of:

CONSULTING

Project ID:

HGIS-02011

Please review the entire report for project type and/or species recommendations for the location information entered. Please retain a copy for future reference.

Disclaimer:

1. This Environmental Review is based on the project study area that was entered. The report must be updated if the project study area, location, or the type of project changes.
2. This is a preliminary environmental screening tool. It is not a substitute for the potential knowledge gained by having a biologist conduct a field survey of the project area. This review is also not intended to replace environmental consultation (including federal consultation under the Endangered Species Act), land use permitting, or the Departments review of site-specific projects.
3. The Departments Heritage Data Management System (HDMS) data is not intended to include potential distribution of special status species. Arizona is large and diverse with plants, animals, and environmental conditions that are ever changing. Consequently, many areas may contain species that biologists do not know about or species previously noted in a particular area may no longer occur there. HDMS data contains information about species occurrences that have actually been reported to the Department. Not all of Arizona has been surveyed for special status species, and surveys that have been conducted have varied greatly in scope and intensity. Such surveys may reveal previously undocumented population of species of special concern.
4. HabiMap Arizona data, specifically Species of Greatest Conservation Need (SGCN) under our State Wildlife Action Plan (SWAP) and Species of Economic and Recreational Importance (SERI), represent potential species distribution models for the State of Arizona which are subject to ongoing change, modification and refinement. The status of a wildlife resource can change quickly, and the availability of new data will necessitate a refined assessment.

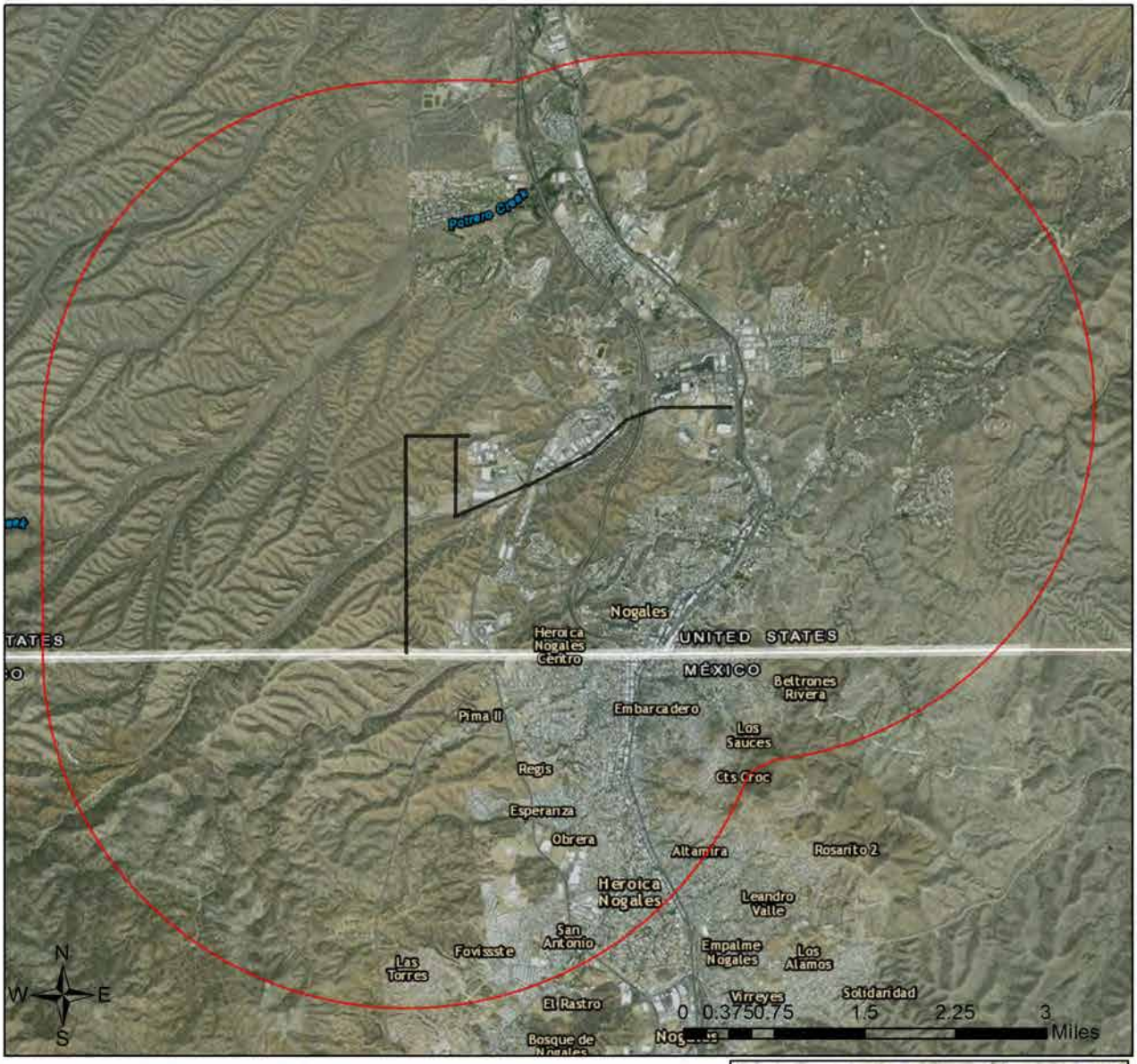
Locations Accuracy Disclaimer:
Project locations are assumed to be both precise and accurate for the purposes of environmental review. The creator/owner of the Project Review Report is solely responsible for the project location and thus the correctness of the Project Review Report content.

Recommendations Disclaimer:

1. The Department is interested in the conservation of all fish and wildlife resources, including those species listed in this report and those that may have not been documented within the project vicinity as well as other game and nongame wildlife.
2. Recommendations have been made by the Department, under authority of Arizona Revised Statutes Title 5 (Amusements and Sports), 17 (Game and Fish), and 28 (Transportation).
3. Potential impacts to fish and wildlife resources may be minimized or avoided by the recommendations generated from information submitted for your proposed project. These recommendations are preliminary in scope, designed to provide early considerations on all species of wildlife.
4. Making this information directly available does not substitute for the Department's review of project proposals, and should not decrease our opportunity to review and evaluate additional project information and/or new project proposals.
5. Further coordination with the Department requires the submittal of this Environmental Review Report with a cover letter and project plans or documentation that includes project narrative, acreage to be impacted, how construction or project activity(s) are to be accomplished, and project locality information (including site map). Once AGFD had received the information, please allow 30 days for completion of project reviews. Send requests to:
   Project Evaluation Program, Habitat Branch
   Arizona Game and Fish Department
   5000 West Carefree Highway
   Phoenix, Arizona 85086-5000
   Phone Number: (623) 236-7600
   Fax Number: (623) 236-7366
   Or
   PEP@azgfd.gov
6. Coordination may also be necessary under the National Environmental Policy Act (NEPA) and/or Endangered Species Act (ESA). Site specific recommendations may be proposed during further NEPA/ESA analysis or through coordination with affected agencies

Hunt Power

Aerial Image Basemap With Locator Map



Project Boundary

Buffered Project Boundary

Project Size (acres): 38.04

Lat/Long (DD): 31.3501 / -110.9686

County(s): Santa Cruz

AGFD Region(s): Tucson

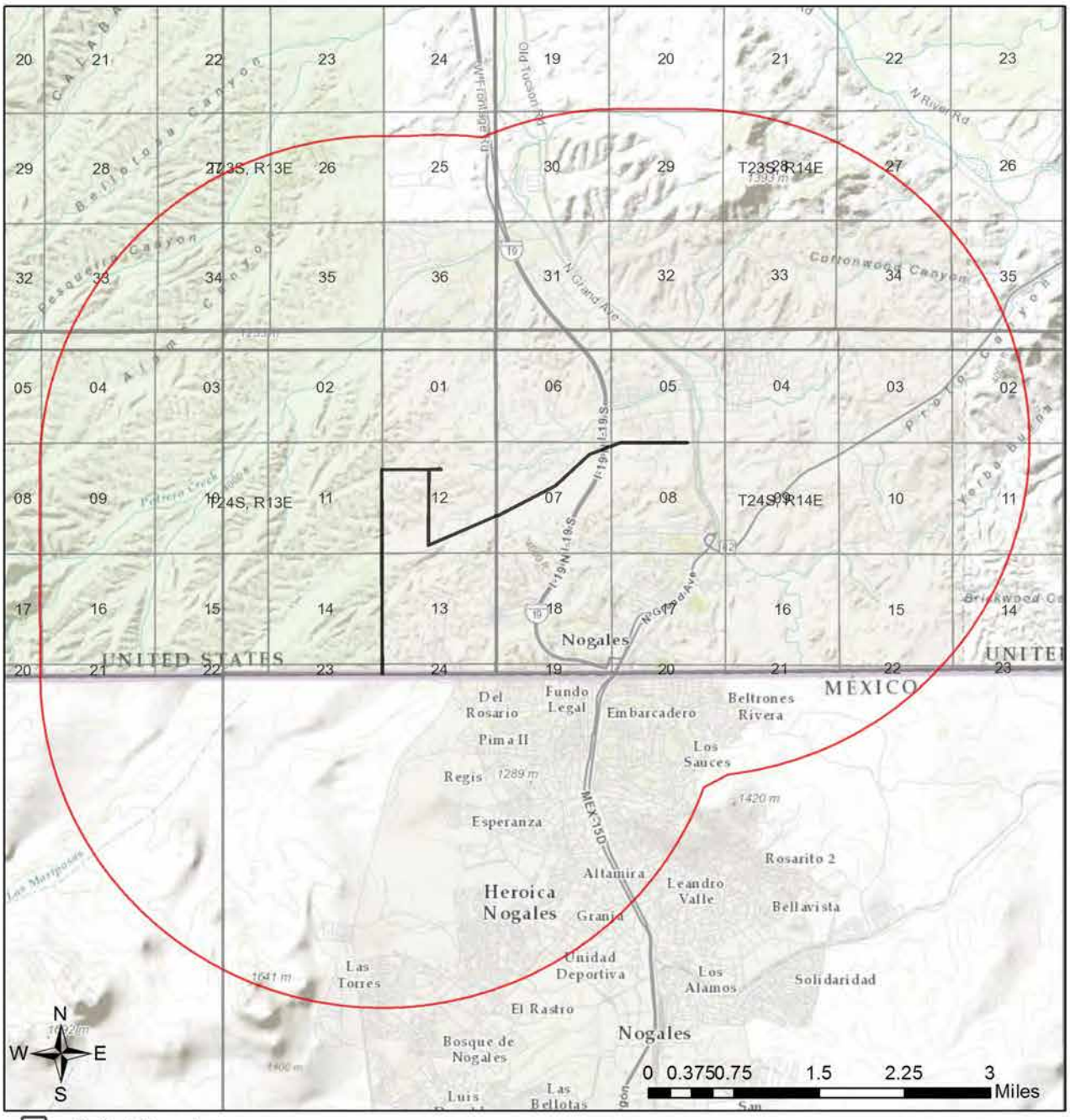
Township/Range(s): T24S, R14E; T24S, R13E

USGS Quad(s): NOGALES

Service Layer Credits: Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong),

Hunt Power

Web Map As Submitted By User



- Project Boundary
- Buffered Project Boundary
- Quadrangles
- Sections
- Townships

Project Size (acres): 38.04

Lat/Long (DD): 31.3501 / -110.9686

County(s): Santa Cruz

AGFD Region(s): Tucson

Township/Range(s): T24S, R14E; T24S, R13E

USGS Quad(s): NOGALES

Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

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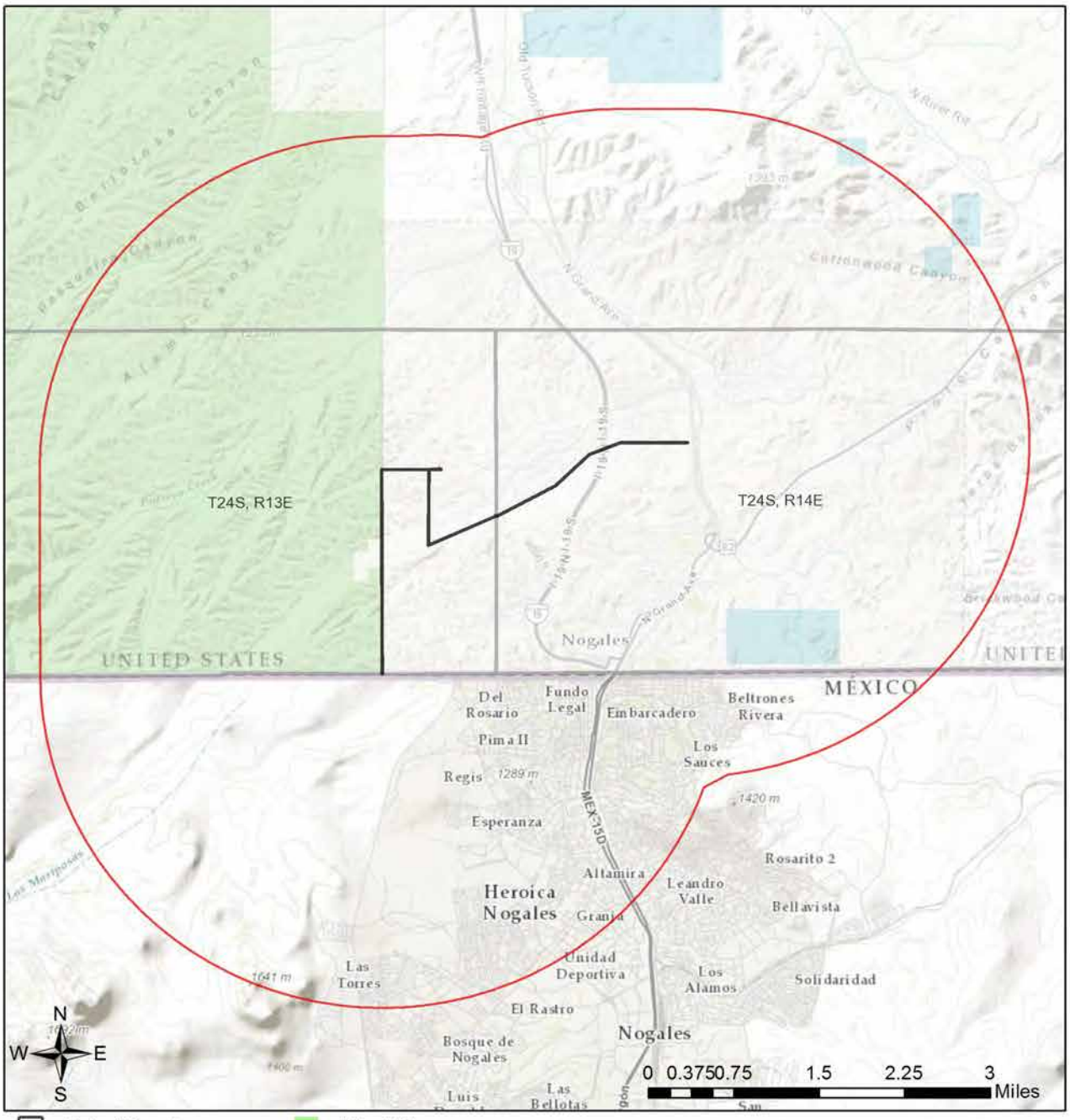
Topo Basemap With Township/Ranges and Land Ownership



- Project Boundary
- Buffered Project Boundary
- Township/Ranges
- AZ Game and Fish Dept.
- BLM
- BOR
- Indian Res.
- Military
- Mixed/Other
- National Park/Mon.
- Private
- State and Regional Parks
- State Trust
- US Forest Service
- Wildlife Area/Refuge

Project Size (acres): 38.04

Lat/Long (DD): 31.3501 / -110.9686

County(s): Santa Cruz

AGFD Region(s): Tucson

Township/Range(s): T24S, R14E; T24S, R13E

USGS Quad(s): NOGALES

Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Special Status Species and Special Areas Documented within 3 Miles of Project Vicinity

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
Agosia chrysogaster chrysogaster	Gila Longfin Dace	SC		S		1B
Amsonia grandiflora	Large-flowered Blue Star	SC	S			
Antilocapra americana sonoriensis	10J area for Sonoran Pronghorn	LE,XN				
Aspidoscelis stictogramma	Giant Spotted Whiptail	SC	S			1B
Buteo plagiatus	Gray Hawk	SC				
CH for Strix occidentalis lucida	Mexican spotted owl Designated Critical Habitat					
Camptostoma imberbe	Northern Beardless-Tyrannulet		S			1B
Canis lupus baileyi	10J area Zone 2 for Mexican gray wolf	LE,XN				
Catostomus clarkii	Desert Sucker	SC	S	S		1B
Coccyzus americanus	Yellow-billed Cuckoo (Western DPS)	LT	S			1A
Coryphantha recurvata	Santa Cruz Beehive Cactus		S		HS	
Coryphantha scheeri var. robustispina	Pima Pineapple Cactus	LE			HS	
Gyalopion quadrangulare	Thornscrub Hook-nosed Snake		S			1B
Macroptilium supinum	Supine Bean	SC	S		SR	
Santa Rita - Tumacacori Linkage Design	Wildlife Corridor					

Note: Status code definitions can be found at http://www.azgfd.gov/w_c/edits/hdms_status_definitions.shtml.

Species of Greatest Conservation Need
Predicted within Project Vicinity based on Predicted Range Models

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
Agosia chrysogaster	Longfin Dace	SC		S		1B
Aix sponsa	Wood Duck					1B
Amazilia violiceps	Violet-crowned Hummingbird		S			1B
Ammodramus savannarum perpallidus	Western Grasshopper Sparrow					1B
Ammospermophilus harrisii	Harris' Antelope Squirrel					1B
Amphispiza quinquestriata	Five-striped Sparrow					1B
Anthus spragueii	Sprague's Pipit	C*				1A
Antrostomus ridgwayi	Buff-collared Nightjar		S			1B
Aquila chrysaetos	Golden Eagle	BGA		S		1B
Aspidoscelis stictogramma	Giant Spotted Whiptail	SC	S			1B
Botaurus lentiginosus	American Bittern					1B
Buteo regalis	Ferruginous Hawk	SC		S		1B
Catostomus clarkii	Desert Sucker	SC	S	S		1B
Chordeiles minor	Common Nighthawk					1B
Coccyzus americanus	Yellow-billed Cuckoo (Western DPS)	LT	S			1A

Species of Greatest Conservation Need
Predicted within Project Vicinity based on Predicted Range Models

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
Colaptes chrysoides	Gilded Flicker			S		1B
Coluber bilineatus	Sonoran Whipsnake					1B
Corynorhinus townsendii pallescens	Pale Townsend's Big-eared Bat	SC	S	S		1B
Craugastor augusti	Barking Frog					1B
Crotalus lepidus	Rock Rattlesnake					1A
Crotalus tigris	Tiger Rattlesnake					1B
Cynanthus latirostris	Broad-billed Hummingbird		S			1B
Dipodomys spectabilis	Banner-tailed Kangaroo Rat			S		1B
Euderma maculatum	Spotted Bat	SC	S	S		1B
Eumops perotis californicus	Greater Western Bonneted Bat	SC		S		1B
Falco peregrinus anatum	American Peregrine Falcon	SC	S	S		1A
Glaucidium gnoma gnoma	Northern Pygmy-owl					1B
Gyalopion quadrangulare	Thornscrub Hook-nosed Snake		S			1B
Haliaeetus leucocephalus	Bald Eagle	SC, BGA	S	S		1A
Heloderma suspectum	Gila Monster					1A
Hypsiglena sp. nov.	Hooded Nightsnake					1B
Incilius alvarius	Sonoran Desert Toad					1B
Kinosternon sonoriense sonoriense	Desert Mud Turtle			S		1B
Lampropeltis getula nigrita	Western Black Kingsnake					1B
Lasiurus blossevillii	Western Red Bat		S			1B
Lasiurus xanthinus	Western Yellow Bat		S			1B
Leopardus pardalis	Ocelot	LE				1A
Leptonycteris curasoae yerbabuenae	Lesser Long-nosed Bat	LE				1A
Lepus alleni	Antelope Jackrabbit					1B
Lithobates chiricahuensis	Chiricahua Leopard Frog	LT				1A
Lithobates tarahumarae	Tarahumara Frog	SC	S			1A
Lithobates yavapaiensis	Lowland Leopard Frog	SC	S	S		1A
Macrotus californicus	California Leaf-nosed Bat	SC		S		1B
Megascops trichopsis	Whiskered Screech-owl		S			1B
Melanerpes uropygialis	Gila Woodpecker					1B
Melospiza lincolnii	Lincoln's Sparrow					1B
Melozone aberti	Abert's Towhee		S			1B
Micruroides euryxanthus	Sonoran Coralsnake					1B
Myotis occultus	Arizona Myotis	SC		S		1B
Myotis velifer	Cave Myotis	SC		S		1B
Myotis yumanensis	Yuma Myotis	SC				1B
Notiosorex cockrumi	Cockrum's Desert Shrew					1B

Species of Greatest Conservation Need
Predicted within Project Vicinity based on Predicted Range Models

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
Nyctinomops femorosaccus	Pocketed Free-tailed Bat					1B
Odocoileus virginianus	White-tailed Deer					1B
Oxybelis aeneus	Brown Vinesnake		S			1B
Pachyramphus aglaiae	Rose-throated Becard		S			1B
Panthera onca	Jaguar	LE				1A
Passerculus sandwichensis	Savannah Sparrow					1B
Peucaea botterii arizonae	Arizona Botteri's Sparrow			S		1B
Peucaea carpalis	Rufous-winged Sparrow					1B
Phrynosoma solare	Regal Horned Lizard					1B
Picoides arizonae	Arizona Woodpecker		S			1B
Poeciliopsis occidentalis occidentalis	Gila Topminnow	LE				1A
Polioptila nigriceps	Black-capped Gnatcatcher					1B
Senticolis triaspis	Green Ratsnake		S			1B
Setophaga petechia	Yellow Warbler					1B
Sialia sialis fulva	Azure Bluebird					1B
Tadarida brasiliensis	Brazilian Free-tailed Bat					1B
Tantilla yaquia	Yaqui Black-headed Snake		S			1B
Thamnophis eques megalops	Northern Mexican Gartersnake	PT	S			1A
Thomomys umbrinus intermedius	Southern Pocket Gopher					1B
Troglodytes pacificus	Pacific Wren					1B
Trogon elegans	Elegant Trogon		S			1B
Tyrannus crassirostris	Thick-billed Kingbird		S			1B
Vireo bellii arizonae	Arizona Bell's Vireo					1B
Vulpes macrotis	Kit Fox					1B

Species of Economic and Recreation Importance Predicted within Project Vicinity

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
Callipepla gambelii	Gambel's Quail					
Cyrtonyx montezumae	Montezuma Quail					1C
Odocoileus hemionus	Mule Deer					
Odocoileus virginianus	White-tailed Deer					1B
Patagioenas fasciata	Band-tailed Pigeon					1C
Pecari tajacu	Javelina					
Puma concolor	Mountain Lion					
Zenaida asiatica	White-winged Dove					

Project Type: Energy Storage/Production/Transfer, Energy Transfer, Power line/electric line (new)

Project Type Recommendations:

Minimize potential introduction or spread of exotic invasive species. Invasive species can be plants, animals (exotic snails), and other organisms (e.g., microbes), which may cause alteration to ecological functions or compete with or prey upon native species and can cause social impacts (e.g., livestock forage reduction, increase wildfire risk). The terms noxious weed or invasive plants are often used interchangeably. Precautions should be taken to wash all equipment utilized in the project activities before leaving the site. Arizona has noxious weed regulations (Arizona Revised Statutes, Rules R3-4-244 and R3-4-245). See Arizona Department of Agriculture website for restricted plants, https://agriculture.az.gov/. Additionally, the U.S. Department of Agriculture has information regarding pest and invasive plant control methods including: pesticide, herbicide, biological control agents, and mechanical control, http://www.usda.gov/wps/portal/usdahome. The Department regulates the importation, purchasing, and transportation of wildlife and fish (Restricted Live Wildlife), please refer to the hunting regulations for further information http://www.azgfd.gov/h_f/hunting_rules.shtml

The Department recommends that wildlife surveys are conducted to determine if noise-sensitive species occur within the project area. Avoidance or minimization measures could include conducting project activities outside of breeding seasons.

For any powerlines built, proper design and construction of the transmission line is necessary to prevent or minimize risk of electrocution of raptors, owls, vultures, and golden or bald eagles, which are protected under state and federal laws. Limit project activities during the breeding season for birds, generally May through late August, depending on species in the local area (raptors breed in early February through May). Conduct avian surveys to determine bird species that may be utilizing the area and develop a plan to avoid disturbance during the nesting season. For underground powerlines, trenches should be covered or back-filled as soon as possible. Incorporate escape ramps in ditches or fencing along the perimeter to deter small mammals and herptefauna (snakes, lizards, tortoise) from entering ditches. In addition, indirect affects to wildlife due to construction (timing of activity, clearing of rights-of-way, associated bridges and culverts, affects to wetlands, fences) should also be considered and mitigated.

Based on the project type entered, coordination with State Historic Preservation Office may be required (http://azstateparks.com/SHPO/index.html).

Based on the project type entered, coordination with U.S. Fish and Wildlife Service (Migratory Bird Treaty Act) may be required (http://www.fws.gov/southwest/es/arizona/).

Vegetation restoration projects (including treatments of invasive or exotic species) should have a completed site-evaluation plan (identifying environmental conditions necessary to re-establish native vegetation), a revegetation plan (species, density, method of establishment), a short and long-term monitoring plan, including adaptive management guidelines to address needs for replacement vegetation.

Project Location and/or Species Recommendations:

HDMS records indicate that one or more native plants listed on the Arizona Native Plant Law and Antiquities Act have been documented within the vicinity of your project area. Please contact:
Arizona Department of Agriculture
1688 W Adams St.
Phoenix, AZ 85007
Phone: 602.542.4373
https://agriculture.az.gov/environmental-services/np1

HDMS records indicate that one or more listed, proposed, or candidate species or Critical Habitat (Designated or Proposed) have been documented in the vicinity of your project. The Endangered Species Act (ESA) gives the US Fish and Wildlife Service (USFWS) regulatory authority over all federally listed species. Please contact USFWS Ecological Services Offices at http://www.fws.gov/southwest/es/arizona/ or:

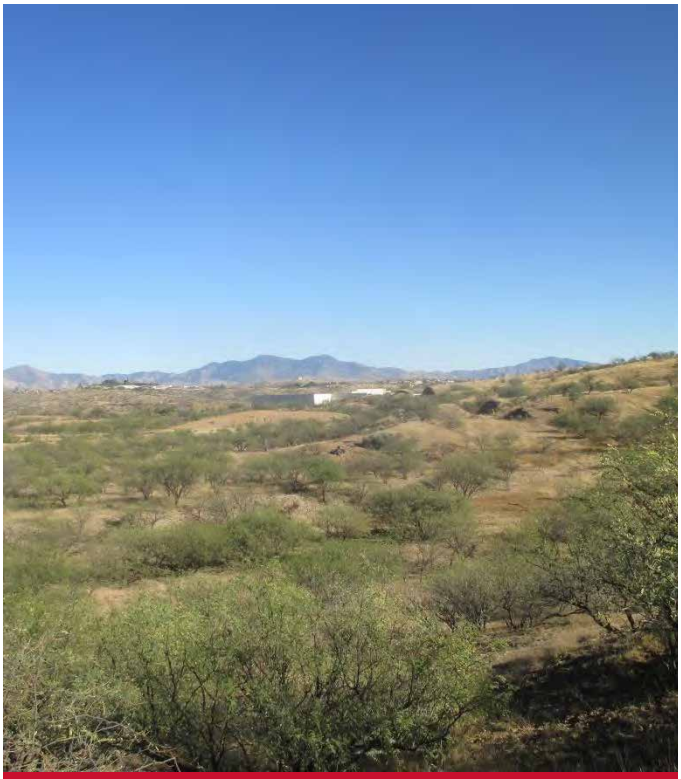
Phoenix Main Office
2321 W. Royal Palm Rd, Suite 103
Phoenix, AZ 85021
Phone: 602-242-0210
Fax: 602-242-2513

Tucson Sub-Office
201 N. Bonita Suite 141
Tucson, AZ 85745
Phone: 520-670-6144
Fax: 520-670-6155

Flagstaff Sub-Office
SW Forest Science Complex
2500 S. Pine Knoll Dr.
Flagstaff, AZ 86001
Phone: 928-556-2157
Fax: 928-556-2121

Analysis indicates that your project is located in the vicinity of an identified wildlife habitat linkage corridor. Project planning and implementation efforts should focus on maintaining adequate opportunities for wildlife permeability. For information pertaining to the linkage assessment and wildlife species that may be affected, please refer to: http://www.corridordesign.org/arizona. Please contact your local Arizona Game and Fish Department Regional Office for specific project recommendations: http://www.azgfd.gov/inside_azgfd/agency_directory.shtml.

Appendix B: Cultural Report



A Class III Cultural Resources Survey for the Nogales Interconnection Project, Nogales, Santa Cruz County, Arizona

Nogales Interconnection Project

Hunt Power

Nogales, Santa Cruz County, Arizona

January 16, 2016

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A Class III Cultural Resources Survey for the Nogales Interconnection Project, Nogales, Santa Cruz County, Arizona

Prepared for

Hunt Power
1900 North Akard Street
Dallas, Texas 75201-2300

Prepared by

Mark Brodbeck

Submitted by

Mark Brodbeck, MA RPA, Principal Investigator
HDR, Inc.
3200 East Camelback Road, Suite 350
Phoenix, Arizona 85018

HDR Cultural Resources Report 15-9

January 16, 2016

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STATE HISTORIC PRESERVATION OFFICE
SURVEY REPORT SUMMARY FORM

I. REPORT TITLE (whether technical report or SRSF only submitted)

Report Title: A Class III Cultural Resources Survey for the Nogales Interconnection Project, Nogales, Santa Cruz County, Arizona

Report Author: Mark Brodbeck

Date: 01/16/2016 **Report No.:** 15-9 ☐ **Check if this submittal is SRSF for Negative Survey**

II. AZSITE & SHPO INFORMATION

ASM Accession Number: n/a **AAA Permit No.:** 2015-64bl **SHPO**

Project Locator UTMs: 503802 **m**E, 3468805 mN **Zone:** 12 NAD 83

USGS 7.5' Quadrangle Names: Nogales, AZ (1981)

III. CONSULTING FIRM INFORMATION

Organization/Consulting Firm: HDR, Inc.

HDR Project Number: 244842

Contact Name: Mark Brodbeck

Address: 3200 East Camelback Road, Suite 350, Phoenix, Arizona 85018

Phone: (602) 522-7700 **Email:** mark.brodbeck@hdrinc.com

IV. AGENCY/PROJECT INFORMATION

Lead Agency/Project Number: Federal Energy Regulatory Commission

Agency Project Name/Number: n/a

Nearest City/Town & County: Nogales, Santa Cruz County

Project Sponsor: Hunt Power

Funding Source(s): Private

Other Permitting/Land Agencies & Permit Numbers: n/a

ASLD Lease Application No.: n/a

V. PROJECT DESCRIPTION

The Nogales Interconnection Project is being developed by Nogales Transmission, L.L.C., a subsidiary of Hunt Power, L.P. The Project is a proposed 150 megawatt (MW) direct current (DC) interconnection, commonly known as a DC tie, that will allow for an asynchronous interconnection between the electric grid in southern Arizona and the electric grid in the northwest region of Mexico.

The Project will consist of three components:

(1) a new 10- to 15-acre Gateway Substation, potentially located on land currently owned by Tucson Electric Power (TEP), where DC tie equipment would be located;

(2) a new, approximately 3-mile 138 kilovolt (kV) transmission line segment originating at the UniSource Energy Services (UES) Valencia substation in Nogales, Arizona, and extending west and south to the new Gateway Substation; and

(3) a new, approximately 2-mile 230 kV transmission line segment extending south from the new Gateway Substation and across the U.S.-Mexico border to interconnect with a transmission line to be constructed by the Comisión Federal de Electricidad (CFE).

Nogales Transmission, L.L.C., is also applying to the Arizona Corporation Commission (ACC) for a Certificate of Environmental Compatibility.

VI. AREA OF POTENTIAL EFFECTS/PROJECT AREA DESCRIPTION

The area of potential effects (APE) is defined as a 200-foot-wide corridor along the proposed transmission line alignment, the Valencia and Gateway Substations, plus a 0.25-mile buffer beyond the project footprint for the consideration of indirect effects to historic properties.

VII. PROJECT AREA INFORMATION

Total Acres: 276.3 **NAD 83; Zone:** 12 **Meridian:** Gila and Salt River Baseline and Meridian

Justification for areas not surveyed (identify land jurisdiction): 206.7 acres of private land were surveyed. The remaining 69.6 acres were not surveyed because right-of-entry had not been obtained from the landowners. The portions of the alternative alignments within Arizona Department of Transportation (ADOT) right-of-way (ROW) were not surveyed because of existing coverage. Steep sloping hillsides immediately north of Target Range Road in Section 13 could not be surveyed because of their dangerous incline; the steep slopes were inspected visually from the top and bottom of the ridge.

Project Location

Land Jurisdiction	Legal Description (T, R, Q, S)	Acres Surveyed	Acres Not Surveyed
Private	Township 24 South, Range 13 East, Sections 12, 13, and 24 Township 24 South, Range 14 East, Sections 5, 7, and 8	206.7	69.6

VIII. INVENTORY CLASS COMPLETED

☐ **Class I Inventory only** ☒ **Class III Intensive Field Survey**

☐ **Other: Identify and provide justification:**

IX. CLASS III SURVEY PERSONNEL AND METHODS

Field Personnel

Project Principal Investigator: Mark Brodbeck/26 years experience in Arizona

Project Director/Field Supervisor: Mark Brodbeck/26 years experience in Arizona

Crew: Eric Albright (20 years experience in Arizona)

Date(s) of Fieldwork: The survey was performed on November 23 and 24, 2015

Methods & Area Surveyed: Class III full coverage pedestrian survey with transects spaced 20 m apart. Survey generally covered 200 to 250 foot wide corridors along the alternative alignments.

Linear Miles; transect intervals m apart Coverage (%): acres:

Block Survey 206.7 acres**; transect intervals** <20 **m apart Coverage (%):** 95

Site recording criteria used [e.g., ASM, other (identify)]: ASM

Ground Surface Visibility: Approximately 75 percent

Integrity of Survey Area Current condition; include disturbances, erosion, flooding, dense vegetation, etc.: The portion of the APE in undeveloped areas, mostly the western portion, was is good condition with little to no disturbances; portions of the APE within developed areas were heavily disturbed by construction and heavy earth-moving activities.

X. CULTURAL RESOURCES

☐ **No cultural resources identified**

☐ **Isolated occurrences only Number of IOs recorded:** 4

☒ **Archaeological sites present; site summary table attached**

Number of Previously Recorded Sites: 2

Number of Newly Recorded Sites: 0

Number of Sites Not Re-located: 0

☐ **Historic period buildings/structures etc. documented/evaluated; historic property inventory forms attached**

None identified

RECOMMENDATIONS

HDR performed a Class III survey of alternative alignments for the Nogales Interconnection Project. The survey covered 206.7 acres of private land. The remaining 69.6 acres were not surveyed because right-of-entry had not been obtained from the landowners. The Interstate 19 and State Route 189 ROWs were not surveyed because current data were available from ADOT. It is recommended that any unsurveyed portions of the APE used for the project, other than the ADOT ROW, be surveyed by qualified archaeologists to determine whether historic properties are present that could be affected by the project. The cultural resources report will be amended after permissions have been obtained and the survey is completed.

The Class III survey documented two previously recorded sites. No new sites were identified. Site AZ EE:9:224(ASM) is a sparse prehistoric artifact scatter. Site AZ EE:9:225(ASM) is a set of rock piles. Both sites are recommended ineligible for listing on the National Register of Historic Places because of their limited information potential. Avoidance measures or further treatment should not be required at either site.

Should any archaeological resources be discovered during implementation of this project, all surface-disturbing activities in the area of discovery should immediately cease until Hunt Power can be notified and can arrange for a qualified archaeologist to assess the find. If human remains or funerary objects are discovered, the Arizona State Museum should be notified, as required by Arizona Revised Statutes § 41-865.

Recommended Finding of Project Effect

☐ **No Historic Properties Affected**

☒ **No Adverse Effect**

☐ **Adverse Effect**

*Based on areas surveyed.

***Final Draft Report Reviewed By (Consultant):**

Reviewer's Name	Title	Years Experience
Susanna Schippers	Technical Editor	15

***Not necessary to repeat this information in the technical report.**

CONSULTANT CERTIFICATION (Signature of Responsible Party, All Technical Report/SRSF submittals)

I certify the information provided herein has been reviewed for content and accuracy and all work meets applicable agency standards.

Mark Bodnick _____ **Date:** January 12, 2016

Signature

Principal Investigator

_____

Title

Site Management Summary Table

Site number	Newly/ Previously recorded	Land jurisdiction	Legal description (T, R, Q, S)	Datum UTMs (NAD 83)	Site type	Cultural/ Temporal affiliation	Eligibility status,[a] Criterion/ Criteria	Treatment recommendation(s)
Archaeological sites								
AZ EE:9:224(ASM)	Previously recorded	Private	T24S, R13E, Section 12 NE¼	503504 mE, 3469572 mN	Artifact scatter	Prehistoric, possibly Archaic	Recommended not eligible	No treatment required
AZ EE:9:225(ASM)	Previously recorded	Private	T24S, R14E, Section 8 NW¼	505875 mE, 3469788 mN	Rock piles	Indeterminate	Determined not eligible	No treatment required

[a] Recommended by recorder, determined by State Historic Preservation Office or agency.

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Contents

Attachments

Tables

Figures

1 Introduction

The Nogales Interconnection Project (Project) is being developed by Nogales Transmission, L.L.C., a subsidiary of Hunt Power, L.P (Applicant). The Project is a proposed 300 megawatt (MW) direct current (DC) interconnection, commonly known as a DC tie that would allow for an asynchronous interconnection between the electric grid in southern Arizona and the electric grid in the northwestern region of Mexico. The project will be constructed in two phases. The first phase of the Project will include the components listed below and the converter capacity will be 150 MW. The second phase, to be constructed at a time that has not yet been determined, will expand the HVDC converter capacity to 300 MW within the proposed Gateway Substation. The project is located on the western side of Nogales in Santa Cruz County, Arizona (Figures 1 and 2).

The Project would consist of three components:

1. A new 10- to 15-acre Gateway Substation, potentially located on land currently owned by Tucson Electric Power (TEP), where DC tie equipment for both phases would be located;
2. A new, approximately 3-mile, 138 kilovolt (kV) transmission line segment originating at the existing UniSource Energy Services (UES) Valencia Substation in Nogales, Arizona, and extending west and south to the new Gateway Substation; and
3. A new, approximately 2-mile, 230 kV transmission line segment extending south from the new Gateway Substation and across the United States-Mexico border to interconnect with a transmission line to be constructed in Mexico.

The proposed project requires a Presidential Permit for the international border infrastructure crossing and approval by the Federal Energy Regulatory Commission (FERC). Nogales Transmission, L.L.C., is also applying to the Arizona Corporation Commission (ACC) for a Certificate of Environmental Compatibility.

Because the project requires a federal permit and regulatory approval, the project is an undertaking subject to compliance with Section 106 of the National Historic Preservation Act (54 United States Code § 300101 et seq). Section 106 requires federal agencies to take into account the effects of their undertakings on cultural resources that qualify for listing on the National Register of Historic Places (National Register), referred to as historic properties. FERC is the lead federal agency for the Project's Section 106 compliance.

At the request of Hunt Power, HDR performed a Class III cultural resources survey of the Project corridor to determine whether any historic properties are present that could be affected by the proposed undertaking. The fieldwork was conducted on November 23 and 24, 2015, and required 4 person days to complete.

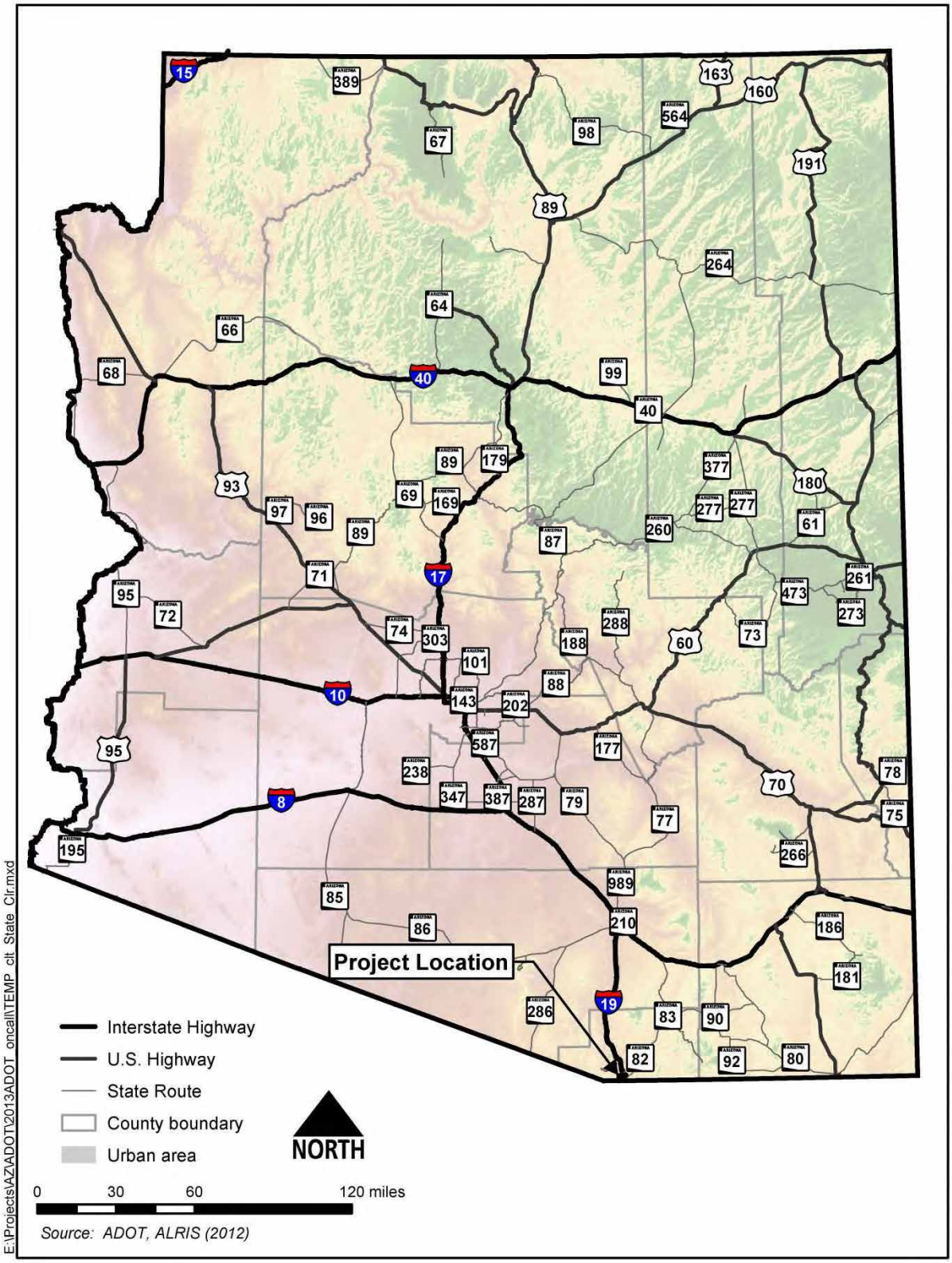

Figure 1. Project location

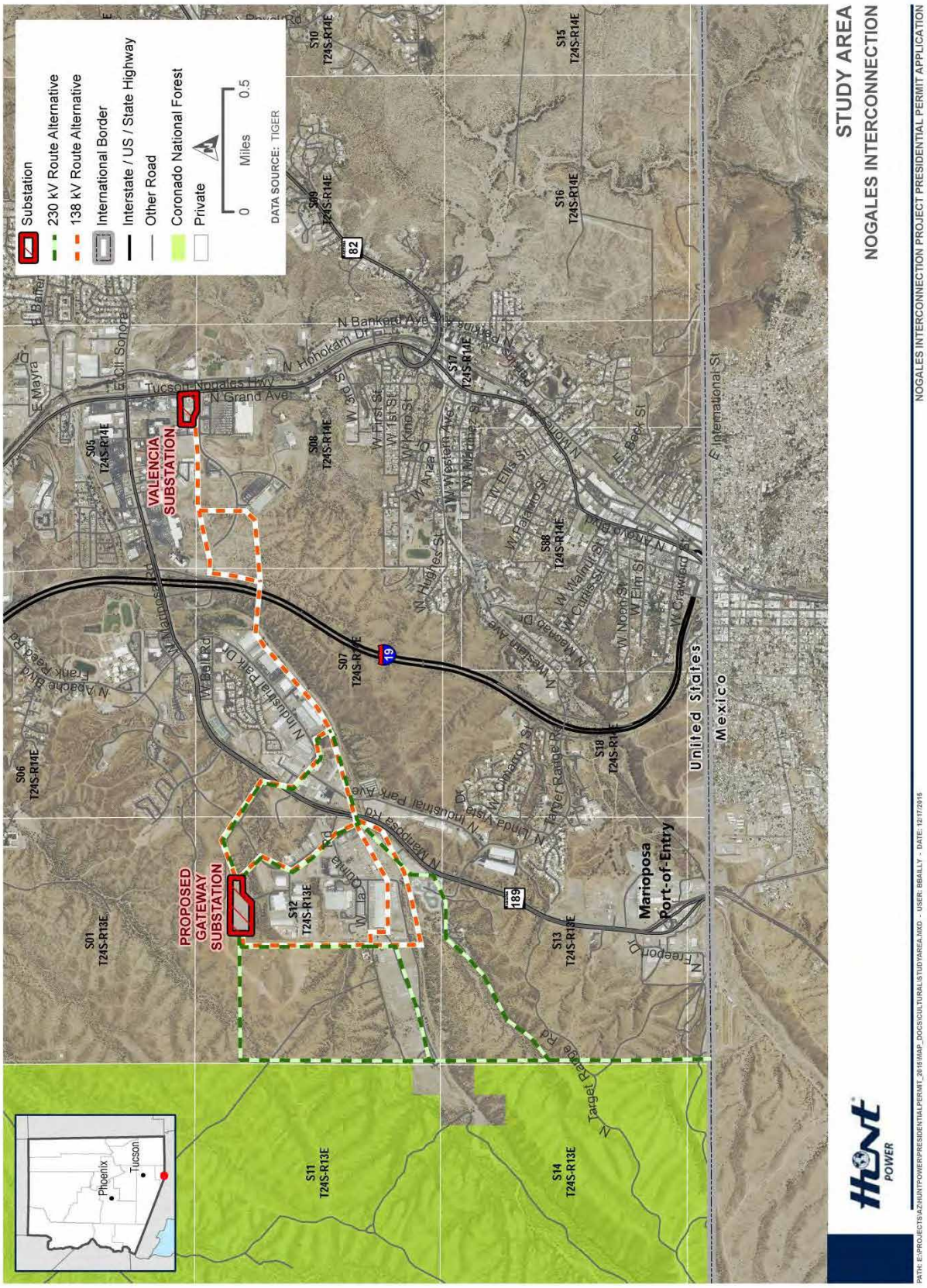

Figure 2. Project study area

1.1 Project Location

The Project is located on the western side of Nogales in southern Santa Cruz County. The Project area extends north-to-south from the U.S.-Mexico border approximately 0.7 mile west of the Mariposa port-of-entry to the Gateway Substation approximately 2 miles to the north, and east-to-west approximately 2 miles between the Gateway and Valencia Substations. The proposed alignments are on private land and highway right-of-way (ROW) owned by the Arizona Department of Transportation (ADOT). The legal description for the Project is Sections 12, 13, and 24 of Township 24 South and Range 13 East, and Sections 5, 7, and 8 of Township 24 South and Range 14 East (Nogales, AZ [1981] U.S. Geological Survey 7.5-minute quadrangle map; Gila and Salt River Base Line and Meridian).

1.2 Area of Potential Effects

The Project area of potential effects (APE) is the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if such properties exist [36 Code of Federal Regulations Part 800.16(d)]. The APE is influenced by the scale and nature of the undertaking and may be different for different kinds of effects caused by the undertaking. The APE for the proposed Project includes a 200-foot-wide corridor along the proposed transmission line alignment, the Valencia and Gateway Substations, plus a 0.25-mile buffer beyond the Project footprint for the consideration of indirect effects to historic properties.

2 Regulatory Context

2.1 National Historic Preservation Act

As noted previously, because of the federal involvement, the Project is an undertaking that requires compliance with Section 106 of the National Historic Preservation Act, as amended (54 United States Code § 300101 et seq.), and its implementing regulations (36 Code of Federal Regulations Part 800). FERC is the lead federal agency for the Project's Section 106 compliance.

Cultural resources generally include archaeological sites, historical buildings and structures, artifacts, and places of traditional, religious, and cultural importance. "Historic properties" are prehistoric and historical cultural resources listed or eligible for listing in the National Register. The National Historic Preservation Act, as amended, and its implementing regulations provide the process and guidelines for historic property evaluations. To be determined eligible for inclusion in the National Register, properties must be important in American history, architecture, archaeology, engineering, or culture. They also must possess integrity of location, design, settings, materials, workmanship, feeling, and association, and meet at least one of the following four criteria:

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

Properties can be of local, state, or national importance. Typically, historic properties are at least 50 years old, but younger properties can be considered for listing if they are of exceptional importance.

3 Environmental Setting

The APE is situated in the upper reaches of the Santa Cruz River drainage in southern Arizona, extending northward from the U.S.-Mexico border. The area is within the Basin and Range physiographic province, which is characterized by broad alluvial valleys separated by steep-sided, fault-block mountain ranges (Chronic 1983). The Patagonia Mountains are approximately 13 miles to the east. The Atascosa Mountains are approximately 11 miles to the northwest. The San Cayetano Mountains are approximately 10 miles to the north. The APE crosses perpendicular to a series of steep-sided ridges north from the border and then trends eastward following Maricopa Canyon across undulating terrain towards Nogales Wash, a tributary to the Santa Cruz River (Figures 3 and 4). The eastern end of the Project, just south of Maricopa Road and Grand Avenue, is near Nogales. Land use in the Project area in mixed. The western portion of the Project area is largely undeveloped land. The central portion of the Project area is transportation-related commercial and industrial along the State Route (SR) 189 corridor. The eastern end is mostly commercial east of Interstate 19 (I-19).

The APE and vicinity has a continental climate with hot summers and cool winters. Average annual rainfall is 18 inches. The elevation ranges from 3,800 to 4,000 feet above mean sea level. The APE is situated at the transition between the Semidesert Grassland and Interior Chaparral vegetative communities (Brown 1994). The Semidesert Grassland biotic community is found at elevations ranging from 4,000 to 5,500 feet above mean sea level. This biotic community is characterized by grasses, flowering annuals, shrubs, cacti, and agaves.

Figure 3. Overview of Project area, south of Target Range Road, facing north

Figure 4. Overview of Project area east of I-19, facing east

Common flora of the biotic community include black grama, Chino grama, mesquite, sotol, prickly pear, and cholla. Much of this community has been heavily grazed, resulting in a decrease in perennials and the presence of introduced annuals. Red brome (*Bromus rubens*) is a prevalent annual. Interior chaparral is a vegetation community growing at mid-elevations (3,000 to 6,000 feet above mean sea level) on the foothills and slopes of the mountain ranges. Chaparral vegetation contains many species, usually including shrub live oak, birchleaf mountain-mahogany, skunkbush sumac, a variety of silktassels, desert ceanothus, Arizona rosewood, barberry, cliffrose, hollyleaf buckthorn, and manzanita.

4 Cultural Setting

Previous investigations in the area have provided useful summaries of the region's cultural history; see Bruder and Garcia (2002), Douglas (1991), Hill and Bruder (2000), Walsh (2010), Woodward (1984), and Woodward and Francissena (1984). These cultural chronologies are framed within five main developmental periods, based on general trends in material culture, subsistence and settlement strategies, and social and economic structure. The five periods are: Paleoindian (pre-9000 B.C.), Archaic (9000 to 300 B.C.), Formative (300 B.C. to A.D. 1450), Protohistoric (A.D. 1450 to 1840), and Historic (1853 to 1950). This discussion of the cultural setting provides the contextual framework for evaluating cultural resources identified in the APE for National Register eligibility and developing management recommendations.

4.1 Paleoindian Period

The earliest evidence of human occupation in southern Arizona and the greater American Southwest dates to the Paleoindian period (pre-9000 B.C.) (Cordell 1997; Haury 1950). During this time, small bands of nomadic hunter-gatherers traversed the landscape in seasonal rounds. Their subsistence depended on hunting small and big game and gathering wild plants and other resources (Irwin-Williams 1979). Hallmarks of Paleoindian artifact assemblages include diagnostic lithic tool-manufacturing technologies, Clovis and Folsom spear points, and contextual associations with bones of extinct Pleistocene fauna such as mammoth, bison, tapir, camel, and horse. The San Pedro River valley, approximately 50 miles east of Nogales, has several well-known mammoth kill sites including Murray Springs, Naco, Lehner, and Escapule (Agenbroad 1975; Haury and others 1953, 1959; Haynes 1966; Hemmings and Haynes 1969; Huckell 1984). Numerous Clovis points were discovered at each of those sites and at many others in southeastern Arizona (Agenbroad 1975; Bryan and Gidley 1926; DiPeso 1953; Haury and others 1953; Hemmings and Haynes 1969; Sayles and Antevs 1941; Woosley and Kriebel 1985).

4.2 Archaic Period

The end of the Paleoindian period coincided with significant climatic changes at the end of the Pleistocene era, which ultimately led to a reorganization of subsistence and settlement strategies throughout the Southwest. The Archaic cultural tradition in southeastern Arizona is termed the Cochise, which is further subdivided into the Sulphur Springs, Chiricahua, and San Pedro phases. The Sulphur Springs phase (10,500 to 9000 B.C.) is the oldest and may be contemporaneous with the Paleoindian cultural tradition (Douglas and Brown 1984). The subsequent Chiricahua phase (9000 to 1500 B.C.) extended from the end of the Pleistocene to approximately 1500 B.C. The available information indicates that, during these cultural phases of the Archaic, southern Arizona was occupied by highly mobile populations moving in seasonal rounds that produced similar projectile point types (Hill and others 1999). During the final phase of the Archaic, the San Pedro, dating from approximately 1500 B.C. to A.D. 300, distinctive cultural features emerged, including pit houses, storage pits, projectile points, and burial features. These artifacts and features both separate this phase from the preceding Archaic cultural assemblages and suggest continuity between Archaic and later Formative populations in southeastern Arizona (Hill and others 1999; Reid and Whittlesey 1997). Increased reliance on agricultural pursuits is notable, with the adoption of various Mesoamerican cultigens, most notably maize (Cordell 1997). The increase in sedentism and reliance on agricultural practices in the Tucson Basin during this time resulted in it being designated the Early Agricultural period (circa 1200 B.C. to A.D. 500) (Mabry and Clark 1994).

4.3 Formative Period

During the Formative period (300 B.C. to A.D. 1450), the predominant cultural tradition in the vicinity of the current Project area probably would be identified as Hohokam, with the Mogollon cultural tradition evident father east. The Hohokam were village-dwelling farmers and artisans who frequently practiced irrigation agriculture and produced copious amounts of elaborately decorated ceramics and shell jewelry (Crown 1987; Crown and Judge 1991; Haury 1976; Wilcox and Sternberg 1983). Four (some scholars argue for five) major periods characterize the Hohokam chronology, which, in turn, are divided into a number of phases based on differences in decorated ceramics, other artifact styles, architectural styles, and mortuary practices.

The Hohokam cultural tradition is distinguished by the development of hierarchical settlement systems; large-scale irrigation agriculture; production of red-on-buff pottery; highly stylized artifacts made of shell, stone, and bone; wide-ranging trade networks; a highly developed burial ritual involving cremations; and the development of public architecture that included ballcourts and platform mounds (Crown and Judge 1991; Wilcox 1979, 1980). The Hohokam “core area” is viewed as the Gila-Salt Basin, which, in turn, was seen as having been surrounded by a number of peripheral subareas. Peripheries south and east of the Gila-Salt Basin include the

Safford, San Pedro, Tucson Basin, and Upper Santa Cruz areas (Cable and Doyel 1987).

The Mogollon cultural tradition likely developed from the preceding San Pedro phase. In its earliest manifestations, Mogollon material culture is largely the same as that of the preceding Archaic, with the addition of plain brown ware ceramics. Later in the Mogollon sequence, circa post A.D. 1050, pit houses were replaced with surface pueblo structures (Reid and Whittlesey 1997). Variability between mountain and valley environments and differential cultural diffusion from adjacent cultural traditions, such as the Ancestral Pueblo and Hohokam, produced considerable regional diversity in the Mogollon cultural tradition (Bronitsky and Merritt 1986). Intrusive ceramics from different areas of Arizona, New Mexico, and northern Mexico are not uncommon (Diehl 2000).

4.4 Protohistoric Period

The Protohistoric period (A.D. 1550 to 1800s) represents the time between the end of the Hohokam cultural tradition and the entry of Europeans for exploration and settlement. Aboriginal groups who occupied south-central Arizona at the time of European contact included the Pima, Tohono O'odham, Sobaipuri, and, to the north and east in mountainous areas, the Apache. Piman speakers, who may be descendants of the Hohokam, generally occupied the river valleys, including the Santa Cruz River valley, living in dispersed rancherias. Their dwellings consisted of shallow depressions with brush superstructures, and they used canal irrigation in some of their agricultural pursuits. The Apache pursued a more nomadic lifeway, subsisting chiefly by means of hunting, gathering, and raiding strategies. Archaeological evidence of their presence consists primarily of ephemeral camp sites with ceramic and lithic materials distinct from those of the Hohokam or Piman speakers.

4.5 Historic Period

The Historic period (1691 to 1900s) began with the entry of Spanish explorers into what is now Arizona in the 1500s. Father Eusebio Kino, an Italian Jesuit priest, was sent to northern New Spain as part of the Spanish Crown's effort to Christianize native peoples of the New World. Kino recorded his 1691 travels through the region, thus providing the first written records of the area. The Spanish developed a stronger influence in the area when Father Visitor Antonio Leal, in consultation with Kino, decided to establish the first Spanish mission in southern Arizona in 1701. The site chosen was the village of Guevavi, located approximately 5 miles northeast of the present Project area (Shelley and Altschul 1987). The mission was spiritually and economically unsuccessful, and was slowly eclipsed in importance by missions to the north.

By 1767, the Jesuits relinquished control of the mission to the Franciscans and, soon after, Guevavi ceased to exist as a settlement. The base of the Spanish operations shifted to the north around Tubac, Tumacacori, Tucson, and San Xavier (Shelley and

Altschul 1987). The southern portion of the Santa Cruz River valley was essentially abandoned.

The area came under Mexican control in 1821, after Mexico became independent of Spain, but this had little impact at the northern edge of Hispanic settlement. As New Spain moved northward, the Spanish encouraged settlement of the area by making large grants to potential settlers. Most of these grants were allotted between 1820 and 1833. Near the Project area, the Baca family was given 94,289 acres of land as partial repayment for land they donated to the town of Las Vegas, New Mexico. Southern Arizona became part of the United States through the 1848 Treaty of Guadalupe-Hidalgo and the Gadsden Purchase of 1854.

Americans continued the ranching and mining activities of the earlier historic era, but also vigorously pursued the subjugation of native societies. Stage and then railroad lines followed the establishment of settlements and, in turn, triggered further development. Except for the urban Tucson metropolitan area, however, much of southern Arizona remains rural even today.

Nogales consisted of a ranch, which also acted as a stage station and livestock center in 1855 when Lt. N. Michler visited the area (Granger 1983). Because the ranch was located along Nogales Wash, it served as a focal point for people traveling between the United States and Mexico. Although the Santa Cruz River valley acted as a thoroughfare between Arizona and Mexico, the area remained sparsely populated until the 1880s. This lack of settlement was partially in response to intensive Apache raiding. Raiding was the Apaches' economic form of warfare. The principal objective of these raids was to obtain booty, especially horses.

The first permanent settlement on the Arizona side of the international border was begun in 1880 with the establishment of the trading post of Jacob Isaacson, who supplied mercantile goods and medicine on the road and at the various mining camps in the area south and east of Tucson. The New Mexico-Arizona Railroad was constructed in 1881 and 1882 by the Atchison, Topeka and Santa Fe Railway (Walker and Bufkin 1986). When the New Mexico-Arizona Railroad was completed, Euroamerican settlement of the area increased, inhibiting the success of the Apache raids. Entrepreneurs, miners, and settlers who anticipated that Nogales would become a border boom town flocked to the area. Copper mining achieved some success north of Nogales, especially at San Xavier (Walker and Bufkin 1986).

The physical and civic development of Nogales during its first 10 years included churches, hotels, electricity service, water storage facilities, seven newspapers, and several mercantile establishments. The Pima County Board of Supervisors incorporated the town of Nogales in 1893. Following incorporation, economic development and growth continued and Nogales became the only center of commerce on Arizona's border, an international shipping point on a major rail line, and the hub of regional mining activity in the surrounding mountains.

A military post named Camp Steven D. Little operated in Nogales from 1910 to 1933. The presence of U.S. military troops at Nogales and other border towns from El Paso to California evolved initially to ensure the international boundary was respected at

the outbreak of the Mexican Revolution in 1910. In 1918 and 1919, the border posts were used as training facilities for troops headed for Europe during World War I. The military facilities were maintained along the border through the 1920s, although they were fewer in number.

By the 1930s, residential neighborhoods had been constructed around the downtown area. Nogales emerged from the Depression with a population of about 5,500 people and a weakened local economy. The shipping industry would remain modest through World War II, but a new industry, tourism, became a major driving force in the regional and local economy. Today, Nogales has a population of over 20,000 people and is a major center for international commerce and distribution.

5 Previous Investigations

Prior to conducting the fieldwork, HDR reviewed existing records and archival sources for information on past projects and known cultural resources in the area. HDR requested site and project records from AZSITE, Arizona's statewide cultural resources database housed at the Arizona State Museum (ASM), and from the Coronado National Forest. In addition, historic maps such as General Land Office plats and aerial photographs were examined to identify historical period land uses of the area. The purpose of the records search was to determine which, if any, portions of the Project area have been previously investigated for cultural resources, to identify documented sites within and near the Project area, and to generate expectations about the types and frequencies of cultural resources that might be encountered during field survey. The records check covered a 0.5-mile area around the alternative corridors.

A few research projects conducted in the 1940s and 1950s provided initial insights on prehistoric and protohistoric settlement in the Nogales area. These included surveys performed by the University of Arizona within the Santa Cruz River valley from the headwaters east of Nogales north toward Tucson (Danson 1946; Frick 1954), as well as work by the Amerind Foundation (DiPeso 1953) at the Palo Parado Site (San Cayetano) about 20 miles north of Nogales. Most work in the area, however, has been driven by cultural resource compliance projects.

The records check indicated the ADOT ROWs within the study area have been previously surveyed for cultural resources; therefore, it is unlikely that new survey within ADOT ROW would be required for the Project. For the most part, land adjacent to the ADOT ROWs within the study area has not been investigated for cultural resources. Portions of the Project footprint outside ADOT ROW would require cultural resource survey; this would include new ROW and temporary construction easements.

The records check revealed that 28 archaeological surveys have taken place, and 10 sites have been recorded within 0.5 mile of the Project alignments (Figure 5; Tables 1 and 2). A map showing site locations is provided in Appendix A. A number of linear surveys intersected the Project alignments west of I-19; however, most of

the Project area had not been previously investigated (Carpenter 1995; Lascaux 1998; Lindemuth and others 2010; Petersen 2008). The portion of the Project area east of I-19 had been covered almost in its entirety by a survey performed for a private development Project (Stephen 2001). The previously recorded sites include five prehistoric artifact scatters, rock piles, a circa 1916 National Guard encampment, a historic period residence, and a railroad. The results of the previous projects suggested prehistoric and historic archaeological sites would be encountered during the survey. Three of the previously recorded sites are within the alignment corridors.

In 2001, URS Corporation (URS) surveyed 63 acres for the proposed Gateway Substation and documented two prehistoric sites: AZ EE:9:223(ASM) and AZ EE:9:224(ASM) (Bauer and Rogge 2001). Site AZ EE:9:223(ASM) was a prehistoric artifact scatter. The site's surface assemblage totaled 41 artifacts, which included nine cores and tested cobbles, five expedient scrapers or possibly utilized flakes, and debitage representing various stages of reduction. URS noted that the site was situated on shallow bedrock and concluded there was little potential for buried cultural deposits. Therefore, URS recommended the site as not eligible for listing on the National Register because of limited information potential. The proposed Gateway Substation platform was subsequently graded and the site is no longer evident.

Site AZ EE:9:224(ASM) is a prehistoric artifact scatter. The site is located east of the graded platform of the proposed Gateway substation and remains intact. URS documented 40 artifacts at the site, which included five cores and tested cobbles, one or two utilized flakes, and debitage representing various stages of reduction. Because the site was set on shallow bedrock, there is little to no potential for buried deposits. URS recommended the site as not eligible for National Register listing. HDR located the site during the current survey and recorded its present condition.

In 2001, Professional Archaeological Services and Technologies (PAST) surveyed a 130-acre parcel on the eastern side of I-19 for a private development project (Stephen 2001). The survey covered most of the alignment corridors between I-19 and the Valencia Substation. PAST recorded one site adjacent to the proposed alignment, AZ EE:9:225(ASM). The site consists of five rock piles, each approximately 1.5 m in diameter. One chipped stone flake was noted nearby, but lacked a clear association. PAST recommended the site not eligible for listing in the National Register because of its limited data potential and questionable temporal origins. HDR located the site during the current survey and recorded its present condition.

Because of the age of most of the prior surveys, and for consistency, the alignment corridors were surveyed in full regardless of prior coverage. The one exception was the ADOT I-19 and SR 189 ROW, which had adequate and recent coverage (Brodbeck and Marsich 2015; Bruder 1992; Grebinger 1971; Lite 1996; Lite and others 1996; Roth 1992; Stephen 2005; Stone 1995; Walsh 2006, 2008). No sites were identified in the ADOT ROW within the transmission line alignment corridors.

This page contains sensitive information about the location of cultural resources and is removed from the report.

Figure 5. Previous surveys

Table 1. Previously recorded sites and historic districts

Site number	Type	National Register status (Criterion)	References
AZ EE:4:43(ASM)	New Mexico and Arizona Railroad	Eligible (A and C)[a]	Lite 1997a
AZ EE:9:54(ASM)	Prehistoric artifact scatter	Eligible (D)	Lite and others 1996
AZ EE:9:86(ASM)	Prehistoric artifact scatter/habitation	Not evaluated	AZSITE records
AZ EE:9:107(ASM)	Prehistoric artifact scatter (El Macayo)	Eligible (D)	Deaver and Van West 2001; Gardiner and Huckell 1987; Neily and Euler 1987; Slawson 1991
AZ EE:9:109(ASM)	National Guard encampment, circa 1916	Not evaluated	Gardiner and Huckell 1987; Neily and Euler 1987; also see Deaver and Van West 2001
AZEE:9:172(ASM)	New Mexico and Arizona Railroad	Eligible A	Lite 1997a
AZ EE:9:177(ASM)	Residence, circa 1940s/1960s	Not eligible	Lite 1997a
AZ EE:9:223(ASM)	Prehistoric lithic scatter	Not eligible	Bauer and Rogge 2001
AZ EE:9:224(ASM)	Prehistoric artifact scatter	Not eligible	Bauer and Rogge 2001
AZ EE:9:225(ASM)	Rock piles	Not eligible[a]	Stephen 2001

[a] with State Historic Preservation Office concurrence

Table 2. Previous projects

Project number	Project name	Company/ Organization	Results	Reference
1964-8.ASM	I-19, Tucson to Nogales	Arizona Highway Department	AZ EE:9:53(ASM) AZ EE:9:54(ASM) AZ EE:9:68(ASM)	Grebinger 1971
85-125.CNF	Materials Site 7238	Coronado National Forest	No information	No information
1987-271.ASM	Santa Cruz County Court House	ASM	AZ EE:9:107(ASM) AZ EE:9:108(ASM) AZ EE:9:109(ASM)	Gardiner and Huckell 1987
1992-133.ASM	Mariposa Road (SR 189) Upgrading Project	Dames and Moore, Inc.	No sites	Bruder 1992
1992-165.ASM	ROW Survey Along SR 189, Arizona	Tierra Right-of-Way Services, Ltd.	No sites	Roth 1992
1995-212.ASM	Mariposa Road/I-19	Archaeological Research Services, Inc.	No sites	Stone 1995
1995-49.ASM	Mariposa Canyon Survey	Tierra Right-of-Way Services, Ltd.	AZ EE:9:159(ASM)	Carpenter 1995
1995-72.ASM	Tucson-Nogales Fiber Optics ROW	Archaeological Consulting Services, Ltd.	No sites	Adams and Hoffman 1995
1996-389.ASM	ADOT/Business 19/ Nogales	Archaeological Research Services, Inc.	AZ EE:9:107(ASM)	Lite 1997a
1996-393.ASM	State Route 189/Nogales	Archaeological Research Services, Inc.	AZ EE:9:172(ASM)	Lite 1996
1996-408.ASM	Interstate-19 Between Nogales and Amado	Archaeological Research Services, Inc.	AZ EE:9:54(ASM)	Lite and others 1996
1997-146.ASM	Business-19/SR 189/ Nogales	Archaeological Research Services, Inc.	AZ EE:9:172(ASM) AZ EE:9:176(ASM) AZ EE:9:177(ASM)	Lite 1997b
1997-423.ASM	Nogales Survey	SWCA, Inc. Environmental Consultants	AZ EE:9:179(ASM)	Lascaux 1998
2000-245.ASM	Ductos de Nogales Lateral Pipeline Project	URS Corporation	No sites	Bauer and others 2000
2001-363.ASM	Nogales Cell Tower Survey	Aztlan Archaeology, Inc.	No sites	Slawson 2001
2001-559.ASM	Escalada Commerce Center	Professional Archaeological Services and Technologies, Inc.	AZ EE:9:225(ASM)	Stephen 2001
2001-573.ASM	Ductos de Nogales Lateral Pipeline Project – Addendum	Environmental Planning Group	No sites	Hill 2001

Table 2. Previous projects

Project number	Project name	Company/ Organization	Results	Reference
2001-827.ASM	Nogales Gateway Project	URS Corporation	AZ EE:9:223(ASM) AZ EE:9:224(ASM)	Bauer and Rogge 2001
2002-44	Potrero Fuelwood	Coronado National Forest	No information	No information
2004-1044.ASM	Mariposa Road to Junction I-19	HDR	No sites	Touchin 2004
2004-55.ASM	Nogales 6	Tierra Right-of-Way Services	No sites	AZSITE records
2004-570.ASM	US Visit Mariposa	Logan Simpson Design	No sites	Breen 2004
2005-483.ASM	Nogales ADOT	Professional Archaeological Services and Technologies	No sites	Stephen 2005
2006-1010.ASM	Border Light Survey I and II	Northland Research	No sites	Lindemuth and others 2010
2006-678.ASM	SR 189 at MP 0.095	Logan Simpson Design	No sites	Walsh 2006
2008-89	Virtual Fence	Coronado National Forest	No information	No information
2008-469.ASM	EPNG Line 2143 Year 2008 PIP	SWCA, Environmental Consultants	No sites	Petersen 2008
2008-695	I-19 sign Rehab	Logan Simpson Design.	No sites	Walsh 2008
2015-226	SR 189, International Border to Grand Avenue	HDR	AZ EE:9:54(ASM) AZ EE:9:86(ASM)	Brodbeck and Marsich 2015

6 Survey Methods

HDR surveyed the alignment corridors on November 23 and 24, 2015. The crew included Mark Brodbeck as field supervisor and principal investigator and archaeologist Eric Albright. Mr. Brodbeck holds a Master of Arts in Anthropology and meets the Secretary of the Interior's Professional Qualification Standards for Archaeology (36 Code of Federal Regulations Part 61). The survey took 4 person days to complete.

The survey covered 206.7 acres of private land. The remaining 69.6 acres of the Project area were not surveyed because the landowners had not given permission to access their property. Overall, surface visibility was fair to good, ranging from about 50 to 75 percent. Steep slopes immediately north of Target Range Road in

Section 13 could not be accessed safely because of the extreme incline. This area was inspected from the top and bottom of the hillside. Given the extreme terrain, it is not likely that any substantial remains of prehistoric human activity would be present.

As standard practice, HDR defines archaeological sites according to site-recording criteria established by ASM:

- any concentration of 30 or more artifacts or other cultural items of a single class in a discrete scatter
- any concentration of 20 or more artifacts of more than one artifact class in a discrete scatter
- one or more archaeological features in temporal association with any number of artifacts
- two or more temporally associated features without artifacts

Cultural manifestations not meeting these criteria are recorded as isolated occurrences unless otherwise noted at the discretion of the field supervisor. Intuitively, sites that generally display integrity of location are potentially interpretable in terms of past human behavior and activities. In contrast, isolated occurrences are single artifacts or relatively few artifacts spatially scattered and/or disassociated manifestations lacking contextual information. When encountered, sites are recorded in the field through written notes, photographs, and sketch maps. The locations of sites and isolated occurrences are recorded with Global Positioning System units and are plotted on aerial photographs and 7.5-minute U.S. Geological Survey (USGS) topographic quadrangles. A Sony DSC-W220 camera was used for digital photography. All artifacts photographed were returned to their provenienced location. No artifacts were collected.

7 Survey Results

The Class III survey documented two previously recorded sites, AZ EE:9:224(ASM) and AZ EE:9:225(ASM), and four isolated occurrences. No new archaeological sites were identified. A map showing survey results is in Appendix B.

AZ EE:9:224 (ASM)

Site Type:	Artifact scatter
Age:	Prehistoric; possibly Archaic
Cultural Affiliation:	Indeterminate
Location:	The site is on the eastern side of the Gateway Substation platform, approximately 175 m north of the end of the paved section of Mariposa Ranch Road. T24S, R13E, NE¼ of Section 12.
Site Dimensions:	80 m by 45 m
UTMs:	503504 mE, 3469572 mN (site center)
Landform:	Toe slope of southward-facing ridgeline
Elevation:	4,020 feet
Land Jurisdiction:	Private
USGS Map Reference:	Nogales, AZ (1981) 7.5-minute quadrangle

Site AZ EE:9:224(ASM) is prehistoric artifact scatter (Figure 6). The site was originally recorded by URS during a survey for the Gateway Substation (Bauer and Rogge 2001). The site is east of the platform on the toe slope of a ridge just above an east-to-west trending drainage. A small, north-to-south ephemeral drainage cuts through the middle portion of the site. Intrusive igneous rocks are scattered across the site. Primary vegetation includes mesquite and bunch grasses.

URS described the site as a surface assemblage with 40 artifacts, including five cores and tested cobbles, one or two utilized flakes, and debitage representing various stages of reduction that included bifacial thinning flakes (Bauer and Rogge 2001). No diagnostic artifacts were observed. The artifacts are predominantly chalcedony, with a few chert items present as well. Small nodules of both types of stone are available in local washes. URS also noted that a few additional artifacts could be shallowly buried at the site, but there was little potential for subsurface archaeological deposits.

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Figure 6. AZ EE:9:224(ASM), site map

HDR found the site as described by URS (Figure 7). The only notable change to the area is the construction of the substation platform and its associated drainage just west of the site, which required heavy earth-moving activity. Despite its close proximity, the site did not seem to be affected by the construction. The site reflects aboriginal occupation, but the lack of cultural and temporal diagnostics provides no basis for more precise dating of the site. The lack of ceramics suggests a potential pre-Formative period association, and the bifacial thinning flakes reflect a lithic reduction technology common during the Archaic era. However, this does not preclude the possibility that the site is of later origin and simply reflects activities that did not involve use of ceramics and other artifact types. The relatively small artifact assemblage and lack of surface features indicate that this site probably represents a single brief episode of reduction of local tool stone and some activity that also involved use of expediently produced flakes.

Figure 7. Overview of AZ EE:9:224(ASM), facing southwest

Recommendation: The site is in good condition and has only been slightly affected by livestock grazing. Nevertheless, it consists of a relatively sparse artifact scatter lacking diagnostics that has been thoroughly documented by archaeological survey. Further study of the site is unlikely to yield important information, and there are no unique aspects of the site that warrant preservation. HDR agrees with URS's original recommendation that the site be considered ineligible for listing on the National Register and should not require further treatment.

AZ EE:9:225(ASM)

Site Type:	Rock piles
Age:	Indeterminate
Cultural Affiliation:	Indeterminate
Site Dimension:	20 m by 15 m
Location:	The site is approximately 215 m north of White Park Drive (north of Home Depot); T24S, R14E, NW¼ of Section 8
UTMs:	505875 mE, 3469788 mN (site datum)
Landform:	Gently sloping, southward-facing ridge
Elevation:	3,820 feet
Land Jurisdiction:	Private
USGS Map Reference:	Nogales, AZ (1981) 7.5-minute quadrangle

AZ EE:9:225(ASM) is a set of rock piles (Figure 8). The site was originally recorded by PAST for the Escalada Commerce Center development Project (Stephen 2001). The site is approximately 215 m north of White Park Drive (north from the Home Depot) on a gently sloping south-facing ridge line. Vegetation observed by HDR includes mesquite, bunch grasses, and a thick stand of Russian thistle.

PAST described the site as a set of five rock piles within an approximately 20 m by 15 m area (Stephen 2001). All five rock piles were approximately 1.5 m in diameter and were composed of rocks averaging about 10 to 15 cm in size. A few larger rocks, up to about 40 cm in size, were also included. PAST also noted one tertiary limestone flake within approximately 8 m of the rock piles. HDR found the site as described by PAST but, unfortunately, it was covered with a thick stand of knee-high Russian thistle, which made surface observations difficult and updating the site map impossible (Figures 9 and 10).

Recommendations: The site appears to be in fair condition, although it was difficult to assess given the cover of thick Russian thistle. A temporary road was bladed east-to-west across the southern end of the site, which may have affected the southernmost rock pile. PAST interpreted the site as a possible small agave cultivation area, although the origin of the rock piles remains unknown and, in fact, could be modern or natural. Furthermore, it is unclear whether the single flake artifact observed is ancillary to the site or reflects an actual prehistoric association. PAST recommended the site as ineligible for listing on the National Register given its limited data potential. AZSITE records indicate the State Historic Preservation Office concurred with the eligibility recommendation on November 9, 2009.

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Figure 8. AZ EE:9:225(ASM), site map (reproduced from the ASM site card)

Figure 9. AZ EE:9:225(ASM), overview facing south

Figure 10. AZ EE:9:225(ASM), rock pile

The cover of thick Russian thistle across the site made surface observations difficult, and, as a result, the HDR archaeologists were not able to retrieve any additional evidence to indicate the site's function, age, or cultural affiliation. In the absence of any new information, HDR recommends that the site's prior determination remains valid. The site is recommended ineligible for National Register listing; no further treatment is warranted.

Isolated Occurrences

Four isolated occurrences were recorded during the survey (Table 3). The locations are provided in Appendix A. Isolate 1 was a quartzite core. Isolate 2 was a plainware sherd. Isolate 3 was a set of three crushed circa 1960s car bodies used for erosion control along the northern side of the wash paralleling Industrial Park Drive (Figure 11). Isolate 4 was a pink secondary chert flake. The isolates are of limited information potential and do not qualify for National Register listing as objects.

Table 3. Isolated occurrences

Number	Description	UTMs (NAD 83)
1	Quartzite core	503573 mE 3469441 mN
2	Plain ware sherd	504306 mE 3469034 mN
3	Crushed car bodies used for erosion control	504197 mE 3468907 mN
4	Pink secondary chert flake	503583 mE 3469415 mN

Figure 11. Isolate 3, circa 1960s car body embedded in side of wash

8 Summary and Management Recommendations

HDR performed a Class III survey of alternative alignments for the Nogales Interconnection Project. The survey covered 206.7 acres of private land. The remaining 69.6 acres was not surveyed because right-of-entry had not been obtained from the landowners. The I-19 and SR 189 ROWs were not surveyed because current data were available from ADOT. It is recommended that any unsurveyed portions of the APE used for the project, other than ADOT ROW, be surveyed by qualified archaeologists to determine whether historical properties are present that could be affected by the Project. The cultural resources report will be amended after permissions have been obtained and the survey is completed.

The Class III survey documented two previously recorded sites. No new sites were identified. Site AZ EE:9:224(ASM) is a sparse prehistoric artifact scatter. Site AZ EE:9:225(ASM) is a set of rock piles. Both sites are recommended ineligible for listing on the National Register because of their limited information potential. Avoidance measures or further treatment should not be required at either site.

Should any archaeological resources be discovered during implementation of this Project, all surface-disturbing activities in the area of discovery should immediately cease until Hunt Power can be notified and arrange for a qualified archaeologist to

assess the find. If human remains or funerary objects are discovered, the ASM should be notified, as required by Arizona Revised Statutes § 41-865.

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Attachment A: Previous Recorded Sites

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Attachment B: Survey Results

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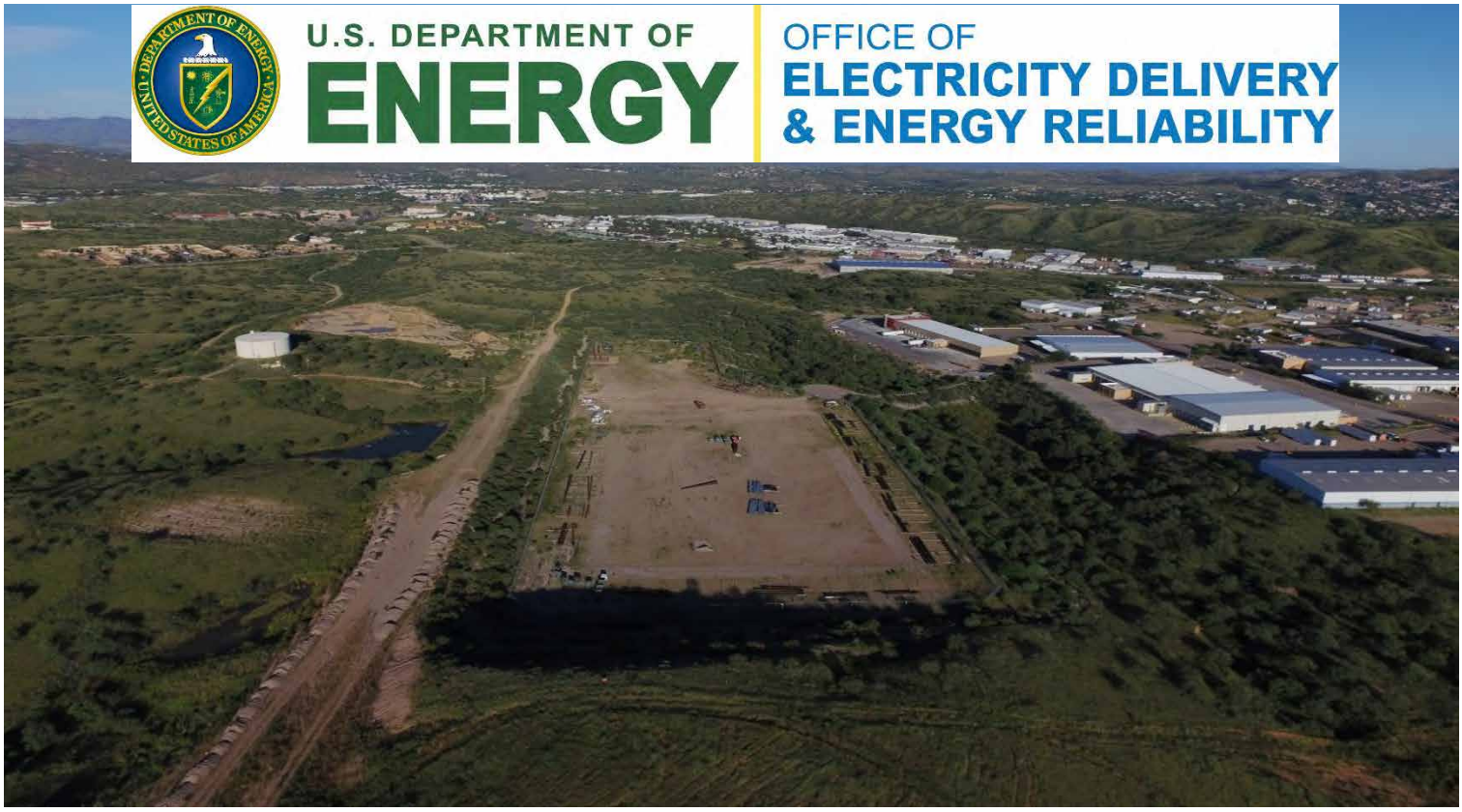
Exhibit B-1(b) – Nogales Interconnection Project Draft Environmental Assessment ("DOE Draft EA")

U.S. DEPARTMENT OF ENERGY

OFFICE OF ELECTRICITY DELIVERY & ENERGY RELIABILITY



NOGALES INTERCONNECTION PROJECT

DRAFT ENVIRONMENTAL ASSESSMENT

DOE/EA-2042

U.S. DEPARTMENT OF ENERGY
OFFICE OF ELECTRICITY DELIVERY AND ENERGY RELIABILITY
WASHINGTON DC

JULY 2017

Cover Photo:
East-facing view of the proposed Gateway Substation site, photo courtesy of Tucson Electric Power.

NOGALES INTERCONNECTION PROJECT
DRAFT ENVIRONMENTAL ASSESSMENT
DOE/EA-2042

U.S. DEPARTMENT OF ENERGY
OFFICE OF ELECTRICITY DELIVERY
AND ENERGY RELIABILITY

COOPERATING AGENCIES
INTERNATIONAL BOUNDARY AND WATER COMMISSION, U.S. SECTION
UNITED STATES FOREST SERVICE
STAFF OF THE ARIZONA CORPORATION COMMISSION

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COVER SHEET

RESPONSIBLE FEDERAL AGENCY
U.S. Department of Energy (DOE)
Office of Electricity Delivery and Energy Reliability

COOPERATING AGENCIES
International Boundary and Water Commission, U.S. Section
U.S. Forest Service, Coronado National Forest
Staff of the Arizona Corporation Commission

TITLE
Nogales Interconnection Project (DOE/EA-2042)

LOCATION
Nogales, Santa Cruz County, Arizona

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ABSTRACT:
Nogales Transmission, L.L.C. applied to DOE for a Presidential permit to construct, connect, operate, and maintain an approximately 5-mile-long, 138-kilovolt (kV) and 230-kV, alternating current (AC) electric transmission system that would cross the international border between Nogales, Santa Cruz County, Arizona and Sonora, Mexico. The proposed Nogales Interconnection Project would be constructed on 150-foot-wide right-of-way (ROW) and would consist of the following components: a new, approximately 3-mile-long, overhead 138-kV AC transmission line between the existing UNS Electric, Inc. Valencia Substation and a new Gateway Substation; a new, approximately 11-acre Gateway Substation, with capacity for direct current (DC) interconnection of up to 300 megawatts (MW) constructed on land currently owned by Tucson Electric Power; a new, approximately 2-mile-long, overhead 230-kV AC transmission line extending south from the new Gateway Substation to the proposed international border crossing; and associated access roads. Minor modifications within the existing footprint of the Valencia Substation would also be made. A portion of the proposed ROW for the new line from the new Gateway Substation to the proposed U.S.-Mexico border crossing would be adjacent to the Coronado National Forest and would not be located directly on U.S. Forest Service land. This Draft Environmental Assessment (EA) addresses the potential environmental impacts of the proposed Project and the No Action Alternative.

PUBLIC COMMENTS: Comments on the Draft EA will be accepted through August 3, 2017. The Notice of Availability (NOA) was sent to interested parties, including federal, state, and local officials; regulatory agency representatives; stakeholder organizations; and private individuals. The Draft EA is available to the public at the Nogales-Rochlin Public Library in Nogales, Arizona and on the Project website at www.nogalesinterconnectionea.com.

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ACRONYMS AND ABBREVIATIONS

°F	degrees Fahrenheit
AC	alternating current
ACC	Arizona Corporation Commission
ACHP	Advisory Council on Historic Preservation
ADA	Arizona Department of Agriculture
ADEQ	Arizona Department of Environmental Quality
ADOT	Arizona Department of Transportation
ADWR	Arizona Department of Water Resources
AGFD	Arizona Game and Fish Department
AM	amplitude modulation
Anza Trail	Juan Bautista de Anza National Historic Trail
APE	area of potential effects
Applicant	Nogales Transmission, L.L.C.
ARS	Arizona Revised Statutes
ASM	Arizona State Museum
ASTM	American Society for Testing and Materials
AZPDES	Arizona Pollutant Discharge Elimination System
BLM	Bureau of Land Management
BMP	best management practice
CBP	U.S. Customs and Border Protection
CENACE	the Centro Nacional de Control de Energia
CEQ	Council on Environmental Quality
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CFR	Code of Federal Regulations
CH_4	methane
CNF	Coronado National Forest
CO	carbon monoxide
CO_2	carbon dioxide
CRE	Mexico Comisión Reguladora de Energia
dBA	A-weighted decibel(s)
DC	direct current
DOE	United States Department of Energy

EA	Environmental Assessment
EMF	electromagnetic field
EO	Executive Order
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FM	frequency modulation
G	gauss
GHG	greenhouse gas
GIS	geographic information system
GMU	Game Management Unit
GWP	global warming potential
HUC	Hydrologic Unit Code
HVDC	high-voltage direct current
I-	Interstate
IPaC	Information for Planning and Consultation
kV	kilovolt
kV/m	kilovolts per meter
L_{max}	maximum allowable noise levels
LUST	leaking underground storage tank
mG	milligauss
MW	megawatt
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act of 1969
NERC	North American Electric Reliability Corporation
NHD	National Hydrography Dataset
NHPA	National Historic Preservation Act
NLCD	National Land Cover Database
NO_2	nitrogen dioxide
NPL	National Priorities List
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places

O_3	ozone
OSHA	Occupational Safety and Health Administration
Pb	lead
PM	particulate matter
$PM_{2.5}$	particulate matter less than 2.5 microns in diameter
PM_{10}	particulate matter less than 10 microns in diameter
Project	Nogales Interconnection Project
ROE	right-of-entry
ROW	right-of-way
SF_6	sulfur hexafluoride
SHPO	State Historic Preservation Office
SO_2	sulfur dioxide
SPCC	Spill Prevention, Control, and Countermeasures
SR	State Route
SWPPP	Stormwater Pollution Prevention Plan
TEP	Tucson Electric Power
UNSE	UNS Electric, Inc.
U.S.	United States
USACE	U.S. Army Corps of Engineers
U.S.C.	United States Code
USCB	U.S. Census Bureau
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
USIBWC	International Boundary and Water Commission, United States Section
WECC	Western Electricity Coordinating Council

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Chapter 1

PURPOSE OF AND NEED FOR ACTION

1.1 BACKGROUND

On April 8, 2016, Nogales Transmission, L.L.C. (Nogales Transmission, or the Applicant),[1] a subsidiary of Hunt Power, L.P., applied to the United States (U.S.) Department of Energy (DOE) for a Presidential permit for the proposed Nogales Interconnection Project (the Project) in accordance with Executive Order (EO) 10485 (September 3, 1953), as amended by EO 12038 (February 3, 1978) and the regulations at 10 Code of Federal Regulations (CFR) 205.320 *et seq*. (2000), "Application for Presidential Permit Authorizing the Construction, Connection, Operation, and Maintenance of Facilities for Transmission of Electric Energy at International Boundaries." On January 9, 2017, the Applicant submitted a letter to DOE amending its Presidential permit application for the proposed Project to reflect a revised proposed international border crossing. On May 31, 2017, the Applicant submitted a letter to DOE amending its Presidential permit application for the proposed Project as a result of changes made to the electrical configuration of the proposed Project but that did not alter the route or right-of-way (ROW) requirements contained in the original April 8, 2016 application or the proposed international border crossing in the January 9, 2017 amendment letter.[2] The proposed Project, as amended, is described in detail below.

As required by 10 CFR 205.320(a), any entity "who operates an electric power transmission or distribution facility crossing the border of the United States, for the transmission of electric energy between the United States and a foreign country, shall have a Presidential permit, in compliance with EO 10485, as amended by EO 12038." EO 10485, as amended by EO 12038, authorizes the Secretary of Energy, "[u]pon finding the issuance of the permit to be consistent with the public interest, and, after obtaining the favorable recommendations of the Secretary of State and the Secretary of Defense thereon, to issue to the applicant, as appropriate, a permit for [the] construction, operation, maintenance, or connection" of "facilities for the transmission of electric energy between the United States and a foreign country." DOE determines whether issuing a Presidential permit would be consistent with the public interest and assesses the environmental effects of the proposed Project, the effect of the proposed Project on electric reliability, and other factors that DOE considers to be relevant to the public interest.

The DOE Office of Electricity Delivery and Energy Reliability, Transmission Permitting and Technical Assistance Division is responsible for reviewing Presidential permit applications and determining whether to grant a permit for electric transmission facilities that cross the United States' international border. The Presidential permit Docket Number for this project is PP-420. If DOE issues a Presidential permit to the Applicant, it would authorize the Applicant to construct, connect, operate, and maintain the United States' portion of the proposed Project where the proposed Project crosses the international border with Mexico.

DOE Order 451.1B5 requires that each "Secretarial Officer and Head of a Field Organization shall, for matters under the office's purview . . . determine that an environmental assessment or an environmental

[1] Nogales Transmission has its principal place of business in Dallas, Texas. Hunt Power, L.P., a Delaware limited partnership, is a subsidiary of Hunt Consolidated, Inc. Hunt Power is part of a larger, privately owned group of companies managed by the Ray L. Hunt family that engages in oil and gas exploration, refining, power, real estate, ranching, and private equity investments.

[2] This EA analyzes the proposed Project as updated by the amendment letters. The April 8, 2016 Presidential permit application and the January 9, 2017 and May 31, 2017 amendments to the application can be accessed at the DOE Project website: http://nogalesinterconnectionea.com and the DOE Presidential permit website: http://energy.gov/oe/services/electricity-policy-coordination-and-implementation/international-electricity-regulation/pending-applications.

impact statement is appropriate or required." After due consideration of the nature and extent of the proposed Project, on June 14, 2016, DOE determined that the appropriate level of environmental review under the National Environmental Policy Act of 1969 (42 United States Code [U.S.C.] 4321 *et seq.*) (NEPA) would be an Environmental Assessment (EA).

DOE prepared this draft EA in compliance with NEPA, the Council on Environmental Quality's (CEQ's) regulations for implementing NEPA (40 CFR Parts 1500–1508), DOE's implementing procedures for NEPA (10 CFR Part 1021), and other applicable regulations, including Compliance with Floodplain and Wetland Environmental Review Requirements (10 CFR Part 1022). The NEPA Document Number for this EA is DOE/EA-2042.

The proposed Project would be located in southern Arizona within the City of Nogales, Santa Cruz County, and include the following components:

- A new, approximately 3-mile-long, overhead double-circuit 138-kilovolt (kV) alternating current (AC) transmission line. The first circuit would originate at an existing pole 1,900 feet west of the existing UNS Electric, Inc. (UNSE) Valencia Substation and terminate at the new Gateway Substation. The existing UNSE 138-kV Vail to Valencia transmission line would be severed and connected to this new line on new double-circuit monopoles, thereby converting the existing Vail to Valencia transmission line to the Vail to Gateway transmission line.
- Utilizing the same new double-circuit monopoles described above, a second circuit would originate at the Gateway Substation, proceed in an easterly direction, and connect with the existing portion of the above-mentioned UNSE 138-kV Vail to Valencia transmission line, which continues east for 1,900 feet to the existing Valencia Substation. This circuit would constitute the new Gateway to Valencia transmission line.
- A new, approximately 2-mile-long, overhead, 230-kV AC transmission line extending south from the new Gateway Substation to the proposed international border crossing. For Alternatives 3 and 4, a stretch of the transmission line would include two parallel pole structures, one for the new double-circuit 138-kV line and one for the new single-circuit 230-kV line.
- Minor modifications to relaying equipment within the existing Valencia Substation to accommodate the connection of the proposed 138-kV transmission line from the Gateway Substation to the Valencia Substation.
- A new, approximately 11-acre Gateway Substation, located on the Gateway site currently owned by Tucson Electric Power (TEP). The Nogales Gateway Substation and the UNSE Gateway Substation would be located on the Gateway site and referred to collectively as the "Gateway Substation."
    - On the western portion of the Gateway site, the Nogales Gateway Substation would consist of a direct current (DC) interconnection of up to 300 megawatts (MW). This bi-directional back-to-back high-voltage direct current (HVDC) converter (i.e., DC tie) would allow for an asynchronous[3] interconnection between the electric grids in southern Arizona and Sonora, Mexico. The DC tie would initially be capable of 150 MW of capacity of bi-directional flow between the U.S. and Mexico. A conceptual diagram of the proposed HVDC converter is illustrated in Figure 1.1-1.
    - The second phase of the proposed Project would involve expanding the DC tie from the initial 150 MW to its full 300-MW capacity within the proposed Gateway Substation. The first phase of construction would begin after all required permits and authorizations are

[3] An asynchronous connection is a connection between electrical networks that operate at different frequencies, or are otherwise incompatible, allowing them to exchange power without requiring the tight coordination of a synchronous network.

obtained by the Applicant from federal, state, and local agencies. The Applicant would notify DOE before beginning construction of the second phase of construction, the timing of which has not yet been determined.

- On the eastern portion of the Gateway site, the 138-kV UNSE Gateway Substation would consist of a three bay breaker and a half open air configuration to accommodate the line from Vail, the line to Valencia, the connection to the first phase of the DC tie, the connection to the future second phase expansion of the DC tie, as well as a future UNSE distribution transformer.

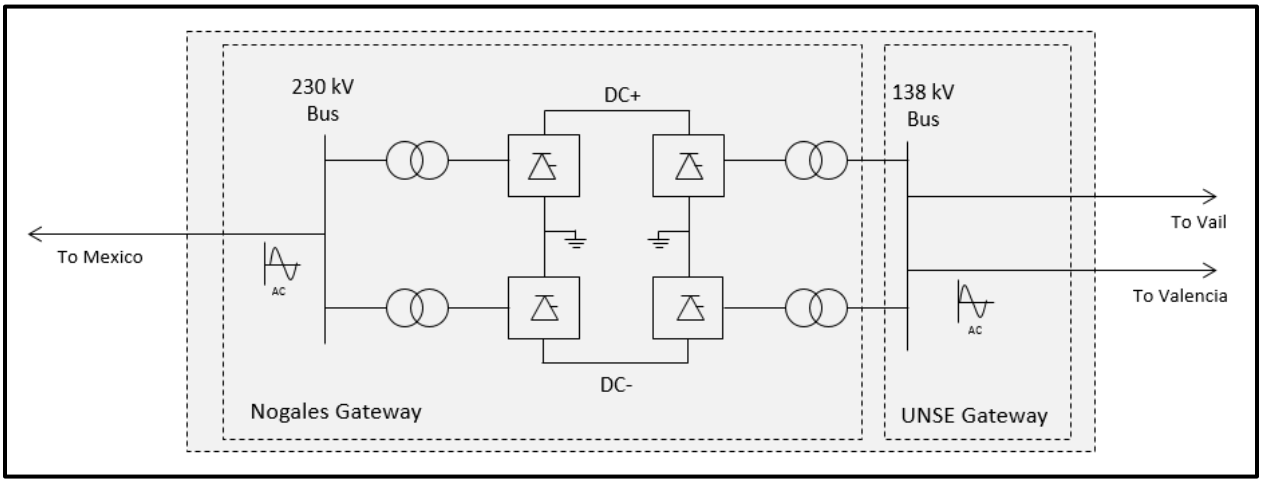

Figure 1.1-1. Conceptual diagram of the proposed bi-directional back-to-back HVDC converter at the proposed Gateway Substation.

The U.S. portion of the proposed Project would cross the U.S.-Mexico border approximately 0.6 mile west of Arizona State Route 189 (SR 189)/Mariposa Road, just west of the Mariposa Port of Entry. The proposed location at which the transmission line would cross the U.S.-Mexico border is 31° 19' 57.846" N and 110° 58' 35.620" W, as shown on Figure 1.1-2.[4] The proposed route segment variations in this figure are described in Section 2.5.2, Route Segment Variations. Four alternative routes for the proposed Project were considered by the Applicant as a part of its route development process described in detail in Section 2.5. The four alternatives were composed of different combinations of the route segment variations, as described in Section 2.6 and are shown in Figure 1.1-3. The Applicant selected the transmission line route indicated in Alternative 3 as its preferred route for the proposed Project.

The Comisión Federal de Electricidad, or Federal Electricity Commission (the Mexican state-owned electric utility), would directly, or via an affiliate, own the transmission assets that would interconnect to the proposed Project in Sonora, Mexico at the proposed international border crossing indicated above. At the U.S.-Mexico border in Sonora, Mexico, the Comisión Federal de Electricidad proposes to construct a 230-kV transmission line that would terminate at the existing Nogales Aeropuerto substation in Heroica Nogales, Mexico (approximately 18 miles south of Nogales, Arizona).[5] The potential impacts from the Mexican portion of the proposed transmission line are not considered in this

[4] The four alternatives are overlain in this figure, with Alternative 3 (the Applicant's Preferred Alternative) shown as the top layer (in red).

[5] The Nogales Aeropuerto substation is both a 230-kV and 115-kV hub with multiple lines that serves industrial and non-industrial demand in Nogales, Sonora and the surrounding area. The Applicant has indicated that the Comisión Federal de Electricidad (through subsidiaries) would be a market participant in Mexico, entering into wholesale power transactions with U.S.- and Mexican-based entities interested in buying and/or selling power.

EA, because NEPA does not require an analysis of potential environmental impacts that occur within another sovereign nation that result from actions approved by that sovereign nation.[6]

To inform the public interest determination, DOE also considers the proposed Project's impact on electric reliability. DOE evaluates whether the proposed Project would adversely affect the operating reliability of the U.S. electric power system under normal and emergency conditions. DOE may also consider other factors relevant to the public interest. Also, DOE must obtain the concurrences of the Secretary of State and the Secretary of Defense before taking final action on a Presidential permit application.

DOE developed the proposed Project website[7] to provide information regarding the proposed Project to the public and opportunity for public comment. Publicly available documents may be downloaded from the Project website, including the entirety of the Applicant's Presidential permit application. Documents may also be found on the DOE Presidential permit website.[8]

1.2 DOE'S ACTION

1.2.1 DOE's Purpose of and Need for Agency Action

The purpose of and need for DOE's action is to comply with EO 10485, as amended by EO 12038, and the regulations at 10 CFR 205.320 *et seq*. (2000) by determining whether to issue a Presidential permit for the proposed Project. Although DOE does not have siting authority, the proposed construction, connection, operation, and maintenance of the transmission system is evaluated in this EA, because it is a "connected action" to the Presidential permit that would authorize the proposed international border crossing; an action closely related to DOE's decision (see 40 CFR 1508.25(a)(1)).

1.2.2 DOE's Proposed Action

DOE's proposed action is the decision regarding the issuance of a Presidential permit to authorize the construction, connection, operation, and maintenance of the proposed transmission line at the proposed location for the international border crossing at the U.S.-Mexico border. If granted, there would be no expiration date for the Presidential permit. DOE does not have approval authority for any of the proposed facilities that extend beyond the immediate area of the border crossing. DOE's preferred alternative is to grant a Presidential permit for the Applicant's proposed international border crossing at latitude 31° 19' 57.846" N and longitude 110° 58' 35.620" W in Nogales, Arizona.

[6] This approach is consistent with Section 2-3(b) of EO 12114, "Environmental Effects Abroad of Major Federal Actions" (January 4, 1979), which specifically states that federal agencies are not required to evaluate impacts outside the U.S. when the foreign nation is participating with the U.S., or is otherwise involved in the proposed action.
[7] The DOE Project website is located at: http://nogalesinterconnectionea.com. The April 8, 2016 Presidential permit application and the January 9, 2017 and May 31, 2017 amendments to the application can be accessed at this website location.
[8] The DOE Presidential permit website is located at: http://energy.gov/oe/services/electricity-policy-coordination-and-implementation/international-electricity-regulation/pending-applications. The April 8, 2016 Presidential permit application and the January 9, 2017 and May 31, 2017 amendments to the application can be accessed at this website location.

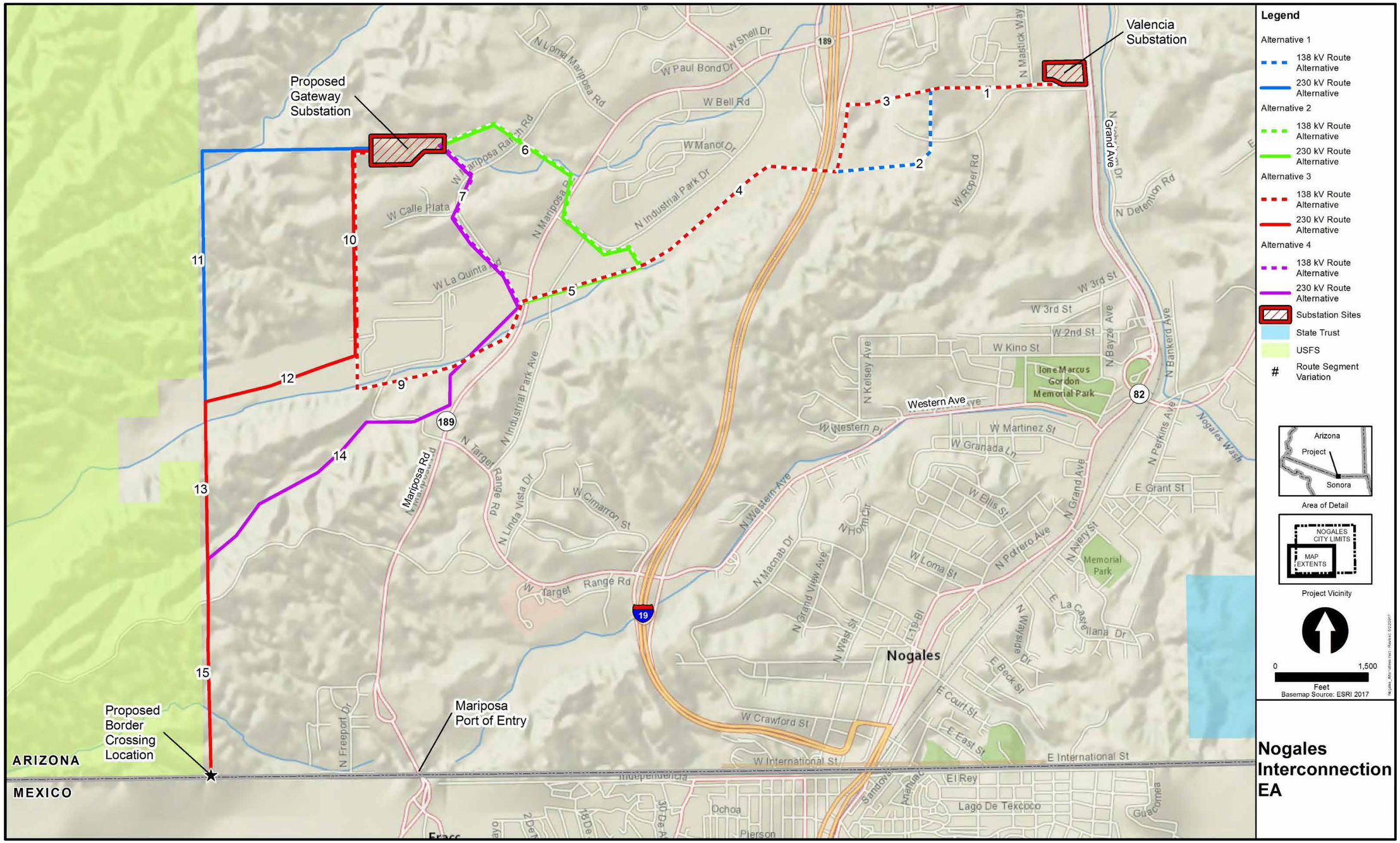

Figure 1.1-2. Proposed Project location.

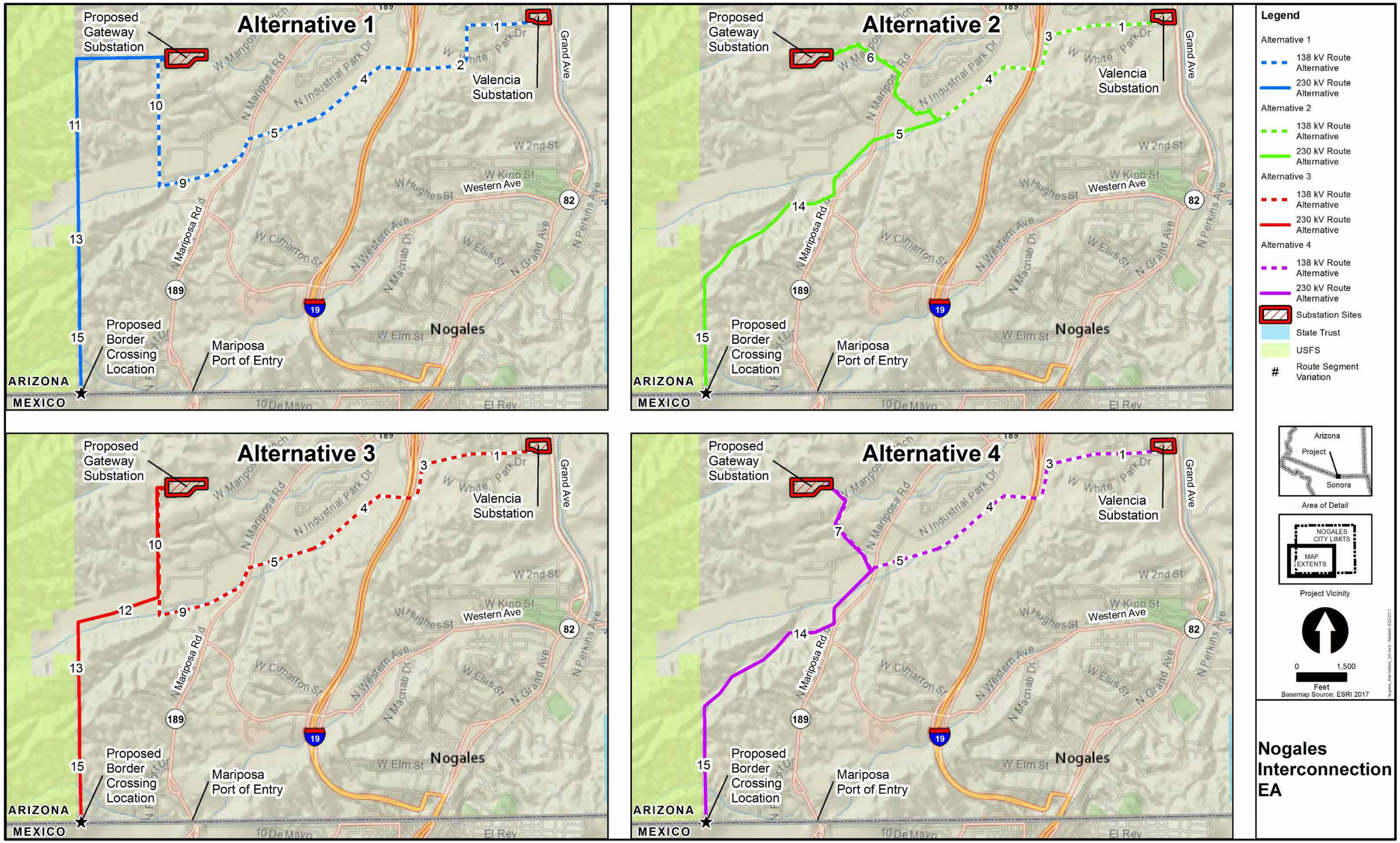

Figure 1.1-3. Proposed Project location – action alternatives.

1.3 NOGALES TRANSMISSION OBJECTIVES

The Applicant's purpose for the proposed Project is to provide an asynchronous interconnection in the vicinity of Nogales, Arizona that would enable bi-directional electricity transfer capability between the Western Electricity Coordinating Council (WECC) and Mexico in order to facilitate cross-border commercial electricity transactions. The proposed Project is being developed as a merchant transmission project, which differs from a traditional public utility project in that the merchant project developer assumes all of the market risk of a project and has no captive customers from which to recover a project's costs. Thus, the Applicant believes that potential customers would subscribe the proposed Project capacity because it would provide value to them in terms of the potential benefits discussed below.

The concept for this project originated in 1991 in a U.S./Mexico Electricity Trade Study (DOE 1991) that identified potential value to both sides of the border with an interconnection in the Noreste region of Mexico (i.e., northwestern Mexico). The proposed Project is consistent with the March 8, 2017 Memorandum of Understanding between the Mexico Comisión Reguladora de Energia (CRE), the Centro Nacional de Control de Energia (CENACE) and the North American Electric Reliability Corporation (NERC), which recognizes the established and growing cross-border operations and activities between the U.S. and Mexico and establishes a collaborative mechanism to enhance the reliability of their respective electric power systems (NERC 2017).

The Applicant has identified several benefits associated with the proposed Project. The potential for cost savings would be enabled through firm and non-firm energy transactions, as well as through diversity of peak demand patterns on both sides of the border. Both UNSE (a subsidiary of UNS Energy Corporation)[9] and Mexico could realize the benefits of reduced costs. In the case of UNSE, generation costs charged to retail customers flow through a UNSE Power Purchase and Fuel clause in their tariffs. If UNSE incurs lower generation costs as a result of an economy energy transaction with Mexico, the Power Purchase and Fuel clause costs borne by customers would be lower. Additionally, increased flows across the UNSE system as a result of cross-border transfers of energy would reduce the unit price of transmission service on the UNSE system. Today, 100% of the transmission costs flow to UNSE retail customers. As additional use of the UNSE system is attributed to users of the proposed Project, however, transmission service costs would be allocated to both retail customers as well as new wholesale customers, resulting in a smaller charge flowing through to UNSE retail customers.

The Applicant also indicates that the proposed Project would support reliability by providing bi-directional power flow and voltage support for the electric grids in the U.S. and Mexico, thereby creating a more robust electric grid. Relative to UNSE, which sits at the southern edge of the U.S. grid, transmission grid voltage control in the Nogales, Arizona area is challenging. The addition of the interconnection with Mexico, as well as the investment in new equipment that allows the interconnection, would improve UNSE's ability to control voltage to the Nogales, Arizona area.[10]

The Applicant expects that the proposed Project would provide emergency assistance, as needed, for the electric system in the U.S. and Mexico. While service in Santa Cruz County is very good, it is subject to outages on the single radial line serving the area. Because the Nogales, Arizona area is at the end of

[9] UNS Energy Corporation is the ultimate U.S. corporate parent of UNSE and TEP, and is an indirect, wholly owned subsidiary of Fortis, Inc., which is a publicly traded, Canada-based holding company.

[10] Related to the proposed Project's DOE Presidential permit Application, Nogales Transmission filed an interconnection request with UNSE and executed a System Impact Study Agreement. UNSE is performing reliability studies under the System Impact Study Agreement to verify that system reliability would not be adversely affected. As discussed above, DOE evaluates reliability as part of its review of the Presidential permit application.

the WECC grid and relies on UNSE's approximately 55-mile-long, 138-kV Vail to Valencia transmission line for its power supply, any disruptions to the grid north of the City of Nogales, and in particular to the radial line, can cause service interruptions within the county of Santa Cruz, Arizona. The addition of the proposed Gateway Substation and the connection to the electric grid in Sonora, Mexico would provide an additional source of electricity for the City of Nogales from Mexico in the event of a transmission line outage or other problem on the WECC system. Furthermore, if an event were to occur north of the Tucson area that caused a decrease in generation capability from the north, the interconnection would have the potential to supply energy from the south to support areas north of the City of Nogales, likely even as far north as Tucson. The DC tie would allow immediate access to resources in Mexico should an event occur on the radial line. The Applicant expects the region's ability to meet future electric capacity requirements to be improved by the proposed Project. The additional transmission capacity provided into Santa Cruz County and the improvements to grid reliability would have the potential to facilitate business growth and provide economic benefits, including tax revenues, over the course of the proposed Project's lifetime.

1.4 PUBLIC PARTICIPATION AND INTERAGENCY COORDINATION

The public participation and interagency coordination elements of the NEPA process promote open communication between the lead federal agency and other regulatory agencies, American Indian tribes, stakeholder organizations, and the public. Table 1.4-1 provides a chronology of the Presidential permit application process for the proposed Project to date.

Table 1.4-1. Presidential permit Application Milestones

Date	Action
April 8, 2016	Nogales Transmission filed a Presidential permit application with DOE
May 19, 2016	DOE issued a Notice of the Application in the Federal Register and invited motions to intervene in the Presidential permit process under 18 CFR 385.214
June 14, 2016	DOE determined that an EA is the appropriate level of environmental review under NEPA
September 2, 2016	DOE invited the International Boundary and Water Commission, U.S. Section (USIBWC), U.S. Forest Service (USFS), U.S. Army Corps of Engineers (USACE), and U.S. Fish and Wildlife Service to participate as cooperating agencies
September 8, 2016	DOE invited the Arizona Corporation Commission (ACC) to participate as a cooperating agency
September 12, 2016	USIBWC accepted the invitation to become a cooperating agency
September 29, 2016	Arizona Power Plant and Transmission Line Siting Committee declined the invitation to become a cooperating agency
October 3, 2016	USACE declined the invitation to become a cooperating agency
October 19, 2016	USFS accepted the invitation to become a cooperating agency
October 21, 2016	Staff of the Utilities Division of the ACC accepted the invitation to become a cooperating agency

1.4.1 Cooperating Agencies

DOE invited several federal and state agencies to participate as cooperating agencies in preparing this EA because of their special expertise or jurisdiction by law (40 CFR 1501.6 and 1508.5), including: the U.S. Forest Service (USFS); U.S. Fish and Wildlife Service (USFWS); U.S. Army Corps of Engineers (USACE); International Boundary and Water Commission, U.S. Section (USIBWC); U.S. Customs and

Border Protection (CBP); and the Arizona Corporation Commission (ACC). The USIBWC, USFS, and staff of the ACC have agreed to be cooperating agencies (see Appendix A for Cooperating Agency Correspondence). CBP, USACE, USFWS, and the Arizona Power Plant and Transmission Line Siting Committee declined to be cooperating agencies. American Indian tribes and tribal organizations were invited to participate, as explained in Section 1.4.4.3 below.

1.4.1.1 International Boundary and Water Commission, United States Section

The USIBWC assesses 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. USIBWC evaluates whether there would be adverse impacts on the visibility and permanent placement of the international boundary monuments and markers, whether the present drainage patterns to and from Mexico would be affected, and if pollution problems would be created. The USIBWC would not approve any construction in the U.S. that increases, concentrates, or relocates overland drainage flows into either the U.S. or Mexico. As such, the USIBWC's proposed action is to concur on, and provide a letter of approval for, Nogales Transmission's proposal relative to activities that would occur at and near the international border with Mexico (USIBWC 2017).

1.4.1.2 United States Forest Service, Coronado National Forest

A portion of the proposed 230-kV transmission line right-of-way (ROW) would be located adjacent to the Coronado National Forest (CNF), Nogales Ranger District. In the area where the proposed ROW is adjacent to the eastern boundary of the CNF, the centerline would be located off-center within the ROW, approximately 100 feet east of the CNF boundary. The USFS uses the scenery management system to manage visual resources on the forest, and USFS staff include landscape architects offering special expertise in assessing a proposed project's potential to impact visual and scenic resources. The USFS also evaluated potential indirect impacts to the CNF.

1.4.1.3 Staff of the Utilities Division of the Arizona Corporation Commission

The staff of the Utilities Division of the ACC is acting as a cooperating agency. Under Article 15 of the Arizona Constitution, the ACC has jurisdiction over the regulation of public service utilities in Arizona and the quality of service and rates they charge. The Arizona Power Plant and Line Siting Committee would determine whether to issue a Certificate of Environmental Compatibility, and the ACC would affirm, deny, or modify the certificate.

1.4.2 Federal Consultations

Prior to issuing a Presidential permit, DOE must also complete formal consultations with federal and state agencies and tribes, in accordance with Section 106 of the National Historic Preservation Act (NHPA), Section 7 of the Endangered Species Act (ESA), and EO 13175 (Consultation and Coordination with Indian Tribal Governments).

1.4.2.1 Section 106 of the National Historic Preservation Act

Section 106 of the NHPA (16 U.S.C. 470) requires that federal agencies take into account the potential adverse effects of their proposed actions (or "undertakings") on historic properties and to develop measures to avoid, minimize, or mitigate any adverse effects. The term "historic properties" means a

prehistoric or historic district, site, building, structure, or object included in or eligible for inclusion in the National Register of Historic Places (NRHP), including properties of traditional religious or cultural importance to American Indians (36 CFR Section 800.16). An "adverse effect" is one which may alter, directly or indirectly, any of the characteristics of an historic property that qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association (36 CFR Section 800.5). NHPA also requires federal agencies to consult with American Indian tribes that may be affected by the proposed undertaking, the Arizona State Historic Preservation Office (SHPO), and other appropriate parties, as identified in 36 CFR Section 800.2 and defined in 36 CFR Section 800.16. The general steps for compliance with Section 106 are as follows:

1. The lead agency must first determine that the project constitutes an undertaking that has the potential to affect historic properties and identify the proper SHPO and appropriate tribes.
2. The lead agency initiates consultation with the SHPO and the appropriate tribes; defines the area of potential effects (APE); and identifies historic properties within the APE;
3. The lead agency determines in consultation with the consulting parties whether the undertaking would have an adverse effect on historic properties within the APE; and,
4. If the lead agency determines that the undertaking would have an adverse effect on historic properties, takes steps to avoid, minimize, and/or mitigate those adverse effects.

DOE is the lead agency implementing Section 106 compliance for the proposed Project. DOE requested initiation of Section 106 consultation under the NHPA for the proposed Project in a September 19, 2016 letter to the Arizona SHPO. DOE also notified the Advisory Council on Historic Preservation (ACHP) and asked for their participation as a consulting party. The ACHP responded in an October 17, 2016 letter indicating that they would determine if their participation is needed when DOE is farther along in the consultation process. DOE also invited other potential Section 106 Consulting Parties, including American Indian tribes, in a September 19, 2016 letter. The SHPO concurred with the consulting party list via email on November 3, 2016. Section 106 Consultation records are provided as Appendix B.

Correspondence between DOE and SHPO has indicated that the APE would consist of a 200-foot corridor along the proposed transmission line centerline of the Applicant's preferred transmission line route (Alternative 3), the existing Valencia Substation, the proposed Gateway Substation, and access roads where ground disturbance would occur (Access Types C, D, and E).

The proposed Project would not cross tribal reservation lands; however, each alternative could have the potential to impact cultural resources of significance to tribes. DOE invited all 22 of the federally recognized American Indian tribes in the state of Arizona via letter on September 19, 2016 to participate as a Section 106 consulting party. The Tohono O'odham Nation accepted this invitation on December 12, 2016. The San Carlos Apache Tribe and the Navajo Nation declined to consult. As of publication of the draft EA, no additional responses have been received. Section 106 consultation efforts for the proposed undertaking are ongoing.

1.4.2.2 Section 7 of the Endangered Species Act

The USFWS oversees compliance with the ESA (16 U.S.C. 1536). Section 7 of the ESA requires that each federal agency "insure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of critical habitat of such species."

DOE, as the lead federal agency for the proposed Project, provided a scoping letter to the USFWS Tucson field office in Tucson, Arizona on September 23, 2016 (see Appendix C and Section 3.4.2 for species-specific information). USFWS replied to DOE via email on November 7, 2016 and subsequent discussions between DOE, USFWS, and the Applicant have led to USFWS advising that consultation would need to be completed for the lesser long-nosed bat (*Leptonycteris curasoae yerbabuenae*) and the Pima pineapple cactus (*Coryphantha scheeri* var. *robustispina*). Consultation under Section 7 of the ESA is ongoing.

1.4.2.3 Government-to-Government Consultation with Federally Recognized Tribes

Section 106 of the NHPA also requires consultation with American Indian tribes whose traditional lands may be affected by the undertaking or that may attach religious and cultural significance to historic properties that may be affected by the undertaking (36 CFR 800.2), and EO 13175 delineates the Government-to-Government relationship between American Indian Tribal Governments and federal agencies through which these consultations must occur. DOE recognizes that each tribe is an individual, sovereign nation with a unique trust relationship to the U.S. government.

DOE obtained tribal claim area maps from the Arizona SHPO, which indicated tribes with current or historic/ancestral interest in the proposed Project area. DOE also referred to the new Government to Government Consultation Toolkit website developed by the Arizona SHPO and the Salt River Pima-Maricopa Indian Community (G2G Toolkit 2017). The proposed Project would not cross tribal reservation lands; however, each alternative could have the potential to impact cultural resources of significance to tribes. The Tohono O'odham Nation and the Pascua Yaqui have tribal claim areas that overlap with the proposed Project area. DOE initiated its government-to-government consultation with American Indian tribes as required under the authority of EO 13175 in a September 13, 2016 letter to the tribal governments of the Tohono O'odham Nation and the Pascua Yaqui Tribe. As explained above, these tribes were also invited to be consulting parties under Section 106. The Tohono O'odham Nation accepted the invitation to engage with DOE in government-to-government consultation, as well as to be a consulting party under Section 106. DOE held a telephone meeting with Mr. Peter Steere, the Tribal Historic Preservation Officer for the Tohono O'odham Nation, on October 28, 2016. Mr. Steere followed up with a letter via email on December 13, 2016, which DOE responded to on January 9, 2017. DOE is continuing its efforts to engage in government-to-government consultation.

1.5 REGULATORY FRAMEWORK

In addition to the Presidential permit and federal consultations described above, the proposed Project requires other federal, state, and local permits, approvals, and consultations before construction and operation can begin, which are listed in Appendix D. The Applicant is working with federal, state, and local agencies to obtain all required permits and approvals and to comply with all applicable laws and regulations.

1.6 PUBLIC PARTICIPATION

Prior to submitting their Presidential permit application to DOE, the Applicant developed a targeted list of potential stakeholders that included federal and state agencies, American Indian tribes, local and county officials, the local business community, non-governmental organizations, and landowners in the proposed Project area. The Applicant held three stakeholder outreach meetings to share information about the proposed Project. On February 5, 2015, a meeting was held at TEP offices including invitees from the

targeted list of agency and non-governmental organization stakeholders. Sixteen stakeholders were invited, and two attended this meeting. A follow-on meeting was held on September 17, 2015, which included a site visit. Twenty-five stakeholders were invited, and eight attended this meeting and site visit. An open-house meeting that was advertised to the public in the Nogales International newspaper was held at a local hotel in Nogales, Arizona on February 5, 2015. Fourteen stakeholders attended this meeting. The Applicant presented its proposed Alternative 1 (as described in Section 2.6.2.1) at the meetings held on February 5, 2015. Comments received from stakeholders at these meetings resulted in the addition of three additional route segment variations, which were presented at the meeting on September 17, 2015.

Input from landowners was also directly solicited, and several meetings were held with landowners. The Applicant also engaged with local officials and businesses through telephone calls, emails, and in-person meetings. Several additional route segment variations were subsequently added. The alternatives presented in this draft EA evolved from these discussions, as well as some additional refinement of the route segment variations by the Applicant.

The Applicant indicated that attendees at the stakeholder outreach meetings included representatives from the CBP, Tohono O'odham Nation, Arizona Department of Transportation (ADOT), Arizona Game and Fish Department (AGFD), the City of Nogales, Santa Cruz County, Friends of Santa Cruz River, Sierra Club, and Tucson Audubon Society. The Applicant also met with representatives from the USACE, USFS, and USIBWC. The local utility, UNSE (which owns the existing Valencia Substation), as well as its sister company, TEP (which owns the property where the proposed Gateway Substation would be located), were also consulted on the proposed Project by the Applicant.

This draft EA is being circulated for public review and will have a 30-day public comment period (see Appendix E Distribution List). DOE invited interested Members of Congress, state and local governments, other federal agencies, American Indian tribal governments, and members of the public to provide comments on the draft EA. Individuals may submit written comments, indicating the DOE NEPA document number DOE/EA-2042, by any of the following methods:

- Project website: http://www.nogalesinterconnectionea.com
- Email: nogalesinterconnectionea@hq.doe.gov
- Mail: Office of Electricity Delivery and Energy Reliability (OE-20), U.S. Department of Energy, 1000 Independence Avenue, SW, Washington, D.C. 20585
- Fax: 1-202-586-8008
- The draft EA is also available on the DOE NEPA website: http://www.nepa.energy.gov

All comments received on or before August 3, 2017 will be considered by DOE during preparation of the final EA. Comments postmarked or received after this date will be considered to the extent practicable.

1.7 ORGANIZATION OF THIS DRAFT EA

This draft EA addresses the following environmental resource areas in detail:

- Geology and Soils
- Vegetation
- Wildlife
- Water Resources and Quality

- Land Use and Recreation
- Visual Resources
- Socioeconomics
- Environmental Justice
- Historic and Cultural Resources
- Air Quality and Climate Change
- Noise
- Infrastructure
- Human Health and Safety
- Hazardous Materials and Waste

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Chapter 2

PROPOSED ACTION AND ALTERNATIVES

2.1 NO ACTION ALTERNATIVE

The No Action Alternative establishes the baseline against which the potential environmental effects of a proposed action can be evaluated.[11] Under the No Action Alternative, DOE would not issue a Presidential permit to the Applicant for the proposed Project; the transmission system would not be authorized to cross the U.S.-Mexico border; the proposed Project would not be constructed in the U.S.; and the potential environmental impacts associated with the proposed Project would not occur. Along with the project-specific environmental impacts, there are other considerations related to the No Action Alternative. If the proposed Project were not constructed, potential cost savings through energy transaction and diversity of peak demand patterns would not be realized; bi-directional power flow and voltage support for the electric grids in the U.S. and Mexico would not be provided; as-needed emergency assistance would not be made available; and the potential economic benefits associated with the additional capacity and improvements to grid reliability would not be realized. Chapter 4 includes an analysis of the No Action Alternative.

2.2 PROPOSED ACTION

DOE's proposed federal action is the decision regarding the issuance of a Presidential permit that would authorize the construction, connection, operation, and maintenance of the proposed 230-kV AC transmission line at the proposed international border crossing location at latitude 31° 19' 57.846" N and longitude 110° 58' 35.620" W in Nogales, Arizona. As noted in Section 1.2.1, although DOE does not have siting authority over the 138-kV or 230-kV lines or the Gateway Substation, the construction, operation, maintenance, and interconnection of the proposed Project, as amended, is evaluated as a "connected action" to the proposed Presidential permit that would authorize the international border crossing only.

2.3 PROPOSED NOGALES INTERCONNECTION PROJECT OVERVIEW

2.3.1 General Project Description

Nogales Transmission (the Applicant) has applied to DOE for a Presidential permit for authorization to construct, connect, operate, and maintain a new AC transmission line across the U.S.-Mexico border.

The proposed Project would consist of the components discussed in Section 1.1; further detail (including a description of the Applicant's Preferred Alternative 3) is provided in the sections below. The proposed transmission system would be an open access facility, and the parties that would be able to obtain capacity would be determined through an open solicitation process. Given that the proposed transmission system would be open access, the Applicant has indicated that it would not be possible to forecast what type (e.g., coal, natural gas, or renewable) or amount of electric power would potentially flow to Mexico via the proposed Project.

[11] 40 CFR 1502.14(d)

2.3.2 Proposed Project Location

The proposed Project would be located in southern Santa Cruz County, within the City of Nogales, Arizona. All proposed Project components are located in an area between the eastern border of the CNF, the international border between the U.S. and Mexico, and Grand Avenue (also known as Business Interstate (I-) 19 or the Tucson–Nogales Highway). The proposed Project would be located mostly on private land parcels. However, the City of Nogales owns land along Mariposa Wash, as well as a small parcel along the border of the CNF, roughly 0.75 mile north of the international border. Additionally, although ADOT owns lands within the general Project area, and the proposed Project would span two state highways (SR 189 and I-19), no poles would be sited in the ADOT ROW.

2.4 PROJECT DETAILS

2.4.1 Project Components

2.4.1.1 Transmission Line

The typical structure type would be a steel, single-pole structure. The proposed Project would be located on mostly new ROW that is approximately 150 feet wide. A detailed description of the location of each of the proposed alternatives (along with figures) is discussed in Section 2.6.3. Generally, structures would be spaced approximately 600 to 1,000 feet apart, with shorter or longer spans where necessary. Table 2.4-1 provides details for the 138-kV structures and Table 2.4-2 provides details for the 230-kV structures. Table 2.4-3 provides details for the triple-circuit capable structures being proposed as part of Alternative 2 only. Figures 2.4-1 through 2.4-4 show sample images of the structures. Figure 2.4-4 illustrates the proposed ROW configuration for a portion of Alternatives 3 and 4, where a stretch of the transmission line would include two parallel pole structures, one for the double-circuit 138-kV line and one for the single-circuit 230-kV line.

On the U.S. side, the final pole structure would be located approximately 300 feet north of the international border and would not be located within the Roosevelt Easement. The border fence at the proposed international crossing is constructed of square tubing filled with concrete and is 18 feet tall. There is another section of border fence in this area approximately 60 feet to the north. This 30–40-foot-long piece was left in place following a fence realignment in 2011. It is a round tubular style bollard that is 18 feet tall (CBP 2017a).

Structure heights would be determined based on the final structure location of the first structure in Mexico. The crossing would be an aerial crossing; no belowground facilities are being proposed. Assuming 10 feet of electrical clearance, the last structure in the U.S. would be expected to be 90–100 feet tall, and the first structure in Mexico would be expected to be 90–120 feet tall.

Table 2.4-1. Single-/Double-Circuit 138-kV Structure

Structure Attribute	Description
Type of structure	Tubular steel pole
Approximate structure height	75−110 feet
Approximate structure spacing	600−1,000 feet
Anticipated number of structures per mile	5−12 structures (depending on terrain and other factors)
Anticipated ROW width	150 feet

Table 2.4-2. Single-/Double-Circuit 230-kV Structure

Structure Attribute	Description
Type of structure	Tubular steel pole
Approximate structure height	95–115 feet
Approximate structure spacing	600–1,000 feet
Anticipated number of structures per mile	5−12 structures (depending on terrain and other factors)
Anticipated ROW width	150 feet

Table 2.4-3. Triple-Circuit Capable Structure (Alternative 2/Route Segment Variation 6 only)

Structure Attribute	Description
Type of structure	Tubular steel pole
Approximate structure height	140 feet
Approximate structure spacing	7 poles
Anticipated ROW width	150 feet

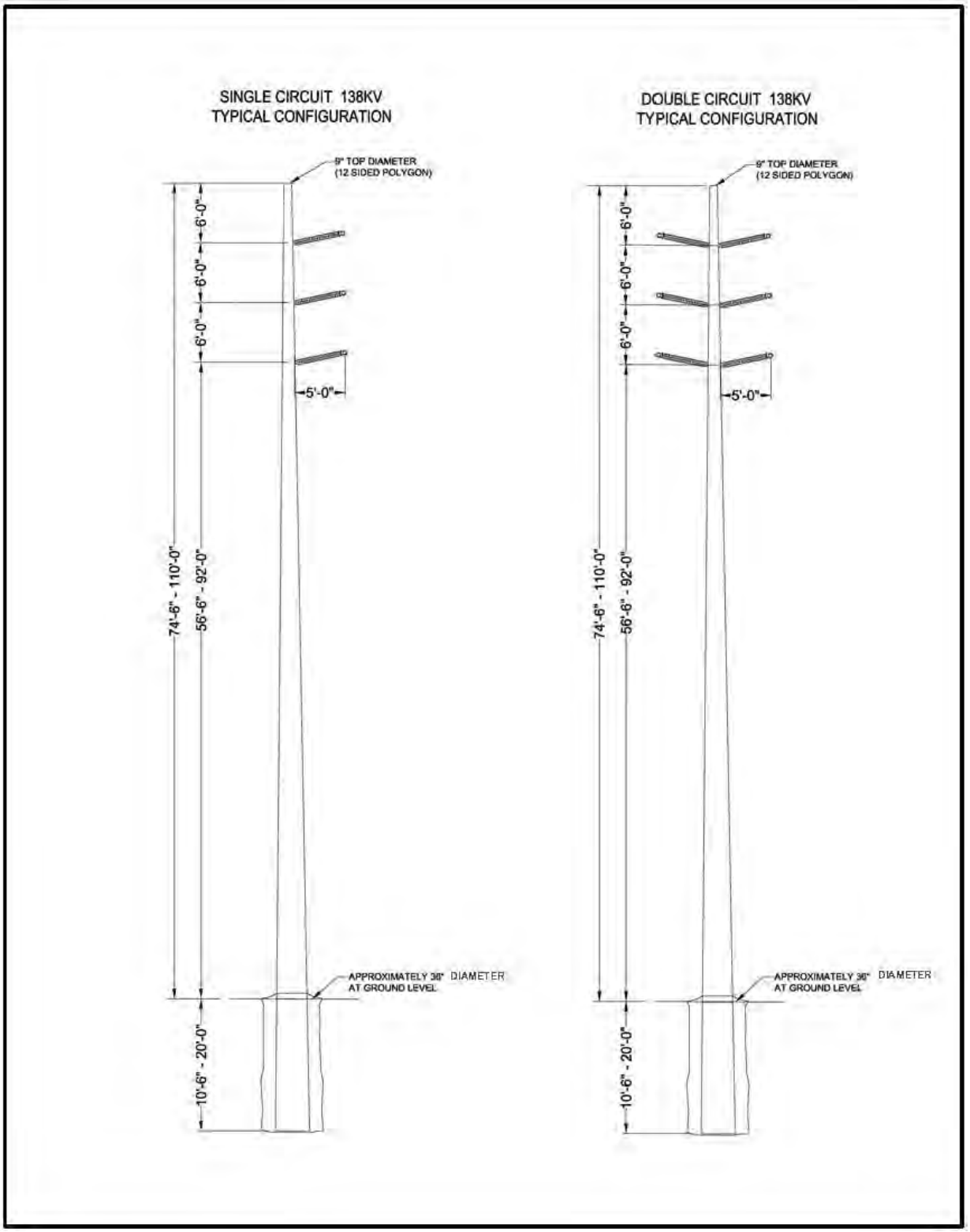

Figure 2.4-1. Single-/double-circuit 138-kV structure.

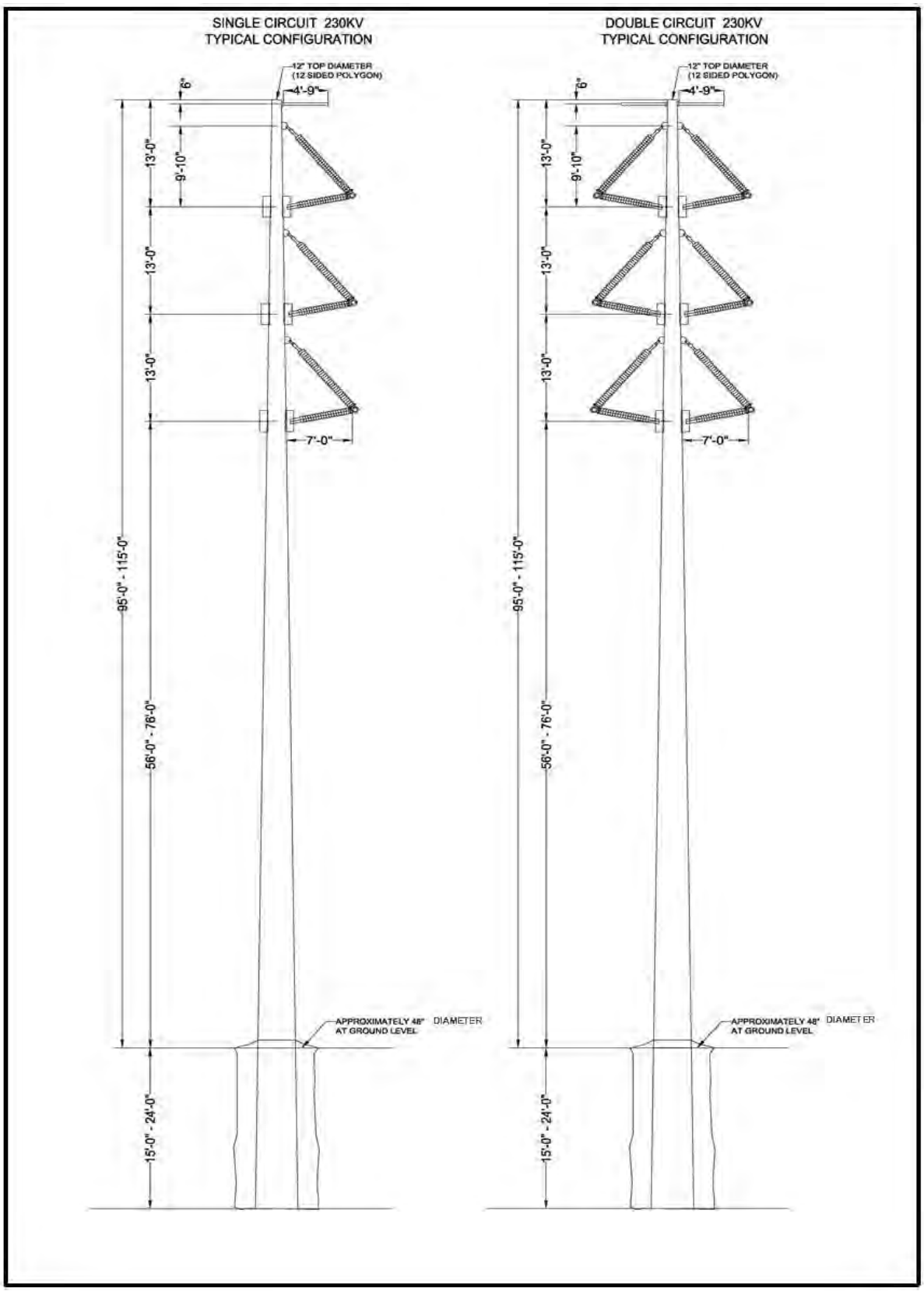

Figure 2.4-2. Single-/double-circuit 230-kV structure.

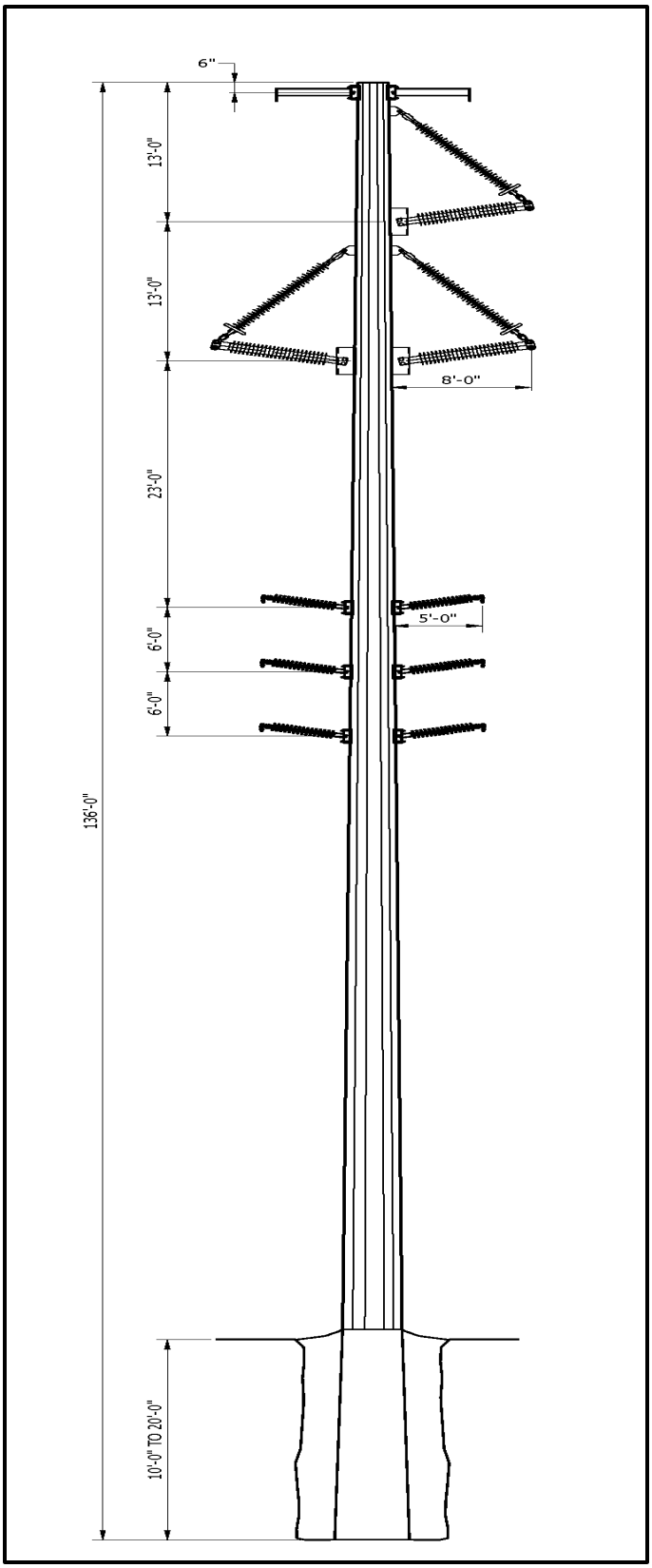

Figure 2.4-3. Triple-circuit capable structure (Alternative 2/Route Segment Variation 6 only).

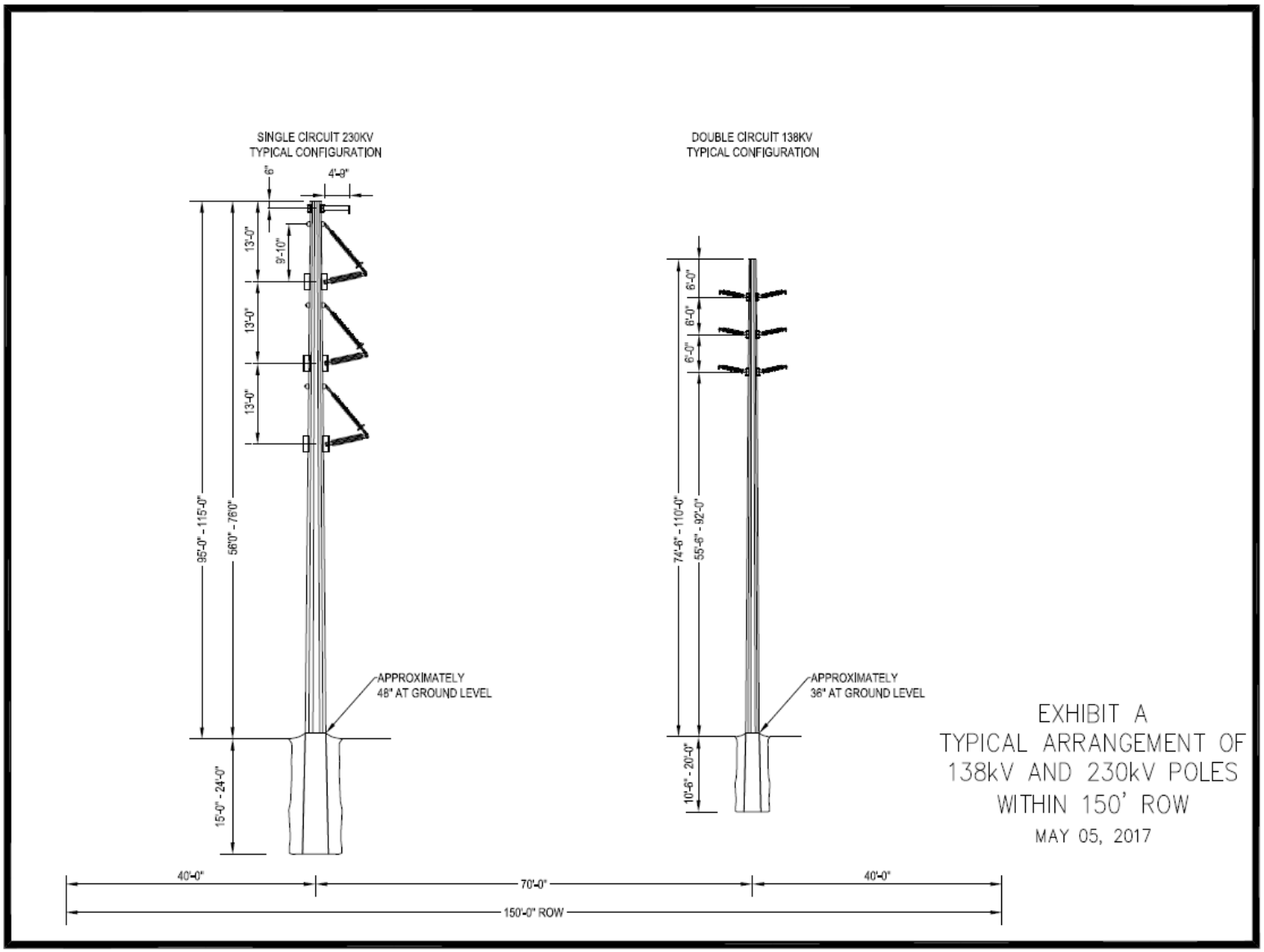

Figure 2.4-4. Single-circuit 230-kV and double-circuit 138-kV structure, co-located in 150-foot-wide ROW in a portion of Alternative 3/Route Segment Variation 10 and Alternative 4/Route Segment Variation 7 only.

2.4.1.2 Gateway Substation

As previously noted, a new substation—the Gateway Substation—is proposed as part of the Project. The Gateway Substation would be located on land owned by TEP, northwest of West Calle Plata and North Mariposa Ranch Road in the City of Nogales. The new substation would be located in an irregularly shaped area measuring an estimated 1,000 × 500 feet (totaling approximately 11 acres). The Gateway Substation was previously cleared and graded by TEP. Figure 2.4-5 provides a one-line electrical diagram of the proposed Project. As described in Section 1.1, the UNSE Gateway and Nogales Gateway Substations would be located on the Gateway site and referred to collectively as the "Gateway Substation."

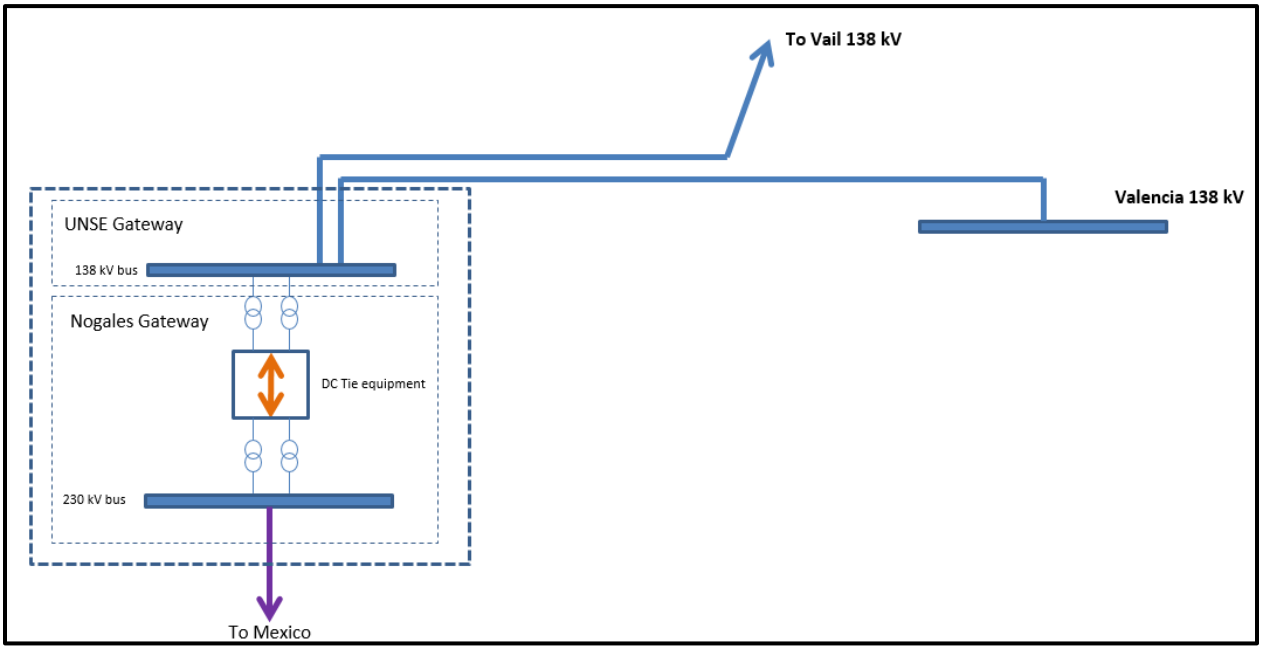

Figure 2.4-5. Proposed Project One-Line Diagram.

2.4.1.3 Access Roads

Five types of access roads (Access Types A through E) would be used for the proposed Project:

- existing private dirt roads that would not require improvements (Access Type A)
- existing public paved roads (Access Type B)
- existing dirt roads that would require improvements (Access Type C)
- new dirt bladed access roads (Access Type D)
- new dirt spur roads (Access Type E)

Access Types A and B are existing roads that would not require improvements. Access Types C and D would be 12 to 16 feet wide and graded. Where a new road would be constructed within the ROW (Access Type D), the new bladed road would go directly from structure to structure, except where topography dictates a less direct route, such as on hillsides, ridgebacks, rock outcrop areas, wash crossings, and treed areas, or in areas where sensitive environmental resources should be avoided. In such cases, the road would follow suitable topography from structure to structure and would be built in

areas that generally cause the least overall disturbance. In some places, new dirt spur roads (Access Type E) to structure sites would be used to connect the other access types to the ROW. Only where necessary, spur roads would be improved, which requires widening to 12 feet wide and grading. Otherwise, spur roads would not be improved in areas with flat terrain. Table 2.4-4 below summarizes the miles of access roads by type by alternative for the proposed Project.

Table 2.4-4. Miles of Access Roads by Type for Each Alternative

Alternative	Access Type A – Existing Dirt (No Upgrade)	Access Type B – Existing Paved (No Upgrade)	Access Type C – Upgraded Existing Dirt Roads	Access Type D – New Dirt Roads	Access Type E – Spur Roads	Total Miles of Access Roads
Alternative 1	3.08	0.24	3.22	2.27	0.49	9.30
Alternative 2	1.57	0.86	1.60	2.00	0.38	6.41
Alternative 3	2.23	0.76	2.60	1.97	0.29	7.85
Alternative 4	1.60	1.15	1.26	2.04	0.30	6.35

In addition to the access roads described above (see Figures 2.6-1 through 2.6-12), once within the ROW, some additional overland travel could be used as necessary. This overland access would be planned during the design phase of the proposed Project, indicated in the Access Road Plan, and flagged and monitored by an environmental monitor. This overland access would be minimized to the extent practicable and designed to have the least impact on vegetation as possible and to avoid any known concerns. Upon finalization of engineering and design of the proposed Project, appropriate ROW would be acquired and mapped, and all access roads and overland access areas described above would be surveyed.

2.4.1.4 Staging Area / Laydown Yard

Construction materials would be hauled either directly from the local highway to structure sites or would be brought first to a material staging area/laydown yard, and then to the structure sites. Staging of equipment and materials (cranes, bucket trucks and other heavy equipment, conductors, etc.) would occur at one dedicated laydown yard defined for the proposed Project. An office trailer and storage container would also be located at the laydown yard. The location of the staging area/laydown yard is expected to be an already disturbed, 3-acre area on land owned by UNSE in the proposed Project area. Therefore, there would be no additional disturbance for staging/laydown purposes.

The transmission line components—including the conductor and hardware—normally are brought to the temporary staging area on flatbed trucks. These materials are stored until needed and then loaded on flatbed trailers or trucks for delivery to each transmission structure site, where they are unloaded for installation.

2.4.2 Construction Schedule

The construction schedule would involve the following activities, some of which would occur concurrently:

- Approximately 4–5 months of construction of the proposed transmission line and associated access roads

- Approximately 10 months of total construction at the proposed Gateway Substation
  - Approximately 1 month for grading
  - Approximately 5 months for the construction of facilities
  - Approximately 4 months for wiring, testing, and start-up
- Approximately 2–3 months of construction of modifications at the existing Valencia Substation

2.4.3 Construction Methods

2.4.3.1 Site Preparation / Preconstruction Activities

The roughly 11-acre site for the proposed Gateway Substation was previously cleared and graded by TEP. No additional site preparation for the proposed new substation is anticipated. For the transmission line, after land access is granted, preparation of the ROW for construction would begin in coordination with landowners. Underground utilities would be identified and located in cooperation with local utility companies. A reasonably level access path, using one of types of access discussed above, would be needed to access the ROW. At structure locations, a stable working surface free of tripping hazards would be needed for installation of foundations and guy anchors, as well as assembling and erecting structures.

2.4.3.2 Right-of-Way and Easements

The proposed Project would require a mostly new, 150-foot-wide ROW to accommodate the transmission line. Nogales Transmission would acquire easement rights across certain parcels to accommodate the facilities. The land evaluation and acquisition process would include title examination, initial landowner contacts, environmental and non-environmental survey, document preparation, and purchase.[12]

2.4.3.3 Gateway Substation Construction

The construction of the DC tie at the Gateway Substation would be built in phases. Initial capacity would be 150 MW, with future expansion to 300 MW within the substation's proposed construction footprint. The substation would be constructed in compliance with applicable requirements of the National Electric Safety Code, Occupational Safety and Health Administration (OSHA), and state and local regulations. Designs would be completed by professional engineers with appropriate experience. Prior to construction, soil boring at key locations would be conducted to determine the engineering properties of the site's soil. As noted above, no clearing and grading of the site is anticipated, as the site was cleared by TEP in 2003; the site is also currently fenced with a 9-foot-tall chain-link fence.

Equipment foundations would be placed by excavating the foundation area, placing forms and reinforcing steel and anchor bolts, and pouring concrete into the forms. After the foundation has been poured, the forms would be removed and the surface of the foundation dressed. Excavated material would be spread at the site or disposed of in accordance with local ordinances and/or per agreement. Structures and equipment would be attached to the foundations as appropriate. Transformers at the substation would be filled with an insulating mineral oil. Measures would be taken to minimize the risk of oil getting into the ground or waterbodies in the event of a rupture or leak, such as structures and/or materials to contain or absorb oil. Post-construction reclamation activities would include removing and disposing of debris, removing all temporary structures, and employing appropriate erosion control measures.

[12] See the Applicant's Presidential permit application at pages 2-8 through 2-11 for a detailed description of the Applicant's land evaluation and acquisition process.

2.4.3.4 Transmission Line Construction

The transmission line would be designed, constructed, operated, and maintained to meet or exceed the requirements of the National Electric Safety Code, OSHA laws and regulations, and Nogales Transmission's policies for safety and protection of staff, contractors, landowners and their property, and the public. Construction of the transmission line is described in the following section, according to the sequence of construction activities.

PERMITTING, SURVEYING AND ENGINEERING

Prior to construction, any applicable permits and ROW authorizations would be obtained from federal, state, and local agencies and private landowners. Survey and engineering design work would locate the transmission line centerline within the approved ROW corridor, determine accurate topographical profiles along the centerlines, and determine the exact location of electrical facilities and access roads. Topography and geotechnical data, and the location of existing aboveground and belowground human-made features within the approved ROW, would also be used to determine the location and design of the transmission line facilities associated with the proposed Project. Pole foundations and proposed access roads would avoid sensitive areas, like washes, riparian areas, and cultural sites (if discovered) to the extent practicable. Prior to construction, the limit of disturbance and any avoidance areas would be staked to match the Construction Period Maps. All project personnel that would be onsite would receive Environmental Awareness Training that includes education on how to interpret the Book of Land Rights (which includes permits and easement agreements), Construction Period Maps, and project flagging.

MATERIAL STAGING

As noted above, construction materials would be hauled either directly from the local highway to structure sites or would be brought first to one dedicated material staging area/laydown yard (an already disturbed, 3-acre staging yard to be located at one of UNSE's previously disturbed and existing staging yard locations within the proposed Project area), and then to the structure sites. The transmission line components—including the conductor and hardware—normally are brought to the temporary staging area on flatbed trucks, where these materials are stored until needed and then loaded on flatbed trucks for delivery to the structure sites, where they are unloaded for installation.

STRUCTURE WORK AREAS

At each structure site, structure work areas would be needed to facilitate the safe operation of equipment, such as construction cranes or line trucks. The area required for the location and safe operation of cranes and line trucks would be approximately 100 × 200 feet (0.5 acre) for tangent and angle structures, while a larger area of 150 × 200 feet (0.7 acre) would be required for dead-end sites. Work area preparation would be required for temporary use areas at each transmission line structure and for tensioning and pulling and wire splicing sites. Previously disturbed sites requiring minimal site preparation would be prioritized for structure work areas during proposed Project design. These structure work areas would be located within the ROW. Measures would be taken to minimize dust and erosion.

STRUCTURE INSTALLATION

Each transmission line structure would require the installation of foundations, which are typically drilled concrete piers or direct embedded foundation systems. Foundation depths would be dependent on geotechnical conditions at each structure site and on the structure type. To erect the structures, materials would be fabricated, staged, and assembled at the laydown yard. From the laydown yard, material and subassemblies would be delivered to the structure work areas via flatbed truck. Subsequent to full or

partial assembly, sections of the structure would be assembled adjacent to the structure location and lifted onto the foundation using a large crane of suitable capacity. The crane would move along the access road and ROW as structures are erected.

STRINGING AND TENSIONING

Tensioning and pulling sites would be required at dead-end and heavy-angle structures. Depending on the alternative, between nine and 13 pulling sites would be required for the proposed Project. Pulling and tensioning locations typically require a 150 × 400–foot work area (i.e., pull site). The majority of pull sites would not be disturbed and minimal or no vegetation clearing would be required. The stringing plan would be designed to minimize impacts to trees and low-growing vegetation to the extent practicable.

Conductors would be placed on the transmission line structures by a process called stringing, which involves a vehicle driving along the transmission line ROW pulling ropes between each tower structure, or the contractor flying in the pulling ropes via helicopter. The ropes would then be attached to a cable, and the cable would be pulled through each span. The cable would be attached to conductors on truck-mounted reels. The cable and conductor are pulled through a pulley system and tightened to the appropriate tension using the conductor puller and truck-mounted tensioning rig, which is temporarily anchored to the ground, at pulling and tensioning locations. When pulling is complete, the conductors would be clamped to each insulator.

Additionally, temporary clearance structures called guard structures would be erected over highways (SR 189 and I-19), transmission lines, structures, and other obstacles prior to conductor stringing. The guard structures are typically vertical wood poles with cross arms and are erected at road crossings or crossings with other energized electric and communication lines to prevent contact during stringing activities. Bucket trucks may also be used to provide temporary clearance. Bucket trucks are trucks fitted with a hinged arm ending in an enclosed platform called a “bucket,” which can be raised to let the worker in the bucket service aerial equipment.

All guard structures would be located within the proposed Project ROW. The temporary disturbance associated with installation of guard structures would consist of an approximately 100 × 100–foot work area at the base of each guard structure and two holes approximately 3 feet in diameter. The installation method of the guard structures would be direct embedding with crushed rock and excavated material. All excavated material for the guard structures would be used to backfill these guard structures. As such, no excavated material would require off-site removal. All topsoil would be salvaged, stockpiled, and replaced upon removal of the guard structures and initiation of restoration activities. For a description of vegetation removal and restoration practices, refer to the Applicant Proposed Measures discussion in Section 4.3 Vegetation.

2.4.4 Operation and Maintenance

A separate entity, Nogales Frontier Operations, L.L.C., would have exclusive operational control over the proposed Project and be responsible for regulatory compliance.[13] Nogales Frontier Operations, L.L.C., anticipates contracting with UNSE, or another local utility or service provider, under an operations and maintenance or similar agreement(s), for the implementation of operation, maintenance, and repair services.

[13] Nogales Frontier Operations, L.L.C. is an existing, wholly-owned subsidiary of Shary Holdings, L.L.C., which is owned by members of the Ray L. Hunt family.

Regular inspection of the transmission system is critical for safe, efficient, and economical operation. Early identification of items needing maintenance, repair, or replacement would ensure continued safe operation of the proposed Project, which would be required to comply with industry standard codes and practices that govern the design and operation of high-voltage electric utility systems, such as the National Electric Safety Code (American National Standards Institute C2). Nogales Frontier Operations, L.L.C. (and/or its contractor) would work with landowners to develop agreements that specify maintenance activities, frequency, and emergency procedures.

2.4.4.1 Transmission Lines

The transmission lines would be operated via remote control from a control center. The transmission lines would be inspected periodically (either by ground or aerial inspection) in accordance with applicable regulations, industry standards, and best management practices (BMPs). The conductors would routinely be inspected for corrosion, equipment misalignment, loose fittings, physical damage, and other mechanical problems. The need for vegetation management would also be determined during inspection patrols. Inspections also assess any unauthorized encroachments and/or trash dumping in the ROW, which could constitute a safety hazard.

Maintenance would be performed as needed during operations by Nogales Frontier Operations, L.L.C. Routine maintenance activities typically consist of bolt tightening and repair or replacement of individual components, and as standard practice do not include new ground-disturbing activities. Electrical equipment that may require repair or replacement (usually due to isolated damage such as lightning or gunshot) includes conductors, insulators, shield wires, fiber-optic lines, and related equipment.

Vegetation management during operation and maintenance of the transmission system would be performed as described in the TEP/UNSE Transmission Vegetation Management Program, which was developed based on NERC Reliability Standard FAC-003-1. The NERC Reliability Standards are determined by Section 215 of the Federal Power Act, which requires the Electric Reliability Organization to develop mandatory and enforceable reliability standards subject to Commission review and approval. Vegetation management may include the removal of trees that fit specific criteria outlined in the Transmission Vegetation Management Program, removal of brush that has the potential to grow into the conductor, as well as management of other vegetation that may put the facilities at risk.

Repair of damage to the transmission line may require the same types of equipment used during construction, including power augers for hole boring, backhoes for excavation, and/or concrete trucks and cranes for structure erection. Other required equipment may include power tensioners; pullers; wire trailers; crawler tractors; and trucks and pickups for hauling materials, tools, and workers. Site and access road disturbances, such as ruts created during damage repair operations, would be restored to a satisfactory condition using rehabilitation procedures. The Applicant would notify the property owners and/or regulatory agencies and obtain proper approvals, as necessary.

2.4.4.2 Substation

The substations would be patrolled on a routine basis. In addition, the equipment would be monitored by operations personnel. In the event of an emergency, a trained maintenance crew would immediately be dispatched to the substation.

2.4.4.3 Access Roads

With the exception of Access Type B (existing, public paved roads), maintenance of access roads would be performed as needed during operations and would be the responsibility of Nogales Frontier

Operations, L.L.C. and/or its contractor. As explained above, Nogales Frontier Operations, L.L.C. anticipates contracting with UNSE or another local utility or service provider, under an operations and maintenance or similar agreement(s), for the implementation of operation, maintenance, and repair services.

2.4.5 Applicant Proposed Measures

Project plans that would be developed to minimize potential project impacts are described below. These plans would be developed by the Applicant and implemented by the Nogales Frontier Operations, L.L.C. and/or its contractor. Design features proposed by the Applicant ("applicant proposed measures") are provided in each of the resource-specific discussions in Chapter 4. DOE considers the applicant proposed measures in its analysis of potential for significant impacts in this EA.

- **Access Road Plan:** this plan would establish requirements for access road design, construction, and/or improvement, including erosion, stabilization/reclamation/revegetation, and dust control measures.
- **Avian Protection Plan:** this plan would be designed to reduce avian mortality resulting from avian interaction with transmission line facilities. The Applicant would collaborate with USFWS and AGFD on development of this plan.
- **Emergency Preparedness and Response Plan:** this plan would help to prevent emergencies, ensure preparedness in the event that an emergency occurs, and provide a systematic and organized response.
- **Erosion, Dust Control, and Air Quality Management Plan:** this plan would identify sources of fugitive dust and provide appropriate dust control measures, control of vehicle access, and vehicle speed restrictions.
- **Fire Protection Plan:** this plan would help to reduce the risk of and minimize the dangers associated with fires.
- **Hazardous Materials Management Plan:** this plan would reduce the risks associated with the storage, use, transportation, and disposal of hazardous materials.
- **Health and Safety Plan:** this plan would ensure the safety of the project employees, construction personnel, and the public.
- **Helicopter Flight and Safety Plan**: this plan would be implemented in the event that helicopters are needed during construction.
- **Noxious and Invasive Plant Species Management and Control Plan:** this plan would be developed to minimize the introduction of, and spread of, any noxious and invasive plant species.
- **Reclamation, Vegetation, and Monitoring Plan**: this plan would describe reclamation, revegetation, native plant management, and noxious and invasive weed control goals and measures.
- **Soil Management Plan:** this plan would identify procedures for managing soils (typically an appendix to a Stormwater Pollution Prevention Plan).
- **Spill Prevention, Control, and Countermeasures Plan (SPCC Plan)**: this plan would address requirements for petroleum spill prevention, preparedness, response, and notification to prevent oil discharges to waters of the U.S.

- **Stormwater Pollution Prevention Plan (SWPPP):** this plan would be developed to meet the requirements of the National Pollutant Discharge Elimination System (NPDES) stormwater program, as well as to minimize impacts to water quality.
- **Traffic and Transportation Management Plan:** in coordination with ADOT and local authorities and incorporating the measures in ADOT's "Environmental Planning" document related to public communication, access, and traffic control (ADOT 2017a), this plan would minimize the potential impacts of construction-related traffic to residences, businesses, and existing roadway users.
- **Waste Management Plan:** this plan would outline non-hazardous waste handling and disposal procedures.

2.5 APPLICANT ROUTE DEVELOPMENT

2.5.1 Applicant's Siting Approach

Nogales Transmission began investigating route options for the proposed Project in 2015. Nogales Transmission first identified a geographic study area within which feasible routes could be considered between the identified connection points at the Valencia Substation, the proposed Gateway Substation, and the international border. The proposed Project's route segment variation development was guided by a strategy of following existing infrastructure corridors where possible. As described in Section 1.6, the Applicant incorporated the comments received from stakeholders during the stakeholder outreach meetings. Several additional route segment variations were subsequently added. The alternatives presented in this draft EA evolved from these discussions and some additional minor refinement of the route segment variations by the Applicant. In total, 15 route segment variations (described in Section 2.5.2) were identified, which were later grouped into four alternative alignments. The Applicant's routing approach focused on:

- Working within or next to existing corridors to the extent practical. The Applicant also sought to site the proposed Project on privately owned land to the extent practicable. However, the proposed Project would also be located in parcels owned by the City of Nogales and cross ADOT ROWs.
- Working with stakeholders to understand and avoid or minimize impacts to sensitive areas and integrating information from existing federal and state planning efforts, such as from the USFS and ADOT.
- Integrating information from the route previously approved by the Arizona Power Plant and Line Siting Committee for the proposed Sahuarita-Nogales Transmission Line Project (ACC Docket Number L-00000C-01-0111-00000).[14]
- Selecting a Preferred Alternative based on coordination with landowners that would be subject to approval by the ACC pursuant to a request for a Certificate of Environmental Compliance.

[14] See ACC docket at: http://edocket.azcc.gov/Docket/DocketDetailSearch?docketId=174#docket-detail-container1.

2.5.2 Route Segment Variations

The route segment variations being considered for the proposed Project as presented in the Applicant's Presidential permit application are described below. These route segment variations were grouped into four alternative alignments.

1. Route Segment Variation 1: It begins at the existing Valencia Substation and continues west for 0.40 mile, following an existing UNSE transmission line to an undeveloped parcel. It is also located adjacent to a multifamily residential development. Utilizes a single-circuit 138-kV line on existing double-circuit capable structures.
2. Route Segment Variation 2: approximately 0.50 mile long. It begins approximately 0.15 mile north of White Park Drive and continues south, paralleling property lines to the existing Home Depot building and then west to the east side of I-19. This segment roughly follows the route proposed in the previously proposed Sahuarita-Nogales Transmission Line Project (DOE 2005). Utilizes a 138-kV double-circuit line on double-circuit capable structures.
3. Route Segment Variation 3: approximately 0.47 mile long. It begins approximately 0.15 mile north of White Park Drive and follows an existing transmission line west toward I-19. It then parallels the east side of I-19 and an existing transmission line south for 0.20 mile. Utilizes a 138-kV double-circuit line on double-circuit capable structures.
4. Route Segment Variation 4: 0.70 mile long. It begins on the east side of I-19 about 0.5 mile south of West Mariposa Road. It crosses I-19 and heads west, crossing the Mariposa Wash. Then continues southwest along property lines on the north side of the Mariposa Wash. Utilizes a 138-kV double-circuit line on double-circuit capable structures.
5. Route Segment Variation 5: 0.40 mile long. It begins on the north side of the Mariposa Wash and continues southwest, crossing Mariposa Road and terminating at the northwest corner of the intersection of Mariposa Road and the Mariposa Wash. Utilizes a 138-kV double-circuit line on double-circuit capable structures.
6. Route Segment Variation 6: 0.90 mile long. It begins on the north side of the Mariposa Wash to Industrial Park Drive. The segment then follows North Industrial Park Drive to Mariposa Road. The segment continues north along West Mariposa Road for 0.1 mile to an unnamed, unpaved road. Follows the unpaved road northwest and west to the proposed Gateway Substation site. Utilizes a triple-circuit transmission line configuration on a single tower with dual-circuit 138-kV and single-circuit 238-kV.
7. Route Segment Variation 7: 0.60 mile long. It begins in the northwest corner of the intersection of Mariposa Road and the Mariposa Wash, and continues along Mariposa Ranch Road northwest, crosses La Quinta Road, and terminates on the east side of the proposed Gateway Substation site. Utilizes a 138-kV double-circuit line and a 230-kV circuit line on double-circuit capable structures.
8. Route Segment Variation 8: 0.60 mile long. Segment 8 was removed from consideration by the Applicant.
9. Route Segment Variation 9: 0.80 mile long. It begins at the northwest corner of the intersection of Mariposa Road and the Mariposa Wash. It crosses the Mariposa Wash on the west side of Mariposa Road and then continues west along the south side of the Mariposa Wash for approximately 0.4 mile. Continues north for 0.20 mile to the south side of La Quinta Road. Utilizes a 138-kV double-circuit line on double-circuit capable structures.

10. Route Segment Variation 10: 0.57 mile long. It begins on the south side of La Quinta Road and continues north for 0.53 mile and then east for 0.04 mile to the proposed Gateway Substation site. Utilizes a 138-kV double-circuit transmission line and a 230-kV single-circuit on double-circuit capable structures in the same corridor.
11. Route Segment Variation 11: 1.28 miles long. It begins at the proposed Gateway Substation site and heads west. Then continues south, adjacent to the CNF boundary (0 feet) to the north side of the Mariposa Wash.
12. Route Segment Variation 12: 0.60 mile long. It begins at the intersection of Segments 8, 9, and 10 and continues in a southwesterly direction along the north side of the Mariposa Wash.
13. Route Segment Variation 13: 0.48 mile long. It begins on the north side of the Mariposa Wash and continues south. The western edge of the proposed ROW is located exactly on the boundary between private and CNF land (0 feet) to accommodate the planned development within the private parcels, at the request of the landowner (i.e., the ROW being located at the western edge of the parcels would be more preferable than bisecting the center of the parcels). The USFS requested that within the 150-foot-wide ROW, the centerline of the poles be placed 100 feet from the CNF boundary; this request was incorporated into the proposed Project.
14. Route Segment Variation 14: 1.33 miles long. It originates at the northwest corner of Mariposa Road and the Mariposa Wash. Continues southwest, crossing the Mariposa Wash and following property lines to a point approximately 0.1 mile north of Target Range Road.
15. Route Segment Variation 15: 0.65 mile long. It starts approximately 0.1 mile north of Target Range Road and continues south to the international border. The western edge of the proposed ROW is on the boundary between private and CNF land (0 feet), following the same rationale explained in Route Segment Variation 13 above.

2.6 ALTERNATIVES ANALYZED IN DETAIL

2.6.1 No Action Alternative

The No Action alternative establishes the baseline against which the potential environmental effects of a proposed action can be evaluated. As described at the start of this Chapter in Section 2.1, under the No Action Alternative, DOE would not issue a Presidential permit for the proposed Project, the transmission system would not be authorized to cross the U.S.-Mexico border, the proposed Project would not be constructed in the U.S., and the potential environmental impacts associated with the proposed Project would not occur. Along with the project-specific environmental impacts, the potential benefits of the proposed Project would not be realized.

2.6.2 Applicant's Preferred Alternative

The Applicant has identified Alternative 3 as its Preferred Alternative. The Applicant selected this alternative for a number of reasons. While the Preferred Alternative is approximately 10% longer than the shortest route (Alternative 4), overall it would require less ground disturbance. The Preferred Alternative would be the most economically feasible, because approximately 3 miles of the transmission line would be constructed as double-circuit, which would reduce the number of poles required; the route is relatively straighter than Alternatives 2 and 4, which would result in fewer turning and dead-end structures. Additionally, this alternative would require the fewest miles of new and upgraded access roads and has relatively easier access for construction than the other alternatives.

2.6.3 Action Alternatives

Nogales Transmission's route segment variations, as described above, were considered and grouped into four alternative alignments: Alternatives 1, 2, 3, and 4 (see Figures 2.6-1 through 2.6-12). Table 2.6-1 describes the segment variations grouped by alternative. Route Segment Variations 1, 4, 5, and 15 are common to all of the alternatives. As discussed above, the Applicant has identified Alternative 3 as its Preferred Alternative.

Table 2.6-1. Route Segment Variations

Route Segment Variation	1	2	3	4	5	6	7	8*	9	10	11	12	13	14	15
Alternative 1	x	x		x	x				x	x	x		x		x
Alternative 2	x		x	x	x	x								x	x
Alternative 3 (Preferred)	x		x	x	x				x	x		x	x		x
Alternative 4	x		x	x	x		x							x	x

* Route Segment Variation 8 was removed from the analysis.

2.6.3.1 Alternative 1

Alternative 1 consists of Route Segment Variations 1, 2, 4, 5, 9, 10, 11, 13, and 15 (see Figures 2.6-1 – 2.6-3). Alternative 1 consists of the southern portion of the route that was proposed by TEP in the Sahuarita-Nogales Transmission Line project (DOE 2005).[15] Alternative 1 would begin at the existing Valencia Substation, extending west and utilizing the existing conductor and poles of an existing 138-kV UNSE transmission line corridor for approximately 0.4 mile. The route would continue south for 0.2 mile toward the existing Home Depot building and then west for approximately 0.5 mile, crossing I-19 and the Mariposa Wash.

The route would continue southwest along a property line and on the north side of the Mariposa Wash to North Mariposa Road. The route would follow Mariposa Road south and Mariposa Wash west for 0.6 mile. The route would then continue north for 0.7 mile to the proposed Gateway Substation. This portion of the route consists of two circuits; the first originates 1,900 feet west of the existing Valencia Substation. Here, the existing Vail to Valencia transmission line would be severed and continue west to the Gateway Substation, thereby converting the existing Vail to Valencia transmission line to the Vail to Gateway transmission line. The second circuit would originate at the Gateway Substation and continue east to the Valencia Substation, utilizing the existing UNSE conductor and poles along Route Segment Variation 1. This circuit would constitute the new Gateway to Valencia transmission line. The 230-kV line would originate at the Gateway Substation, continue west for 0.5 mile and then continue south, adjacent to the eastern boundary of the CNF to the international border.

[15] In August 2000, TEP applied for a Presidential permit for the proposed Sahuarita-Nogales Transmission Line project (DOE Docket Number PP-229). The Final Environmental Impact Statement (DOE/EIS-0336) was published in January 2005. However, the Presidential permit was never issued. For more information, see the Office of NEPA Policy and Compliance website: http://energy.gov/nepa/downloads/eis-0336-final-environmental-impact-statement-0. On July 29, 2016, TEP sent a letter to DOE requesting that its Presidential permit application for the proposed Sahuarita-Nogales Transmission Line project be withdrawn. DOE has withdrawn the application.

At approximately 5.8 miles, it is the longest of the four alternatives and follows the least amount of existing infrastructure. Alternative 1 would use 3.08 miles of Access Type A and 0.24 mile of Access Type B and require the upgrade of 3.22 miles of Access Type C roads. Additionally, 2.27 miles of Access Type D and 0.49 mile of Access Type E roads would be constructed.

2.6.3.2 Alternative 2

Alternative 2 consists of Route Segment Variations 1, 3, 4, 5, 6, 14, and 15 (see Figures 2.6-4 – 2.6-6). Alternative 2 would begin at the existing Valencia Substation and follow an existing UNSE transmission line corridor west for approximately 0.4 mile. Alternative 2 would utilize the existing conductor and poles for approximately 1,900 feet on an existing 138-kV UNSE transmission line along Route Segment Variation 1.The route would continue south and then west, utilizing double-circuit 138-kV construction.

The route would cross I-19 and the Mariposa Wash. The route would continue southwest along a property line and on the north side of the Mariposa Wash, then follow the east side of this parcel north to Industrial Park Drive. The route would then follow Industrial Park Drive to Mariposa Road, proceed north along Mariposa Road for 0.1 mile to an unnamed unpaved road and continue northwest and west to the new Gateway Substation site. On the western portion of Alterative 2, both circuits would be connected to the Gateway Substation. On the eastern portion, the existing Vail to Valencia line would be severed and connected to one circuit of this new line, thereby converting the existing Vail to Valencia transmission line to the Vail to Gateway transmission line. The second circuit would connect with the existing portion of the UNSE 138-kV transmission line at an existing pole 1,900 feet west of the existing Valencia Substation, and continue east along the north side of W. White Park Drive to the Valencia Substation. This circuit would constitute the new Gateway to Valencia transmission line.

Alternative 2 follows the same path out of the Gateway Substation for the 230-kV line. The route would then continue in a southwest direction for 1.7 miles to a point approximately 0.1 mile north of Target Range Road and then continue south, paralleling the eastern boundary of the CNF to the international border. The 230-kV line would originate at the Gateway Substation and end at the Mexico border. Alternative 2 would also utilize triple-circuit transmission line configuration of 138 kV and 230 kV for approximately 4,700 feet along Route Segment Variation 6 that would be approximately 140 feet tall.

Alternative 2 is the third longest route at approximately 4.9 miles. Alternative 2 would use 1.57 miles of Access Type A and 0.86 mile of Access Type B, and require the upgrade of 1.60 miles of Access Type C roads. Additionally, 2.00 miles of Access Type D and 0.38 mile of Access Type E roads would be constructed.

2.6.3.3 Alternative 3 (Applicant's Preferred Alternative)

Alternative 3 consists of Route Segment Variations 1, 3, 4, 5, 9, 10, 12, 13, and 15 (see Figures 2.6-7 – 2.6-9). Alternative 3 would begin at the existing Valencia Substation and follow an existing UNSE transmission line corridor west for approximately 0.4 mile. Alternative 3 would utilize the existing conductor and poles for approximately 1,900 feet on an existing 138-kV UNSE line. The route would then continue, utilizing double-circuit 138-kV construction, south and then west, crossing I-19 and the Mariposa Wash. The route would continue southwest along a property line and on the north side of the Mariposa Wash to Mariposa Road. The route would cross Mariposa Road and continue along the south side of the Mariposa Wash for 0.6 mile. The route would then continue north for 0.75 mile to the proposed Gateway Substation.

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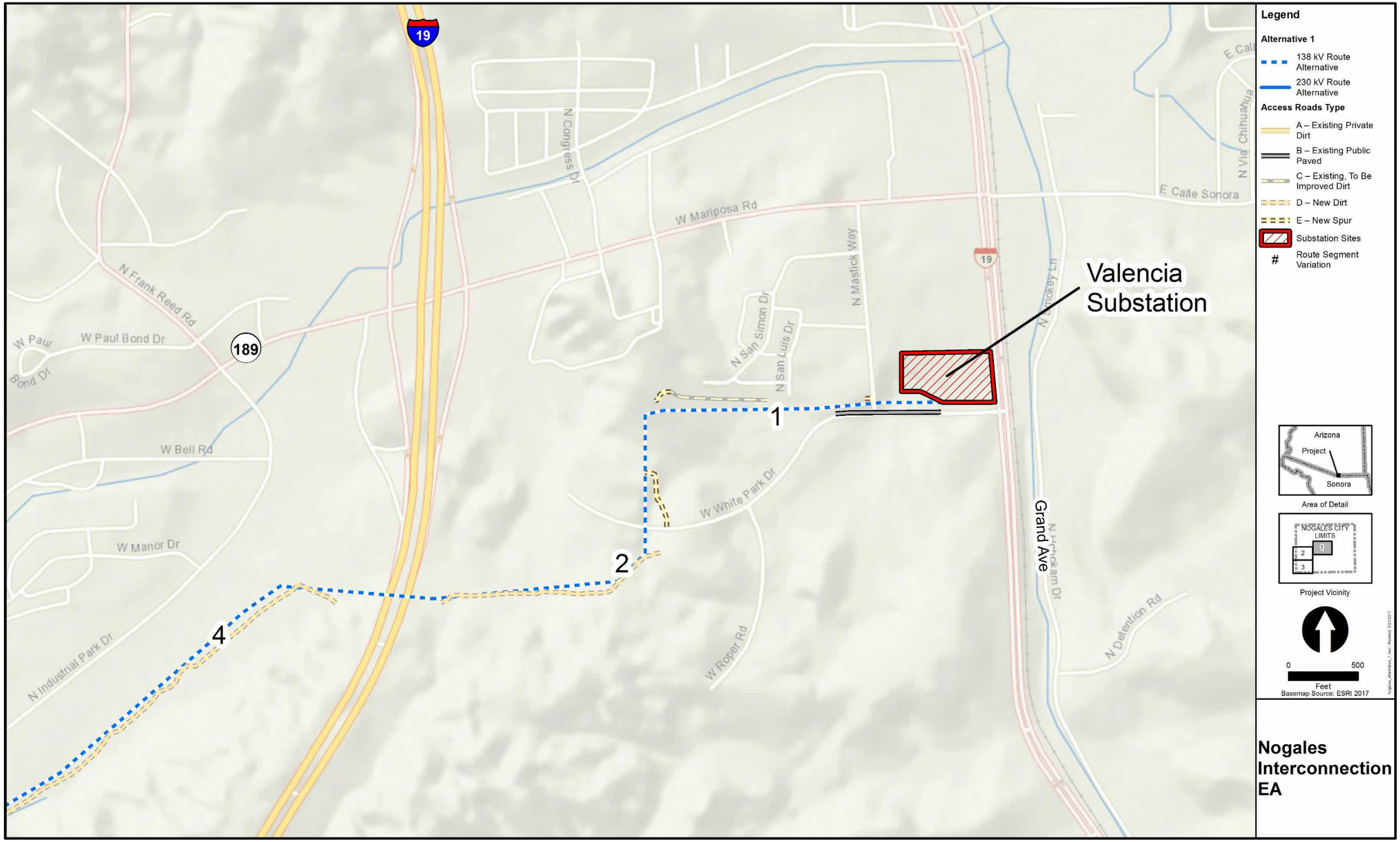

Figure 2.6-1. Overview of Alternative 1, map 1 of 3.

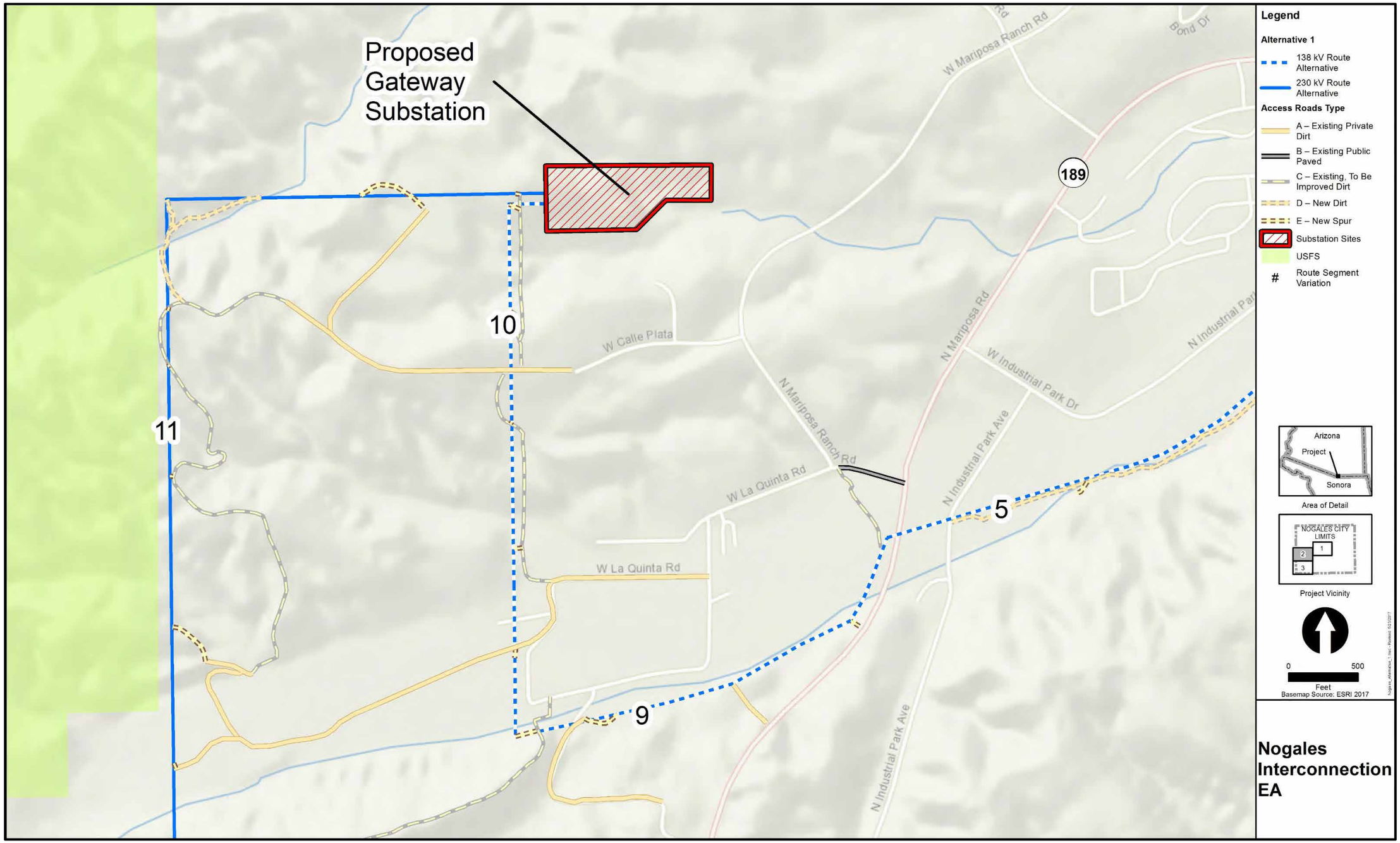

Figure 2.6-2. Overview of Alternative 1, map 2 of 3.

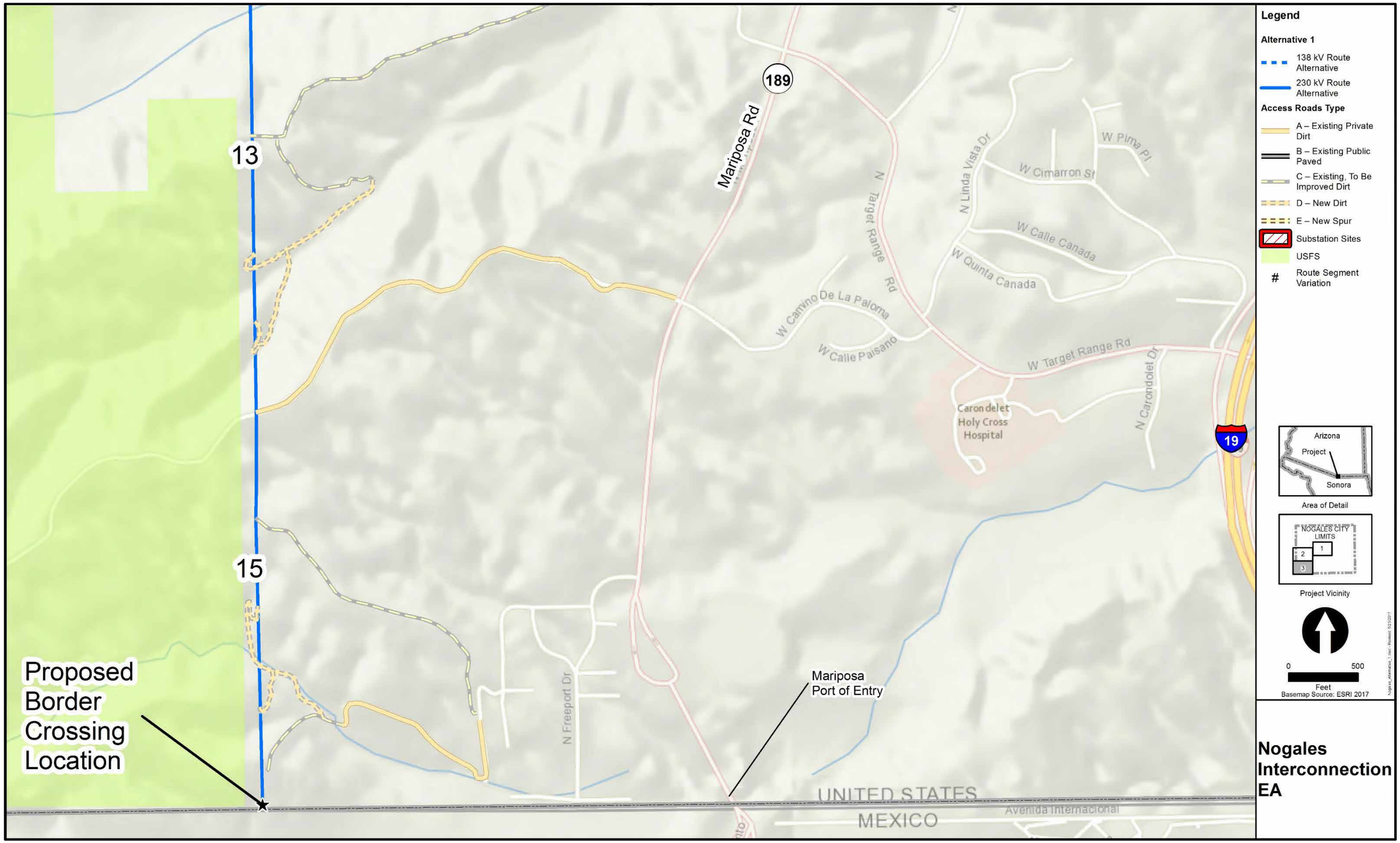

Figure 2.6-3. Overview of Alternative 1, map 3 of 3.

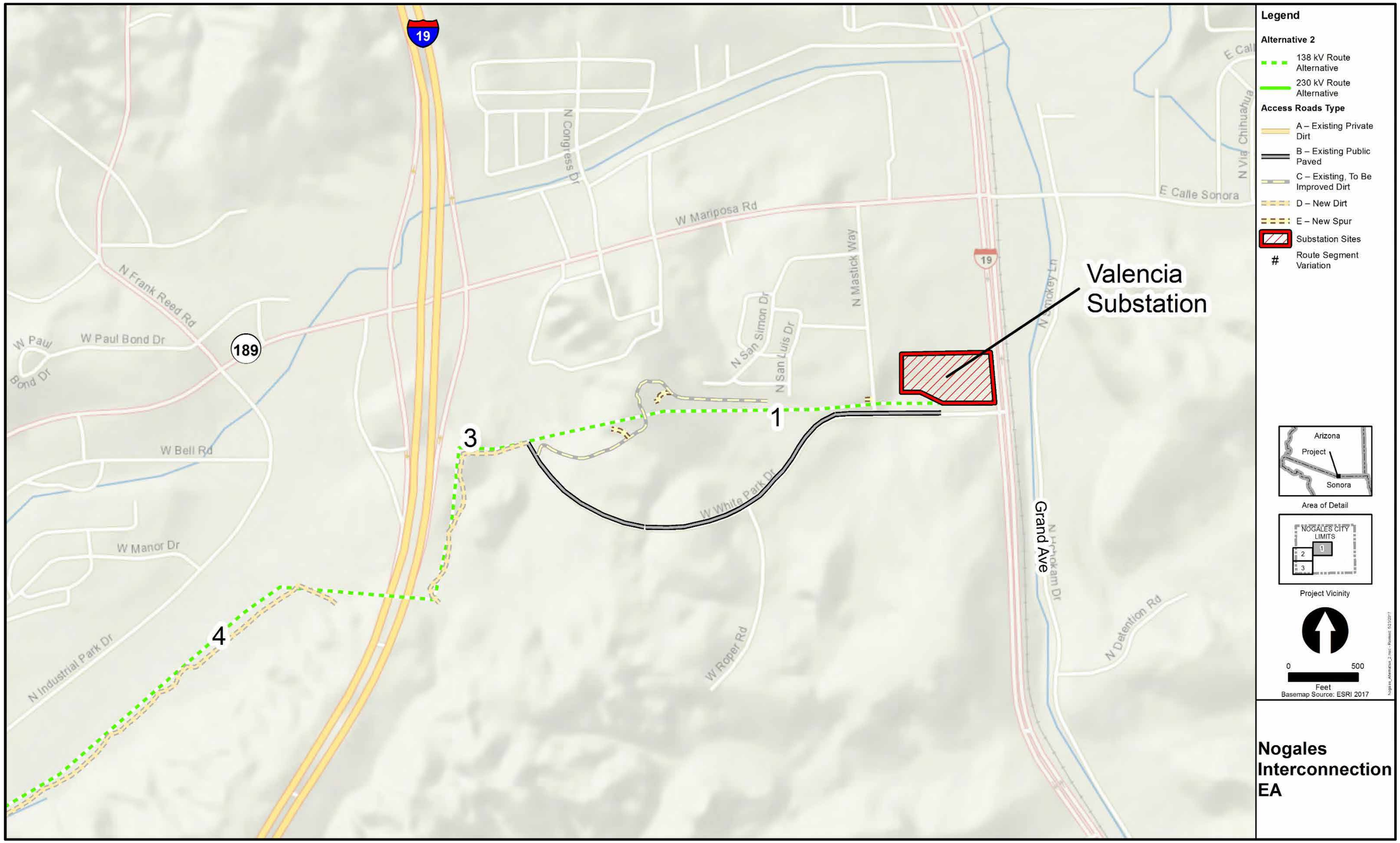

Figure 2.6-4. Overview of Alternative 2, map 1 of 3.

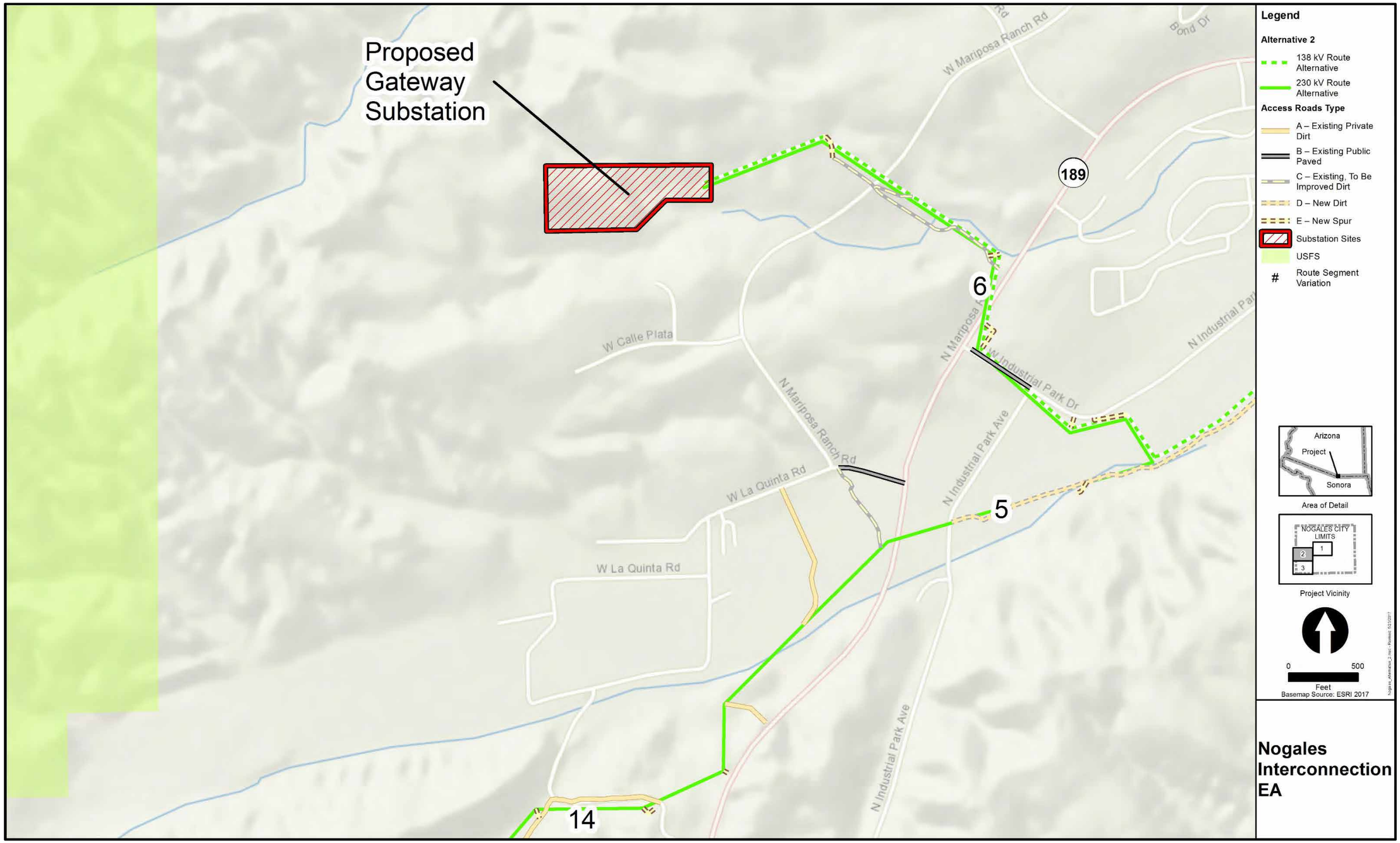

Figure 2.6-5. Overview of Alternative 2, map 2 of 3.

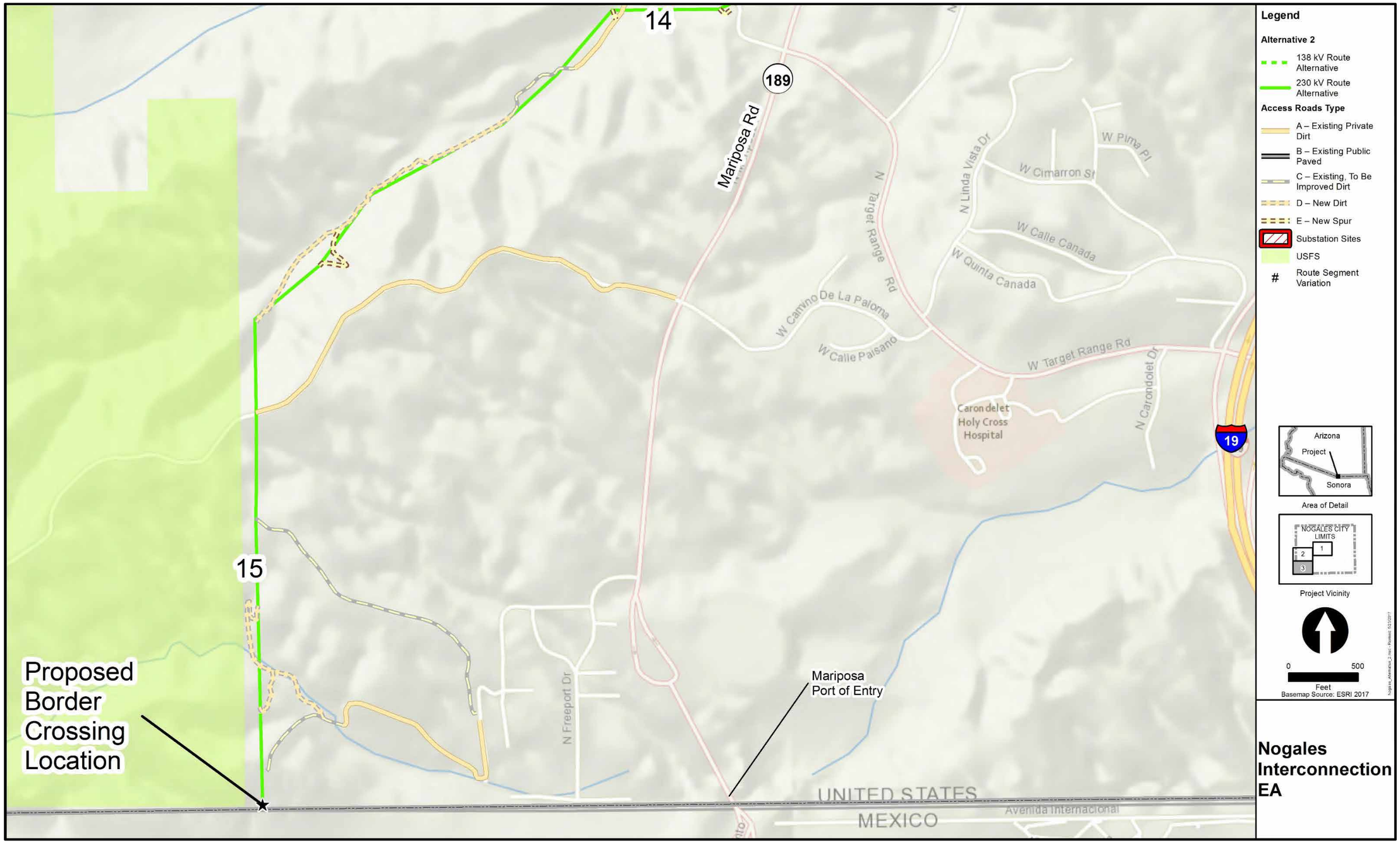

Figure 2.6-6. Overview of Alternative 2, map 3 of 3.

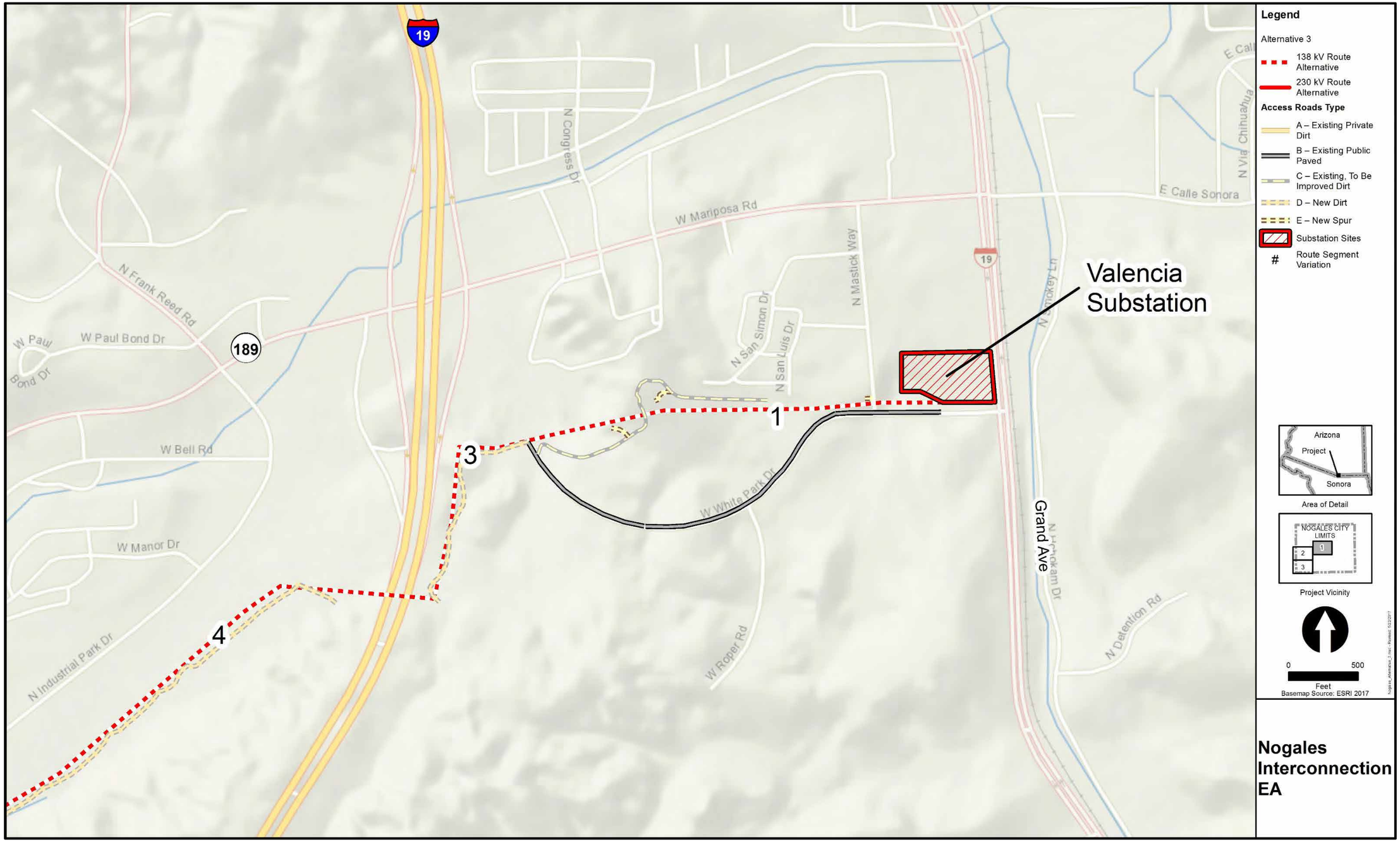

Figure 2.6-7. Overview of Alternative 3, map 1 of 3.

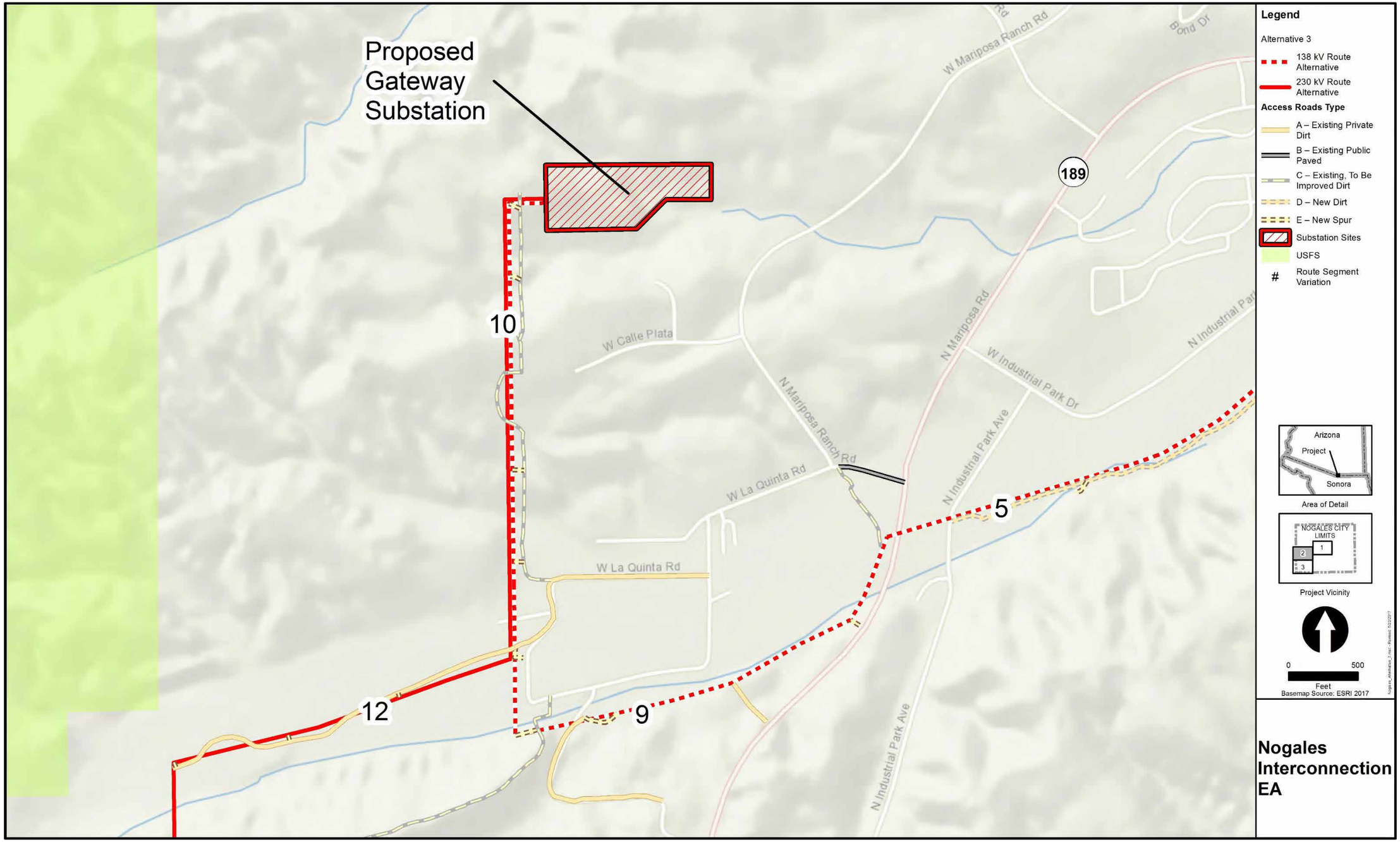

Figure 2.6-8. Overview of Alternative 3, map 2 of 3.

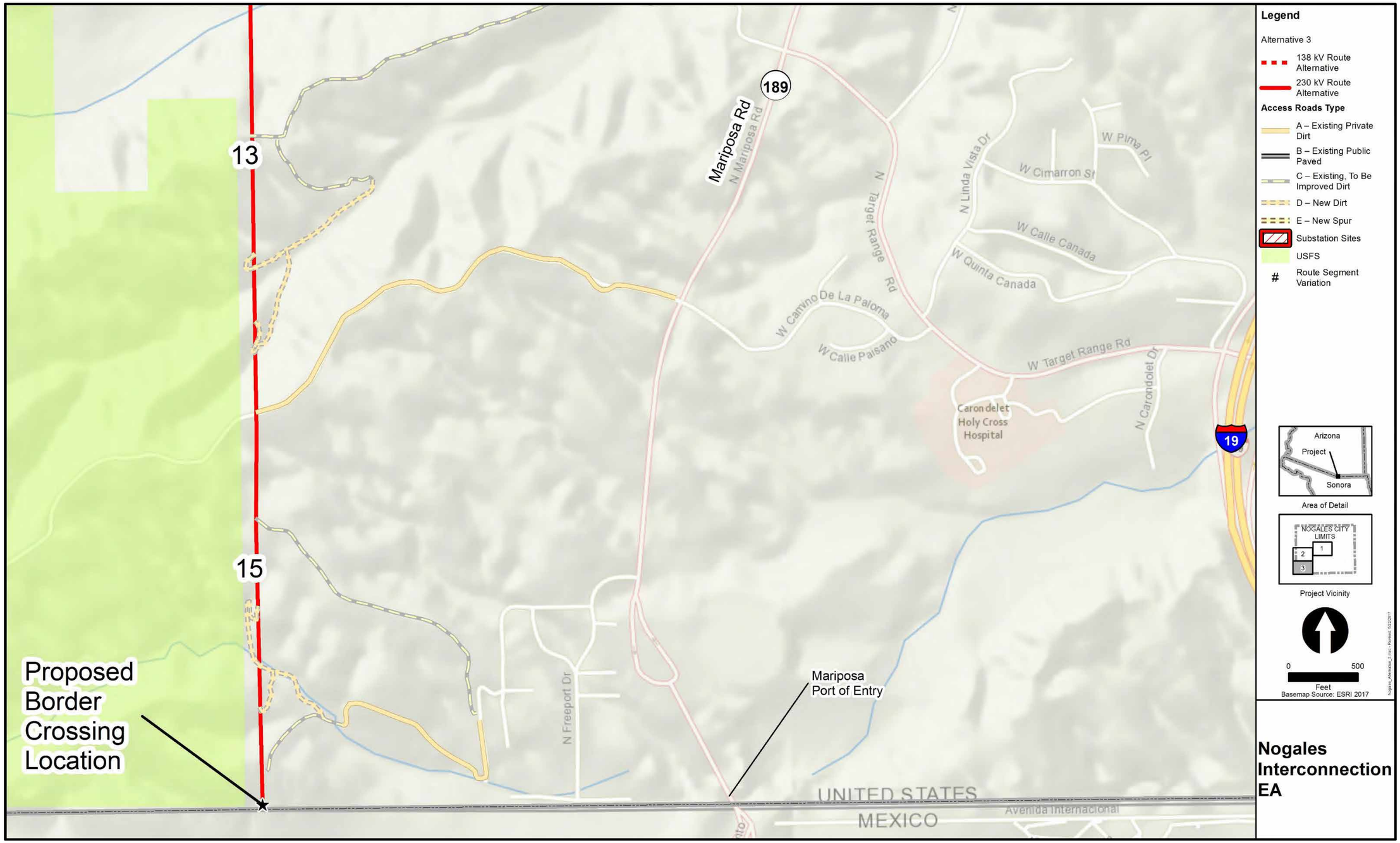

Figure 2.6-9. Overview of Alternative 3, map 3 of 3.

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On the western portion of Alternative 3, both circuits would be connected to the Gateway Substation. On the eastern portion, the existing Vail to Valencia line would be severed and connected to one circuit of this new line, thereby converting the existing Vail to Valencia transmission line to the Vail to Gateway transmission line. The second circuit would connect with the existing portion of the UNSE 138-kV transmission line at an existing pole 1,900 feet west of the existing Valencia Substation, and continue east along the north side of W. White Park Drive to the Valencia Substation. This circuit would constitute the new Gateway to Valencia transmission line.

The route would exit the Gateway Substation site and return south along the same route for 0.6 mile. The route would continue southwest on the north side of the Mariposa Wash and then continue south to the international border. Alternative 3 would utilize a double-circuit transmission line configuration of 138 kV and another parallel line of 230 kV for approximately 3,500 feet along Route Segment Variation 10. Average pole height along Route Segment Variation 10 would be 100 feet.

Alternative 3 is the second longest route at approximately 5.1 miles. Alternative 3 would use 2.23 miles of Access Type A and 0.76 mile of Access Type B, and require the upgrade of 2.60 miles of Access Type C roads. Additionally, 1.97 miles of Access Type D and 0.56 mile of Access Type E roads would be constructed.

2.6.3.4 Alternative 4

Alternative 4 consists of Route Segment Variations 1, 3, 4, 5, 7, 14, and 15 (see Figures 2.6-10 – 2.6-12). Alternative 4 would begin at the existing Valencia Substation and follow an existing UNSE transmission line corridor west for approximately 0.4 mile. Alternative 4 would utilize existing conductor and poles for approximately 1,900 feet on an existing 138-kV UNSE transmission line. The route would continue south utilizing double-circuit 138-kV construction, and then west, crossing I-19 and the Mariposa Wash. The route would continue southwest along a property line and on the north side of the Mariposa Wash to Mariposa Road. The route would cross Mariposa Road and continue northwest along Mariposa Ranch Road to the proposed Gateway Substation.

On the western portion of Alternative 4, both circuits would be connected to the Gateway Substation. On the eastern portion, the existing Vail to Valencia line would be severed and connected to one circuit of this new line, thereby converting the existing Vail to Valencia line to the Vail to Gateway transmission line. The second circuit would connect with the existing portion of the UNSE 138-kV transmission line at an existing pole 1,900 feet west of the existing Valencia Substation and continue east along the north side of W. White Park Drive to the Valencia Substation. This circuit would constitute the new Gateway to Valencia transmission line.

The route for the 230-kV line would leave the Gateway Substation and return southeast along the same path to the northwest corner of Mariposa Road and the Mariposa Wash. The route would then continue in a southwest direction for 1.3 miles to a point approximately 0.1 mile north of Target Range Road. The route would continue south on Target Range Road to the international border. Alternative 4 would also utilize a double-circuit transmission line configuration of 138 kV and another line energized at 230 kV for approximately 3,200 feet along Route Segment Variation 7. Pole height along Route Segment Variation 7 would be approximately 105 feet.

Alternative 4 is the shortest route at approximately 4.6 miles. Alternative 4 would use 1.60 miles of Access Type A and 1.15 miles of Access Type B, and require the upgrade of 1.26 miles of Access Type C roads. Additionally, 2.04 miles of Access Type D and 0.66 mile of Access Type E roads would be constructed.

2.7 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS

The route segment variations discussed above could be combined to create a new alternative alignment if the new combination of segment variations connects the Valencia Substation to the Gateway Substation, and the Gateway Substation to the border. However, other route segment variation combinations were eliminated from further detail, because they would create greater areas of disturbance, involve landowners who do not support the proposed Project being sited on their property, and ultimately cost more to obtain ROWs and construct.

Developing an alternative along the Grand Avenue/I-19 corridor or the SR-189 corridor was considered but eliminated, because ADOT indicated that there are existing improvement plans within their ROWs, as well as development plans in adjacent parcels. Landowners expressed concern that the creation of a new corridor in this area would bisect private land parcels, potentially resulting in a negative impact on private land values and future development of the area.

Developing an alternative farther to the east (i.e., east of SR 189) was considered by the Applicant but eliminated because there are no other major north-south corridors in this area, and population density and existing development on the Mexican side of the border would make siting an international border crossing location in this area more challenging than in the crossing location of the Project as proposed.

No other locations for the proposed Gateway Substation were considered because this parcel was previously acquired by TEP in 2001 as part of the Sahuarita-Nogales Transmission Line Project. This site was cleared by TEP in 2003 and is currently being used for storage. Also, during the stakeholder outreach meetings held in 2015, no concerns were raised regarding the further development of this site for the proposed Project.

The original international border crossing location proposed by the Applicant was the same location considered as part of the Sahuarita-Nogales Transmission Line Project. The proposed crossing site was shifted 25 feet to the east, as requested by the USFS, so that the centerline would be 100 feet away from the border with the CNF (rather than 75 feet, as originally proposed). In this way, the facilities are sited as far from the boundary with the CNF as possible within the proposed ROW boundary.

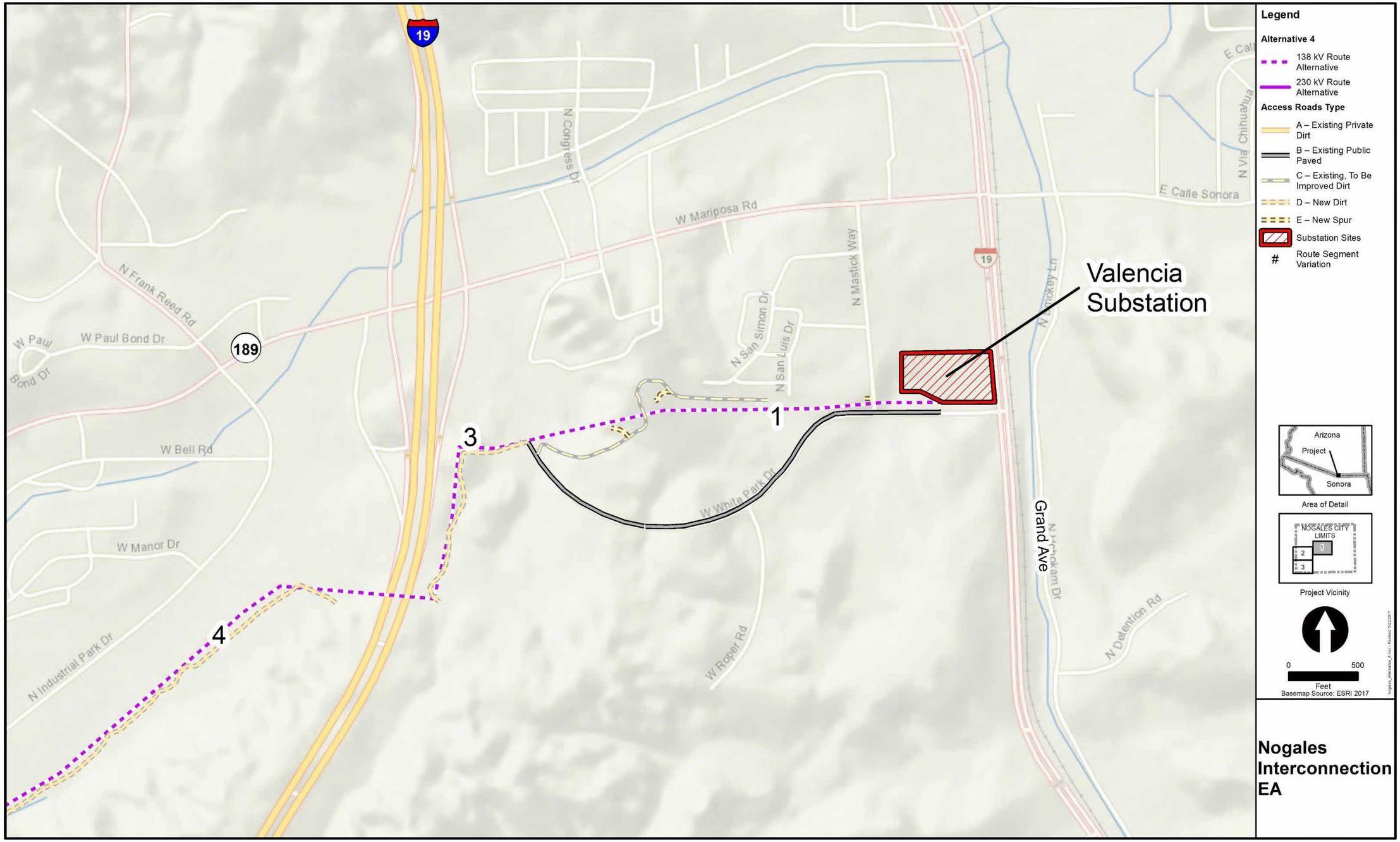

Figure 2.6-10. Overview of Alternative 4, map 1 of 3.

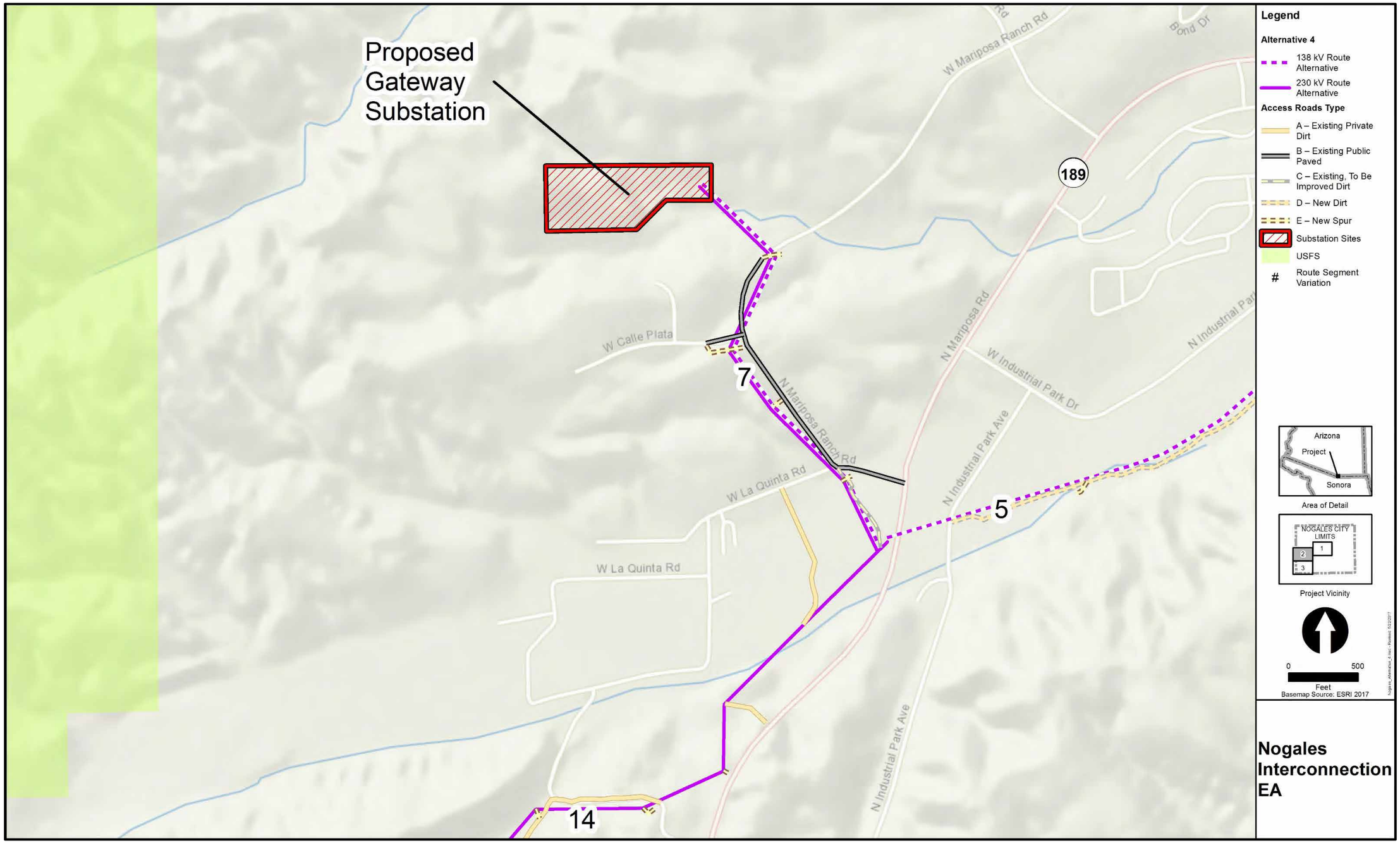

Figure 2.6-11. Overview of Alternative 4, map 2 of 3.

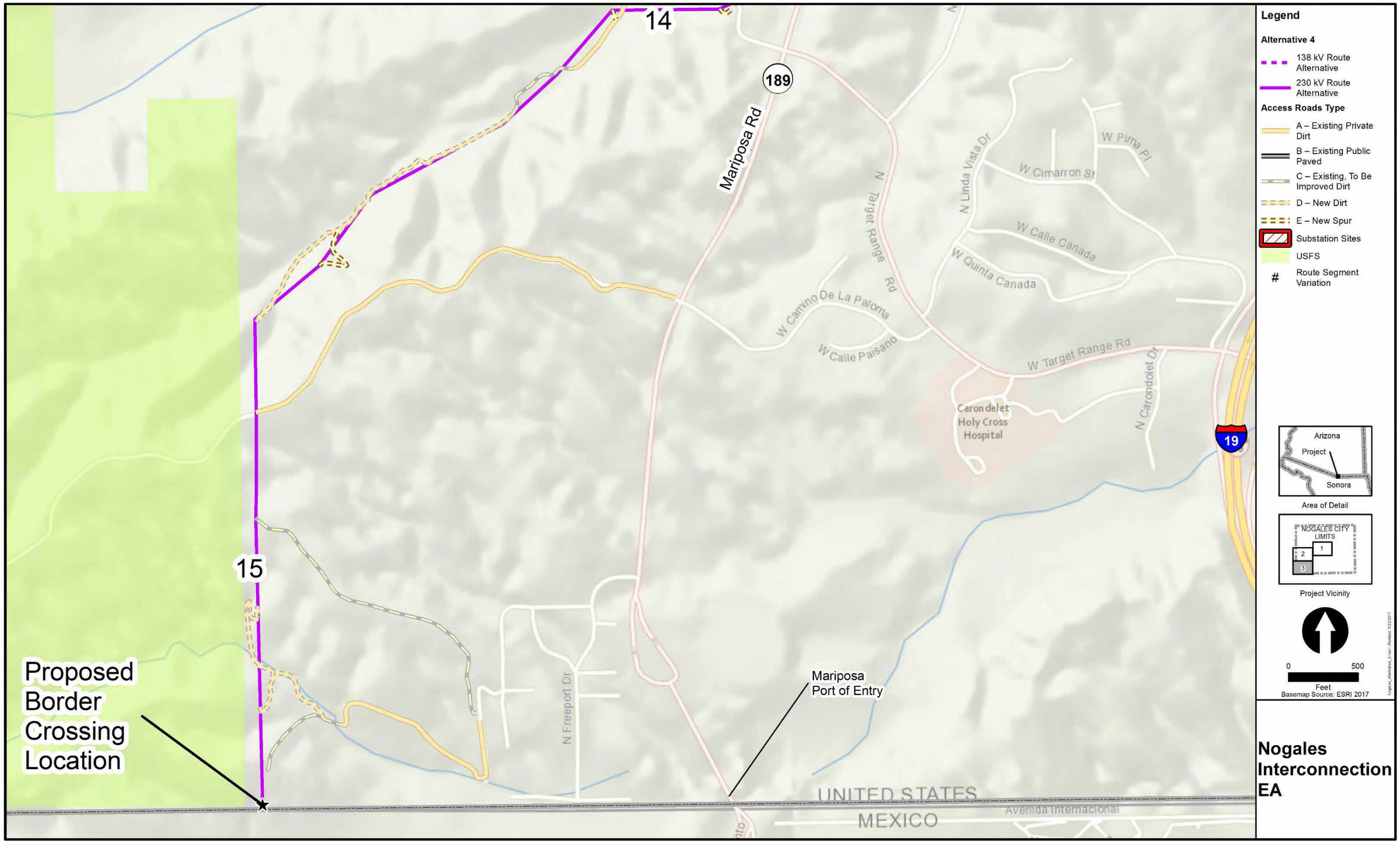

Figure 2.6-12. Overview of Alternative 4, map 3 of 3.

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Chapter 3

AFFECTED ENVIRONMENT

3.1 INTRODUCTION

Chapter 3 discusses the existing environmental conditions of the analysis areas for the proposed Project. The resources considered in the analysis are listed in Section 3.1.1 and described in the following sections. The analysis area for each of the resources is described in Section 3.1.2.

3.1.1 Resources Considered in this Analysis

The following resources are analyzed in this chapter (summarized in Table 3.1-1).

Table 3.1-1. Resources Considered for Detailed Analysis in this EA

Resource	Section of Chapter 3 where analyzed
Geology and Soils	Section 3.2
Vegetation	Section 3.3
Wildlife	Section 3.4
Water Resources and Quality	Section 3.5
Land Use and Recreation	Section 3.6
Visual Resources	Section 3.7
Socioeconomics	Section 3.8
Environmental Justice	Section 3.9
Historic and Cultural Resources	Section 3.10
Air Quality and Climate Change	Section 3.11
Noise	Section 3.12
Infrastructure	Section 3.13
Human Health and Safety	Section 3.14
Hazardous Materials and Waste	Section 3.15

3.1.2 Analysis Area

The analysis area for each resource is described below. Analysis areas were established to provide a broad enough geographic context within which the impacts of the proposed Project and alternatives can be described. The analysis area for each resource topic applies to all subsections within that topic and is limited to the U.S.

The analysis area for the following resources is a ***1-mile buffer*** of the centerline of the action alternatives (Alternatives 1 through 4):

1. Geology and Soils
2. Vegetation

3. Wildlife
4. Water Resources and Quality
5. Noise
6. Infrastructure
7. Hazardous Materials and Waste

The following resources or sub-resources have an analysis area that is ***different from the 1-mile buffer*** for various reasons (as described in detail in that section):

1. Seismicity: 25-mile buffer of the centerline of the action alternatives
2. Land Use and Recreation: Santa Cruz County
3. Visual Resources: 5-mile buffer of the centerline of the action alternatives
4. Socioeconomics: Santa Cruz County
5. Environmental Justice: Census Tracts 9662 and 9664.01, with a reference area consisting of the City of Nogales, Arizona
6. Historic and Cultural Resources: APE (200-foot-wide corridor along the proposed transmission line centerline; the existing Valencia Substation; the proposed Gateway Substation; and access roads that would require ground-disturbing activity (Access Type C – existing, to-be-improved dirt roads, Access Type D – new dirt roads, and Access Type E – new dirt spur roads)
7. Air Quality: Santa Cruz County
8. Climate Change: considered on a global scale
9. Radio, Television, and Cellular Communication (subsection): 1,500-foot buffer of the centerline of the action alternatives
10. Human Health and Safety: 1,000-foot buffer of the centerline of the action alternatives

3.2 GEOLOGY AND SOILS

The analysis area for geology and soils is a 1-mile buffer of the centerline of the action alternatives. The analysis area falls within the Mexican Highland Section of the Basin and Range physiographic province of the Intermontane Plateaus. This province is characterized by elongated northwest-southeast-trending mountain ranges divided by broad, smooth, alluvial valleys (NRCS 2006). Elevation within the analysis area ranges from approximately 3,765 feet (near the Valencia Substation) to 4,239 feet above mean sea level (near the U.S.-Mexico border). The terrain in the analysis area is characterized by an extensive pattern of short, dissected ridges and draws formed along longer ridges descending from nearby mountains.

3.2.1 Geology

Most of the analysis area is covered by deep alluvium (carried by rivers and streams) from adjacent mountains. The younger deposits consist of alluvial derived sediments transported from mountains to rivers, streams, washes, and floodplains. The older deposits consist of alluvial and eolian (wind-deposited) derived sediments found in valleys and at the base of mountains. Table 3.2-1 describes the two types of alluvium that can be found in the analysis area.

Table 3.2-1. Geology of the Analysis Area

Geologic Type	Description
Middle Miocene to Oligocene Sedimentary Rocks (32 to 11 million years ago [Ma])	Conglomerate, sandstone, mudstone, limestone, and rock-avalanche breccia (sheet-like deposits of crushed rock) deposited and tilted during widespread normal faulting and basin development. Sediments, mostly conglomerate and sandstone, are commonly medium to dark brown, reddish brown, or brownish gray; younger strata are generally lighter colors. Most deposits are 30 to 20 Ma in southeastern Arizona and 25 to 15 Ma in central and western Arizona.
Pliocene to Middle Miocene Deposits (16 to 2 Ma)	Moderately to strongly consolidated conglomerate and sandstone deposited in basins during and after late Tertiary faulting. Includes lesser amounts of mudstone, siltstone, limestone, and gypsum. These deposits are generally light gray or tan. They commonly form high rounded hills and ridges in modern basins, and locally form prominent bluffs. Deposits of this unit are widely exposed in the dissected basins of southeastern and central Arizona.

Source: Arizona Geological Survey (2016).

The analysis area is located within the Santa Cruz Valley, an area that is rich in geological resources, including copper, molybdenum, and gold. According to the Arizona Geological Survey, no major mines, including major coal, oil, or gas resources, exist in the analysis area (AGS 2016).

3.2.2 Hazards

Geologic hazards are natural physical conditions that, when present, can result in damage to land and structures or injury to people. Potential geologic hazards in the analysis area were determined through database searches, literature reviews, and topographic map reviews. Potential geologic hazards that could occur within the analysis area include faults and seismic activity, subsidence, slumping and landslides, and debris flows. Overall, the analysis area is at relatively low risk for geologic hazards, discussed in more detail in the subsections below.

3.2.2.1 Land Subsidence

Land subsidence, when attributable to groundwater withdrawal in alluvial basins, is a process of compression and subsequent consolidation of the alluvial sediments. Through geologic time, groundwater levels in the alluvial basin material were at or near the ground surface or at elevations controlled by rivers and drainage systems traversing the basins. Human activities have affected, and are continuing to affect, groundwater levels in many of these basins. Groundwater pumping, primarily for agricultural, industrial, and municipal uses, has depleted stored groundwater in many areas. Over time, and given the correct geologic conditions, subsidence can lead to earth fissure. The nearest documented subsidence area is in Green Valley, Arizona, approximately 35 miles north of the analysis area (ADWR 2015). No earth fissures have been documented in the analysis area (AGS 2016).

3.2.2.2 Slumping and Landslides

Generally, any steep slope is susceptible to slumping or landslides under the right conditions. Flash floods are relatively common during Arizona's monsoon season. These floods and their potential debris flows can occur in any of the many washes that occur within the analysis area. However, most slopes in the analysis area are relatively short and gentle and not highly susceptible to failure during heavy rains.

3.2.2.3 Seismicity

Potentially active faults are scattered throughout southeastern and central Arizona, with the nearest being approximately 10 miles to the north of the analysis area. Of the nine potentially active faults in the

analysis area, all have had little historical activity, low slip rates, and long intervals between ruptures. Because of these conditions, the U.S. Geological Survey (USGS) considers Santa Cruz County to be at low to moderate risk for earthquakes (AGS 2016).

3.2.3 Soils/Sediments

Eleven soil types occur in the analysis area. These are listed and described in Table 3.2-2 and depicted on Figure 3.2-1. Substrates in the analysis area are primarily well-drained, gravelly sandy loams to very gravelly sandy clay loams on slopes (NRCS 2016a). NRCS administers the Farmland Protection Policy Act of 1981 (7 U.S.C. Chapter 73, Sections 4201–4209). Certain soil types are considered prime farmland and are protected under the Act. There is currently no prime farmland within the analysis area, though four of the soil types found in the analysis area would be prime farmland if irrigated (see the description below in Table 3.2-2).

Table 3.2-2. Soil Map Units in the Analysis Area

Soil Type	Description	Percentage of Analysis Area*
Caralampi gravelly sandy loam, 10 to 40 percent slopes	Well-drained, gravelly to very gravelly sandy loam. On old dissected fans. Soils are derived from old alluvium and are in a medium runoff class. Not prime farmland.	10.99%
Caralampi gravelly sandy loam, 10 to 60 percent slopes, eroded	Well-drained, gravelly to very gravelly sandy loam. On old dissected fans. Soils are derived from old alluvium and are in a medium runoff class. Not prime farmland.	38.30%
Chiricahua cobbly sandy loam, 10 to 45 percent slopes	Well-drained, gravelly to very gravelly sandy loam. On old dissected fans. Soils are derived from old alluvium and are in a medium runoff class. Not prime farmland.	1.32%
Chiricahua-Lampshire association, rolling	Very gravelly soils found on mountains, derived from weathered granite and volcanic rock, with slopes of 10% to 15%. Not prime farmland	1.59%
Comoro soils, 0 to 5 percent slopes	Well-drained, gravelly sandy loam soils typically found in floodplains. Soils are derived from mixed recent alluvium and are in a low runoff class. Prime farmland if irrigated.	8.01%
Grabe soils	Well-drained loam to sandy loam soils with a 0% to 1% slope. These soils are typically found in floodplains and have a low runoff class. Prime farmland if irrigated.	8.58%
Grabe-Comoro complex, 0 to 5 percent slopes	Well-drained loam to sandy loam soils with a 0% to 5% slope. These soils are typically found in floodplains and have a low runoff class. Prime farmland if irrigated.	3.44%
Lampshire-Chiricahua association, steep	Well-drained, shallow, cobbly loam with a 0 to 90% slope. On hills and mountains. Soils are derived from granitic and metamorphic rock and are in a high runoff class. Not prime farmland.	2.25%
Pima soils	Well-drained, gravelly sandy loam soils found in floodplains with slopes of 0% to 3%. Soils are derived from recent mixed alluvium and are in a low runoff class. Prime farmland if irrigated.	1.75%
Rock outcrop-Lithic Haplustolls association	Soils found on summits, flanks, and side slopes of hills and mountains with 15% to 60% slopes. Not prime farmland.	7.08%
White House-Caralampi complex, 10 to 35 percent slopes	Well-drained, gravelly to very gravelly sandy loam and gravelly to very gravelly sandy clay loam. Slopes are typically 10% to 35% and are in a medium runoff class. Not prime farmland.	16.70%

Source: NRCS (2016a).

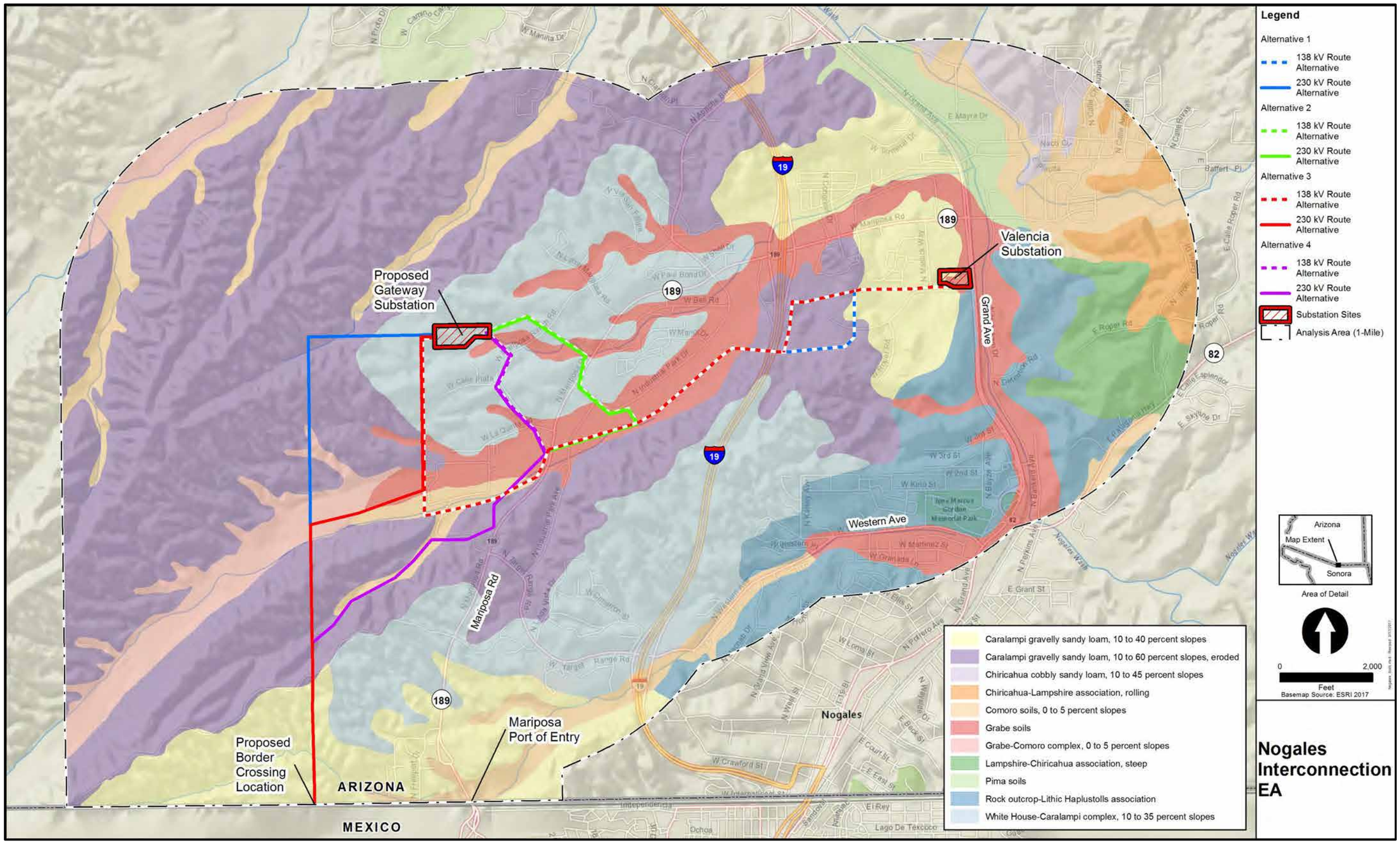

Figure 3.2-1. Soil types in the analysis area.

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3.3 VEGETATION

3.3.1 General Vegetation

The analysis area for vegetation is a 1-mile buffer of the centerline of the action alternatives. Ten types of vegetation communities are found in the analysis area (see Figure 3.3-1). However, one of the 10 types (Mogollon Chaparral), only covers 0.0002% of the analysis area. As such, there is no further discussion of this type. Table 3.3-1 describes the nine vegetation types. Fifty-six percent of the analysis area consists of developed land of various intensities, while the remaining 44% consists of natural vegetative communities (USGS 2005). The landscape in the western portion of the analysis area consists primarily of undisturbed natural habitat with some evidence of grazing and development, as opposed to the eastern portion, where development has replaced or affected the majority of the existing habitat, and weedy plant species are dominant. The NRCS PLANTS database was used for plant naming conventions (NRCS 2016b).

Table 3.3-1. Vegetation Communities in the Analysis Area

Vegetation Community	Description	Percentage of Analysis Area
Apacherian-Chihuahuan Mesquite Upland Scrub	This system occurs as upland shrublands that are concentrated in the extensive grassland-shrubland transition in foothills and piedmont in the Chihuahuan Desert. Substrates are typically derived from alluvium. Mesquite (*Prosopis* sp.) and other deep-rooted shrubs dominate, and grass cover is low.	18%
Apacherian-Chihuahuan Piedmont Semi-Desert Grassland and Steppe	This system is a broadly defined desert grassland, mixed shrub-succulent or xeromorphic tree savanna, found on mesas and steeper piedmont and foothill slopes in the Chihuahuan Desert. Diverse perennial grasses, with some succulent species and shrub-sized tree species, characterize it.	9%
Chihuahuan Creosotebush, Mixed Desert and Thorn Scrub	This cover type includes xeric creosotebush (*Larrea tridentata*) basins and plains, and the mixed desert scrub in the foothill transition zone above.	<1%
Chihuahuan Mixed Salt Desert Scrub	This system includes extensive open-canopied shrublands of typically saline basins, on alluvial flats and around playas. Saltbush (*Atriplex* sp.) species predominate.	1%
Developed, Medium – High Intensity	*Developed, Medium Intensity:* Includes areas with a mixture of constructed materials and vegetation. Impervious surface accounts for 50% to 79% of the total cover. These areas most commonly include single-family housing units. *Developed, High Intensity:* Includes highly developed areas where people reside or work in high numbers. Examples include apartment complexes, row houses, and commercial/industrial. Impervious surfaces account for 80% to 100% of the total cover.	34%
Developed, Open Space – Low Intensity	*Open Space*: Includes areas with a mixture of some construction materials, but mostly vegetation in the form of lawn grasses. Impervious surfaces account for less than 20% of total cover. These areas most commonly include large lot single-family housing units, parks, golf courses, and vegetation planted in developed settings for recreation, erosion control, or aesthetic purposes. *Developed, Low Intensity:* Includes areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 20% to 49% of total cover. These areas most commonly include single-family housing units.	22%
Madrean Encinal	This system includes seral stands dominated by shrubby Madrean oaks (*Quercus* sp.), typically with a strong graminoid layer (*Aristida* sp., *Bouteloua* sp., etc.).	14%

Table 3.3-1. Vegetation Communities in the Analysis Area (Continued)

Vegetation Community	Description	Percentage of Analysis Area
North American Warm Desert Riparian Mesquite Bosque	This system consists of low-elevation (<1,100 m) riparian corridors along intermittent streams in valleys. Dominant trees include honey (*Prosopis glandulosa*) and velvet mesquite (*Prosopis velutina*), while dominant shrub species consist of mule fat (*Baccharis salicifolia*), arrowweed (*Pluchea sericea*), and coyote willow (*Salix exigua*).	1%
North American Warm Desert Wash	This ecological system is restricted to intermittently flooded washes or arroyos that dissect bajadas, mesas, plains and basin floors throughout the warm deserts of North America, occurring as linear or braided strips within desert scrub or desert grassland-dominated landscapes.	<1%

Source: USGS (2005).

A diverse community of trees, shrubs, succulents, forbs (herbaceous flowering plants), and grasses is found in these vegetation communities. A greater density and diversity of plant species is found along the natural drainages. Common trees, shrubs, and succulents include one-seed juniper (*Juniperus monosperma*), alligator juniper (*Juniperus deppeana*), Mexican pinyon (*Pinus cembroides*), mesquite (*Prosopis* sp.), acacia (*Acacia* sp.), desert broom (*Baccharis sarothroides*), beargrass (*Nolina* sp.), ocotillo (*Fouquieria splendens*), agave (*Agave* sp.), yucca (*Yucca* sp.), sotol (*Dasylirion* sp.), prickly pear (*Opuntia* sp.), and various other cacti. Common native grasses include grama (*Bouteloua* sp.), tobosagrass (*Pleuraphis* sp.), muhly (*Muhlenbergia* sp.), and threeawn (*Aristida* sp.) (Brown 1994). Mariposa Wash, a major wash, traverses the analysis area in a southwest-to-northeast direction. Although Mariposa Wash is classified as perennial in the National Hydrography Dataset (NHD) (USGS 2017), the wash did not contain water at the time of the 2017 field visits, and therefore does not technically meet the criteria for a perennial waterbody. Vegetation along the wash is also associated with a disturbed landscape, and the dominant vegetation includes desert broom, mesquite, acacia, and various grass species.

The Arizona Native Plant Law (ARS 3-901 *et seq*.) protects many of Arizona's plants from removal and destruction (ADA 2015). Plants protected by the Arizona Native Plant Law that are found in the analysis area include cacti, yucca, agave, mesquite, and beargrass.

3.3.2 Threatened, Endangered, and Special-Status Species

3.3.2.1 Federally Listed or Protected Species and Habitat

The ESA protects species that are in danger of becoming extinct and the habitats they live in. The USFWS Information for Planning and Consultation (IPaC) system was used to investigate endangered, threatened, and candidate species that may be found in the analysis area (accessed on October 5, 2016 and May 4, 2017). The AGFD online environmental review tool (accessed on October 5, 2016 and May 4, 2017) was also used to investigate documented endangered, threatened, and candidate species within 3 miles of the analysis area, as well as other special status species.

The Pima pineapple cactus (*Coryphantha scheeri* var. *robustispina*) is the only listed plant species known to occur within 3 miles of the analysis area. Listed endangered in 1993, Pima pineapple cacti have been documented on valley floors between the Baboquivari and Santa Rita Mountains, in desert scrubland or ecotone between desert scrubland and desert grassland, and on relatively flat areas. This species is generally restricted to elevations of less than 4,000 feet (USFWS 2007). There is the potential for this species to occur within the analysis area, as there is suitable habitat, and it is within the species' range.

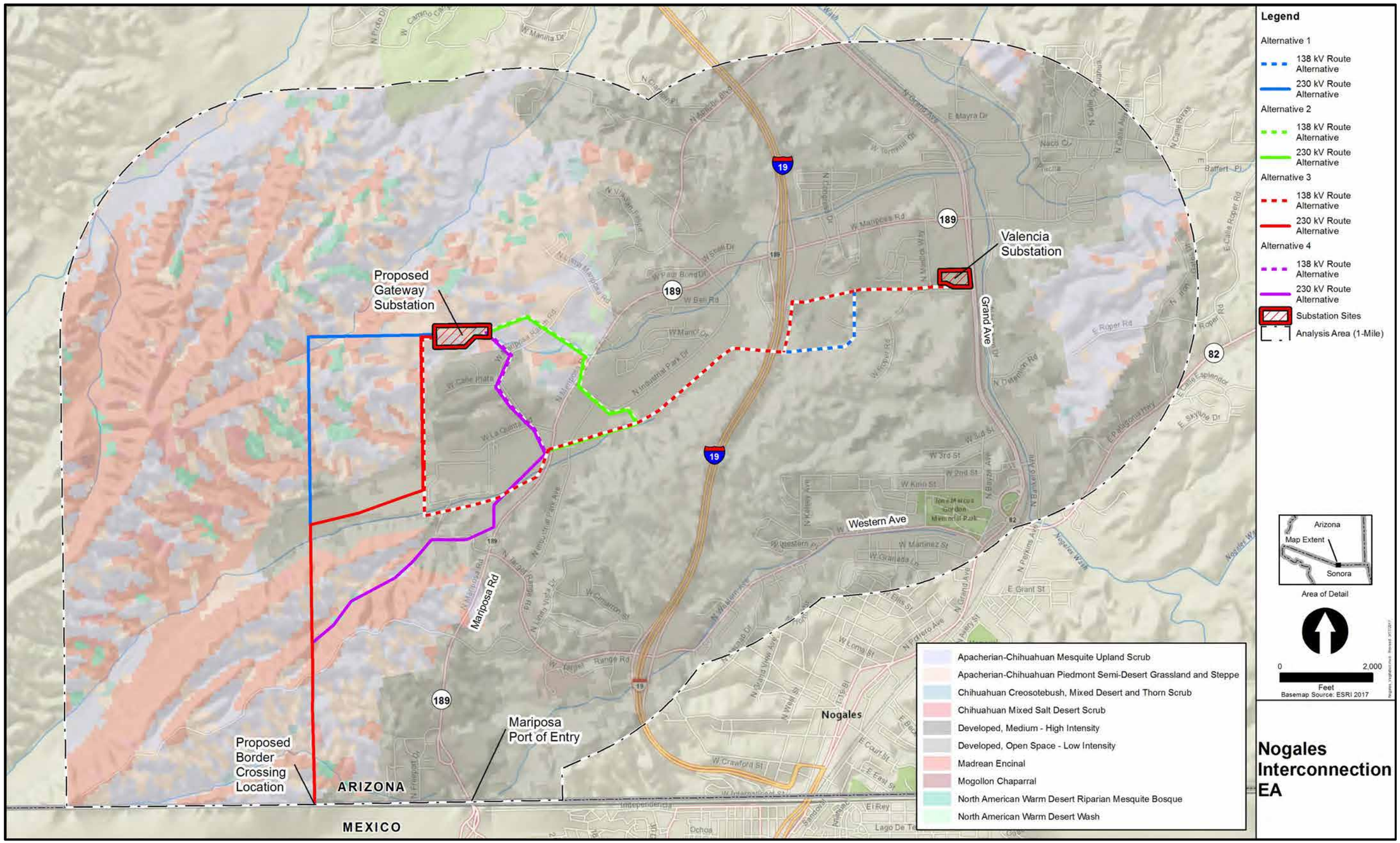

Figure 3.3-1. Vegetation communities in the analysis area.

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3.3.2.2 State-listed Species

The AGFD online environmental review tool (accessed on October 5, 2016 and May 4, 2017) lists the following special status species that have been documented within 3 miles of the analysis area: Special status plant species are regulated at different levels based on plant status and/or land ownership (AGFD 2016). The ADA regulates native plants according to the Arizona Native Plant Law and assigns some species of native plants into four categories: highly safeguarded (removal is generally not allowed), salvage restricted (a permit is required for removal), salvage assessed (may require a permit for removal), and harvest restricted (a permit is required to cut or remove plants for by-products or wood) (ADA 2015). Table 3.3-2 lists plant species of concern and their likelihood of occurrence in the analysis area. All plant species listed in the table below are protected by the Arizona Native Plant Law, except the large-flowered blue star (*Amsonia grandiflora*). The Santa Cruz beehive cactus (*Coryphantha recurvata*) is considered to be highly safeguarded and salvage restricted, while the supine bean (*Macroptilium supinum*) is salvage restricted (AGFD 2016).

The potential for occurrence of each species is summarized according to the categories listed below. Because not all species are accommodated precisely by a given category (i.e., category definitions may be too restrictive), an expanded rationale for each category assignment is provided. Potential for occurrence categories are as follows.

- *Known to occur*—the species has been documented in the analysis area by a reliable observer.
- *May occur*—the analysis area is within the species' currently known range, and vegetation communities, soils, etc. resemble those known to be used by the species.
- *Unlikely to occur*—the analysis area is within the species' currently known range, but vegetation communities, soils, etc. do not resemble those known to be used by the species, or the analysis area is clearly outside the species' currently known range.
- *None*—the analysis area is well outside the known geographic and elevational range, or lacks suitable habitat necessary for the species, or both. Species with highly restricted ranges are considered to have no potential to occur if the analysis area is outside its known range, even if the required habitat characteristics are present on-site.

Table 3.3-2. State Plant Species of Concern Documented within 3 miles of the Analysis Area

Common Name	Scientific Name	Habitat	Potential for Occurrence
Large-flowered blue star	*Amsonia grandiflora*	Canyon bottoms and sides in oak woodlands, often associated with Emory and Mexican blue oak. Elevation: 3,900–4,500 feet (Arizona Rare Plant Committee n.d.)	May occur: suitable habitat occurs within the analysis area.
Santa Cruz beehive cactus	*Coryphantha recurvata*	Rocky hillsides and/or rock crevices. Found in the valleys and foothills of oak woodlands and desert grasslands. Elevation: 3,500–5,500 feet (Arizona Rare Plant Committee n.d.)	Known to occur: surveys within the analysis area identified 25 individuals of this species.
Supine bean	*Macroptilium supinum*	Ridge tops and gentle slopes of rolling hills in semidesert grassland or grassy openings in oak-juniper woodland; growing in sandy loam. Elevation: 3,600–4,900 feet (Arizona Rare Plant Committee n.d.)	May occur: suitable habitat occurs within the analysis area, and surveys of the analysis area identified a possible individual plant.

Source: AGFD (2016).

The analysis area contains suitable habitat for all of the special status plants described in Table 3.3-2. As part of the Applicant's Presidential permit application, initial vegetation surveys (described below) were performed.

As part of the Applicant's Presidential permit application, initial species-specific plant surveys were conducted on November 30 and December 1, 2015 for the Pima pineapple cactus, Santa Cruz beehive cactus, supine bean, and agaves (HDR 2016a).[16] This biological survey documented that agave, a lesser long-nosed bat forage species, is present within the proposed Project area. ADA-protected native plants were also documented. Numerous other protected native plants, including cacti, agaves, yuccas, and various trees, were observed during field surveys and would require coordination with ADA if impacts to plants would not be avoided. No Pima pineapple cacti were documented during these surveys.[17]

As part of the Section 7 Consultation, additional field surveys for the Applicant's Preferred Alternative (Alternative 3) were completed in May 2017 in support of the preparation of the Biological Assessment. Approximately 70% of the 5.1 miles of transmission line ROW and 4.83 miles of new or upgraded access roads was surveyed. Some areas were not surveyed due to lack of right-of-entry (ROE) from landowners, as well as terrain and access safety issues (SWCA 2017). As with the surveys completed by the Applicant in 2015, agave, Santa Cruz beehive cactus, as well as a number of other ADA-protected native plants were also documented. The USFWS "Pima Pineapple Cactus Recommended Survey Protocol, 3 Tier Survey Methods" (Roller 1996) was followed. No Pima pineapple cacti were documented.

3.3.3 Invasive Species

Invasive grasses known to occur in the analysis area include Lehman's lovegrass (*Eragrostis lehmanniana*), Johnsongrass (*Sorghum halepense*), buffelgrass (*Pennisetum ciliare*), and Bermudagrass (*Cynodon dactylon*). Russian thistle (*Salsola tragus*) has also been recorded in proximity to the analysis area (HDR 2016a).

3.4 WILDLIFE

3.4.1 General Wildlife

The analysis area for wildlife is a 1-mile buffer of the centerline of the action alternatives. A wide variety of mammals, birds, reptiles, and amphibians are likely to use the analysis area throughout the year or during different times of the year. Common mammals include white-tailed deer (*Odocoileus virginianus couesi*), black-tailed jackrabbit (*Lepus californicus*), cottontail rabbit (*Sylvilagus* sp.), javelina (*Tayassu tajacu*), coyote (*Canis latrans*), skunk (*Mephitis mephitis*), raccoon (*Procyon lotor*), bobcat (*Lynx rufus*), gray fox (*Urocyon cinereoargenteus*), big brown bat (*Eptesicus fuscus*), and fringed myotis (*Myotis thysanodes*). Common birds include mourning dove (*Zenaida macroura*), white-winged dove (*Zenaida asiatica*), common raven (*Corvus corax*), turkey vulture (*Cathartes aura*), and Gambel's quail (*Callipepla gambelii*). Common reptiles include the ornate tree lizard (*Urosaurus ornatus*), Clark's spiny lizard (*Sceloporus clarkii*), gophersnake (*Pituophis catenifer*), common kingsnake (*Lampropeltis getula*), and western diamond-backed rattlesnake (*Crotalus atrox*). Amphibians include Couch's spadefoot (*Scaphiopus couchii*), Mexican spadefoot (*Spea multiplicata*), and the lowland leopard frog (*Rana*

[16] Surveys were performed over approximately 75% of the proposed ROW; Route Segment Variations 6, 7, 8, 9, 10, 11, 13, and 14 were only partially surveyed, because ROE had not been obtained.

[17] A zig-zag survey approach was used during these initial surveys rather than the USFWS survey protocol for Pima pineapple cactus.

yavapaiensis). White-tailed deer, black-tailed jackrabbit, cottontail rabbit, and numerous species of birds were observed during field surveys.

Pollinators are an important component in the landscape of the analysis area. Arizona supports the highest native, wild bee diversity observed in the U.S., as native bees become most diverse in semi-arid to arid regions, which provide suitable dry soil conditions for nesting. Arizona also contains 17 species of hummingbirds at various times of the year, as well as western white-winged doves, and one species of nectar bat that migrates south to overwinter (the lesser long-nosed bat is listed as federally endangered). Additionally, over 600 species of butterflies and moths have been identified in Santa Cruz County.

Wildlife is likely to be found in greater abundance in the western portion of the analysis area, where the greatest extent of undisturbed natural habitat is currently located; however, wildlife would also use vegetated lands found throughout the analysis area. Perennial bodies of water that exist in the analysis area are Nogales Wash, Mariposa Wash, and Potrero Creek. The north-south reach of Nogales Wash is also classified as intermittent for most of its length in the analysis area. Additionally, numerous ephemeral streams and nine intermittent ponds/tanks occur within the analysis area. Although Mariposa Wash is classified as perennial in the NHD (USGS 2017), the wash did not contain water at the time of the 2017 field visits, and therefore does not meet the criteria for a perennial waterbody. Xeroriparian vegetation (washes that are dry most of the year but share more defining vegetative characteristics with traditional wet riparian habitats than surrounding upland communities) along these water sources and ephemeral drainages is likely to attract a wide diversity of wildlife, and the drainages serve as wildlife movement corridors.

3.4.2 Threatened, Endangered, and Special Status Species

3.4.2.1 Federally Listed or Protected Species and Habitat

The ESA protects species that are in danger of becoming extinct and the habitats they live in.
The USFWS IPaC system was used to investigate endangered, threatened, and candidate species that may be found in the analysis area (USFWS 2016a, 2017). The AGFD online environmental review tool (accessed on October 5, 2016 and May 4, 2017 [AGFD 2016, 2017]) was also used to investigate documented endangered, threatened, and candidate species within 3 miles of the analysis area, as well as other special status species. Table 3.4-1 lists endangered, threatened, and candidate wildlife species and their likelihood of occurrence in the analysis area.

The potential for occurrence of each species is summarized according to the categories listed below. For a definition of the potential for occurrence categories, please refer to Section 3.3.2.2 above.

The lesser long-nosed bat, an endangered species, is anticipated to occur in the analysis area. The lesser long-nosed bat occurs seasonally in Arizona from April to September in desert scrub and grassland/oak transition habitat where it feeds on nectar and pollen from the flowers of columnar cacti and agave (AGFD 2011a). The habitat found in the western portion of the analysis area is suitable for lesser long-nosed bat and may be a resource for this species. During initial biological surveys completed as part of the Applicant's Presidential permit application, 27 agaves were recorded (HDR 2016a). Additional survey was completed in May 2017 (as discussed above) as part of the Section 7 Consultation process for Alternative 3 (the Applicant's Preferred Alternative); 94 agave were identified within the ROW and new or upgraded access roads for Alternative 3. Of these, two agaves were last years' blooms and were dead, and one agave showed signs of pending inflorescence. Eleven of the 94 agaves were determined to be close to mature size, with the potential to flower in coming years.

Table 3.4-1. Endangered, Threatened, and Candidate Species Documented within 3 miles of the Analysis Area

Common Name	Scientific Name	Status	Habitat	Potential for Occurrence
Mammals				
Jaguar	*Panthera onca*	Endangered	Found in Sonoran desertscrub up through subalpine conifer forest Elevation: 1,600–9,000 feet (AGFD 2004)	Unlikely to occur; this species may pass through the analysis area but would avoid the area if developed; designated critical habitat is 1.5 miles to the west, on National Forest System lands.
Lesser long-nosed bat	*Leptonycteris curasoae yerbabuenae*	Endangered	Desert scrub habitat with agave and columnar cacti present as food plants Elevation: 1,600–7,500 feet (AGFD 2011a)	May occur; this species may pass through the analysis area during migration in the fall and spring; it feeds on pollen of columnar cacti and agaves when they are in bloom.
Mexican gray wolf	*Canis lupus baileyi*	Endangered, experimental nonessential population	Chaparral, woodland, and forested areas; may cross desert areas Elevation: 4,000–12,000 feet (AGFD 2001a)	Unlikely to occur; project is in 10(j)* area; this species could pass through the analysis area but would likely avoid the area if developed.
Ocelot	*Leopardus pardalis*	Endangered	Variable, including thorn scrub, semiarid woodland, tropical deciduous and semideciduous forest, subtropical forest, lowland rainforest, palm savanna, and seasonally flooded savanna woodland; in Arizona, most recent (since 2009) detections have occurred in Madrean Encinal woodland Elevation: generally <4,000 feet (AGFD 2010a)	Unlikely to occur; this species may pass through the analysis area, but would likely avoid the area if developed.
Sonoran pronghorn	*Antilocapra americana sonoriensis*	Endangered, experimental nonessential population	Broad intermountain alluvial valleys with creosote-bursage and palo verde-mixed cacti associations Elevation: 400–1,600 feet (AGFD 2002a)	Unlikely to occur; project is in 10(j)* area; no suitable habitat within the analysis area.
Birds				
Mexican spotted owl	*Strix occidentalis lucida*	Threatened	Nests in canyons and dense forests with multilayered foliage structure Elevation: 4,100–9,000 feet (AGFD 2005)	Unlikely to occur; designated critical habitat is 1.5 miles to the west on National Forest System lands; no suitable habitat within the analysis area.
Southwestern willow flycatcher	*Empidonax traillii extimus*	Endangered	Cottonwood/willow (Populus sp./Salix sp.) and tamarisk (Tamarix sp.) vegetation communities along rivers and streams Elevation: <8,500 feet (AGFD 2002c)	Unlikely to occur; no suitable habitat within the analysis area.
Sprague's pipet	*Anthus spragueii*	Candidate	Strong preference for native grasslands with vegetation of intermediate height and lacking woody shrubs Elevation: <5,000 feet (AGFD 2010b)	Unlikely to occur; no suitable habitat within the analysis area.

Table 3.4-1. Endangered, Threatened, and Candidate Species Documented within 3 miles of the Analysis Area (Continued)

Common Name	Scientific Name	Status	Habitat	Potential for Occurrence
Birds, cont'd.				
Yellow-billed cuckoo	*Coccyzus americanus*	Threatened	Large blocks of riparian woodlands (cottonwood, willow, or tamarisk galleries) Elevation: <6,500 feet (AGFD 2011b)	Unlikely to occur; no suitable habitat within the analysis area.
Reptiles				
Northern Mexican gartersnake	*Thamnophis eques megalops*	Threatened	Cienegas, livestock tanks, large-river riparian woodlands and forests, streamside gallery forests Elevation: 3,000–5,000 feet (AGFD 2001c)	Unlikely to occur; no suitable habitat within the analysis area.
Amphibians				
Arizona treefrog	*Hyla wrightorum*	Candidate	Habitat with water within Madrean oak woodlands, savannah, pine-oak woodlands, and mixed conifer forests Elevation: 5,000–8,500 feet (AGFD 2013c)	Unlikely to occur; no suitable aquatic habitat within the analysis area.
Chiricahua leopard frog	*Rana chiricahuensis*	Threatened	Restricted to springs, livestock tanks, and streams in upper portion of watersheds that are free from non-native predators or where marginal habitat for non-native predators exists Elevation: 3,281–8,890 feet (AGFD 2015a)	Unlikely to occur; no suitable aquatic habitat within the analysis area.
Fish				
Gila topminnow	*Poeciliopsis occidentalis*	Endangered	Small streams, springs, and cienegas; vegetated shallows Elevation: <4,500 feet (AGFD 2001b)	Unlikely to occur; no suitable aquatic habitat within the analysis area.
Snails				
Huachuca springsnail	*Pyrgulopsis thompsoni*	Candidate	Aquatic areas, small springs with vegetation and slow to moderate flow Elevation: 4,500–7,200 feet (AGFD 2015b)	Unlikely to occur; no suitable aquatic habitat within the analysis area.
Insects				
Stephan's riffle beetle	*Heterelmis stephani*	Candidate	Free-flowing springs and seeps, commonly referred to as rheocrenes Elevation: 5,100–6,600 feet (AGFD 2002d)	Unlikely to occur; no suitable aquatic habitat within the analysis area.

Source: USFWS (2016a).

* A 10(j) area is an area where experimental populations of endangered or threatened species are introduced into the wild in a location that is geographically isolated from non-introduced populations (NMFS 2015).

Critical habitats: There is designated final critical habitat for jaguar and Mexican spotted owl within 3 miles of the analysis area, with the closest critical habitat for both species occurring approximately 1.5 miles west of the analysis area. These designated critical habitats occur outside the analysis area for both species, on CNF lands.

3.4.2.2 State-listed Species

The AGFD online environmental review tool (accessed on October 5, 2016 and May 4, 2017 [AGFD 2016, 2017]) lists the following special status species that have been documented within 3 miles of the analysis area. Table 3.4-2 lists species of concern and their likelihood of occurrence in the analysis area. All species are unlikely to occur, with the exception of the yellow-nosed cotton rat.

Table 3.4-2. State Species of Concern Documented within 3 Miles of the Analysis Area

Species	State Status	Habitat	Potential for Occurrence
Mammals			
Yellow-nosed cotton rat *Sigmodon ochrognathus*	Species of Concern	Grassy slopes in oak-pine woodlands, and montane meadows within ponderosa pine (*Pinus ponderosa*) and Douglas-fir (*Pseudotsuga menziesii*) forests. It is often associated with rocks.	May occur: suitable habitat occurs within the analysis area.
Birds			
Gray hawk *Buteo plagiatus*	Species of Concern	Riparian woodlands with large trees (cottonwoods [*Populus* sp.]), usually near mesquite forests Elevation: not listed (AGFD 2013a)	Unlikely to occur; no suitable habitat within the analysis area.
Reptiles			
Giant spotted whiptail *Aspidoscelis stictogramma*	Species of Concern	Riparian habitat dominated by sycamore (*Platanus* sp.), cottonwood, ash (*Fraxinus* sp.), and various grasses and forbs Elevation: sea level–4,500 feet (AGFD 2013b)	Unlikely to occur; no suitable habitat within the analysis area.
Fish			
Gila longfin dace *Agosia chrysogaster chrysogaster*	Species of Concern	Wide ranging from intermittent hot low-desert streams to clear and cool brooks at higher elevations; usually occupy relatively small streams Elevation: <4,900 feet (AGFD 1997)	Unlikely to occur; no suitable aquatic habitat within the analysis area.
Desert sucker *Catostomus clarkii*	Species of Concern	Rapids and flowing pools of streams and rivers; adults live in stream and river pools Elevation: 480–8,840 feet (AGFD 2002b)	Unlikely to occur; no suitable aquatic habitat within the analysis area.

Source: AGFD (2016, 2017).

3.4.3 Migratory Birds and Raptors

Migratory birds are regulated by the USFWS under the Migratory Bird Treaty Act. The analysis area provides habitats that are used both seasonally and year-round, for both breeding and migration, by a variety of migratory bird species.

Migratory bird species that may use the analysis area for breeding include: Bell's vireo (*Vireo belli*), Bendire's thrasher (*Toxostoma bendirei*), black-throated gray warbler (*Dendroica nigrescens*), Botteri's sparrow (*Aimophila botterii*), canyon towhee (*Pipilo fuscus*), Costa's hummingbird (*Calypte costae*), elegant trogon (*Trogon elegans*), grasshopper sparrow (*Ammodramus savannarum ammolegus*), Lawrence's goldfinch (*Carduelis lawrencei*), loggerhead shrike (*Lanius ludovicianus*), Lucy's warbler (*Vermivora luciae*), northern beardless-tyrannulet (*Campostoma imberbe*), olive warbler (*Peucedramus taeniatus*), red-faced warbler (*Cardellina rubrifrons*), rose-throated becard (*Pachyramphus aglaiae*), rufous-crowned sparrow (*Aimophila ruficeps*), rufous-winged sparrow (*Aimophila carpalis*), Sonoran

yellow warbler (*Dendroica petechial* ssp. *sonorana*), varied bunting (*Passerina versicolor*), Virginia's warbler (*Vermivora virginiae*), willow flycatcher (*Empidonax traillii*), and phainopepla (*Phainopepla nitens*).

Wintering migratory bird species include Baird's sparrow (*Ammodramus bairdii*), black-chinned sparrow (*Spizella atrogularis*), Brewer's sparrow (*Spizella breweri*), fox sparrow (*Passerella iliaca*), gray vireo (*Vireo vicinior*), lark bunting (*Calamospiza melanocorys*), Lewis's woodpecker (*Melanerpes lewis*), long-billed curlew (*Numenius americanus*), McCown's longspur (*Calcarius mccownii*), Sprague's pipit (*Anthus spragueii*), and Williamson's sapsucker (*Sphyrapicus thyroideus*).

Migrating and/or resident birds of prey expected to pass over or use habitat within the analysis area include golden eagle (*Aquila chrysaetos*), bald eagle (*Haliaeetus leucocephalus*), red-tailed hawk (*Buteo jamaicensis*), gray hawk (*Buteo plagiatus*), common back-hawk (*Buteogallus anthracinus*), Harris's hawk (*Parabuteo unicinctus*), Swainson's hawk (*Buteo swainsoni*), zone-tailed hawk (*Buteo albonotatus*), ferruginous hawk (*Buteo regalis*), white-tailed kite (*Elanus leucurus*), northern harrier (*Circus cyaneus*), sharp-shinned hawk (*Accipiter striatus*), and Cooper's hawk (*Accipiter cooperii*). Additionally, smaller birds of prey, such as crested caracara (*Caracara cheriway*), peregrine falcon (*Falco peregrinus*), prairie falcon (*Falco mexicanus*), merlin (*Falco columbarius*), and American kestrel (*Falco sparverius*), in addition to owl species such as barn owl (*Tyto alba*), great horned owl (*Bubo virginianus*), short-eared owl (*Asio flammeus*), elf owl (*Micrathene whitneyi*), and burrowing owl (*Athene cunicularia*), may pass over the analysis area (Arizona Field Ornithologists 2003). Of these species, Swainson's hawk, peregrine falcon, golden eagle, common black-hawk, elf owl, and burrowing owl may use the analysis area for breeding, while bald eagle and short-eared owl are wintering species (USFWS 2016a).

3.4.4 Coronado National Forest Management Indicator Species

Management Indicator Species are a category of species selected by the USFS, because the welfare of the identified species is presumed to be an indicator of the welfare of other species in the habitat. The species' condition can be used to assess the impacts of management actions on a particular area. Managing for these species usually requires significant allocations of land or resources. Table 3.4-3 describes CNF Management Indicator Species, habitat requirements, and potential for occurrence in the analysis area.

Table 3.4-3. Coronado Forest Management Indicator Species in the Analysis Area

Common Name (*Species Name*)	Group(s)*	Range or Habitat Requirements*	Potential for Occurrence in proposed Project Area
White-tailed deer (*Odocoileus virginianus couesi*)	Species Needing Diversity, Species Needing Herbaceous Cover and Game Species indicator groups.	Primarily in mixed-oak woodlands and higher-elevation semidesert grasslands and locally in pine forests and along riparian corridors.	May occur. The impact analysis area contains semidesert grassland habitat.
Montezuma (Mearns') quail (*Cyrtonyx montezumae mearnsi*)	Species Needing Herbaceous Cover, Game Species and Special Interest Species indicator groups.	Quality grassland and Madrean Encinal woodland habitats.	May occur. The impact analysis area contains semidesert grassland habitat.
Pronghorn antelope (*Antilocapra americana*)	Species Needing Herbaceous Cover and Game Species indicator groups.	Grasslands in the Sulphur Springs, San Rafael and San Bernardino Valleys and Altar Valleys and the Sonoita grasslands north of the Canelo Hills.	Unlikely to occur. While grassland habitats are present in the impact analysis area, the impact analysis area is outside the species' known range.

Table 3.4-3. Coronado Forest Management Indicator Species in the Analysis Area (Continued)

Common Name (*Species Name*)	Group(s)*	Range or Habitat Requirements*	Potential for Occurrence in proposed Project Area
Desert bighorn sheep (*Ovis Canadensis deserti*)	Game Species and Threatened and Endangered Species groups in the Forest Plan.	Rugged, open canopied mountains with scattered stands of grass and water. The species is endemic to the Pusch Ridge Wilderness Area in the Santa Catalina Mountains.	Unlikely to occur. Suitable habitat for this species is not present in the impact analysis area and is outside the species' known range.
Merriam's turkey (*Meleagris gallopavo*)	Species Needing Diversity and the Game Species indicator groups.	Mixed conifer, ponderosa pine (*Pinus ponderosa*), Evergreen-grasslands with sufficient tree roosting sites, free water and green feed and insects during breeding season.	Unlikely to occur. Suitable habitat is not present in the impact analysis area.
Northern gray hawk (*Asturina nitida maxima*)	Riparian Species, Species Needing Dense Canopy, and Special Interest Species indicator groups.	Well-developed lower-elevation deciduous riparian areas, specifically the tropical-subtropical riparian deciduous woodlands of velvet mesquite (*Prosopis velutina*) and hackberry (*Celtis reticulata*) bordering strands of cottonwood (*Populus fremontii*) and willow (*Salix gooddingii*). Sites on the CNF also include more open stands of cottonwood, sycamore (*Platanus* sp.), and Madrean oaks with adjacent mesquite uplands.	Unlikely to occur. Suitable riparian habitat is not present in the impact analysis area.
American peregrine falcon (*Falco peregrinus anatum*)	Threatened and Endangered Species group.	Suitable cliffs for nesting.	Unlikely to occur. No cliffs suitable for nesting are present in the impact analysis area.
Blue-throated hummingbird (*Lampornis clemenciae*)	Riparian Species and Special Interest Species indicator groups.	Wet pine-oak and oak canyons above 4,500 feet in elevation.	Unlikely to occur. Suitable habitat is not present in the impact analysis area.
Elegant (Coppery-tailed) trogon (*Trogon elegans*)	Cavity Nesters, Riparian Species, Species Needing Diversity and the Special Interest Species indicator group.	Mixed deciduous riparian bottoms in the pine-oak belt from 4,500 to 6,500 feet.	Unlikely to occur. Suitable habitat is not present in the impact analysis area and is below the elevational range of the species.
Rose-throated becard (*Pachyramphus aglaiae*)	Riparian Species and Special Interest Species indicator groups.	Cottonwood and sycamore groves along streams and rivers in extreme south-central Arizona. The species is known from only one location on the CNF, Sycamore Creek.	Unlikely to occur. The impact analysis area does not include Sycamore Canyon.
Thick-billed kingbird (*Tyrannus crassirostris*)	Riparian Species and Special Interest Species indicator groups.	Lower elevation sycamore and cottonwood stands in canyons at the base of mountains or in larger creeks and rivers.	Unlikely to occur. Suitable riparian habitat is not present in the impact analysis area.
Sulphur-bellied flycatcher (*Myiodynastes luteiventris*)	Cavity Nesters, Riparian Species, Species Needing Diversity and Special Interest Species indicator groups.	Summer residents in the Santa Rita, Huachuca, and Chiricahua Mountains and rarely in the Santa Catalina and Pinaleño Mountains. The species nests in mid-elevation (5,000–7,000 feet) mixed deciduous riparian canyons composed of Arizona sycamore and walnut (*Juglans major*). They build a nest of small sticks inside a cavity, usually in an Arizona sycamore at a height between 20 and 50 feet above the ground. They reside on the CNF only during the nesting season, generally June–September.	Unlikely to occur. The impact analysis area is outside the species' elevational range and does not contain suitable habitat for the species.

Table 3.4-3. Coronado Forest Management Indicator Species in the Analysis Area (Continued)

Common Name (*Species Name*)	Group(s)*	Range or Habitat Requirements*	Potential for Occurrence in proposed Project Area
Buff-breasted flycatcher (*Empidonax fulvifrons*)	Species Needing Diversity and Special Interest Species indicator groups.	Open pine forests above 6,000 feet.	Unlikely to occur. The impact analysis area is outside the species' elevational range and does not contain suitable habitat for the species.
Northern beardless tyrannulet (*Camptostoma imberbe*)	Riparian Species, Species Needing Dense Canopy, and Special Interest Species indicator groups.	Dense mesquite understory.	May occur. Dense mesquite understory may occur in the impact analysis area.
Baird's sparrow (*Ammodramus bairdii*)	Species Needing Herbaceous Cover indicator group.	Tall, dense tobosa/grama grasslands. Occurs on the CNF only in winter.	May occur. Grasslands are present in the impact analysis area.
Five-striped sparrow (*Aimophila quinquestriata*)	Special Interest Species and the Threatened and Endangered Species indicator groups.	Dense hillside vegetation ranging from brushy semidesert to tropical deciduous woodland.	May occur. Suitable habitat is present in the impact analysis area.
Bell's vireo (*Vireo bellii*)	Riparian Species and Species Needing Dense Canopy indicator groups.	Near rivers and desert washes with thick understory vegetation. On the CNF, their distribution is limited to lower elevation (below 3,500 feet) mesquite thickets near the CNF boundary.	Unlikely to occur. While mesquite thickets may be present in the impact analysis area, it is above the elevational range of the species.
Desert massasauga (*Sistrurus catenatus edwardsii*)	Species Needing Herbaceous cover and Threatened and Endangered Species groups.	Primarily in tobosagrass (*Hilaria mutica*) grasslands in the San Bernardino Valley at the southeastern corner of the Chiricahua Mountains.	Unlikely to occur. While grasslands are present in the impact analysis area, it is outside the known range of the species.
Arizona ridge-nosed rattlesnake (*Crotalus willardi willardi*)	Threatened and Endangered Species group.	Bottoms and hillsides in evergreen oak and pine-oak woodland. Broadleaf evergreen woodland, evergreen woodland, deciduous and evergreen riparian, and mixed and transition coniferous forest. Chaparral is used to a lesser extent. Microsites within these broader vegetation types include rock crevices, dense leaf litter, and bunchgrasses.	May occur. Madrean Encinal woodland is present in the impact analysis area.
Twin-spotted rattlesnake (*Crotalus pricei*)	Threatened and Endangered Species group.	High-elevation rock outcrops and talus slopes generally on south-facing slopes in coniferous forests in at least four mountain ranges in southeastern Arizona. It can frequent open grassy forest floors and rock outcroppings in the adjacent oak woodland.	Unlikely to occur. Suitable habitat for the species is not present in the impact analysis area.
Sonora tiger salamander (*Ambystoma tigrinum stebbinsi*)	Threatened and Endangered Species group.	Grassland, oak woodland, and pine-oak woodland of the upper Santa Cruz and San Pedro Rivers.	Unlikely to occur. While grassland habitat is present, the impact analysis area is over 2.5 miles from the Santa Cruz River.
Tarahumara frog (*Lithobates tarahumarae*)	Threatened and Endangered Species group.	Boulder-strewn perennial streams and seasonal streams with bedrock beds that include deep, drought-resistant plunge pools. There are six historic populations on the CNF (in streams), not currently found on the CNF.	Unlikely to occur. No suitable habitat exists in the impact analysis area, and it is outside the known range of the species.
Western barking frog (*Eleutherodactylus augusti cactorum*)	Threatened and Endangered Species group.	Crevices in limestone or rhyolite rock outcrops on hillsides within the Madrean Encinal woodlands. Within the CNF, they have been documented in the Huachuca, Pajarito, and Santa Rita Mountains.	May occur. The southwestern portion of the impact analysis area is located in the Pajarito Mountains and includes suitable habitat for the species.

Table 3.4-3. Coronado Forest Management Indicator Species in the Analysis Area (Continued)

Common Name (*Species Name*)	Group(s)*	Range or Habitat Requirements*	Potential for Occurrence in proposed Project Area
Mexican stoneroller (*Campostoma ornatum*)	Threatened and Endangered Species group.	Shallow riffles and runs over gravel/cobble substrates, occur in Rucker Canyon in the Chiricahua Mountains on the CNF.	Unlikely to occur. The impact analysis area is outside the known range of the species.
Apache (Arizona) trout (*Oncorhynchus apache*)	Threatened and Endangered Species group.	Pinaleño Mountains in several creeks including Ash and Marijilda and Grant Creeks on the CNF.	Unlikely to occur. No suitable habitat exists in the impact analysis area, and it is outside the known range of the species.
Gila topminnow (*Poeciliopsis occidentalis*)	Threatened and Endangered Species group.	Redrock Canyon drainage on the CNF.	Unlikely to occur. No suitable habitat exists in the impact analysis area, and it is outside the known range of the species.
Gila chub (*Gila intermedia*)	Threatened and Endangered Species group.	Sabino and O'Donnell Creeks on the CNF.	Unlikely to occur. No suitable habitat exists in the impact analysis area, and it is outside the known range of the species.
Sonora chub (*Gila ditaenia*)	Threatened and Endangered Species group.	Sycamore Canyon and California Gulch on the Nogales Ranger District of the CNF. Critical habitat is designated within portions of Sycamore Canyon.	Unlikely to occur. No suitable habitat exists in the impact analysis area and it is outside the known range of the species.
Spikedace (*Meda fulgida*)	Threatened and Endangered Species group.	Small streams in Arizona and New Mexico. Habitat on the CNF is not occupied.	Unlikely to occur. No suitable habitat exists in the impact analysis area, and it is outside the known range of the species.
Mountain (Arizona) treefrog (*Hyla wrightorum*)	Threatened and Endangered Species group.	On the CNF, it has been found in only a few locations in the Huachuca Mountains at elevations of 4,920 to 6,560 feet in evergreen woodland and riparian areas in pine-oak woodland.	Unlikely to occur. While Madrean Encinal woodland is present in the impact analysis area, it is below the elevational range of the species.
Mount Graham red (spruce) squirrel (*Tamiasciurus hudsonicus grahamensis*)	Threatened and Endangered Species group.	Spruce-fir and mixed conifer forests at higher elevations of the Pinaleño Mountains on the CNF.	Unlikely to occur. No suitable habitat exists in the impact analysis area, and it is outside the known range of the species.
Black bear (*Ursus americanus*)	Riparian Species, Species Needing Diversity and the Game Species indicator groups.	Found in all habitats on the CNF except grassland and riparian. A high-density population occurs in the Pinaleño Mountains.	May occur. Suitable habitat is present in the impact analysis area.
Gould's turkey (*Meleagris gallopavo mexicana*)	Threatened and Endangered Species indicator group.	Oak-grassland-riparian associations with trees of sufficient size for roosting, free water, and green feed and insects during the breeding season.	May occur. Grassland habitat is present in the impact analysis area.

Source: USFS (2011).

Other CNF Management Indicator Species include species groups, such as those considered to be primary and secondary cavity nesters. Primary cavity nesters are those species that excavate and nest in cavities, whereas secondary cavity nesters use cavities excavated by primary cavity nesters. At least six primary cavity nesters and 30 secondary cavity nesters are found within the CNF. Cavity nesters on the CNF occur primarily within forested areas, including riparian habitats, Madrean Encinal woodlands, coniferous forests, and Sonoran desert habitats that contain saguaro cactus (*Carnegiea gigantea*). The analysis area includes Madrean Encinal woodlands but does not contain riparian, forested, or Sonoran desert habitat (see Section 3.3). Although the species in this group specifically nest in cavities, some of them make use of other habitats throughout their lifecycle.

3.4.5 Wildlife Corridors

Public agencies across Arizona identified large blocks of protected habitat, the potential wildlife movement corridors through and between them, the factors that could possibly disrupt these linkage zones, and opportunities for conservation. The Santa Rita-Tumacacori Linkage Design (delineating wildlife movement corridors between the Santa Rita Mountain Complex and the Tumacacori-Atascosa-Pajarito Mountain Complex) and the Mexico-Tumacacori-Baboquivari Linkage Design (delineating wildlife movement corridors between Mexico's Emerald Mountains, the Tumacacori Highlands/Buenos Aires National Wildlife Refuge, and Baboquivari Mountains) wildlife corridors occur within 3 miles of the analysis area (AGFD 2016, 2017). Wildlife movement corridors preserve the ability of wildlife species to move between or within habitat blocks, allow animals to access essential resources (such as food and water) during daily activities; allow longer seasonal migratory movements between summer and winter habitats; and facilitate the dispersal movements of animals in search of mates or breeding sites. These linkage designs exist to inform project planners about appropriate environmental protection measures for projects that may affect wildlife movement.

3.5 WATER RESOURCES AND QUALITY

The analysis area for water resources and quality is a 1-mile buffer of the centerline of the action alternatives.

The Mohave and Sonoran Deserts are susceptible to periods of dryness that can span months to years. The monsoon is important during the summer, when it produces up to half of the average annual precipitation from July to September. Exposure to mid-latitude storm tracks during the winter, monsoon circulation during the summer, and elevation can influence precipitation across the year. As monsoon precipitation is produced primarily by thunderstorms, large variances in seasonal precipitation can be found across the landscape from localized storm cells. During the winter, heavy precipitation can produce widespread flooding in Arizona. Flash floods associated with thunderstorms can also occur, many during the monsoon. Because of heavy precipitation rates, topographic channeling, and the impervious nature of the land surface in some urban and desert areas, the flooding produced by these thunderstorms can be abrupt and severe.

Severity of wildfire can be affected by seasonal and multi-year droughts. Past climatic conditions, reconstructed from tree rings, suggest that droughts lasting up to several decades have occurred in the Colorado River Basin approximately once or twice per century during the past 500 to 1,000 years (Woodhouse et al. 2010). Droughts in Arizona and New Mexico tend to be strongly related to large-scale shifts in the atmospheric circulation associated with El Niño, which tends to produce the "North American dipole," a situation in which relative conditions of precipitation and temperature (high vs. low) occur in opposition simultaneously for the Pacific Northwest and for the Southern California–Arizona–New Mexico area (Dettinger et al. 1998).

3.5.1 Surface Water

3.5.1.1 Streams/Washes

The analysis area occurs within the Santa Cruz watershed (6th level Hydrologic Unit Code [HUC] 150503). The analysis area falls within the Santa Cruz Active Water Management Area, which crosses into Mexico, requiring bi-national coordination of water management efforts. The Santa Cruz River is one of the main water supply sources for Nogales, Arizona and Nogales, Sonora, Mexico.

The Santa Cruz Watershed basin floor is generally level, with several primary and secondary drainage channels draining to the northwest. These channels convey surface runoff and alluvial sediment northward and westward through the basin after eroding from the Santa Catalina, Rincon, Tucson, and Tortolita ranges in the U.S. and the San Antonio, El Pinito, and El Chivato ranges in Mexico (ADWR 2015).

The majority of the streams in the analysis area are within the Nogales Wash watershed (12th level HUC 150503010309) and are tributaries of the Mariposa Wash, Al Harrison Wash, and Ephraim Canyon Wash subwatersheds. Their collective hydrologic contribution to Nogales Wash is expected to be minor at the watershed-level scale; however, periodic high-water and sediment deposition events are likely to occur in Mariposa Wash during seasonal rainfall. The largest amount of precipitation generally occurs during the summer monsoon in July and August, though a smaller amount will also occur during winter months of December and January (WRRC 2012). A lesser number of streams that occur within the analysis area occur within the Potrero Creek watershed (12th level HUC 150503010310) and are tributaries of the Potrero Creek subwatershed. The collective hydrologic contribution to Potrero Creek is expected to be minor at the watershed-level scale.

The streams in the analysis area, when flowing, are tributaries of Nogales Wash, a tributary of Potrero Creek, which flows into the Santa Cruz River. The USACE has defined a reach of the Santa Cruz River, starting near Tubac, Arizona, and flowing north, as a water of the U.S., subject to USACE's jurisdiction under authority the Clean Water Act of 1972, as amended (USACE 2008). This portion of the Santa Cruz River is approximately 22 miles away by stream channel from the analysis area.

Streams are considered to be ephemeral when they contain water as a result of precipitation only. Streams are considered to be intermittent when they contain water for part of the year, but more than just after a precipitation event. Finally, streams are considered to be perennial when they contain water throughout the year (except during drought) (USGS 2006).

Locations of streams were identified using the USGS NHD (USGS 2017) and through geographic information system (GIS)-based interpretation of aerial photography and topographic contours.
The majority of streams in the analysis area consist of small, dry, ephemeral drainages characteristic of the region's semiarid climate and landscape. These drainage features are generally dry for long periods but may flow during high-intensity, short-duration, summer thunderstorms and during less-intense, longer-duration, winter storms. Streambeds tend to be very permeable, and substantial water is lost to the subsurface as flow moves downstream.

Perennial bodies of water that exist in the analysis area consist of the Nogales Wash, Mariposa Wash, and Potrero Creek. As noted previously, although Mariposa Wash is classified as perennial in the NHD data (USGS 2017), the wash did not contain water at the time of the May 2017 field visits. Nogales Wash is also classified as intermittent (in addition to perennial). In fact, most of the reach of this wash in the analysis area is intermittent. Numerous ephemeral streams and nine intermittent waterbodies, three of which are listed as wetlands, also occur within the analysis area (see Figure 3.5-1).

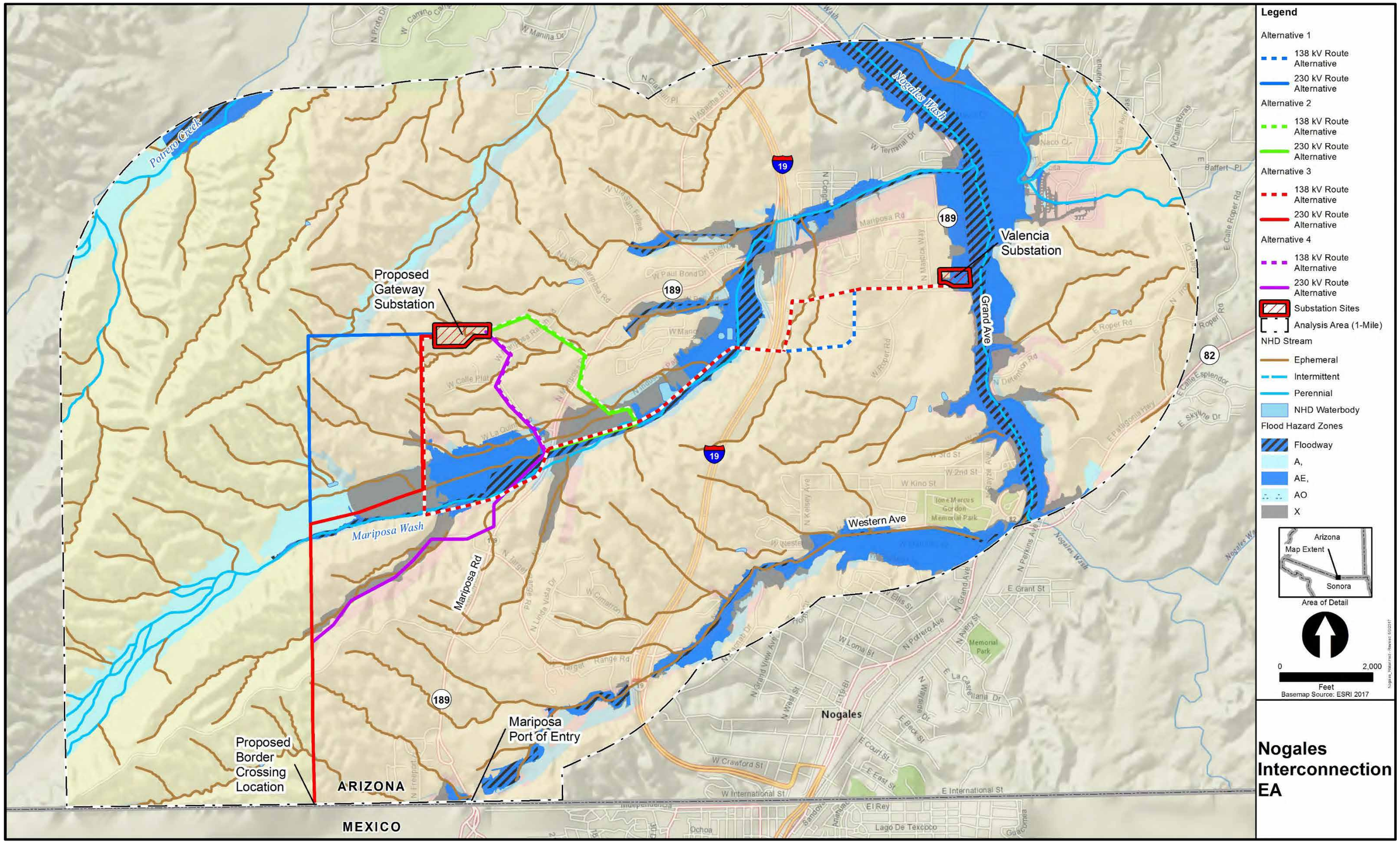

Figure 3.5-1. Water resources within the analysis area.

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3.5.1.2 Wetlands

Geospatial analysis of the National Wetlands Inventory data set (USFWS 2016b) was used to determine the presence or absence of wetlands in the analysis area. Three intermittent wetlands were identified during the review and consist of two freshwater emergent wetlands with temporarily flooded water regimes (one of which has been impounded) and one freshwater pond with a semi-permanently flooded water regime (also impounded). No evidence of wetlands based on vegetation, soils, or wetland hydrology was observed by biologists during initial field surveys, completed as part of the Applicant's Presidential permit application (HDR 2016a).

3.5.1.3 Floodplains

Flood zones are areas that the Federal Emergency Management Agency (FEMA) has defined according to varying levels of flood risk. Encroachment on flood zones can reduce the normal overflow storage and conveyance area, resulting in backing up floodwaters that can affect adjacent areas by displacing floodwaters into areas not typically subject to flooding. EO 11988, Floodplain Management, directs federal agencies, and the activities undertaken or authorized by them, to reduce the risk of flood loss and minimize flood impacts on human safety, health, and welfare.

In 2011, FEMA performed a Flood Insurance Study for Santa Cruz County that included the City of Nogales, the purpose of which was to revise and update flood risk data. The study noted that flood control measures have been installed in Nogales, Arizona and Nogales, Sonora, Mexico to address flood problems along Nogales Wash. Subsequent to the installation of flood control devices, including concrete-lined channels and covered floodways, flood problems along Nogales Wash have decreased and now generally consist of shallow flooding along streets and roadways. Other flood control measures within the City of Nogales are located along Ephraim Canyon Wash and include channel enlargement in some areas and a covered floodway near its confluence with Nogales Wash (FEMA 2011).

Review of FEMA floodplain data, Map Nos. 04023C0627C and 04023C0629C (FEMA 2016) indicates that there are flood zones associated with the Ephraim Canyon and Mariposa, Nogales, and Al Harrison Washes in the analysis area (see Figure 3.5-1). Portions of these drainages are considered high-risk areas (Zones "A" and "AE"). Zone A is defined as areas with a 1% annual chance of flooding for which no Base Flood Elevation has been determined. In the Nogales area, Zone A is also considered a Special Flood Hazard Area. Zone AE is defined as an area with a 1% annual chance of flooding.

Moderate- to low-risk areas (Zone "X500"; 500-year flood zones) are also present for Mariposa Wash. Zone X (in this case, X500) covers areas determined to be outside 500-year floodplain and outside the 1% and 0.2% annual chance floodplains. Both 100- and 500-year flooding limits for Ephraim Canyon, and Nogales and Mariposa Washes overlap the analysis area, while only 100-year flood limits for Al Harrison Wash are in the analysis area. Since portions of floodplains and wetlands in the analysis area may be affected. In accordance with DOE guidelines for floodplain management (DOE 2015), the EA includes a floodplain and wetlands assessment. See Section 4.5 for a Floodplain Statement of Findings.

In addition to the mapped floodplains, unmapped floodplains associated with smaller ephemeral and intermittent streams may exist in the analysis area. These unmapped floodplains are generally small and are immediately adjacent to each stream. Inundation of these floodplains is typically associated with large rainstorms. Because each stream's drainage basin is small, rainstorms that cause flooding are localized to the immediate area around the streams. Flooding adjacent to these streams would likely be of short duration because of the high permeability of the streambed material.

3.5.2 Groundwater

The analysis area occurs within the Santa Cruz Watershed (6th level HUC 150503). The Upper Santa Cruz and Avra Basin is a sole source aquifer designated area (EPA 2016a). Sole source aquifers are defined by the U.S. Environmental Protection Agency (EPA) as aquifers that supply at least 50% of the drinking water for its service area; there are no other reasonably available alternative drinking water sources should the aquifer become contaminated. The analysis area includes the surface area above the aquifer and its recharge area.

The mountains surrounding the Santa Cruz Watershed are composed of metamorphic, sedimentary, and intrusive igneous rock extending beneath the alluvial material filling the basin (Pima County 2006). This relatively impermeable material provides a physical boundary that forms the area's groundwater basins. Alluvial deposits, eroded from the surrounding block-faulted mountains, form the basin fill of the Santa Cruz Watershed. The basin fill alluvium forms a regional aquifer throughout the watershed.

The majority of public-supply, household, agricultural, and industrial water needs in the Santa Cruz Watershed are fulfilled by groundwater. In total, 224 wells occur within the analysis area: 191 are privately owned and the other 33 are publicly owned—20 by the City of Nogales, nine by the Arizona Department of Environmental Quality (ADEQ), two by the ADWR, one by CBP, and one by ADOT (ADWR 2016).

3.5.3 Water Quality

Within the analysis area, one impaired waterbody occurs. Nogales Wash is a Section 303(d)-listed impaired waterbody (AZ15050301-011) monitored by ADEQ for ammonia, chlorine, dissolved copper, and *Escherichia coli*. Water quality in the wash is heavily influenced by rain events and subsequent urban runoff from the cities of Nogales, Arizona and Sonora, Mexico. The major source of contamination has been linked to infrastructure deterioration in Mexico, which allows raw sewage to flow into Arizona. (City of Nogales 2014b).

The analysis area also falls within the Upper Santa Cruz and Avra Basin Sole Source Aquifer Designated Area, which was identified by the EPA as a priority management area to prevent contamination of groundwater resources (EPA 2016a). Groundwater testing by the City of Nogales in 2014 resulted in the detection of the presence of total coliform bacteria in 2 of 300 annual samples. The likely source of this contamination is bacteria that are naturally present in the environment. Further testing did not detect the presence of fecal coliform or *E. coli* (City of Nogales 2014b).

3.6 LAND USE AND RECREATION

3.6.1 General Land Use

The analysis area for land use is Santa Cruz County. This section discusses existing land use and land cover in the area of analysis.

Land use in the analysis area is a mix of ownership of public lands, undeveloped private land, general commercial, light industrial, and multifamily residential (see Figures 3.6-1 and 3.6-2).

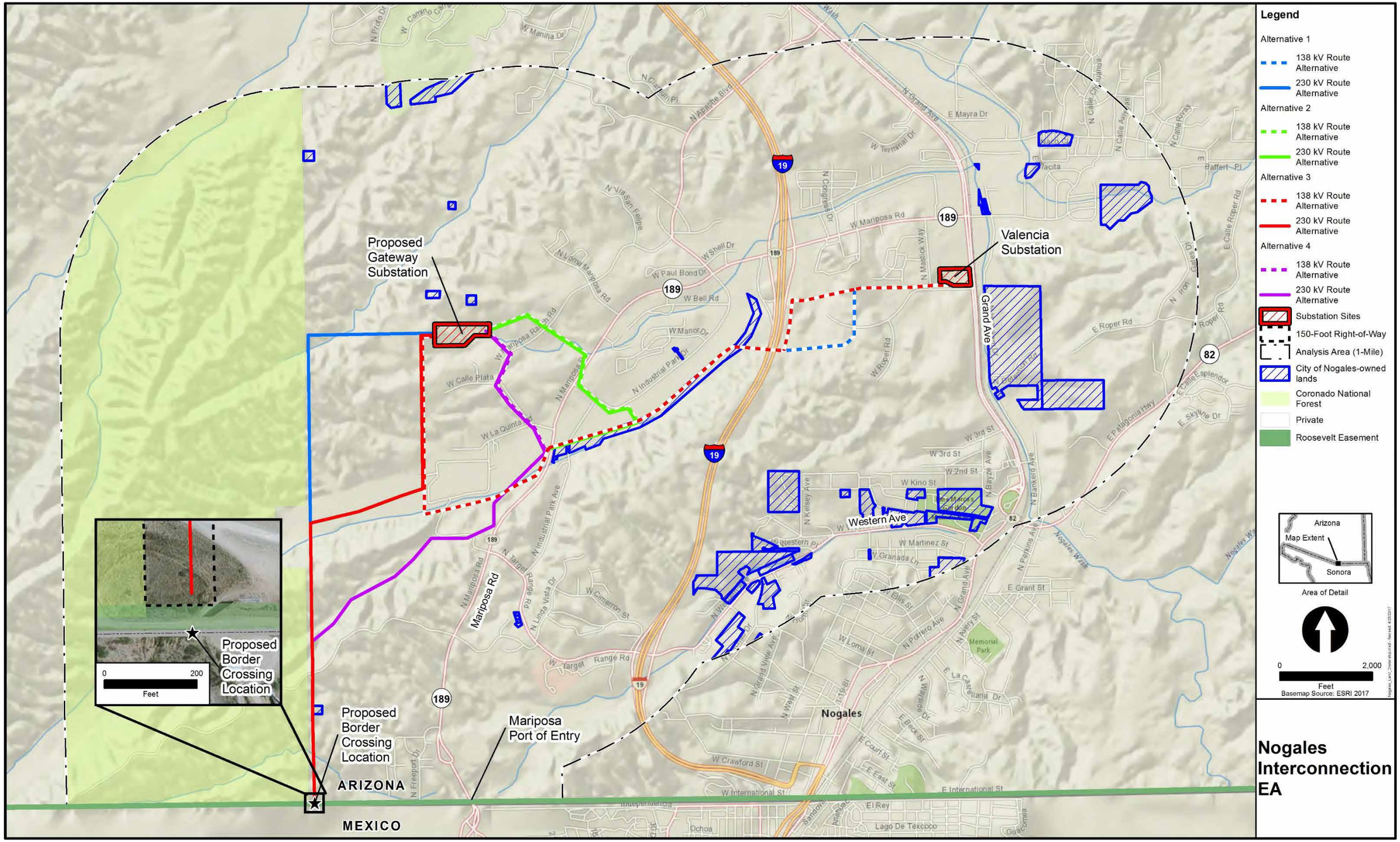

Figure 3.6-1. Land ownership in the analysis area.

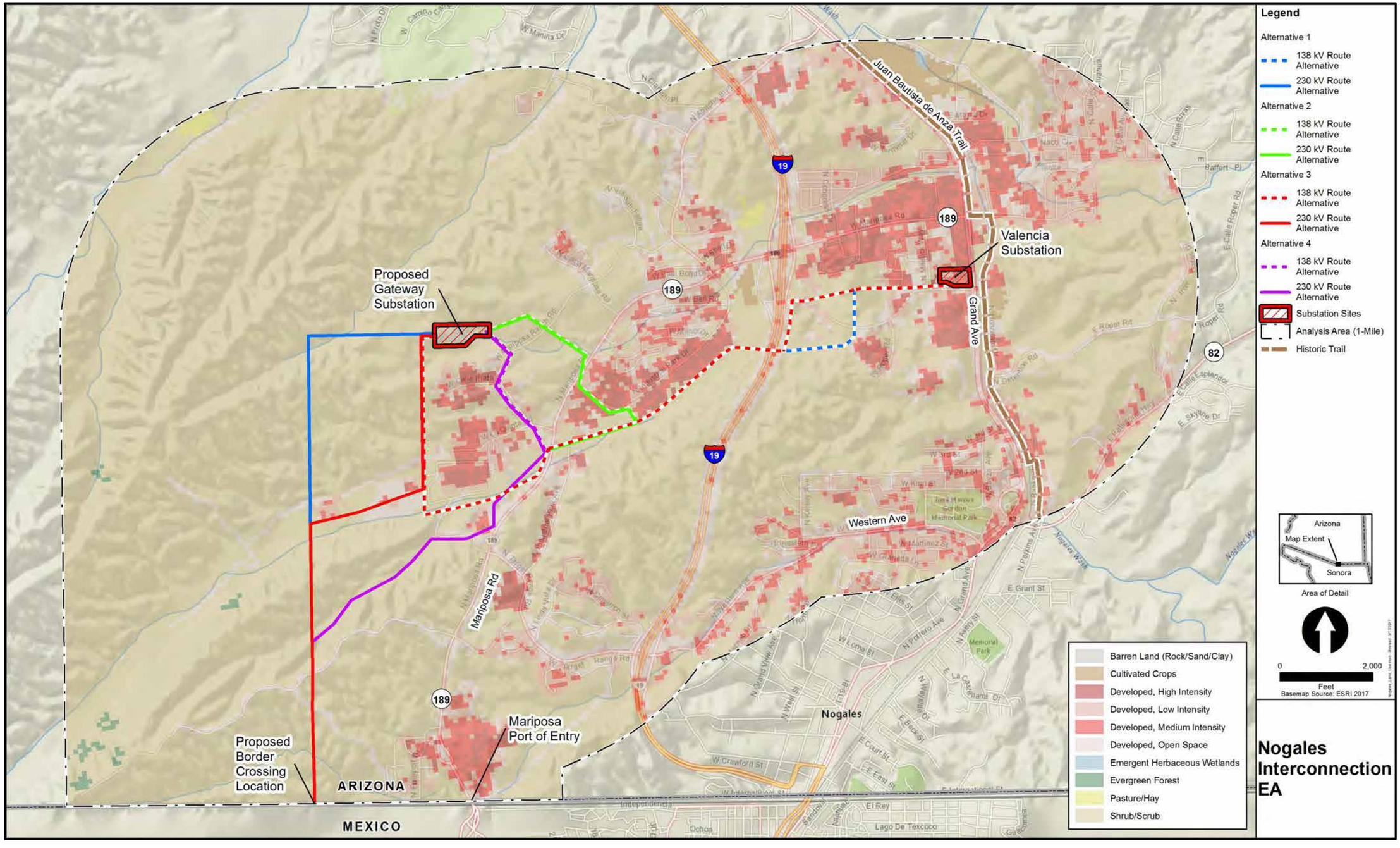

Figure 3.6-2. Land use in the analysis area.

Generally, the analysis area is more developed within the eastern portion, with open, undeveloped desert within the western portion. The National Land Cover Database (NLCD) provides information on land cover types nationwide using a 16-category classification system (Homer et al. 2015), as shown in Figure 3.6-2. Using this database, the primary land cover types in the analysis area were identified:

Shrub/scrub: areas dominated by shrubs less than 16 feet tall with shrub canopy typically greater than 20% of total vegetation. This class includes true shrubs, young trees in an early successional stage, or trees stunted from environmental conditions.

Developed, low intensity: areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 20% to 49% percent of total cover. These areas most commonly include single-family housing units.

Developed, open space: areas with a mixture of some constructed materials, but mostly vegetation in the form of lawn grasses. Impervious surfaces account for less than 20% of total cover. These areas most commonly include large-lot single-family housing units, parks, golf courses, and vegetation planted in developed settings for recreation, erosion control, or aesthetic purposes.

Developed, medium intensity: areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 50% to 79% of the total cover. These areas most commonly include single-family housing units.

Developed, high intensity: highly developed areas where people reside or work in high numbers. Examples include apartment complexes, row houses, and commercial/industrial. Impervious surfaces account for 80% to 100% of the total cover.

Cultivated crops: areas used for the production of annual crops, such as corn, soybeans, vegetables, tobacco, and cotton, and also perennial woody crops, such as orchards and vineyards. Crop vegetation accounts for greater than 20% of total vegetation. This class also includes all land being actively tilled.

Evergreen forest: areas dominated by trees generally greater than 16 feet tall and greater than 20% of total vegetation cover. More than 75% of the tree species maintain their leaves all year. Canopy is never without green foliage.

Pasture/hay: areas of grasses, legumes, or grass-legume mixtures planted for livestock grazing or the production of seed or hay crops, typically on a perennial cycle. Pasture/hay vegetation accounts for greater than 20% of total vegetation.

Barren land (rock/sand/clay): areas of bedrock, desert pavement, scarps, talus, slides, volcanic material, glacial debris, sand dunes, strip mines, gravel pits, and other accumulations of earthen material. Generally, vegetation accounts for less than 15% of total cover.

Emergent herbaceous wetlands: areas where perennial herbaceous vegetation accounts for greater than 80% of vegetative cover and the soil or substrate is periodically saturated with or covered with water.

As summarized in Table 3.6-1, most land cover in the analysis area (71%) is classified as “shrub/scrub,” consisting of areas dominated by shrubs less than 16 feet tall. Following shrub/scrub is “developed, low intensity” at 11%, which consists of areas with a mixture of constructed materials and vegetation. Developed land cover comprises approximately 27% of the analysis area.

Table 3.6-1. Land Cover of the Analysis Area

Cover Type	Acreage*	Percentage of Analysis Area
Shrub/scrub	5,189	71%
Developed, low intensity	785	11%
Developed, open space	592	8%
Developed, medium intensity	378	5%
Developed, high intensity	202	3%
Cultivated crops	52	1%
Evergreen forest	12	<1%
Pasture/hay	11	<1%
Barren land (rock/sand/clay)	8	<1%
Emergent herbaceous wetlands	1	<1%
Total*	**7,230**	**100%**

Source: NLCD (Homer et al. 2015).

* Because of rounding and use of raster data, total does not equal the total area of analysis.

3.6.2 Land Use Plans and Policies

3.6.2.1 City of Nogales

The analysis area (with the exception of the CNF) is located in the City of Nogales' Designated Growth Area, as identified by the General Plan (City of Nogales 2011a). The General Plan includes a "Guiding Principle" for infrastructure/communication to "provide the adequate infrastructure and communication technology needed to serve current and future populations" (City of Nogales 2011a:8).

Although transmission lines and substations are not included specifically as an Element of the General Plan, the Growth Areas and Land Use Elements include Goals and Policies for commercial and industrial development and provide implementation measures to direct commercial and industrial development to areas compatible with the General Plan Land Uses.

3.6.2.2 Santa Cruz County

The analysis area is located in Santa Cruz County, which is managed by the Santa Cruz County Comprehensive Plan (Santa Cruz County 2016). The Plan includes goals and objectives for infrastructure under the "Cost of Development Element" that would be applicable to transmission lines and substation construction and operation: "Objective 9.1: Locate and scale public facilities and utilities appropriately to maximize efficiency and minimize adverse impacts to wildlife, views, natural areas and existing developments" (Santa Cruz County 2016:51).

Development in Santa Cruz County has historically been located along the Santa Cruz River, and later, along I-19. Many of the county's land use goals, objectives, and policies involve the conservation of the ranching and farming heritage, open vistas, and natural landscapes. Additionally, the availability of water across the county is an important limiting factor in the growth and development of the area.

3.6.2.3 Existing Residences

Existing residences within the vicinity of the proposed Project are concentrated in two general areas: near the existing Valencia Substation and generally east and northeast of the proposed Gateway Substation. The majority of the existing residences are multifamily housing units and consist of apartments and condominiums.

Of the seven multifamily residential developments identified within the analysis area, two are condominiums (Villa San Simone Subdivision and Villa Mariposa Subdivision between West Mariposa Road and North Mastick Way, near the existing Valencia Substation), four are apartment complexes (Loma Mariposa Apartments, Santa Rita Apartments, Santa Carolina Apartments, and Villa Paraiso Apartments, generally northeast of the proposed Gateway Substation just north of SR 189), and one is a manufactured home community (Mariposa Manor, east of the proposed Gateway Substation and just south of SR 189).

3.6.2.4 Existing Businesses

Within the vicinity of the proposed Project, retail and service-based businesses are located closer to the eastern portion, generally around Grand Avenue and the existing Valencia Substation. These businesses include medical offices, such as general practitioners, dentists, and optometrists; retail stores, such as Wal-Mart and Home Depot; a strip mall; and pharmacies, motels, office buildings, and restaurants.

The western portion of the analysis area is located in a business environment that is more industrial in nature and contains facilities for manufacturing, freight shipping, and construction supply. These businesses include the United Parcel Service, BorderPro, Swift, Reynolds Logistics, and Arizona Forwarding Co. In addition to private businesses, the U.S. Border Patrol's Nogales Station is adjacent to Route Segment Variation 10.

3.6.2.5 Nogales Ranger District, Coronado National Forest

The westernmost portion of the analysis area is adjacent and parallel to the City of Nogales' border with the CNF, Nogales Ranger District. The management for the Nogales Ranger District of the CNF is provided in the 1986 Coronado National Forest Plan (Forest Plan), as amended in 2009. The analysis area occurs in areas of the CNF that are managed as Management Area 7: Unique Resources (Including Riparian Areas). The emphasis and intensity of Management Area 7 is to: "Manage to perpetuate the unique wildlife or vegetative species while producing livestock forage and fuel wood on a sustained basis. Recreation activities and other uses may occur to the extent that they do not degrade the unique values. Visual quality objectives will be met. Facilities may be allowed and maintained for the purpose of protecting these resources" (USFS 1986:67).

The analysis area includes 1,654 acres of CNF land. The Forest Plan includes prescriptions for managing utility corridors. Lands goals in the management direction of the Forest Plan include: "allow the use of available National Forest lands for appropriate public or private interests consistent with National Forest policies" (USFS 1986:11). In addition, special use management prescriptions are identified: "3. Utility lines will be placed underground when necessary to meet the visual quality objective unless this is not feasible because of overriding environmental concerns, costs, and technical considerations. Existing utility lines that do not meet the visual quality objective will be placed underground or realigned when reconstruction becomes necessary;" and "4. Existing utility and transportation corridors will continue to be used for those types of uses. Every attempt should be made to locate new utilities within those existing corridors that meet the visual quality objective. Existing corridors that do not meet the visual quality

objective should be relocated when construction becomes necessary. New corridors shall be located so that the visual quality objectives are met" (USFS 1986:40–41).

As the proposed Project would not be located on USFS-managed lands, Forest Plan prescriptions would not apply to the proposed Project. The analysis in Chapter 4, Section 4.6.2.1, describes potential indirect impacts of the proposed Project to the CNF.

3.6.2.6 Roosevelt Easement at the International Border

The analysis area includes the 60-foot-wide strip of land parallel and adjacent to the U.S.-Mexico border known as the Roosevelt Easement (see Figure 3.6-1). This easement was reserved to ensure its integrity by two Presidential Proclamations signed by President William McKinley and President Theodore Roosevelt in 1897 and 1907, respectively. The Roosevelt Easement has been held in the interest of the U.S. Government at large. The 60-foot-wide strip of reserved land is continuous along the U.S. side of the border from Nogales, Arizona westward to the Colorado River, including the area of the proposed international border crossing. The preservation of the reserved land's integrity is required. The Applicant has committed that there would be no structures, facilities, or physical occupancy of any kind located within the Roosevelt Easement during construction, operation, maintenance, or emergency procedures. On the U.S. side, the final pole structure would be located approximately 300 feet north of the international border and would not be located within the Roosevelt Easement.

3.6.2.7 Unauthorized Right-of-Way Use

The U.S. Border Patrol is responsible for patrolling the U.S. international border with Mexico between the ports of entry, which includes areas within the analysis area. The U.S. Border Patrol has nine administrative sectors along the U.S.-Mexico international border. Each sector is responsible for the appropriate deployment of personnel, technology, and infrastructure necessary to increase the security and safety of the border region. The proposed Project is within the Tucson Sector, which covers a 262-mile-long portion of the border in Arizona from the New Mexico state line to the Pima County/Yuma County, Arizona line (CBP 2016a). Each sector is further divided into areas of responsibility that are assigned to Border Patrol Stations. The Tucson sector is divided into eight stations, of which the Nogales Station area of responsibility falls within the analysis area. The Nogales Station patrols over 1,100 square miles, including Nogales, Rio Rico, and portions of the CNF, as well as 32 miles of the international border (CBP 2015).

The Mariposa Port of Entry border crossing is located within the analysis area where Grand Avenue/I-19 intersects with the international border; here pedestrians, buses, passenger vehicles, trains, and trucks enter and exit the U.S. to and from Mexico year-round. In addition to this controlled access point at the Mariposa Port of Entry, there is an approximately 20–30-foot-tall fence stretching the entire length of the analysis area between the U.S. and Mexico, further controlling access between the two countries. In short, there is limited opportunity for unauthorized/illegal vehicular travel between the U.S. and Mexico because of the Mariposa Port of Entry, CBP Nogales Station, and CBP border fence, as well as area law enforcement. There is, however, the potential for unauthorized land uses such as general trespassing onto private land in the analysis area and motorized vehicle use within the CNF that would not be on established roads and trails.

3.6.3 Zoning and Ordinances

3.6.3.1 Local Zoning

Local zoning in the analysis area includes the City of Nogales. The portion of the analysis area east of I-19 is primarily zoned for general commercial use, with the exception of one multifamily residential development on the southwest side of Mariposa Road and Mastick Way. The area immediately south of and adjacent to the residential development is an existing utility corridor. The land immediately west of I-19 is also zoned for general commercial use and then transitions to light industrial use (City of Nogales 2011b). The light industrial use–zoned areas include both existing industrial development and, farther west, a planned industrial park that would occur on existing undeveloped land adjacent to the CNF.

Within the City of Nogales, the majority of the analysis area is defined as Centro Commercial, Nogales Growth Area, and Mariposa International Commerce/Industrial Park (City of Nogales 2011b). These major planning areas are defined as follows:

> *Centro Commercial:* Comprising the Nogales Urban Core/Historic Downtown and adjacent to Nogales, Sonora, Centro Cultural serves as the cultural heart of Nogales. This area includes the Dennis DeConcini and the Morley Gate pedestrian ports of entry and is designated as Nogales' walkable, mixed-used, historic urban core where historic preservation, restoration, and redevelopment (as defined by the *Centro Commercial* designation) play a key role. Redevelopment within this area strengthens the City's revenue generating retail base, explores opportunities for mixed-use, and identifies programs and funds for the incorporation of an Arts District.
>
> *Nogales Growth Area:* Comprises the major tracts of vacant or undeveloped land within the current city limits of Nogales. To permit greater design flexibility and more creative and imaginative design for development than generally possible under the current zoning and subdivision regulations, proposed large-scale developments within this area require the preparation of a Planned Area Development in conformance to the City of Nogales Zoning Ordinance. This area includes a large tract of environmentally sensitive land owned by the Arizona State Land Department.
>
> *Mariposa International Commerce/Industrial Park:* This modern, high-tech industrial park area incorporates opportunities for additional industry, state-of-the-art packing and distribution centers, assembly/manufacture, technology/innovation, business incubators, corporate campuses, alternative energy generation (solar/wind), and other major employment centers requiring proximity to the international border. This growth area takes advantage of its proximity to the nation's third-busiest land port of entry, La Mariposa, and provides visitors, tourists, truck drivers and the community with a diversity of highway-oriented commerce, industry support services, and hotels/hospitality uses along the SR 189 corridor.

Applicable guidance regarding infrastructure development from the City of Nogales General Plan Land Use Element Goals and Policies include:

> Goal 3: Locate commercial and industrial development and industrial parks in areas suited for such development. Policy 1: Require that commercial and industrial development and industrial parks comply with all applicable requirements of this General Plan.
>
> Goal 7: Balance public infrastructure and community facilities projects with land use planning and economic development efforts. Policy 1: Coordinate and anticipate infrastructure and community facilities needs and updates with existing and planned development to support economic development efforts. (City of Nogales 2011b)

Permitted land uses in the analysis area are regulated at the local level by the City of Nogales zoning regulations. As specified in the City's Zoning Code, utility structures and facilities related to the transmission of power or communications are considered permitted conditional uses and must be approved by the City's Planning and Zoning Commission. The City of Nogales previously issued a Conditional Use Permit approving development of a substation at the site of the proposed Gateway Substation. The permit has since expired; the Applicant intends to reapply for the Gateway Substation Conditional Use Permit.

3.6.3.2 County Zoning

County zoning in the analysis area includes Santa Cruz County. Where the proposed Project is located within the City of Nogales' municipal planning area, local zoning applies. The analysis area includes portions of County lands at the edge of the western portion of the proposed Project along the boundary with the CNF. These areas are zoned as PL (public land) and General Rural (Santa Cruz County 2015a).

3.6.4 Livestock Facilities

Both private and government livestock facilities are located in the western portion of the analysis area, adjacent to currently undeveloped land. Of the three identified facilities, one is used by the CBP, another is used by the U.S. Department of Agriculture (USDA), and the third is privately owned and most likely used for commercial purposes.

Horse patrols are an integral component of U.S. Border Patrol operations within the Nogales Station area of operation. The U.S. Border Patrol maintains a livestock corral for up to 18 horses in an area located within the Nogales Station that is just east of the proposed ROW for Route Segment Variation 10. These horses are used to patrol rugged terrain (CBP 2017b). The USDA facility is used as a contingency verification and inspection point, which includes corrals for cattle (USDA 2014). The USDA facility was in use at the time of a site visit in May 2017. The third and smallest livestock facility is located just southeast of the Nogales Station on a private property.

3.6.5 Recreation

Recreation in the analysis area includes hiking, hunting, birdwatching, and nature study; these activities occur outside the urbanized portions of Nogales. No outdoor recreation likely takes place in the commercial and industrial areas of the analysis area (within the City of Nogales) except at the two City of Nogales parks within the analysis area: Keno Park and Memorial Park, each located east of I-19.

As stated above, the majority of the analysis area is zoned commercial or industrial, limiting the ability for the public to pursue recreational activities. However, the analysis area does include 1,654 acres of the CNF, and this area of the CNF is managed for multiple uses, including recreation. The Pajarito Wilderness area is the closest designated recreation area and is more than 10 miles west of the analysis area, located within the CNF. There are no preserves or other designated recreation sites in the analysis area. No designated trails are in or near the analysis area.

The analysis area includes GMU 36B (west of I-19) and GMU 34A (east of I-19). Species within these units are similar, and include javelina, mule deer, white-tailed deer, cottontail rabbit, dove, and quail; GMU 34A also includes black bear hunting opportunities.

The Juan Bautista de Anza National Historic Trail (Anza Trail) is within the analysis area, located east of I-19 along the Nogales Wash. The U.S. portion of the Anza Trail begins in Nogales, Arizona and extends to the San Francisco Bay (City of Nogales 2014a; NPS 2003).

3.7 VISUAL RESOURCES

The analysis area for visual resources is a 5-mile buffer around the centerline of the action alternatives. The analysis area for visual resources was determined through a combination of Google Earth review and GIS desktop analysis to identify vegetation, landforms, and land use and gain an understanding of the landscape. Recent research on visibility indicates that monopoles are typically not visible beyond 5 miles in landscapes similar to that of the proposed Project (Sullivan et al. 2014). When applied to the proposed Project, the visibility mapping[18] in this study indicated that the proposed transmission line would not be visible, or would be negligibly visible, beyond the 5-mile threshold.

Viewing distance is a key factor that affects the potential degree of project visibility. Visual details generally become apparent to the viewer when they are observed in the foreground, at a distance of 0.25 to 0.5 mile or less. The primary focus of the visual analysis included in this EA is the foreground zone, where visual details are most apparent, up to approximately 1 mile from the proposed Project area, where change could be noticeable.

The analysis area includes the portions of the Nogales Ranger District of the CNF (see Section 3.6.2.5). The 1986 Coronado National Forest Land and Resource Management Plan, amended through 2009, provides visual and scenic resources management direction for national forest lands in southeastern Arizona and southwestern New Mexico (USFS 1986). It is currently undergoing revision as a draft plan. Visual resources are a key issue in both the existing and draft plans, with utility corridors specifically addressed. In the current plan, existing utility corridors are identified as the preferred location for new utility lines for projects being sited on CNF lands. The 1986 Forest Plan is considered in this EA analysis because of the proximity of the CNF to the proposed Project. As described in Chapter 2, no portion of the proposed Project would be located on CNF lands.

The most critical views that represent areas of public sensitivity or heightened scenic quality were considered in the analysis. For the proposed Project, two such critical views were considered: viewing from within and upon the CNF, and the residential area east of the proposed Gateway Substation. The remaining areas are either private lands not open to the public or considered as not important to the landscape and affected public (e.g., industrial areas); see Section 4.7.2.2 in Chapter 4.

3.7.1 Landscape

The landscape includes both undeveloped and developed areas. The topography of the analysis area consists of rolling terrain, heavily creased with ridges and washes, the largest being Mariposa Wash. The topography of the analysis area ranges from 3,765 to 4,239 feet above mean sea level. To the east, there are foreground views of the City of Nogales, and to the west, there are foreground views of the industrial areas and rolling foothills. To the east and west, there are background mountain views of the

[18] Visibility mapping is a GIS-modeling exercise where the proposed project is modeled on a landscape map, and shading is added to indicate whether or not the proposed project may be visible. For purposes of describing a project's visual setting and assessing potential visual impacts, the visibility mapping can be broken down into foreground, middle ground, and background zones. The foreground is defined as the zone within 0.25 mile to 0.5 mile of the viewer; the middle ground is defined as the zone that extends from the foreground to a maximum of 3 to 5 miles of the viewer; and the background zone extends from the middle ground to infinity (Smardon et al. 1986).

Huachuca and Patagonia Mountains and Tumacacori Mountains, respectively. The vegetation of the undeveloped area primarily consists of semi-desert grassland and shrub/woodland type communities, where the dominant native plants are mesquite trees (*Prosopis velutina*), desert broom (*Baccharis sarothroides*), and grasses.

3.7.2 Human Settlement

The dense, downtown portion of the City of Nogales occurs in the southeastern portion of the analysis area. Small residential areas are located west of the existing Valencia Substation and east and northeast of the proposed Gateway Substation (refer to Sections 3.6.2.3 for a description of the existing residential areas in the vicinity). Residential neighborhoods also occur throughout the central portion of the analysis area, south to the Mexican border.

Portions of the I-19 corridor are located within the central analysis area. The Mexico-to-Tucson portion of the Union Pacific Railroad parallels the east side of Grand Avenue. Portions of the analysis area consist of light industrial development, where most of the buildings are large, corrugated metal structures. SR 189 also occurs within the analysis area, and retail areas line this route, beyond which is currently mostly undeveloped land. The western portion of the analysis area consists of mostly undeveloped land, south to the Mexican border.

The existing Valencia Substation is adjacent to Grand Avenue in a commercial area. The base elevation of the Valencia Substation is located approximately 10–25 feet below the terrain in the surrounding commercial area, providing some visual relief to neighboring commercial and residential areas from this facility. The proposed Gateway Substation location is an existing graded site used for storing construction materials, adjacent to parcels zoned for light industrial use. The base elevation of the proposed Gateway Substation is located approximately 30–60 feet below the terrain in the surrounding commercial area.

3.8 SOCIOECONOMICS

The analysis area for socioeconomics is Santa Cruz County. A description of the existing conditions for population and housing; employment and income; taxes and revenue; and tourism is discussed below.

3.8.1 Population and Housing

Santa Cruz County is the smallest of the 15 counties of the state of Arizona, and is located adjacent to Pima and Cochise Counties. The City of Nogales is the county seat of Santa Cruz County. Other municipalities in the county include Sonoita, Patagonia, Tubac, Rio Rico, and Elgin.

The 2015 population for Santa Cruz County was estimated at 47,073 people (USCB 2015), which is a 0.7% decline from 2010, after an increase of 19% from 2000 to 2010 (USCB 2000, 2010). Table 3.8-1 summarizes population estimates based on USCB data for the U.S., the state of Arizona, and Santa Cruz County.

In 2015, Santa Cruz County contained approximately 18,105 total housing units, of which 15.2% were vacant. The vacancy rate for homeowners was 5.3%, and the vacancy rate for rental housing units is 8.8% (USCB 2015).

Table 3.8-1. Comparative Population Estimates for the Analysis Area

Location	2000*	2010*	2015†	2000 to 2010	
				Population Change	Percent Change
United States	281,421,906	308,745,538	316,515,021	27,323,632	+8.9%
Arizona	5,130,632	6,392,017	6,641,928	1,261,385	+19.7%
Santa Cruz County	38,381	47,420	47,073	9,039	+19.1%

* Source: USCB (2000, 2010).

† Source: 2011–2015 American Community Survey 5-Year Estimates (USCB 2015).

3.8.2 Employment and Income

Table 3.8-2 summarizes estimated employment statistics for Santa Cruz County and includes comparative data for the U.S. and Arizona. In 2015, the unemployment rate in Santa Cruz County was higher (11.3%) than that of the state of Arizona (8.9%), and the U.S. (8.3%). Data from the U.S. Bureau of Labor Statistics (2016) indicate that the unemployment rate in Nogales, Arizona averaged 11.5% for 2015 and 13.0% as of August 2016.

Table 3.8-2. Estimated Employment Statistics in the Analysis Area

Industry	United States	Arizona	Santa Cruz County
Population 16 years and over	251,221,309	5,207,123	35,115
In labor force	63.7%	59.7%	55.4%
Employed	58%	54%	49.1%
Unemployed	8.3%	8.9%	11.3%
Not in labor force	36.3%	40.3%	44.6%

Source: 2011–2015 American Community Survey 5-Year Estimates (USCB 2015).

Table 3.8-3 summarizes estimated occupation and income statistics for Santa Cruz County and includes comparative data for the U.S. and Arizona. As indicated in Table 3.8-3, in 2015, median household income in Santa Cruz County was 20% lower than that of the state of Arizona and 26% lower than that of the U.S. Additionally, Santa Cruz County had a larger percentage of the civilian employed workforce participating in occupations such as sales/office and natural resources/construction/maintenance.

Table 3.8-3. Estimated Occupation and Income Statistics in the Analysis Area

Occupation	United States	Arizona	Santa Cruz County
Civilian employed population aged 16 years and over	145,747,779	2,813,406	17,246
Median household income	*$53,889*	*$50,255*	*$40,140*
Management, business, science, and arts	36.6%	35.1%	26.8%
Service	18.1%	19.9%	18.6%
Sales and office	24.1%	26.2%	31.6%
Natural resources, construction, and maintenance	8.9%	9.2%	10.1%
Production, transportation, and material moving	12.2%	9.7%	12.9%

Source: 2011–2015 American Community Survey 5-Year Estimates (USCB 2015).

3.8.3 Taxes and Revenue

The principal economic activities of the City of Nogales largely include international trade, manufacturing, tourism, and related services. The Ambos Nogales region (which includes both Nogales, Arizona and Nogales, Sonora) contains one of the largest cooperative manufacturing (maquiladora) clusters in North America, with more than 110 companies located in the region (Nogales-Santa Cruz Economic Development Foundation 2015). Additionally, the Mariposa Port of Entry is the largest U.S. port of entry for Mexican produce.

The largest employers in greater Nogales, Arizona include both publicly traded and private companies, as well as municipal, state, and federal government employers. Larger employers generate new wealth for the region and include transportation, logistics, and distribution functions that serve the produce and manufacturing industries in the region. Non-traded companies include retail, hospitality, medical, education, and government. These employers redistribute wealth within the region, particularly if they are owned locally. Large privately companies include E.D.S. Manufacturing, Prestolite Wire, and Safeway, while publicly traded employers include Home Depot and Wal-Mart.

Within the vicinity of the proposed Project, retail and service-based businesses are located closer to the eastern portion, generally located around Grand Avenue and the existing Valencia Substation. These businesses include medical offices, such as general practitioners, dentists, and optometrists; retail stores such as Wal-Mart and Home Depot; a strip mall; and pharmacies, motels, real estate offices, and restaurants. The western portion of the analysis area is light industrial in nature, and contains facilities for produce storage and distribution, manufacturing, freight shipping, and construction supply.

Combined sales tax in the region is 6.6% (Santa Cruz County outside the City of Nogales limits) and 8.6% (City of Nogales). Corporate income tax in Arizona is 6.7%. In 2014, Santa Cruz County had a total general revenue of $58,485,102, of which $14,495,463 was generated from property taxes (Santa Cruz County 2015a). The Santa Cruz County Assessor's Office values all locally assessed properties in the county for ad valorem tax purposes. These properties include commercial, owner-occupied, rental, and vacant land. The City of Nogales had a total general revenue of $19,534,518 in 2015, of which $8,691,466 was generated from sales taxes. The remainder includes revenue generated from fees, shared revenues, and services (City of Nogales 2015b).

3.8.4 Tourism

Tourism in the analysis area is managed by the Nogales-Santa Cruz County Chamber of Commerce and is focused largely on travel in and out of Mexico, as well as recreational opportunities, such as agricultural/viticulture (such as wine tasting) tourism, golf, and historic exploration in the City of Nogales and the greater Santa Cruz County area.

Tourism has been an important economic sector for the City of Nogales, serving as one of the state's most prominent locations where U.S. visitors can gain convenient access into Mexico. The Mariposa Port of Entry includes commercial, vehicular, and pedestrian points of entry. Additionally, Mexican visitors cross the border to the City of Nogales and many make purchases, supporting a range of retailers and restaurants. Currently, the City of Nogales has not seen a rebound in the health and performance of its visitor industry like most other destinations in Arizona after experiencing highs in 2008 and 2009. Additionally, pedestrian border crossings are down 60% when compared to 2007 levels at the Mariposa Port of Entry (Arizona Office of Tourism 2013).

3.9 ENVIRONMENTAL JUSTICE

This section provides demographic information on minority and low-income populations, which have the potential to be environmental justice populations. EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, directs federal agencies to "promote nondiscrimination in federal programs substantially affecting human health and the environment, and provide minority and low-income communities access to public information on, and an opportunity for public participation in, matters relating to human health or the environment." EO 12898 also directs agencies to identify and consider any disproportionately high and adverse human health or environmental effects that its actions might have on minority and low-income communities (collectively, the environmental justice populations) and provide opportunities for community input.

This analysis adheres to the practices outlined in the recently published report of the Federal Interagency Working Group on Environmental Justice and the NEPA Committee, Promising Practices for EJ Methodologies in NEPA Reviews (FIWGEJ 2016).

The environmental justice data below represent the geographic extent in which project-specific effects on minority and low-income populations would occur. The analysis area for environmental justice consists of Census Tracts 9662 and 9664.01 (see Figure 3.9-1). Census Tract 9662 comprises the less-developed area to the north and west of central City of Nogales, consists primarily of industrial-zoned land and residential areas, and covers an area of 3,921 acres. Census Tract 9664.01 comprises the more residential portion of the City of Nogales to the west of the central commercial district from the U.S. border, including Grand Avenue to SR 189 and covers an area of 1,999 acres. Portions of these census tracts occur outside the analysis area. The analysis area is analogous to the "affected area" in the Federal Interagency Working Group on Environmental Justice guidance (FIWGEJ 2016). The region of comparison consists of the City of Nogales. The region of comparison is analogous to the "reference area" in the same guidance (FIWGEJ 2016). Data for Santa Cruz County are also included for context, to provide a wider scope of comparison, but were not used to identify environmental justice populations.

3.9.1 Minority Populations

Minority populations are those identified in the census data as American Indian or Alaskan Native; Asian or Pacific Islander; Black, not of Hispanic origin; Hispanic; some other race; or two or more races (CEQ 1997). The U.S. Census Bureau defines "white" as a "person having origins in any of the original peoples of Europe, the Middle East, or North Africa." Minority communities may be defined where either: 1) the minority population in the affected area exceeds 50%, or 2) the minority population percentage of the affected area is meaningfully greater than the minority population in the reference area (EPA 1994).

Table 3.9-1 describes the minority population statistics for the analysis area (Census Tracts 9662 and 9664.01) and region of comparison (the City of Nogales). In 2015, minority populations constituted between 92% and 97% of the total population within the analysis area. The Hispanic population was the largest minority population, with 92% and 91% of the total populations in Census Tracts 9662 and 9664.01, respectively. The Hispanic population in these Census Tracts is comparable to the 93% Hispanic population of the City of Nogales. Because the analysis area has a minority population that exceeds 50% of the total population, the full analysis area falls within the definition of an environmental justice population.

Table 3.9-1. Minority Statistics for Census Tracts and Region of Comparison

Minority Population Percentage*	City of Nogales	Census Tract 9662	Census Tract 9664.01
Hispanic or Latino origin (of any race)	92.7%	91.9%	91.2%
White alone, not Hispanic or Latino	5.4%	2.9%	7.7%
Race and Hispanic or Latino Origin			
White	79.8%	82.3%	85.9%
Black or African American	0.3%	0.0%	0.5%
American Indian and Alaskan Native	0.2%	0.0%	0.1%
Asian	1.3%	5.4%	0.0%
Native Hawaiian and Other Pacific Islander	0.0%	0.0%	0.0%
Some other race	17.4%	11.7%	10.4%
Two or more races	1.0%	0.7%	3.1%

Source: 2011–2015 American Community Survey 5-Year Estimates (USCB 2015).

* Race alone or in combination with one or more other races.

Additionally, within the City of Nogales, the percentage of the population that spoke English less than "very well" was 31.7%, while in Census Tract 9664.01, it was 30.1% and in Census Tract 9662, 25.6% (USCB 2015). Neither Census Tract contains a greater percentage of population that speaks English less than "very well" than the reference area of the City of Nogales.

3.9.2 Low-income Populations

Low-income populations are identified as individuals and families that are living at or below the U.S. Department of Health and Human Services poverty guidelines. "Low income," as defined by the poverty guidelines for 2016, was $11,880 for an individual and $24,300 for a family of four (HHS 2016). The USCB defines poverty-level thresholds for individuals and a family of four as income levels below $12,082 and $24,257, respectively (USCB 2015). Poverty thresholds do not vary geographically but are updated annually for inflation using the Consumer Price Index.

Table 3.9-2 describes the low-income population statistics for the area of analysis and region of comparison, using 2015 data. Neither of the two census tracts in the analysis area contains a larger percentage of low-income population than the reference area, the City of Nogales. Additionally, median household income and per-capita income for both census tracts are above both U.S. Department of Health and Human Services poverty guidelines and USCB poverty-level thresholds.

Table 3.9-2. Income Statistics for Census Tracts and Region of Comparison

Characteristic	City of Nogales	Census Tract 9662	Census Tract 9664.01
Median household income	$28,044	$34,632	$28,438
Per-capita income	$14,440	$19,311	$12,279
Percent below poverty level (individuals)	32.7%	25.9%	18.9%
Percent below poverty level (families)	28.7%	20.8%	17.4%

Source: 2011–2015 American Community Survey 5-Year Estimates (USCB 2015).

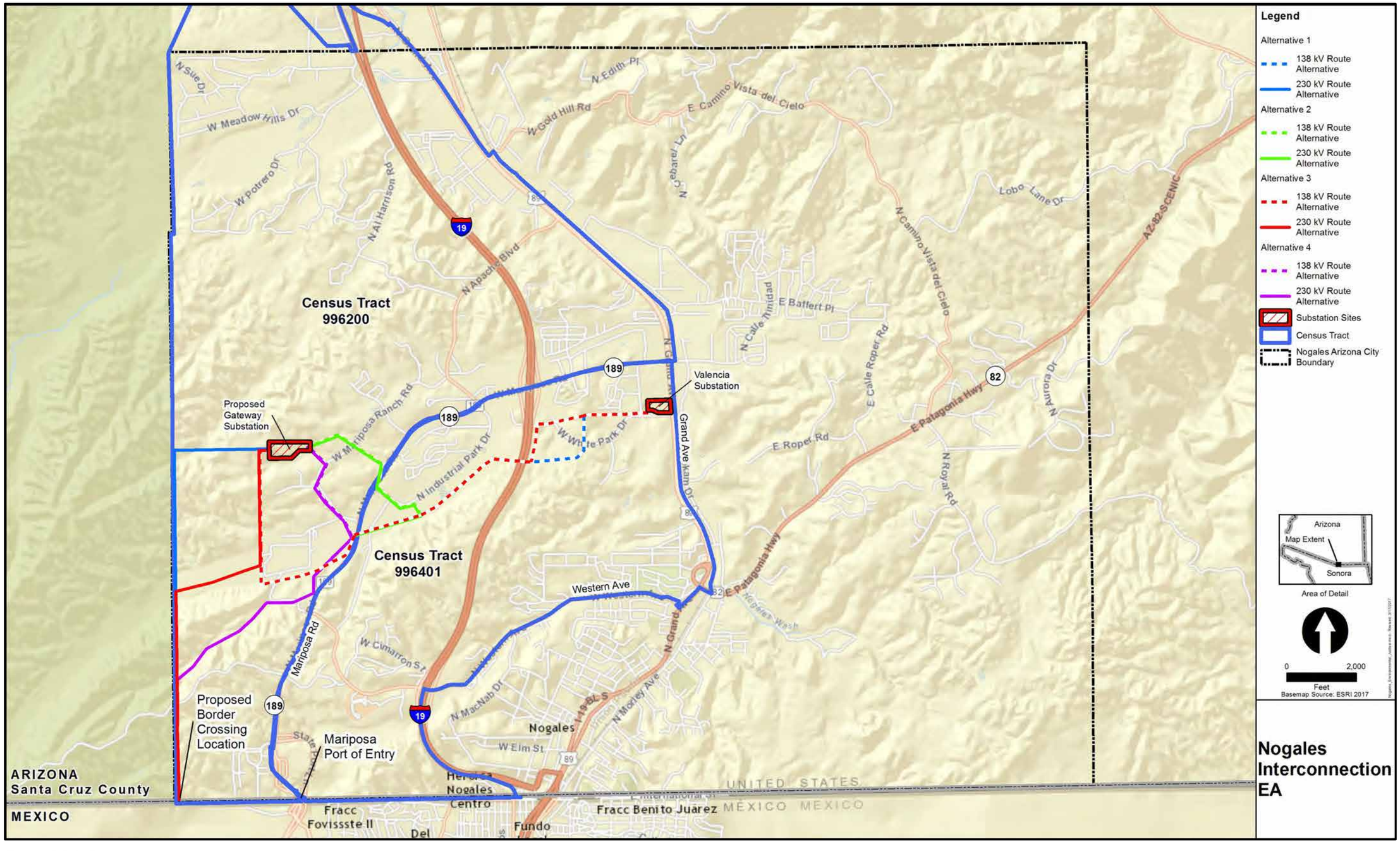

Figure 3.9-1. Census tracts in the analysis area.

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3.10 HISTORIC AND CULTURAL RESOURCES

The proposed Project is an undertaking that must comply with Section 106 of the NHPA as amended (54 U.S.C. 300101 *et seq*.) and its implementing regulations (36 CFR Part 800). Section 106 requires federal agencies in consultation with the SHPO and other interested parties to take into account the effects of its undertakings on historic properties. Historic properties are prehistoric, historic, and traditional cultural resources listed or eligible for listing in the NRHP. The term "historic properties" also includes traditional cultural properties. See Appendix B for National Historic Preservation Act Section 106 Consultation Documentation.

3.10.1 Analysis Area

Federal regulations define the area of potential effects as the geographic area within which a proposed project may directly or indirectly alter the character or use of historic properties (if those properties exist in or near the project area) (36 CFR §800.16[d]). In consultation with the Arizona SHPO, the APE for this proposed Project was defined as a 200-foot-wide corridor along the proposed transmission line centerline; the existing Valencia Substation; the proposed Gateway Substation; and access roads that would require ground-disturbing activity (Access Types C, D, and E). Proposed existing access roads that do not need improvements (Access Types A and B) (i.e., there would be no new ground-disturbing activity) were not included in the APE. An indirect APE was defined to be approximately 0.25 mile on either side of the proposed ROW.

The analysis area for historic and cultural resources for this EA uses the maximum extent of the APE, which is 0.25 mile on either side of the proposed ROW. Cultural resources considered in this analysis are those resources that are the physical manifestations of the activities of past or present cultures, including archaeological sites, historic buildings and structures, trails, and other places of traditional cultural or religious importance. Cultural resources can be human-made or natural features and are unique, finite, and non-renewable.

3.10.2 Cultural Setting

The analysis area has been used by people for thousands of years. The earliest known occupants in southern Arizona are the nomadic big hunters of the Paleoindian (pre–ca. 6500 B.C.). Changes in climate during the beginning of the Holocene led to the Archaic adaptations (ca. 6500 B.C.–ca. A.D. 650) of mobile hunting and gathering of smaller game and seasonal available plant resources. During the Late Archaic or Early Agricultural period, seasonal maize farming supplemented with foraging and hunting became the dominant subsistence pattern. The increase in the dependence of agriculture resulted in a change in settlement patterns as more people lived, at least for part of the year, in villages and hamlets. During the Formative Period (ca. A.D. 650–1450), the Hohokam were the dominant culture in southern Arizona. Hohokam lived in larger, more permanent villages, practiced floodwater and irrigation agriculture, participated in trade networks throughout the Southwest, and manufactured ceramics and other goods.

Hohokam social and economic structures collapsed around A.D. 1450, but O'odham groups were living and farming in southern Arizona when the Spanish arrived in the 1690s. Father Eusebio Francisco Kino established the mission at San Xavier del Bac in 1700, as well as at Tumacacori and Tubac; however, revolts and conflicts with the local O'odham groups and the Apache led to the establishment of Spanish military presidios. Although some Spanish and later Mexican settlers came to southern Arizona, Euro-American settlement began in earnest after the Treaty of Guadalupe in 1848 and the Homestead Act of 1862. Conflicts with the Apache led to the establishment of several U.S. military posts in the area. At this

time, the City of Nogales was a ranch along Nogales Wash. After the end of the Apache Wars, a trading post was established in 1880. With the subsequent completion of the New Mexico–Arizona Railroad in 1881–1882, settlers, miners, ranchers, and entrepreneurs quickly moved in. Camp Steven D. Little operated from 1910 to 1933 as one of many posts established to maintain the border during and after the Mexican revolution. Today, the City of Nogales serves as a trade center for goods from Mexico and other countries, as well as a tourist destination.

3.10.2.1 Resources within the Analysis Area

The analysis area (also the APE, as noted above) has been the subject of some previous research over the past 75 years, dating back to the 1940s (Danson 1946; DiPeso 1953; Frick 1954). Most of the work done in the area has been driven by cultural resource compliance projects. While there has been some work in the analysis area over the past several decades (35 cultural resource pedestrian surveys), only 26% of the area has been surveyed for cultural resources.

Portions of all four alternatives for this proposed Project have been the subject of previous research and cultural surveys, either based on work done by ADOT for ROW projects along SR 189 and I-19, by the Applicant in support of the Presidential permit (HDR 2016b), or by DOE in support of consultation under Section 106 of the NHPA. Based on the previous survey coverage described above, six sites have been recorded within the analysis area, including three prehistoric artifact scatters, rock piles, the Tucson-Nogales Highway, and the New Mexico and Arizona Railroad. Two of the sites are either determined or recommended eligible for the NRHP, three are either determined or recommended not eligible for the NRHP, and one is unevaluated. No NRHP-listed sites or buildings or eligible historic buildings are found within the analysis area.

3.10.3 American Indian Consultation

As described in Section 1.4.4, Federal Consultations, DOE extended invitations to participate as a Section 106 consulting party to all federally recognized tribes in the state of Arizona in a September 19, 2016 letter. DOE also extended an invitation for government-to-government consultation with the Tohono O'odham Nation and the Pascua Yaqui Tribe in a September 13, 2016 letter. The Tohono O'odham Nation accepted the invitation to consult.

3.11 AIR QUALITY AND CLIMATE CHANGE

The analysis area for air quality is Santa Cruz County, and climate change is considered on a global scale.

3.11.1 Ambient Air Quality Standards

Under the authority of the Clean Air Act and its amendments, EPA has established National Ambient Air Quality Standards (NAAQS) for six relatively common air pollutants known as criteria pollutants. EPA regulates them by developing human health- or environmentally-based criteria for setting permissible levels. The criteria pollutants are ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), lead (Pb), sulfur dioxide (SO_2), and particulate matter (PM), which includes two subcategories: particles with an aerodynamic diameter equal to or less than 10 microns in diameter (PM_{10}) and 2.5 microns in diameter ($PM_{2.5}$ or fine particles). The criteria pollutants are the predominant air pollutants of concern for public health and the environment. The NAAQS (40 CFR 50) are summarized in Table 3.11-1. Arizona has adopted the NAAQS into its rules, except that the more recent NAAQS for O_3, established in 2015, are not yet included in the Arizona rules, and Arizona's attainment and non-attainment boundaries may change.

Table 3.11-1. NAAQS for Air Quality Pollutants

Pollutant	Averaging Time	Primary Standard	Secondary Standard
Carbon monoxide (CO)	8-hour[a]	9 ppm (10 mg/m^3)	None
	1-hour[a]	35 ppm (40 mg/m^3)	None
Lead (Pb)	Rolling 3-month average	0.15 µg/m^3	Same as primary
Nitrogen dioxide (NO_2)	Annual (arithmetic mean)	0.053 ppm (100 µg/m^3)	Same as primary
	1-hour[b]	0.100 ppm (188 µg/m^3)	Same as primary
Particulate matter (PM_{10})	24-hour[c]	150 µg/m^3	Same as primary
Particulate matter ($PM_{2.5}$)	Annual (arithmetic mean)[d]	12.0 µg/m^3	Same as primary
	24-hour[e]	35 µg/m^3	Same as primary
Ozone (O_3)	8-hour[f]	0.070 ppm (2015 standard)	Same as primary
Sulfur dioxide (SO_2)	Annual (arithmetic mean)[g]	0.03 ppm	None
	24-hour[a,g]	0.14 ppm	None
	3-hour[a]	None	0.5 ppm (1,300 µg/m^3)
	1-hour[h]	0.075 ppm (196 µg/m^3)	Same as primary

Source: 40 CFR 50 (EPA 2016b).

Notes: mg/m^3 = milligrams per cubic meter, µg/m^3 = micrograms per cubic meter, ppb = parts per billion, ppm = parts per million

[a] Not to be exceeded more than once per year.

[b] Standard is attained when the 3-year average of the eighth-highest daily maximum 1-hour average NO2 concentration does not exceed 0.100 ppm (100 ppb).

[c] Not to be exceeded more than once per year on average over three years.

[d] To attain this standard, the 3-year average at any monitor must not exceed 12.0 µg/m^3.

[e] To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 µg/m^3 (effective December 17, 2006).

[f] To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average O_3 concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm (effective May 27, 2008).

[g] To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average O_3 concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm. The 1997 standard—and the implementation rules for that standard—will remain in place for implementation purposes as EPA undertakes rulemaking to address the transition from the 1997 O_3 standard (0.08 ppm) to the 2008 O_3 standard (0.075 ppm).

[h] The annual and 24-hour SO_2 NAAQS will be revoked as of 1 year after the effective date of designations for the newer 1-hour SO_2 NAAQS, which EPA must complete by July 2, 2016. Standard is attained when the 3-year average of the fourth-highest daily maximum 1-hour average NO_2 concentration does not exceed 0.100 ppm (100 ppb).

The Valencia Substation is considered an "Operating Major" source under Title V the Clean Air Act; UNSE maintains a Title V permit to operate this substation. According to the EPA, a major source has actual or potential emissions at or above the major source threshold for any "air pollutant." The major source threshold for any air pollutant is 100 tons/year (this is the "default value") (EPA 2017e).

3.11.2 Attainment vs. Nonattainment and General Conformity

When the measured concentrations of a criteria pollutant in a geographic region are less than those permitted by NAAQS, the region is designated by EPA as an "attainment area" for that pollutant; if the concentration of a criteria pollutant exceeds federal standards, the region is designated by EPA as a "nonattainment area." The City of Nogales is in the Nogales Planning Area, which is designated as a nonattainment area for the 24-hour PM_{10} NAAQS and the $PM_{2.5}$ NAAQS. However, on January 7, 2013, EPA published a final rule in the Federal Register designating the Nogales Planning Area as being in attainment for the $PM_{2.5}$ NAAQS, which indicates that the 2006 24-hour NAAQS for $PM_{2.5}$ has been attained (EPA 2013). Each state with a nonattainment area is required to develop and implement a State Implementation Plan outlining how the region will reach attainment levels within periods specified in the

Clean Air Act. Former nonattainment areas that are now in compliance with NAAQS are designated as "maintenance" areas. For maintenance areas, the State Implementation Plan must outline how the state will maintain NAAQS compliance. The classification and designation status in 40 CFR 81 remain nonattainment for this area until such time as EPA determines that Arizona has met the Clean Air Act requirements for re-designating the Nogales nonattainment area to attainment, including approving the state-submitted $PM_{2.5}$ maintenance plan for the area and determining that the area has met the other requirements for re-designation.

The ADEQ has implemented the Nogales Planning Area State Implementation Plan (ADEQ 2012) to reduce PM emission sources, such as fugitive dust from unpaved roads, road construction dust, commercial and industrial construction dust, and paved road dust.

The General Conformity rule, established under the Clean Air Act, directs federal agencies to work with state, tribal, and local governments in nonattainment or maintenance areas to ensure that federal actions conform to the air quality plans established in the applicable state or tribal implementation plan. In this case, DOE is required to determine general conformity with the Nogales Planning Area State Implementation Plan (ADEQ 2012).

3.11.3 Climate Patterns

The climate of the Mojave and Sonoran Deserts of Arizona are the hottest (based on July maximum temperatures), driest regions of the contiguous U.S. Persistent cold pools, also known as inversions, can form in valleys and basins during periods of stagnant weather during the winter, leading to a buildup of pollution in some areas. Southern Arizona generally experiences mild winters, but is susceptible to hard freezes when winter storms move far south of normal positions. Hard freezes damage agricultural crops, ornamental plants, and (through frozen pipes) public and household utilities. Deserts in Arizona also experience episodes of extended high temperatures that affect ecosystems, hydrology, agriculture and livestock, and human comfort, health, and mortality.

3.11.4 Climate Change

The Earth absorbs heat energy from the sun and returns most of this heat to space. Greenhouse gasses (GHGs) trap heat in the lower atmosphere (the atmosphere extending from Earth's surface to approximately 4 to 12 miles above the surface) by absorbing the heat energy emitted by Earth's surface and lower atmosphere and reradiating much of it back to the Earth's surface, causing warming (commonly known as the greenhouse effect). Global atmospheric concentrations of GHGs have increased since the beginning of the industrial revolution, changing the energy balance of the Earth and causing it to warm, which in turn affects climatic conditions. Global climate change refers to long-term (multi-decadal) trends in global average surface temperature, precipitation patterns, ice cover, sea levels, cloud cover, sea-surface temperatures and currents, and other climate conditions (EPA 2017a). EPA has defined several gaseous compounds or groups of compounds as GHGs: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and various fluoride gases, including sulfur hexafluoride (SF_6). The current global warming potential (GWP) [19] for the above gases as listed in EPA rules (40 CFR 98; U.S. GPO 2017) for a

[19] Each GHG has a different level of radiative forcing (the ability to trap heat). To compare their relative global warming impact, gases are converted to carbon dioxide equivalent using their unique global warming potential (GWP), which is a measure of how much energy the emissions of 1 ton of a gas will absorb over a given period of time, relative to the emissions of 1 ton of carbon dioxide. The larger the global warming potential, the more that a gas contributes to global warming compared to carbon dioxide over a 100-year period. Carbon dioxide has a GWP of 1, because it is the gas being used as a reference (EPA 2017b).

100-year time horizon is: carbon dioxide: 1, methane: 25, nitrous oxide: 298, and sulfur hexafluoride: 22,800.[20]

Many state and local governments are already preparing for the impacts of climate change through "adaptation," which is planning for the changes that are expected to occur (EPA 2015). In Arizona, efforts are underway to mitigate and respond to the impacts of climate change, including energy efficiency rebates, renewable energy programs, and emission banks. Mechanisms being used by governments to prepare for climate change include: land-use planning; provisions to protect infrastructure and ecosystems; regulations related to the design and construction of buildings, roads, and bridges; and preparation for emergency response and recovery (Garfin et al. 2013). Planning documents for Santa Cruz County and the City of Nogales do not include any climate change-related measures. Other local adaptation planning and actions are unfolding in municipalities of different sizes, and regional agencies and regional aggregations of governments are also taking actions.

3.12 NOISE

The analysis area for noise is a 1-mile buffer of the centerline of the action alternatives. The State of Arizona does not regulate environmental noise from stationary sources, such as substations and transmission lines. The City of Nogales regulates environmental noise through its noise ordinance (Nogales Code of Ordinances, Ord. No. 90-08-09, 8-5-4(B), 8-29-1990 [City of Nogales 1990]). The ordinance identifies maximum allowable noise levels (L_{max}) at the property line of the noise receiver.

The ordinance contains different L_{max} limits for daytime and nighttime, as well as for different receiving land uses. The ordinance states that it is primarily (but not exclusively) intended to be applied to vehicles and stereos in vehicles. It also states that noise sources regulated by other federal or state regulatory programs are exempt from the ordinance. Table 3.12-1 identifies the L_{max} at receiving land uses (Section 12-59, City of Nogales noise ordinance).

Table 3.12-1. Maximum Allowable Noise Levels for Continuous Noise Sources

Property Type	6 a.m. to 10 p.m. (dBA)*	10 p.m. to 6 a.m. (dBA)
Hospital	60	50
Residential	65	55
Commercial	70	60
Industrial	85	70

Source: Nogales, Arizona. Ord. No. 90-08-09, 8-5-4(B), 8-29-1990 (City of Nogales 1990).

* Noise level in decibels on A-weighted scale, "slow" setting, L_{max} reading.

Local conditions in the analysis area, such as traffic, U.S. Border Patrol helicopter activities, topography, and winds can alter background noise conditions. In general, the L_{max} sound levels at outdoor quiet urban nighttime noise levels range from 40 to 50 dBA (EPA 1974). The majority of the analysis area would be expected to have background noise L_{max} of about 35 dBA or less, as there are no sources of noise in these areas to contribute to a higher background noise level. In addition to natural background, noise sources in the analysis area could include CBP patrol traffic (both vehicular and aerial), transmission lines, trains, business activities at area industrial facilities, low-density traffic on rural roads, high-density traffic on city streets and freeways (i.e., near I-19), and general aircraft overflights.

[20] Source: 40 CFR 98, Subpart A, Table A-1, current as of May 3, 2017.

As described in Section 3.6 Land Use and Recreation, zoning in the analysis area is predominantly commercial and light-industrial, with some pockets of residential. The proposed Gateway Substation site, as well as the existing Valencia Substation, are zoned light industrial.

In addition to the commercial and light-industrial areas, there are also large open, undeveloped tracts of land designated as the Nogales Growth Area (City of Nogales 2011b), as well as some residential use. Residences are considered sensitive noise receptors. As discussed in Section 3.6.2.3, existing residences within the vicinity of the proposed Project are concentrated in two general areas: near the existing Valencia Substation and generally east and northeast of the proposed Gateway Substation. The majority of the existing residences are multifamily housing units, and consist of apartments, condominiums, and one manufactured home community. The Mariposa Manor manufactured home community is the closest residential receptor, located approximately 2,700 feet east of the Gateway Substation property line.

Other sensitive receptors in the analysis area known at this time include two daycare facilities, one retirement home, one motel, and four healthcare facilities/doctor's offices.

3.13 INFRASTRUCTURE

The analysis area for infrastructure is a 1-mile buffer of the centerline of the action alternatives. Infrastructure is defined as those human-made facilities and systems that are fundamental for serving the needs of a population in a specified area. The specific infrastructure components considered in this EA include transportation and traffic; electric power, natural gas, and water supply systems; solid and stormwater management; communications systems; and emergency management.

Four minor roads in the analysis area serve the City of Nogales (see Figure 3.13-1). West White Park Drive and North Mastick Way, both adjacent to the Valencia Substation, provide access to the proposed Project area from I-19. North Industrial Park Avenue (adjacent and parallel to SR 189) and West La Quinta Road (also adjacent to SR 189) provide access to industrial areas on either side of SR 189. Gravel roads and trails are found along the hills in the western portion of the area of analysis, including roads used by the U.S. Border Patrol.

There are four major roadways in the analysis area: I-19, Grand Avenue (also known as Business I-19 or the Tucson–Nogales Highway), SR 189/Mariposa Road, and SR 82/Patagonia Highway (which connects with Grand Avenue 1.5 miles north of the U.S.-Mexico border) (see Figure 3.6-1). All four of these roadways are four lanes wide and provide important access to the Mariposa Port of Entry. SR 189 and Grand Avenue provide access from the Mexican border to the City of Nogales and direct connection to I-19. All roadways pass through or near the proposed Project area in a north-south alignment, with the exception of SR 82, which connects with Grand Avenue southeast of the analysis area.

The major roadways in the analysis area serve one of the 10 busiest cargo ports along the U.S.-Mexico border—the Mariposa Port of Entry. SR 189 and the Mariposa Port of Entry is the busiest land port in Arizona. Nearly 2.8 million privately owned vehicles pass through the Mariposa Port of Entry area annually (GSA 2016). Average annual daily traffic volume is provided in Table 3.13-1.

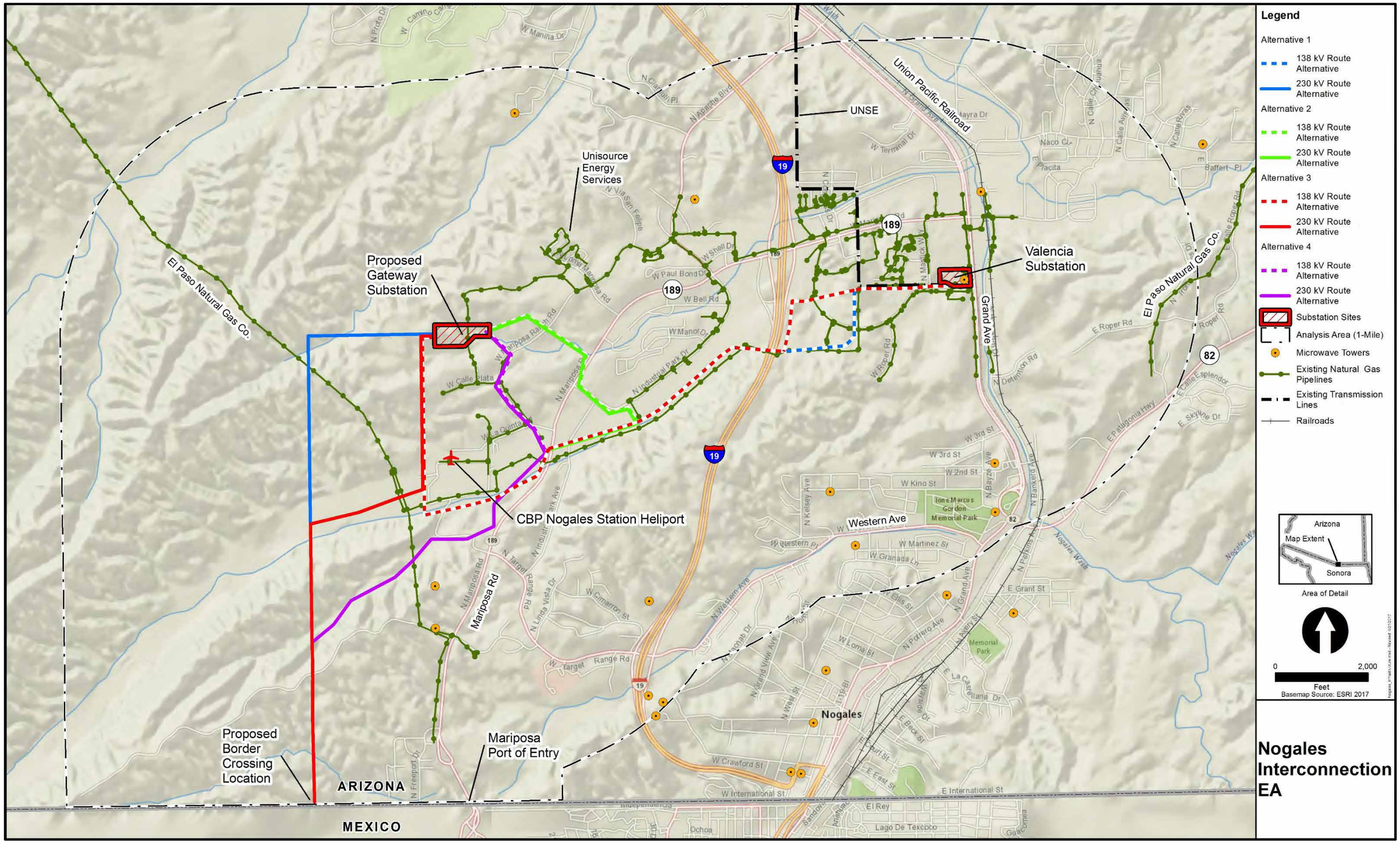

Figure 3.13-1. Infrastructure in the analysis area.

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Table 3.13-1. Major Roadways and Traffic Volumes

Roadway	Average Annual Daily Traffic Volume
I-19 (from Western Avenue to SR 189 interchange)	13,009
Grand Avenue (from Arroyo Boulevard to SR 82 interchange)	18,000
SR 189 (from Target Range Road to Industrial Park Drive)	13,116
SR 82 (from I-19 interchange to Thelma Street)	6,405

Source: ADOT (2015a, 2015b).

ADOT is planning improvements to SR 189 because of the likelihood of increased traffic through the Mariposa Port of Entry. The SR 189 corridor is continuing to experience increased interest for light industrial, warehouse and distribution, which will likely lead to additional transportation-related development and an increase in traffic (ADOT 2017b). I-19 is a designated section of the CANAMEX Corridor, which connects Mexico, the U.S., and Canada. Through the 1995 National Highway Systems Designation Act, Congress established CANAMEX as a High Priority Corridor, with a goal of stimulating investment and economic growth in the region and enhancing safety and efficiency in the corridor (CCC 2015).

The Union Pacific Railroad operates the railroad from the City of Nogales north to the East-West Sunset Route in Tucson and from the City of Nogales south to Ferromex Rail, running to Hermosillo, Guaymas, and Guadalajara in Mexico. This rail line has been used by 750–800 trains per year between 2014 and 2016 (Bureau of Transportation 2016). This rail line does not intersect the proposed Project alternatives, as it is located east of the existing Valencia Substation and Grand Avenue; however it is located within the analysis area for the affected environment.

The Nogales International Airport is the closest airport, within the U.S. to the analysis area (located approximately 6 miles northeast). It is a County-owned, public-use airport, categorized as a general aviation facility by the Federal Aviation Administration and is not served by commercial airlines. CBP operates a heliport 1.4 miles north of the Mariposa Port of Entry at the Nogales Station.

One electric transmission line occurs within the analysis area, UNSE's 138-kV Vail to Valencia line, which originates at the Vail Substation, just southeast of Tucson, Arizona, extends approximately 55 miles, and terminates at the existing Valencia Substation in the City of Nogales. It is the primary electricity source for the City of Nogales and the surrounding communities (UNSE 2013, 2017).

There are several natural gas pipelines that occur within the analysis area owned by El Paso Natural Gas Company (a Kinder Morgan Company) and UNSE. The El Paso Natural Gas lines are interstate lines that occur within the western and eastern portions of the analysis area. The UNSE lines run through the center of the analysis area (Platts 2014; UNSE 2017).

Two hundred and twenty-four wells occur within the analysis area: 191 are privately owned and the other 33 are publicly owned, 20 by the City of Nogales, nine by ADEQ, two by ADWR, one by CBP, and one by ADOT (ADWR 2016). Table 3.13-2 describes the six wells that occur in proximity to the proposed Project. The City of Nogales Water Department manages water systems in the analysis area. There are no municipal wastewater treatment facilities in the analysis area.

Table 3.13-2. Wells within the Analysis Area

Location	Description
Approximately 230 feet from the proposed Project centerline; 70 feet deep	Exploration (owned by ADOT)
Approximately 250 feet from the proposed Project centerline; 500 feet deep	Groundwater
Approximately 40 feet from the proposed Project centerline; 360 feet deep	Groundwater
Approximately 230 feet from the proposed Project centerline; 600 feet deep	Groundwater
Approximately 240 feet from the proposed Project centerline; no depths reported (2 wells)	Special designation cathodic (rust) protection

Source: ADWR (2016).

The City of Nogales Environmental Services Department provides solid waste services within the analysis area. The City of Nogales contracts with Tucson Recycling and Waste to operate a waste transfer facility, which is located east of I-19 within the analysis area. No landfills are located within the analysis area.

The City of Nogales was required to develop a Stormwater Management Plan as a municipality authorized to discharge stormwater as a Municipal Separate Storm Sewer System (MS4) under the Arizona Pollutant Discharge Elimination System (AZPDES) permit program administered by the ADEQ, Permit No. AZG2002-002. This Phase II Small MS4 Permit was reissued on November 24, 2010 and modified on June 3, 2011.

Stormwater flows in developed areas are higher in volume, pollutants, and temperature than flows in less-developed areas, which have more natural vegetation and soil to filter the stormwater runoff. In addition to increased impervious areas, urban development creates new pollution sources, as population density increases and generates higher levels of car emissions, fertilizers and pesticides, litter, pet wastes, and household hazardous wastes. Therefore, higher population densities and increased impervious areas generally result in a greater concentration of pollutants in stormwater discharges from municipal separate storm sewer systems (City of Nogales 2015a). The proposed Project area would cross existing stormwater management infrastructure, including several roadway culverts, swales, and ditches. Most of this infrastructure is located within ROWs owned and maintained by ADOT or by the City of Nogales.

Communications technologies identified within the analysis area can be divided into two broad categories: omnidirectional and unidirectional signals. Omnidirectional refers to those antennae that are able to transmit or receive signals in any direction; unidirectional refers to those antennae that are able to transmit or receive signals in one direction. Microwave signals are unidirectional and all others (e.g., radio, television, communications, and cellular phone) are omnidirectional.

Generally, electric transmission lines do not cause interference with omnidirectional radio, television, or other communication antenna reception. While it is rare in everyday operations, four potential interference sources exist: gap discharges, corona discharges, shadowing effects, and reflection effects.

Gap discharge interference is the most commonly noticed form of transmission line interference with omnidirectional signals. Gap discharges may occur on transmission and distribution lines where small gaps (i.e., spaces) develop between mechanically connected metal parts. As sparks discharge across a gap, they create the potential for electrical noise, which can occur with any electrical line voltage. The degree

of interference depends on the quality and strength of the transmitted communication signal, the quality of the antenna system, and the distance between the receiver and the electrical line. Gap discharges typically are not a design issue, but tend to be associated with equipment maintenance, occurring at areas where gaps have formed due to broken or ill-fitted hardware (e.g., clamps, insulators, and brackets). Because gap discharges are a hardware issue, they can be repaired when they occur.

While gap discharges and their effects can happen on any electrical line, they typically occur on lower voltage distribution lines. The gap discharge potential of larger transmission lines, like those for the proposed Project, tends to be minimized, because there are fewer structures and a higher mechanical load on hardware. Shadowing and reflection effects typically are associated with large structures (e.g., high buildings) that may cause reception problems by disturbing broadcast links and leading to poor radio and television reception.

Multipath reflection or scattering interference can be caused by the combination of a signal that travels directly to the receiver and a signal reflected from the structure that travels a slightly longer distance, and thus may be received slightly later by the receiver. If one signal arrives with significant delay relative to the other, the picture quality of both analog and digital television broadcast signals may be impacted. With analog broadcasts, a second image may appear on the receiver's screen and displace the other. This type of reception interference is known as ghosting or delayed image. With digital broadcasts, the picture can become pixelated or freeze and become unstable. The most significant factors affecting the potential for signal shadow and multipath reflection are structure height above the surrounding landscape and the presence of large, flat metallic facades.

Microwave antennae are operated as high-frequency, unidirectional, point-to-point systems and depend on line-of-sight between antenna receivers. These systems are unlikely to be adversely affected by electrical noise, but could be affected by infrastructure located directly between two microwave signal points. Communication tower locations were identified by accessing the Federal Communications Commission (2016) database. Based on the data available, 12 communication towers are within the analysis area. The CBP also provided input regarding the proximity of their communication and surveillance towers.

Emergency services in the analysis area are managed locally by the City of Nogales and private companies. In addition, Santa Cruz County administers a Local Emergency Planning Committee. The Committee manages a system that allows the public to sign up to receive emergency alerts on their mobile devices. The Nogales Fire Department and Holy Cross Hospital are located within the area of analysis.

3.14 HUMAN HEALTH AND SAFETY

The analysis area for human health and safety consists of a 1,000-foot buffer of the centerline of the action alternatives.

3.14.1 Contractor Health and Safety

Existing conditions in the analysis area that may result in contractor health and safety concerns for the proposed Project include risks associated with vehicles and traffic, construction activities, heavy equipment installation and transportation, contact with electrical lines, and the potential to sever existing utility lines. Employers and contractors are responsible for complying with national, local, and worksite safety regulations.

3.14.2 Public Safety

3.14.2.1 Electric and Magnetic Field Safety

Anything that carries an electric current, including electric transmission cables, produces an electromagnetic field (EMF). Electrical fields are measured in units of kilovolts per meter (kV/m), and magnetic fields are measured in units of gauss (G). Environmental EMF exposures are generally very small and more appropriately measured in milligauss (mG), or thousandths of a gauss. The strength of EMF increases as electric current increases but generally decreases with increasing distance from the source of the electric current. Public risks associated with EMF also vary with the type of electric power being produced. DC electric power does not induce electric currents in humans; however, AC electric power has been shown to create weak electric currents in humans (NIEHS 2002).

EMFs are phenomena that occur both naturally and as a result of human activity. Naturally occurring EMFs are caused by the weather and Earth's geomagnetic field. The public is exposed to EMF daily through the Earth's natural geomagnetic field (approximately 465 mG in the proposed Project area [NCEI 2016]) and through the use of common household appliances (DOE 1996; Exponent 2015). The International Commission on Non-Ionizing Radiation Protection (2009) developed an exposure limit of 4,000,000 mG for the general public.

In the case of a transmission line, magnetic fields are created when current flows through the line. The strength of the fields is determined mainly by line current, line height, and distance. EMFs occur within the analysis area from other existing distribution and high-voltage transmission lines. There are currently no specific Occupational Safety and Health Administration standards that address exposure to EMFs.

3.14.2.2 Corona

Corona is a phenomenon associated with all energized transmission lines. Under certain conditions, the localized electric field near an energized conductor can be sufficiently concentrated to produce a tiny electric discharge that can ionize air close to the conductors (EPRI 1982). This partial discharge of electrical energy is called corona discharge or corona. Several factors, including conductor voltage; shape and diameter; and surface irregularities, such as scratches, nicks, dust, or water drops, can affect a conductor's electrical surface gradient and its corona performance. Corona is the physical manifestation of energy loss and can transform discharge energy into very small amounts of sound, radio noise, heat, and chemical reactions of the air components. Corona is a type of EMF.

Corona noise occurs in areas where there are existing transmission lines in the analysis area. The level of noise associated with the corona effect strongly depends on weather conditions, as well as the condition of the transmission line. The proposed Project location is generally considered to have fair weather during most of the year; however, foul weather, or rain conditions, occurs periodically and seasonally; during these times corona noise is more common. In arid regions of the west, corona-generated audible noise is generally not discernible within 0.25 mile or less from the center of the nearest transmission tower. Corona discharges occur within the analysis area from other existing distribution and high-voltage transmission lines.

3.14.2.3 Contaminated Soils and Groundwater

Publicly available databases were searched to gather information regarding known sites of environmental concern within the analysis area. Sites of potential environmental concern include, but are not limited to, Superfund sites, underground storage tanks (USTs)/leaking USTs, and EPA-permitted facilities. EPA's

Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) contains data on potentially hazardous waste sites that have been reported to EPA, as well as sites listed on the National Priorities List (NPL). EPA and ADEQ databases were queried to identify sites of potential environmental concern in relation to the analysis area.

There are two CERCLIS sites (EPA 2016c). As noted in Table 3.14-1, both of the CERCLIS sites are "archived," which means that "to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list this site on the National Priorities List" (EPA 2017c). There are no active ("open") LUST cleanups within the analysis area (see Table 3.14-2). CBP maintains a Toxic Release Inventory permit for the Nogales Station; no air, land, or on-site releases have been reported for this facility (EPA 2017d).

Table 3.14-1. CERCLIS Sites within the Analysis Area

City	Route Segment Variation	Facility Name	EPA ID #	Status
Nogales, AZ	1	Citizen Utilities	AZ0001038553	Archived
Nogales, AZ	1	Nogales Grand Avenue Plume	AZN000908518	Archived

Source: EPA (2016c).

Table 3.14-2. Leaking Underground Storage Tank Sites Located within the Analysis Area

City	Route Segment Variation	Facility Name	Total USTs	USTs that Have Leaked	Open LUST Cases
Nogales, AZ	1	Horne Ford	2	1	0
Nogales, AZ	2	Union 76	2	2	0
Nogales, AZ	3	Tony's Self-Serve #2	1	1	0
Nogales, AZ	1	Circle K #745	3	3	0
Nogales, AZ	1	Circle K #259	4	4	0
Nogales, AZ	1	Fastrip #9906/9907	1	1	0
Nogales, AZ	1	Citizens Utilities – Valencia	1	1	0
Nogales, AZ	4	Nogales SOC #125202	1	1	0
Nogales, AZ	1	Citizen Auto Stage	1	1	0
Nogales, AZ	1	WP Market	1	1	0

Source: ADEQ (2016).

3.15 HAZARDOUS MATERIALS AND WASTE

The analysis area for hazardous materials and waste consists of a 1-mile buffer around the proposed Project centerline, which satisfies the search distances specified in American Society for Testing and Materials (ASTM) Standard E 1527-13 (ASTM 2013). The analysis area includes both developed and undeveloped areas. Under the federal Resource Conservation and Recovery Act and state statutes and codes modeled on the federal law, ADEQ has the authority to monitor and direct businesses that may generate, transport, or dispose of hazardous waste in Arizona. As the analysis area is a mixture of residential, commercial, light industrial, and undeveloped land, there are no widespread prior or current industrial uses that would suggest a concentration of hazardous waste would be present. Isolated instances of refuse dumping, to the extent found in the analysis area, are household trash, rather than industrial wastes that would be more likely to contain hazardous materials. Only CERCLIS and LUST environmental resource records were found in the analysis area, as described above in Section 3.14.

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Chapter 4

ENVIRONMENTAL CONSEQUENCES

4.1 INTRODUCTION

The proposed action alternatives may cause, directly or indirectly, changes in the natural and built environments. The No Action Alternative is described in Section 4.1.3.

4.1.1 Effects/Impacts

The terms "effect" and "impact" are synonymous under NEPA. Effects may refer to ecological, aesthetic, historical, cultural, economic, or social phenomena that may be caused by one of the action alternatives. Effects may be direct, indirect, or cumulative in nature.

Effects, or impacts, can be beneficial or adverse, result from the action directly or indirectly, and short-, long-term, or cumulative in nature. A direct effect occurs at the same time and place as the action. Indirect effects are reasonably foreseeable effects that occur later in time or are removed in distance from the action. Direct and indirect effects are discussed under each affected resource. Short-term effects, or impacts, result in changes to the environment that are stabilized or mitigated rapidly and without long-term effects; these changes typically occur during construction or maintenance events during the life of the proposed Project. Long-term impacts are defined as those that would remain substantially for the life of the proposed Project, or beyond short-term impacts. Cumulative impacts are the incremental direct and indirect impacts resulting from the action added to those of other past, present, and reasonably foreseeable future actions.

CEQ NEPA implementing regulations at 40 CFR 1508.27 address the concept of significance (or "significantly"). Determining potential *significance* of impacts from a proposed action requires consideration of both the *context* and *intensity* of the effects of an action on, or the importance of that action to, the human environment. *Context* means that the effect(s) of an action must be analyzed within a framework or within physical or conceptual limits. Local, regional, national, and both short- and long-term impacts are relevant to context, as defined in 40 CFR 1508.27(a). *Intensity* refers to the severity or level of magnitude of impact. 40 CFR 1508.27(b) sets out a need for agency decision makers to consider a variety of factors in evaluating intensity, including but not limited to, whether or not the impact would be beneficial or adverse, the duration of the impact, and unique characteristics of the environment (e.g., the presence of endangered species).

4.1.2 Analysis Approach Summary

The proposed Project footprint for each of the action alternatives includes the 150-foot-wide ROW,[21] access roads that would require improvement, and the Gateway Substation. Access Type A (existing

[21] Acreage estimates were calculated using geographic information system (GIS) software (ArcMap 10.3). The total footprint acreage of the ROW was calculated by creating a buffer of 75 feet on either side of the proposed transmission line centerline for each alternative. In the area near the proposed Gateway Substation, the estimated footprint of the ROW is overly conservative (i.e., slightly wider than 150 feet). Additionally, the ROW footprint was not modified/narrowed to adjust for areas (e.g., existing industrial parks in the northeast portion of the project) where a 150-foot ROW would not be possible due to the existing built environment. In these areas as well, the estimated footprint of the ROW is overly conservative, as it would be narrower than 150 feet in some places.

private dirt roads not requiring improvement) and Access Type B (existing public paved roads) were not included in the acreage calculations for impact, though impacts were considered and discussed qualitatively in the relevant sections below. Acreages impacted were calculated for Access Type C (existing dirt roads that would require improvement), Access Type D (new dirt bladed access roads), and Access Type E (new dirt spur roads). While the existing Valencia Substation is included in the proposed Project description, it was not included in the analysis, because any modifications made within the existing Valencia Substation would be located within the existing, disturbed property line. Similarly, the use of an already disturbed, 3-acre staging yard owned by UNSE and located in the proposed Project area was not included in the analysis, because there would be no additional ground disturbance for staging/laydown purposes.

Anticipated effects during construction are generally considered to be short-term (temporary), and anticipated effects from operation and maintenance are generally considered to be long-term (permanent).

For the purpose of analysis, the following assumptions were made:

4.1.2.1 Temporary Impacts

- Calculations assume that the full ROW would be disturbed during construction. All references to construction impacts in the ROW assume that 100% of the ROW acreage would potentially be disturbed. Temporary disturbance during construction could come from any number of activities, such as overland access, construction of upgraded or new access roads, structure work areas, pulling stations, vegetation clearing, etc.
- Additional disturbance outside of the ROW is limited to access roads and includes construction of spur roads (Access Type E) between the structures and the closest access road, as well as the construction or upgrade of access roads outside of the ROW (Access Types C and D).
- The Gateway Substation site has already been graded; however, due to construction activities at the substation, additional temporary impacts are anticipated within the approximately 11-acre footprint.

4.1.2.2 Permanent Impacts

- Calculations assume that the full ROW would potentially be used and disturbed during operation and maintenance. Disturbance during operation and maintenance could come from any number of activities, such as overland access for inspection and repairs, maintenance of roads in the ROW, and vegetation management activities.
- Calculations assume that the structure locations and the access roads within the 150-foot ROW would result in long-term disturbance during operation and maintenance for the life of the proposed Project.
- Additional permanent disturbance outside of the ROW includes the final footprint of spur roads (Access Type E), and the final footprint of new or upgraded access roads outside of the ROW (Access Types C and D).
- Approximately 11 acres for the Gateway Substation final footprint would result in permanent disturbance.

4.1.3 No Action Alternative

As described in Section 2.1, the No Action Alternative establishes the baseline against which the potential environmental effects of a proposed action can be evaluated. Under the No Action Alternative, DOE would not issue a Presidential permit for the proposed Project, the transmission system would not be authorized to cross the U.S.-Mexico border, the proposed Project would not be constructed in the U.S., and the potential environmental impacts associated with the proposed Project would not occur. Along with the project-specific environmental impacts, the potential benefits of the proposed Project would not be realized.

4.1.4 Common Impacts Across All Alternatives

The impact analyses for the following resources consider impacts common to all of the action alternatives, as there are no meaningful distinctions to make between the alternatives for each of these resources.

- Visual Resources
- Socioeconomics
- Environmental Justice
- Air Quality and Climate Change
- Noise
- Infrastructure (except Travel and Transportation)
- Human Health and Safety
- Hazardous Materials and Waste

4.2 GEOLOGY AND SOILS

4.2.1 Impact Analysis Area and Indicators

The impact analysis area for direct impacts to geology and soil resources is the footprint of each of the action alternatives (as described in Section 4.1.2). The analysis area for indirect impacts is the analysis area as described in Section 3.1.2 (a 1-mile buffer of the centerline of the action alternatives).

The following indicators were considered when analyzing impacts to geology and soils:

- Geology
  - Removal or physical disturbance of important geological resources in the analysis area.
  - Inhibiting access to mineral resources in the analysis area.
  - Increase in potential for geological hazards if the proposed Project were to be constructed.
- Soils
  - Disturbance of sensitive soils, such as prime and unique farmland.
  - Loss of topsoil due to construction, operation, and/or maintenance activities (i.e., removal or mixing of topsoil).
  - Soil compaction from vehicular traffic.
  - Soil erosion due to water and wind.

4.2.2 Impact Analysis

4.2.2.1 No Action Alternative

Under the No Action Alternative, DOE would not issue a Presidential permit for the proposed Project, the transmission system would not be authorized to cross the U.S.-Mexico border, the proposed Project would not be constructed in the U.S., and the potential environmental impacts associated with the proposed Project as discussed below would not occur.

4.2.2.2 Action Alternatives

COMMON IMPACTS ACROSS ALL ALTERNATIVES

Many of the impacts to geology and soils are common to all of the action alternatives. Calculations assume that the full ROW would be used and disturbed during construction, as well as during operations and maintenance. Following is a discussion of those impacts. Discernible differences are then discussed by alternative.

Geology

Although consideration of geologic resources in Section 3.2.1 notes that the analysis area for the affected environment is rich in geologic resources, such as copper, molybdenum, and gold, none of these resources would be within the footprint of, or adjacent to, the proposed action alternatives. There would be no direct or indirect impacts to important geologic resources. Additionally, no impacts to mineral resources in terms of access would be anticipated.

In terms of geologic hazards, the nearest documented subsidence area is in Green Valley, Arizona, approximately 35 miles north of the impact analysis area. Potential for slope failure, slumping, and landslides is low, considering the area's topography of generally gently rolling hills. The risk of seismic activity is low, given the area's history and the location of active faults; as noted in Section 3.2.2.3, the closest active fault is over 10 miles away. In summary, no increase in the potential for geologic hazards would be anticipated.

Soils

In terms of soils within the impact analysis area, construction of the proposed Project would result in short-term direct impacts to soils in the ROW, along upgraded or new access roads outside the ROW, and at the Gateway Substation. Indirect impacts would not be anticipated to soils in terms of loss of topsoil, compaction, or erosion; however, indirect impacts to soil resources could include colonization of noxious weeds on disturbed soils, which could occur anywhere that soil would be disturbed. Weeds could outcompete native species due to their ability to thrive under conditions with low soil moisture content, poor nutrient availability, and coarse soil textures. Applicant proposed measures (see Section 4.3 below) would be used to prevent the spread of weeds. Further, applicant proposed measures intended to reduce impacts to soils would prevent indirect impacts; any impacts to soils would be within the ROW and during construction; indirect impacts to soils elsewhere and at a future time would not occur. The soil surface would be disturbed and sometimes compacted by heavy equipment traffic in the ROW and on access roads, during construction at the new Gateway Substation, and side casting of transmission structure foundation spoil material. When soils are disturbed, they would be more susceptible to wind and water erosion. Clearing vegetation in the ROW and during access road construction (where necessary) would decrease vegetation cover and increase the potential for erosion.

Long-term impacts to soils within the impact analysis area would be caused by the placement of transmission line structures (e.g., pole foundations), foundations and other permanent structures at the Gateway Substation, and upgraded or new access roads used during operation and maintenance. Soil would be permanently displaced for structure foundations, generally ranging from 7 to 11 feet in diameter per structure, resulting in displacement of 0.06 to 0.07 total surface acres of soil by alternative (approximately nine structures per mile for approximately 5 miles).

The excavated soil would be sidecast (placed beside the excavation area) around the new pole foundations in a manner that would not change the existing topography and drainage (e.g., graded to match the existing topography). Increased soil compaction would occur as a result of heavy construction equipment needed to install the transmission line structures and build the Gateway Substation. Soils in the ROW and along new access roads would also be affected by grading for access and overland travel within the ROW. As noted in Section 2.4.1.2, the Gateway Substation site has already been graded. If additional grading would be required for foundations, additional long-term disturbance impacts would result.

Where possible, the temporary and permanent impacts to soils are quantified by alternative in the following sections. In regard to Access Type C, the existing dirt roads are approximately 10 feet wide and would be graded and widened to approximately 12 to 16 feet wide; the estimated disturbance was calculated to include the entire roadbed.

ALTERNATIVE 1

Of the 11 soil types in the analysis area for the affected environment, six are located within the impact analysis area for Alternative 1. Table 4.2-1 lists these six soil types and the amount of potential disturbance.

Table 4.2-1. Disturbance to Soils – Alternative 1 (in acres)

Soil Type	ROW*	Gateway Substation	Access Type C-Upgraded Existing Dirt Roads†, ‡	Access Type D-New Dirt Roads†	Access Type E-Spur Roads†	Total Disturbance
Caralampi gravelly sandy loam, 10 to 40 percent slopes	17.96	0.00	0.89	0.63	0.10	**19.58**
Caralampi gravelly sandy loam, 10 to 60 percent slopes, eroded	39.14	0.00	3.06	1.91	0.27	**44.38**
Comoro soils, 0 to 5 percent slopes	8.3	0.00	0.17	0.20	0.07	**8.74**
Grabe soils	22.08	0.00	0.36	1.65	0.07	**24.16**
Grabe-Comoro complex, 0 to 5 percent slopes	5.32	0.00	0.37	0.00	0.02	**5.71**
White House-Caralampi complex, 10 to 35 percent slopes	22.73	10.73	1.39	0.00	0.18	**35.03**
Total**	**115.53**	**10.73**	**6.24**	**4.39**	**0.71**	**137.60**

* As noted in Section 4.1.2, 100% disturbance of the ROW is calculated.

** Components may not sum to total due to rounding.

† Acres of permanent access roads (Types C, D, and E) outside the ROW.

‡ Type C access road is estimated disturbance of the entire existing road surface and upgrade-associated disturbance.

Of these six soil types, only the Grabe and Grabe-Comoro are considered to be prime farmland if irrigated; the maximum disturbance to these soils would be the ROW and access road construction disturbance, which totals 29.87 acres. No other prime farmland soils are located within the impact analysis area for Alternative 1. Although there are soils that would support prime farmland if irrigated, Alternative 1 would be located in an area that is already disturbed by development and is not available, or zoned, for agriculture. Comoro, Grabe and Grabe-Comoro generally occur in the floodplains of Mariposa Wash and Nogales Wash (see Figure 3.2-1). The Caralampi gravelly sandy loam soils and White House-Caralampi complex types would experience the greatest disturbance (approximately 60 and 35 acres, respectively); neither is prime farmland if irrigated.

Under Alternative 1, long-term direct effects could potentially impact up to 115.53 acres of six different types of soils since the Applicant may use the entire ROW for access and operation and maintenance activities. Operation and maintenance activities required for vegetation management could be located anywhere within the 115.53 acres of the ROW. As stated in TEP's Transmission Vegetation Management Program, to maintain the minimum "clearance" of vegetation in proximity to facilities, operation and maintenance objectives for managing vegetation would include keeping the transmission facilities clear of all incompatible trees, brush, and other vegetation that could grow too close to conductors.

Long-term direct effects would occur on 25.49 surface acres of soil resources as a result of construction of the Gateway Substation, upgraded and new access roads within and outside of the ROW, and the estimated structure foundation footprint.

ALTERNATIVE 2

Of the 11 soil types in the analysis area for the affected environment, five are located within the impact analysis area for Alternative 2. Table 4.2-2 lists these five soil types and the amount of potential disturbance.

Table 4.2-2. Disturbance to Soils – Alternative 2 (in acres)

Soil Type	ROW*	Gateway Substation	Access Type C-Upgraded Existing Dirt Roads†, ‡	Access Type D-New Dirt Roads†	Access Type E-Spur Roads†	Total Disturbance
Caralampi gravelly sandy loam, 10 to 40 percent slopes	16.22	0.00	0.91	0.63	0.03	**17.79**
Caralampi gravelly sandy loam, 10 to 60 percent slopes, eroded	25.90	0.00	0.64	0.97	0.23	**27.74**
Comoro soils, 0 to 5 percent slopes	9.83	0.00	0.12	0.61	0.03	**10.59**
Grabe soils	26.52	0.00	0.46	1.65	0.15	**28.78**
White House-Caralampi complex, 10 to 35 percent slopes	23.27	10.73	0.96	0.00	0.11	**35.07**
Total**	**101.74**	**10.73**	**3.09**	**3.86**	**0.55**	**119.97**

* As noted in Section 4.1.2, 100% disturbance of the ROW is calculated.

** Components may not sum to total due to rounding.

† Acres of permanent access roads (Types C, D, and E) outside the ROW.

‡ Type C access road is estimated disturbance of the entire existing road surface and upgrade-associated disturbance.

Of these five impacted soil types, only the Grabe and Comoro soils are considered to be prime farmland if irrigated; the maximum disturbance to these soils would be the short-term ROW and access road construction disturbance which totals 36.67 acres. No other prime farmland soils are located within the impact analysis area for Alternative 2. Although there are soils that would support prime farmland if irrigated, Alternative 2 would be located in an area that is already disturbed by development and is not available, or zoned, for agricultural development. Comoro and Grabe generally occur in the floodplains of Mariposa Wash and Nogales Wash (see Figure 3.2-1). Alternative 2 would have the greatest impact to Grabe and White House-Caralampi soils, at approximately 29 and 35 acres, respectively.

Under Alternative 2, long-term direct effects could potentially impact up to 101.74 acres of five different types of soils, since the Applicant may use the entire ROW for access and operation and maintenance activities. Operation and maintenance activities required for vegetation management could be located anywhere within the 101.74 acres of the ROW. As stated in TEP's Transmission Vegetation Management Program, to maintain the minimum "clearance" of vegetation in proximity to facilities, operation and maintenance objectives for managing vegetation would include keeping the transmission facilities clear of all incompatible trees, brush, and other vegetation that could grow too close to conductors.

Long-term direct effects would occur to a total of 21.66 surface acres of soil resources as a result of the Gateway Substation, upgraded and new access roads within and outside of the ROW, and the estimated transmission line infrastructure footprint.

ALTERNATIVE 3

Of the 11 soil types in the analysis area for the affected environment, six are located within the impact analysis area for Alternative 3. Table 4.2-3 lists these five soil types and the amount of potential disturbance.

Table 4.2-3. Disturbance to Soils – Alternative 3 (in acres)

Soil Type	ROW*	Gateway Substation	Access Type C-Upgraded Existing Dirt Roads†, ‡	Access Type D-New Dirt Roads†	Access Type E-Spur Roads†	Total Disturbance
Caralampi gravelly sandy loam, 10 to 40 percent slopes	16.22	0.00	0.91	0.63	0.03	**17.79**
Caralampi gravelly sandy loam, 10 to 60 percent slopes, eroded	26.22	0.00	2.20	1.32	0.13	**29.87**
Comoro soils, 0 to 5 percent slopes	9.42	0.00	0.17	0.20	0.07	**9.86**
Grabe soils	26.14	0.00	0.36	1.65	0.07	**28.23**
Grabe-Comoro complex, 0 to 5 percent slopes	5.05	0.00	0.00	0.00	0.02	**5.25**
White House-Caralampi complex, 10 to 35 percent slopes	20.41	10.73	1.40	0.00	0. 08	**32.62**
Total**	**103.46**	**10.73**	**5.04**	**3.8**	**0.40**	**123.62**

* As noted in Section 4.1.2, 100% disturbance of the ROW is calculated.

** Components may not sum to total due to rounding.

† Acres of permanent access roads (Types C, D, and E) outside the ROW.

‡ Type C access road is estimated disturbance of the entire existing road surface and upgrade-associated disturbance.

Of these six soil types, only the Grabe, Grabe-Comoro, and Comoro soils are considered to be prime farmland if irrigated; the maximum disturbance to these soils would be the ROW and access road construction disturbance, which totals 41.32 acres. No other prime farmland soils are located within the impact analysis area for Alternative 3. Although there are soils that would support prime farmland if irrigated, Alternative 3 would be located in an area that is already disturbed by development and is not available, or zoned, for agricultural development. Comoro, Grabe, and Grabe-Comoro soils generally occur in the floodplains of Mariposa Wash and Nogales Wash (see Figure 3.2-1). Alternative 3 would have the greatest impact to Caralampi gravelly sandy loam (10 to 60 percent slopes, eroded) and White House-Caralampi soils, at approximately 30 and 33 acres, respectively.

Under Alternative 3, long-term direct effects could potentially impact up to 103.46 acres of five different types of soils, since the Applicant may use the entire ROW for access and operation and maintenance activities. Operation and maintenance activities required for vegetation management could be located anywhere within the 103.46 acres of the ROW. As stated in TEP's Transmission Vegetation Management Program, to maintain the minimum "clearance" of vegetation in proximity to facilities, operation and maintenance objectives for managing vegetation would include keeping the transmission facilities clear of all incompatible trees, brush, and other vegetation that could grow too close to conductors.

Long-term effects would occur on a total of 23.33 surface acres of soil resources as a result of the Gateway Substation, upgraded and new access roads within and outside the ROW, and the estimated transmission line infrastructure footprint.

ALTERNATIVE 4

Of the 11 soil types in the analysis area for the affected environment, five are located within the impact analysis area for Alternative 4. Table 4.2-4 lists the four soil types and the amount of potential disturbance.

Of these five impacted soil types, only the Grabe and Comoro soils are considered prime farmland if irrigated; the maximum disturbance to these soils would be the ROW and access road disturbance, which totals 35.36 acres. No other prime farmland soils are located within the impact analysis area for Alternative 4. Although there are soils that would support prime farmland if irrigated, Alternative 4 would be located in an area that is already disturbed by development and is not available, or zoned, for agricultural development. Comoro and Grabe generally occur in the floodplains of Mariposa Wash and Nogales Wash (see Figure 3.2-1). Alternative 4 would have the greatest impact to Caralampi gravelly sandy loam (10 to 60 percent slopes, eroded), Grabe, and White House-Caralampi soils, at approximately 28, 27, and 29 acres, respectively.

Under Alternative 4, long-term direct effects could potentially impact up to 95.43 acres of five different types of soils, since the Applicant may use the entire ROW for access and operation and maintenance activities. Operation and maintenance activities required for vegetation management could be located anywhere within the 95.43 acres of the ROW. As stated in TEP's Transmission Vegetation Management Program, to maintain the minimum "clearance" of vegetation in proximity to facilities, operation and maintenance objectives for managing vegetation would include keeping the transmission facilities clear of all incompatible trees, brush, and other vegetation that could grow too close to conductors.

Long-term impacts would occur on a total of 20.88 surface acres of soil resources as a result of the Gateway Substation, upgraded and new access roads within and outside the ROW, and the estimated structure foundation footprint.

Table 4.2-4. Disturbance to Soils – Alternative 4 (in acres)

Soil Type	ROW*	Gateway Substation	Access Type C-Upgraded Existing Dirt Roads†, ‡	Access Type D-New Dirt Roads†	Access Type E-Spur Roads†	Total Disturbance
Caralampi gravelly sandy loam, 10 to 40 percent slopes	16.22	0.00	0.91	0.63	0.03	**17.79**
Caralampi gravelly sandy loam, 10 to 60 percent slopes, eroded	25.89	0.00	0.64	0.97	0.23	**27.73**
Comoro soils, 0 to 5 percent slopes	9.83	0.00	0.12	0.61	0.03	**10.59**
Grabe soils	25.43	0.00	0.25	1.65	0.03	**27.36**
White House-Caralampi complex, 10 to 35 percent slopes	18.06	10.73	0.52	0.00	0.15	**29.46**
Total**	**95.43**	**10.73**	**2.44**	**3.86**	**0.47**	**112.93**

* As noted in Section 4.1.2, 100% disturbance of the ROW is calculated.

** Components may not sum to total due to rounding.

† Acres of permanent access roads (Types C, D, and E) outside the ROW.

‡ Type C access road is estimated disturbance of the entire existing road surface and upgrade-associated disturbance.

4.2.3 Applicant Proposed Measures

When the following applicant proposed measures are incorporated into the construction, operation, and maintenance of the proposed Project, impacts to geology and soils would be minimized.

- Post-construction restoration activities would include removal and disposal of debris, removal of temporary structures, and employment of appropriate erosion control measures. Areas requiring stabilization would be seeded with low-growing species, such as grasses and forbs, or otherwise stabilized against erosion, in consultation with landowners and appropriate agencies.
- Structure sites would be restored to approximate pre-construction contours prior to revegetation with native species. During final restoration, ground contours would be restored to approximate pre-construction contours. Areas disturbed by construction activities that do not have appropriate regrowth would be reseeded with native vegetation similar to what was removed, except for vegetation that might violate height restrictions.

The following plans would be developed and implemented: Access Road Plan; Erosion, Dust Control, and Air Quality Management Plan; Soil Management Plan; SWPPP.

4.3 VEGETATION

4.3.1 Impact Analysis Area and Indicators

The impact analysis area for direct impacts to vegetation is the footprint of each of the action alternatives (as described in Section 4.1.2). The analysis area for indirect impacts is the analysis area as described in Section 3.1.2 (a 1-mile buffer of the alternatives).

The following indicators were considered when analyzing impacts to vegetation:

- Disturbance to and long-term loss of natural (native species) vegetative communities or associations.
- Disturbance to and loss of wetland and/or riparian areas caused by degradation of water quality, diversion of water sources, or erosion or sedimentation from altered drainage patterns.
- Introduction or increased spread of noxious weeds and other invasive exotic weed species into the proposed Project footprint and adjacent areas.

4.3.2 Impact Analysis

4.3.2.1 No Action Alternative

Under the No Action Alternative, DOE would not issue a Presidential permit for the proposed Project, the transmission system would not be authorized to cross the U.S.-Mexico border, the proposed Project would not be constructed in the U.S., and the potential environmental impacts associated with the proposed Project as discussed below would not occur.

4.3.2.2 Action Alternatives

COMMON IMPACTS ACROSS ALL ALTERNATIVES

Many of the impacts to vegetation are common to all of the action alternatives. Calculations assume that the full ROW would potentially be used and disturbed during construction. Following is a discussion of those impacts. Discernible differences are then discussed by alternative.

General Vegetation

In terms of vegetation within the impact analysis area, construction of the proposed Project would result in direct impacts to vegetation in the ROW, at the Gateway Substation, and access roads that would require ground disturbance (Access Type C, D, and E). There would be short- to long-term loss of vegetation where construction equipment and activities would trample plants and in areas where soil disturbance would occur.

Impacts on the desert vegetative communities would be long-term due to the time required to reestablish the vegetative characteristic of these community types. The arid environment is not conducive to plant growth, and regeneration of vegetation following construction would be relatively slow. The succession of desert species appears to generally progress from short- to long-lived species. Some long-lived species, such as honey mesquite and creosotebush, may require hundreds to thousands of years to recolonize a disturbed area (Abella 2010). Over time, these areas would naturally revegetate, or be seeded with low-growing vegetation that is similar to what was removed.

Long-term impacts to vegetation within the impact analysis area would be caused by the placement of transmission line structures (e.g., pole foundations) and permanent access roads. The long-term loss of vegetation would occur along the permanent access road, spur roads, foundations in the Gateway Substation, and transmission line structures. The Gateway Substation site has already been graded and contains no vegetation.

New access roads could contribute to habitat fragmentation and potentially lead to the creation of illegal trails and paths by off-road vehicles. Habitat fragmentation creates smaller sections of land that result in

"edge effects," which can create opportunities for introduced, invasive, or opportunistic species to replace other naturally occurring species in an ecosystem. Some habitat fragmentation may occur in the western portions of the action alternatives, where undeveloped lands are located. The miles of new roads (Access Types D and E) would vary by alternative and are discussed by alternative below.

Where feasible, existing access roads were used to reduce the potential impacts to vegetation (refer to Section 2.4.1.3). Road and trail formation disturbs and compacts soils resulting in increased wind and water erosion, tramples and removes vegetation, and may introduce and/or spread noxious and/or invasive species (BLM 2008; Jordan 2000). Furthermore, the area of impact could potentially expand if unauthorized traffic from illegal activities ventures out from the new access roads into adjacent areas, creating a system of trails.

Threatened, Endangered, and Special Status Species

The impact analysis area contains potential habitat for one federally listed plant species (Pima pineapple cactus) and three state-listed special status plant species (large-flowered blue star, Santa Cruz beehive cactus [also listed as a USFWS species of concern], and supine bean). As described in Section 3.3.2, initial biological surveys found Santa Cruz beehive cacti and supine bean within the direct impact analysis area. Additionally, agaves and other native plants, such as mesquite, cholla, and various genera of cacti, were observed. The ADA Native Plant Law protects many of Arizona's native plants from indiscriminant removal and destruction (ADA 2015). All of Arizona's native cacti, agaves, and many other desert native plants, are protected by the Native Plant Law and require notification to the ADA and permits for their removal or destruction. Depending upon the location of ground or vegetation-disturbing construction activity, protected native plants may require removal and relocation. Therefore, impacts are not likely to result in a trend toward federal listing or loss of population viability.

Although no individual Pima pineapple cacti were recorded during initial biological surveys, indirect impacts could occur. New access roads could improve access to potential Pima pineapple cacti populations and/or into potential habitat, increasing the potential for illegal collection, or trampling/crushing from off-highway-vehicle use.

Invasive Species

Vegetation removal and ground disturbance, particularly in the western portion of the action alternative routes, may contribute to the introduction or spread of invasive species from contaminated equipment moving within the ROW. This may also occur as a result of disturbed soils providing more favorable conditions for aggressive invasive plants. Introduced, invasive, or opportunistic species, such as desert broom or invasive grasses, may become more prevalent in the less-developed parts of any of the action alternatives following construction. Additionally, vehicles using newly developed access roads during operation and maintenance could increase the potential for the spread of these species.

Where possible, the short- and long-term impacts to vegetation are quantified by alternative in the following sections.

ALTERNATIVE 1

Of the nine vegetation communities in the analysis area for the affected environment, eight are located within the impact analysis area for Alternative 1. Table 4.3-1 lists these eight vegetation communities and the amount of potential disturbance.

Table 4.3-1. Disturbance to Vegetation – Alternative 1 (in acres)

Vegetation Community	ROW*	Gateway Substation	Access Type C-Upgraded Existing Dirt Roads†, ‡	Access Type D-New Dirt Roads†	Access Type E-Spur Roads†	Total Disturbance
Madrean Encinal	17.08	0.67	1.41	0.55	0.01	**19.72**
Apacherian-Chihuahuan Mesquite Upland Scrub	14.31	3.82	1.71	0.12	0.02	**19.98**
Apacherian-Chihuahuan Piedmont Semi-Desert Grassland and Steppe	9.79	5.02	0.60	0.26	0.00	**15.67**
Chihuahuan Mixed Salt Desert Scrub	1.88	0.00	0.00	0.00	0.00	**1.88**
Chihuahuan Creosotebush, Mixed Desert and Thorn Scrub	0.00	1.21	0.00	0.00	0.00	**1.21**
North American Warm Desert Riparian Mesquite Bosque	0.06	0.00	0.24	0.19	0.00	**0.49**
North American Warm Desert Wash	0.00	0.00	0.00	0.00	0.00	**0.00**
Developed Land	61.71	0.00	1.31	0.10	0.23	**63.35**
Total**	**104.83**	**10.71**	**5.26**	**1.21**	**0.27**	**122.28**

* As noted in Section 4.1.2, 100% disturbance of the ROW is calculated

** Components may not sum to total due to rounding.

† Acres of permanent access roads (Types C, D, and E) outside the ROW.

‡ Type C access road is estimated disturbance of the entire existing road surface and upgrade-associated disturbance.

Within the ROW for Alternative 1, biological surveys recorded 29 agaves, 25 Santa Cruz beehive cacti, and one potential supine bean (HDR 2016a). Under this alternative, 58.93 acres (48%) of the proposed Project area would consist of undeveloped land with the potential to be disturbed, both short-term during construction and a smaller percentage that would be subject to long-term impacts from transmission line infrastructure (e.g., structures foundations), new access roads, and vegetation maintenance activities. As noted under Section 4.2.2.2, the 104.83 acres that comprise vegetation communities within the ROW for Alternative 1 could be subject to the long-term impacts from operation and maintenance activities, namely vegetation management.

The short-term impacts from construction of a total of 5.98 miles of access roads (3.22 miles of upgraded [Access Type C] and 2.76 miles of new [Access Types D and E]) would increase the potential for the spread of invasive species, during both construction and operation and maintenance. Implementation of the applicant proposed measures described below would reduce this potential. Long-term impacts during operation to the existing public and private roads, as well as the upgraded roads are not anticipated to be significant, as use of the road by employees would be low. Additionally, construction of new access roads could increase the potential for use of the roads by the public, and may increase the likelihood of unauthorized off-road use that could affect populations of state- or federally-listed plant species in the vicinity. However, signage would be posted to make users aware that the access roads would be closed to the public, as well as subject to trespass laws.

ALTERNATIVE 2

Of the nine vegetation communities in the analysis area for the affected environment, eight are located within the impact analysis area for Alternative 2. Table 4.3-2 lists these eight vegetation communities and the amount of potential disturbance.

Table 4.3-2. Disturbance to Vegetation – Alternative 2 (in acres)

Vegetation Community	ROW*	Gateway Substation	Access Type C-Upgraded Existing Dirt Roads†, ‡	Access Type D-New Dirt Roads†	Access Type E-Spur Roads†	Total Disturbance
Madrean Encinal	10.05	0.67	0.18	0.23	0.05	**11.18**
Apacherian-Chihuahuan Mesquite Upland Scrub	14.43	3.82	0.78	0.01	0.00	**19.04**
Apacherian-Chihuahuan Piedmont Semi-Desert Grassland and Steppe	6.11	5.02	0.08	0.07	0.00	**11.28**
Chihuahuan Mixed Salt Desert Scrub	0.84	0.00	0.00	0.00	0.00	**0.84**
Chihuahuan Creosotebush, Mixed Desert and Thorn Scrub	0.03	1.21	0.00	0.00	0.00	**1.24**
North American Warm Desert Riparian Mesquite Bosque	1.46	0.00	0.08	0.18	0.00	**1.72**
North American Warm Desert Wash	0.78	0.00	0.00	0.00	0.00	**0.78**
Developed Land	57.54	0.00	1.05	0.08	0.06	**58.73**
Total**	**91.25**	**10.71**	**2.16**	**0.57**	**0.11**	**104.80**

*As noted in Section 4.1.2, 100% disturbance of the ROW is calculated.

** Components may not sum to total due to rounding.

† Acres of permanent access roads (Types C, D, and E) outside the ROW.

‡ Type C access road is estimated disturbance of the entire existing road surface and upgrade-associated disturbance.

Within the ROW for Alternative 2, biological surveys recorded 22 agaves and 25 Santa Cruz beehive cacti (HDR 2016a). Under this alternative, 46.07 acres (44%) of the proposed Project area would consist of undeveloped land with the potential to be disturbed, both short-term during construction and a smaller percentage that would be subject to long-term impacts from transmission line infrastructure, new access roads, and vegetation maintenance activities. The 91.25 acres that comprise vegetation communities within the ROW for Alternative 2 could be subject to the long-term impacts from operation and maintenance activities, namely vegetation management.

The short-term impacts from construction of a total of 3.98 miles of access roads (1.60 miles of upgraded [Access Type C] and 2.38 miles of new [Access Types D and E]) would increase the potential for spread of invasive species, during both construction and operation and maintenance. Implementation of the applicant proposed measures described below would reduce the potential for introduction or spread of invasive species. Long-term impacts during operation to the existing public and private roads, as well as the upgraded roads, are not anticipated to be significant, as use of the road by employees would be low. Additionally, construction of new access roads could increase the potential for use of the roads by the public, and may increase the likelihood of unauthorized off-road use that could affect populations of state-

or federally-listed plant species in the vicinity. However, signage would be posted to make users aware that the access roads would be closed to the public, as well as subject to trespass laws.

ALTERNATIVE 3

Of the nine vegetation communities in the analysis area for the affected environment, eight are located within the impact analysis area for Alternative 3. Table 4.3-3 lists these eight vegetation communities and the amount of short- and long-term disturbance.

Table 4.3-3. Disturbance to Vegetation – Alternative 3 (in acres)

Vegetation Community	ROW*	Gateway Substation	Access Type C-Upgraded Existing Dirt Roads†, ‡	Access Type D-New Dirt Roads†	Access Type E-Spur Roads†	Total Disturbance
Madrean Encinal	8.47	0.67	1.16	0.55	0.00	**10.85**
Apacherian-Chihuahuan Mesquite Upland Scrub	10.50	3.82	1.06	0.04	0.00	**15.42**
Apacherian-Chihuahuan Piedmont Semi-Desert Grassland and Steppe	5.64	5.02	0.26	0.19	0.00	**11.11**
Chihuahuan Mixed Salt Desert Scrub	0.84	0.00	0.00	0.00	0.00	**0.84**
Chihuahuan Creosotebush, Mixed Desert and Thorn Scrub	0.00	1.21	0.00	0.00	0.00	**1.21**
North American Warm Desert Riparian Mesquite Bosque	0.00	0.00	0.09	0.19	0.00	**0.28**
North American Warm Desert Wash	0.00	0.00	0.00	0.00	0.00	**0.00**
Developed Land	67.29	0.00	1.62	0.08	0.10	**69.09**
Total**	**92.75**	**10.71**	**4.19**	**1.04**	**0.10**	**108.79**

* As noted in Section 4.1.2, 100% disturbance of the ROW is calculated.

** Components may not sum to total due to rounding.

† Acres of permanent access roads (Types C, D, and E) outside the ROW.

‡ Type C access road is estimated disturbance of the entire existing road surface and upgrade-associated disturbance.

Within the ROW for Alternative 3, biological surveys recorded 94 agaves[22] (SWCA 2017) and 25 Santa Cruz beehive cacti (HDR 2016a). Under this alternative, 39.70 acres (37%) of the proposed Project area would consist of undeveloped land with the potential to be disturbed, both short-term during construction and a smaller percentage that would be subject to long-term impacts from transmission line infrastructure, new access roads, and vegetation maintenance activities. The 92.75 acres that comprise vegetation communities within the ROW for Alternative 3 could be subject to the long-term impacts from operation and maintenance activities, namely vegetation management.

[22] SWCA performed surveys for agaves in support of the development of a Biological Assessment (Appendix C). These surveys included the proposed ROW and new and upgraded access roads for Alternative 3, and approximately 70% of this area was surveyed for agaves and Pima pineapple cactus using USFWS Pima pineapple survey protocol. Surveys for other alternatives were performed using a zig zag technique within only the proposed ROW and no access roads, which did not result in 100% coverage of the project area under each alternative (HDR had recorded 22 agaves within the ROW for this alternative [HDR 2016a]); therefore numbers of agaves recorded between Alternative 3 and all other action alternatives cannot be quantitatively compared.

The short-term impacts from construction of a total of 4.83 miles of access roads (2.60 miles of upgraded [Access Type C] and 2.26 miles of new [Access Types D and E]) would increase the potential for spread of invasive species, during both construction and operation and maintenance. Implementation of the applicant proposed measures described below would reduce the potential for introduction or spread of invasive species. Long-term impacts during operation to the existing public and private roads, as well as the upgraded roads, are not anticipated to be significant, as use of the road by employees would be low. Additionally, construction of new access roads could increase the potential for use of the roads by the public, and may increase the likelihood of unauthorized off-road use that could affect populations of state- or federally-listed listed plant species in the vicinity. However, signage would be posted to make users aware that the access roads would be closed to the public, as well as subject to trespass laws.

ALTERNATIVE 4

Of the nine vegetation communities in the analysis area for the affected environment, six are within the impact analysis area for Alternative 4. Table 4.3-4 lists these six vegetation communities and the amount of short- and long-term disturbance.

Table 4.3-4. Disturbance to Vegetation – Alternative 4 (in acres)

Vegetation Community	ROW*	Gateway Substation	Access Type C-Upgraded Existing Dirt Roads†, ‡	Access Type D-New Dirt Roads†	Access Type E-Spur Roads†	Total Disturbance
Madrean Encinal	9.67	0.67	0.18	0.23	0.05	**10.80**
Apacherian-Chihuahuan Mesquite Upland Scrub	9.40	3.82	0.63	0.01	0.00	**13.86**
Apacherian-Chihuahuan Piedmont Semi-Desert Grassland and Steppe	2.24	5.02	0.08	0.07	0.00	**7.41**
Chihuahuan Mixed Salt Desert Scrub	0.84	0.00	0.00	0.00	0.00	**0.84**
Chihuahuan Creosotebush, Mixed Desert and Thorn Scrub	0.00	1.21	0.00	0.00	0.00	**1.21**
North American Warm Desert Riparian Mesquite Bosque	1.46	0.00	0.08	0.19	0.00	**1.73**
North American Warm Desert Wash	0.00	0.00	0.00	0.00	0.00	**0.00**
Developed Land	61.43	0.00	0.83	0.09	0.14	**62.45**
Total**	**85.03**	**10.71**	**1.79**	**0.58**	**0.19**	**98.26**

*As noted in Section 4.1.2, 100% disturbance of the ROW is calculated.

** Components may not sum to total due to rounding.

† Acres of permanent access roads (Types C, D, and E) outside the ROW.

‡ Type C access road is estimated disturbance of the entire existing road surface and upgrade-associated disturbance.

Within the ROW for Alternative 4, biological surveys recorded 22 agaves and 25 Santa Cruz beehive cacti (HDR 2016a). Two segment variations were only partially surveyed. Under this alternative, 35.81 acres (36%) of the proposed Project area would consist of undeveloped land with the potential to be disturbed, both short-term during construction and a smaller percentage that would be subject to long-term impacts from transmission line infrastructure, new access roads, and vegetation maintenance activities. The 85.03 acres that comprise vegetation communities within the ROW for Alternative 4 could

be subject to the long-term impacts from operation and maintenance activities, namely vegetation management.

The short-term impacts from construction of a total of 3.56 miles of access roads (1.26 miles of upgraded [Access Type C] and 2.34 miles of new [Access Types D and E]) would increase the potential for spread of invasive species, during both construction and operation and maintenance. Implementation of the applicant proposed measures described below would reduce the potential for introduction or spread of invasive species. Long-term impacts during operation to the existing public and private roads, as well as the upgraded roads, are not anticipated to be significant, as use of the road by employees would be low. Additionally, construction of new access roads could increase the potential for use of the roads by the public, and may increase the likelihood of unauthorized off-road use that could affect populations of state- or federally-listed plant species in the vicinity. However, signage would be posted to make users aware that the access roads would be closed to the public, as well as subject to trespass laws.

4.3.3 Applicant Proposed Measures

When the following applicant proposed measures are incorporated into the construction, operation, and maintenance of the proposed Project, impacts to vegetation would be minimized.

- Where biological surveys have not been completed, additional survey by the Applicant, in coordination with the USFWS and using the USFWS survey protocol for the Pima pineapple cactus, would be completed prior to any construction disturbance.
- Where impacts to agaves cannot be avoided, the Applicant would be required to comply with USFWS requirements, which may include both transplanting and planting an additional agave for each transplant or replacing them at a 3:1 ratio (or other requirement, as determined by the USFWS).
- If protected native plants within the ROW would be affected, ADA notification would be provided 60 days prior to construction. Prior to vegetation removal, all viable protected native plants would be tagged for avoidance, transplanted to areas of the ROW that would not be disturbed, or removed. Local nurseries, the Cacti and Succulent Society, and/or other interested non-governmental organizations who have obtained plant tags from the ADA would remove the protected native plants.
- Every effort would be made to avoid impacts to vegetation through selective vegetation removal.
- Natural regrowth of vegetation would be allowed in areas where it would not interfere with operation and maintenance. Vegetation removal and management activities would be based on NERC Reliability Standard FAC-003-1.
- An environmental monitor would be present during all phases of construction to ensure that personnel stay within the limits of disturbance and avoid any areas identified for avoidance, as well as to respond to routine questions or address unexpected problems that may occur.
- The Applicant would conduct a Worker Environmental Awareness Program training and require all personnel to attend before entry to the project site. To demonstrate completion of training, a hardhat sticker would be issued. Personnel without a sticker would be required to leave the project site until training is completed.
- To prevent the introduction of invasive species seeds, the Applicant and its contractor would inspect all equipment at the laydown yard (in an on-site, contained setting), and the equipment would be washed prior to entering the ROW. This procedure would be described in more detail in the Noxious and Invasive Plant Species Management and Control Plan.

- To prevent invasive species seeds from leaving the impact analysis area, the Applicant and its contractor would inspect all construction equipment and remove all attached plant/vegetation and soil/mud debris prior to leaving the construction site. As above, this procedure would be described in more detail in the Noxious and Invasive Plant Species Management and Control Plan.
- Post-construction restoration activities would include removal and disposal of debris, removal of temporary structures, and employment of appropriate erosion control measures. Areas requiring stabilization would be seeded with low-growing species, such as grasses and forbs, or otherwise stabilized against erosion, in consultation with landowners and appropriate agencies.
- Structure sites would be restored to approximate pre-construction contours prior to revegetation with native species. Areas disturbed by construction activities that do not have appropriate regrowth would be reseeded with native vegetation similar to what was removed, except for vegetation that might violate height restrictions.
- Seeding would occur between November and March to ensure the greatest chance of success. Restoration would be completed within 6 months of the proposed Project being operational.
- In order to discourage unauthorized use of access roads, the Applicant would discuss including locked gates at access roads with landowners as part of the landowner agreements. Signage would be posted to make users aware that the access roads would be closed to the public, as well as subject to trespass laws.

The following plans would be developed and implemented: Access Road Plan; Noxious and Invasive Plant Species Management and Control Plan; Reclamation, Vegetation, and Monitoring Plan; Soil Management Plan.

4.4 WILDLIFE

4.4.1 Impact Analysis Area and Indicators

The impact analysis area for impacts to wildlife is the footprint of each of the action alternatives (as described in Section 4.1.2). The analysis area for indirect impacts is the analysis area, as described in Chapter 3 (a 1-mile buffer of the alternatives).

Impact indicators for wildlife consist of vegetative cover loss, habitat fragmentation, increased opportunities for predation, and disturbance. The following indicators were considered when analyzing impacts to wildlife:

- Disturbance to and loss or degradation of habitat:
  - Loss or degradation of terrestrial habitat from disturbance to vegetation during construction.
  - Degradation of aquatic and wetland habitat from increased soil erosion and/or chemical contamination.
  - Increased risk of vehicular mortality (direct and indirect) due to construction activities and vehicular travel during operation and maintenance.
  - Displacement or decrease in fitness due to noise and human activity associated with all aspects of construction, operation, and maintenance.

- Special Status Species:
  - Direct loss to any population of special status species that would jeopardize the continued existence of that population.
  - Loss to any population of wildlife or an activity that would result in a species being listed or proposed for listing as endangered or threatened.
- Wildlife Corridors:
  - Disturbance to or loss or degradation of habitat functioning as a linkage corridor, as identified by the AGFD.

4.4.2 Impact Analysis

4.4.2.1 No Action Alternative

Under the No Action Alternative, DOE would not issue a Presidential permit for the proposed Project, the transmission system would not be authorized to cross the U.S.-Mexico border, the proposed Project would not be constructed in the U.S., and the potential environmental impacts associated with the proposed Project as discussed below would not occur.

4.4.2.2 Action Alternatives

COMMON IMPACTS ACROSS ALL ALTERNATIVES

Many of the impacts to wildlife are common to all of the action alternatives. Calculations assume that the full ROW would potentially be used and disturbed during construction. Following is a discussion of those impacts. Discernible differences are then discussed by alternative.

General Wildlife

Construction activity and noise may temporarily disturb or displace animals that live in and use the habitat in the proposed Project area (see Section 4.12, Noise, for a detailed discussion of potential noise impacts). Potential short-term direct impacts to wildlife as a result of the construction of the proposed Project may include direct mortality of individual wildlife resulting from crushing by construction equipment, collapse of burrows, vehicle strikes, interference with breeding, loss of habitat, and loss of forage plants. These impacts would result from the construction of upgraded or new access roads, construction of transmission line infrastructure, and clearing of vegetation. These impacts would be greatest for less vagile[23] wildlife with small home ranges, such as reptiles or small rodents, than larger or more mobile wildlife species that could avoid the construction area and survive in adjacent habitat, avoiding direct impacts. Potential indirect impacts to wildlife include disturbances related to construction activities, including clearing, heavy equipment use, noise, and dust emissions. These impacts are expected to be short-term.

The short-term impacts from construction of upgraded and new access roads would increase the potential for spread of invasive species during both construction and operation and maintenance, which could degrade wildlife habitat within and in proximity to the proposed Project area. Implementation of the applicant proposed measures would reduce the potential for introduction or spread of invasive species.

[23] Showing an ability or tendency to change or adapt to new situations; in ecological terms, this term refers to an organism that changes its location or distribution over time.

Short-term impacts to wetland resources have the potential to affect wildlife; a desktop study of wetland resources indicated that there are approximately 1.09 acres. These waterbodies are characterized as intermittent lake/pond and are located in a light industrial area. Wetland or riparian vegetation may occur in these areas, but due to location and ephemeral hydrologic regime, it is unlikely to provide important permanent wetland habitat for wildlife species.

Long-term impacts on wildlife as a result of the proposed Project would include the reduction of cover, nesting areas, and food resources caused by habitat loss, fragmentation, human disturbance from operation and maintenance, the increased risk of direct mortality resulting from vehicle strikes along new access roads and spurs, and indirect mortality related to increased opportunities for predation via new transmission line structures. Raptor species may use transmission infrastructure as perching and nesting habitat, which may result in increased predation pressure on prey species (discussed in more detail below under Migratory Birds and Raptors). No changes in wildlife distribution are expected to occur on a regional scale as a result of the proposed Project, although small-animal species (such as small mammals and reptiles) may be excluded from areas that are cleared for support structures or access roads in the long-term.

Long-term effects on wetland resources and associated wildlife would occur on approximately 0.08 acre of potential wetland habitat, described above, as a result of new access road construction within the ROW. This area would be used as an access road for operation and maintenance activities. However, because of its location (within an industrial-zoned area) and intermittent hydrologic regime, it is unlikely to provide important permanent wetland habitat for wildlife species. Therefore, impacts are not anticipated.

Long-term impacts from access roads during operation and maintenance could include an increase in potential for direct mortality from vehicle strikes, but are not anticipated to be significant, as use of the road by employees would be low. Additionally, construction of new access roads could increase the potential for use of the roads by the public, and may increase the likelihood of unauthorized off-road use, which could affect habitat of wildlife species in the vicinity of the proposed Project area.

Additionally, there could be an increased probability of bird strikes and/or electrocutions of birds with transmission lines and structures. Habitat loss impacts would be minimal as a result of the placement of transmission structures, and would primarily occur as a result of the construction of access roads during construction and vegetation clearing during construction and maintenance activities.

Threatened, Endangered, and Special Status Species

The only federally-listed wildlife species known to occur in the impact analysis area is the lesser long-nosed bat. While this species only occurs in Arizona during a portion of the year (April–September), direct impacts from the proposed Project have the potential to affect the plants this species relies on for nectar. Agaves are distributed in patches across the landscape, particularly in the western portion of the analysis area, and the loss of significant numbers of either species may alter foraging patterns or roost selection, or reduce individual survivorship. The number of agaves that would be affected by the proposed Project, and that are likely to flower in any season, is small. Any action alternative may affect the lesser long-nosed bat; however, given the small number of agaves that would be affected by any of the action alternatives and the number of available agaves in the surrounding habitat, this effect is not likely to be adverse.

Only one state-listed special status species, the yellow-nosed cotton rat, would have the potential to occur within the impact analysis area. As habitat for this species includes grassy slopes in oak-pine woodlands, impacts to potential habitat can be estimated using impacts to the Madrean Encinal vegetation community described in Section 3.3, Vegetation. This species breeds from March through October and may produce

several litters during that time. Nests can be found in burrows or areas of dense vegetation. Direct impacts from construction activities could include crushing by construction equipment, collapse of burrows, vehicle strikes, interference with breeding, loss of habitat, and loss of forage plants. Indirect impacts would be the same as those described for general wildlife.

Long-term impacts to the yellow-nosed cotton rat include the increased potential for direct mortality from vehicle strikes, habitat loss, and loss of forage plants should invasive plant species become established. Habitat loss impacts would be minimal as a result of the placement of transmission structures and would primarily occur as a result of the construction of access roads and vegetation clearing. Due to the amount of suitable habitat that would be available adjacent to the proposed Project area, impacts from habitat loss are anticipated to not be significant.

Coronado National Forest Management Indicator Species

Implementation of the proposed Project has the potential to affect Management Indicator Species as a result of indirect impacts. As a portion of the proposed Project area for each of the action alternatives occurs adjacent to the boundary of the CNF, but would not directly impact the CNF, direct impacts to Management Indicator Species would be unlikely to occur. Indirect, short-term effects from construction activities would be similar to those described above for General Wildlife. Long-term, indirect effects would be similar to those described in the same section.

Migratory Birds and Raptors

As noted in Chapter 3, all migratory birds are protected by the Migratory Bird Treaty Act, which includes all common songbirds, waterfowl, shorebirds, hawks, owls, eagles, ravens, crows, native doves, swifts, martins, swallows, and others. The migratory bird breeding season for most birds in southern Arizona generally occurs between February through August, though some birds, such as burrowing owls, have been known to breed year-round. Therefore, breeding birds may be affected by construction activities year-round. This impact would be limited to direct impacts to birds nesting in the impact analysis area. Direct impacts from construction activities include disturbance of breeding birds, which may result in reduced breeding success, or destruction of nests and/or nesting habitat, in addition to those described for general wildlife. Indirect impacts would be similar to those described for general wildlife.

Long-term impacts to migratory birds and raptors from operation and maintenance would be similar to those described for general wildlife, described above, in addition to those described below.

Long-term, direct impacts would include increased availability of perch sites for raptors during nesting and hunting, and increase in potential nest platforms. This may lead to an imbalance in the prey base due to increased use by one or more raptor species. Additionally, some studies have confirmed that some species (grassland birds in particular) abandon habitat within 1 mile or more of tall artificial structures. Long-term impacts may also include transmission line collisions by flying birds and bird electrocutions. Habitat adjacent to the proposed Project area determines bird abundance and the species present within that portion. Mortality levels are not anticipated to result in long-term loss of population viability in any individual raptor species or lead to a trend toward listing under the ESA, because over the life of the proposed Project, mortality levels are anticipated to be low and the length of the transmission line is relatively small, compared with the availability of adjacent habitat. Electrocution would not be anticipated to be a substantial hazard, because the lines would be spaced wider than the largest local raptor's (in this case, that of a golden eagle) wingspan (APLIC 2006).

Wildlife Corridors

While the Santa Rita-Tumacacori and the Mexico-Tumacacori-Baboquivari Linkage Design wildlife corridors occur within 4 miles to the north and west of the impact analysis area, the proposed Project would not be anticipated to impact these wildlife corridors. Due to the amount of available habitat located on CNF lands directly adjacent to the proposed Project area, disturbance of habitat during construction and long-term loss of habitat from infrastructure would be unlikely to have a measurable effect on habitat quality. Additionally, due to the proximity of the proposed Project to human development, it is also unlikely that the proposed Project area functions as high-quality wildlife corridor habitat. Therefore, the proposed Project is not anticipated to impact wildlife corridors.

ALTERNATIVE 1

Under Alternative 1, 58.93 acres of potentially suitable habitat for wildlife would be disturbed during construction. Potentially suitable habitat is identified as any vegetative community, with the exception of lands classified as developed. For each of the action alternatives, see Section 4.3, Vegetation, for specific communities and acreages. Long-term direct effects would occur as a result of the long-term conversion of 19.23 acres of potential wildlife habitat, as a result of construction of the Gateway Substation, upgraded and new access roads within and outside of the ROW, and the estimated transmission line infrastructure footprint that would occur within any vegetative community, with the exception of lands classified as developed.

Surveys of the ROW recorded 29 agaves within the survey area (HDR 2016a), which provide foraging opportunities for the lesser long-nosed bat. In the proposed Project area, 19.72 acres of Madrean Encinal vegetative community, which may provide potentially suitable habitat for the yellow-nosed cotton rat, could be disturbed during construction. Long-term direct effects would occur as a result of the long-term conversion of 2.64 acres of Madrean Encinal vegetative community, as a result of construction of the Gateway Substation and upgraded and new access roads within and outside of the ROW. An estimated 45 transmission line structures (calculated by an average of nine structures per mile for 5 total miles) would be required under this alternative, which would increase the availability of perch sites for raptors in the immediate area.

ALTERNATIVE 2

Under Alternative 2, 46.07 acres of potentially suitable habitat for wildlife would be disturbed during construction. Potentially suitable habitat is identified as any vegetative community, with the exception of lands classified as developed. For each of the action alternatives, see Section 4.3, Vegetation, for specific communities and acreages. Long-term direct effects would occur as a result of the long-term conversion of 15.78 acres of potentially suitable wildlife habitat, as a result of construction of the Gateway Substation, upgraded and new access roads within and outside the ROW, and the estimated transmission line infrastructure footprint that would occur within any vegetative community, with the exception of lands classified as developed.

Initial biological surveys of the ROW recorded 22 agaves (HRD 2016a) within the survey area, which provide foraging opportunities for the lesser long-nosed bat. In the proposed Project area, 11.18 acres of Madrean Encinal vegetative community, which may provide potentially suitable habitat for the yellow-nosed cotton rat, could be disturbed during construction. Long-term direct effects would occur as a result of the long-term conversion of 1.13 acres of Madrean Encinal vegetative community, as a result of construction of the Gateway Substation and upgraded and new access roads within and outside of the ROW. An estimated 45 transmission line structures would be required under this alternative, which would increase the availability of perch sites for raptors in the immediate area.

ALTERNATIVE 3

Under Alternative 3, 39.70 acres of potentially suitable habitat for wildlife would be disturbed during construction. Potentially suitable habitat is identified as any vegetative community, with the exception of lands classified as developed. For each of the action alternatives, see Section 4.3, Vegetation, for specific communities and acreages. Long-term direct effects would occur as a result of the long-term conversion of 17.65 acres of potentially suitable wildlife habitat, as a result of construction of the Gateway Substation, upgraded and new access roads within and outside of the ROW, and the estimated transmission line infrastructure footprint that would occur within any vegetative community, with the exception of lands classified as developed.

Biological surveys of the ROW recorded 94 agaves[24] (SWCA 2017) within the survey area, which provide foraging opportunities for the lesser long-nosed bat. In the proposed Project area, 10.85 acres of Madrean Encinal vegetative community, which may provide potentially suitable habitat for the yellow-nosed cotton rat, could be disturbed during construction. Long-term direct effects would occur as a result of the long-term conversion of 2.38 acres of Madrean Encinal vegetative community, as a result of construction of the Gateway Substation and upgraded and new access roads within and outside of the ROW. An estimated 45 transmission line structures would be required under this alternative, which would increase the availability of perch sites for raptors in the immediate area.

ALTERNATIVE 4

Under Alternative 4, 35.81 acres of potentially suitable habitat for wildlife would be disturbed during construction and operation. Potentially suitable habitat is identified as any vegetative community, with the exception of lands classified as developed. For each of the action alternatives, see Section 4.3, Vegetation, for specific communities and acreages. Long-term direct effects would occur as a result of the long-term conversion of 15.63 acres of potentially suitable wildlife habitat, as a result of construction of the Gateway Substation, upgraded and new access roads within and outside of the ROW, and the estimated transmission line infrastructure footprint that would occur within any vegetative community, with the exception of lands classified as developed.

Initial biological surveys of the ROW recorded 22 agaves (HDR 2016a) within the survey area, which provide foraging opportunities for the lesser long-nosed bat. In the proposed Project area, 10.80 acres of Madrean Encinal vegetative community, which may provide potentially suitable habitat for the yellow-nosed cotton rat, could be disturbed by both construction. Long-term direct effects would occur as a result of the long-term conversion of 1.13 acres of Madrean Encinal vegetative community, as a result of construction of the Gateway Substation and upgraded and new access roads within and outside of the ROW. An estimated 45 transmission line structures would be required under this alternative, which would increase the availability of perch sites for raptors in the immediate area.

4.4.3 Applicant Proposed Measures

When the following applicant proposed measures are incorporated into the construction, operation, and maintenance of the proposed Project, impacts to wildlife would be minimized.

[24] SWCA performed surveys for agaves in support of the development of a Biological Assessment (Appendix C). These surveys included the proposed ROW and new and upgraded access roads for Alternative 3, and approximately 70% of this area was surveyed for agaves and Pima pineapple cactus using USFWS Pima pineapple survey protocol. Surveys for other alternatives were performed using a zig zag technique within only the proposed ROW and no access roads, which did not result in 100% coverage of the project area under each alternative (HDR had recorded 22 agaves within the ROW for this alternative [HDR 2016a]); therefore numbers of agaves recorded between Alternative 3 and all other action alternatives cannot be quantitatively compared.

- Selective vegetation removal would be employed, with every effort made to avoid impacts to vegetation, thereby reducing impacts to wildlife habitat.

The following plans would be developed and implemented: Aviation Protection Plan; Noxious and Invasive Plant Species Management and Control Plan; Reclamation, Vegetation, and Monitoring Plan.

4.5 WATER RESOURCES AND QUALITY

4.5.1 Impact Analysis Area and Indicators

The impact analysis area for direct impacts to water resources and quality is the footprint of each of the action alternatives (as described in Section 4.1.2), and the Nogales Wash watershed (12th level HUC 150503010309) is the impact analysis area for indirect impacts.

Impact indicators for water resources and quality include the potential for change in water quantity or quality. The following indicators were considered when analyzing impacts to water resources and quality:

- Surface Water:
  - Qualitative assessment of the effects on any perennial or flowing waters, including discharge of stormwater.
  - Qualitative assessment of the effects on any intermittent or ephemeral waters, including the discharge of stormwater.
- Wetland Resources:
  - Number, acreage, and type of wetlands or special aquatic sites for which disturbance would be unavoidable.
- Floodplains:
  - Acreage of disturbance within floodplains.
  - Presence of any permanent physical structures within floodplains.
- Groundwater:
  - Disturbance to wells that occur within the ROW (considering number and type of wells).
- Water Quality:
  - Number and type of water bodies that occur within the ROW with special management designation and restrictions.
  - Qualitative assessment of the effects on any specially designated waters, including impaired waters.
  - Qualitative assessment of the potential for accidental or intentional release of contaminants to surface waters and groundwater.

4.5.2 Impact Analysis

4.5.2.1 No Action Alternative

Under the No Action Alternative, DOE would not issue a Presidential permit for the proposed Project, the transmission system would not be authorized to cross the U.S.-Mexico border, the proposed Project

would not be constructed in the U.S., and the potential environmental impacts associated with the proposed Project as discussed below would not occur.

4.5.2.2 Action Alternatives

Many of the impacts to water resources and quality are common to all of the action alternatives. Following is a discussion of those impacts. Discernible differences are then discussed by alternative.

SURFACE WATER

Streams/Washes

As described in Chapter 3, although Mariposa Wash, a narrow, deeply incised wash, is classified as perennial in the NHD data (USGS 2017), the wash did not contain water at the time of the May 2017 field visits. Nogales Wash is also classified as intermittent (in addition to perennial), and most of the reach of this wash in the analysis area is intermittent.

The proposed Project area would cross numerous ephemeral washes, many very small, and all action alternatives would cross Mariposa Wash. Potential impacts to surface waterbodies would result from increased erosion and subsequent sedimentation due to construction activities within the proposed Project area. Access roads associated with the proposed Project would traverse numerous ephemeral streams.

Soil disturbance (as described in Section 4.2, Geology and Soils) during construction would temporarily increase erosion potential that could affect streams and drainage features. The potential impacts to surface waterbodies would be from increased erosion and subsequent siltation due to construction activities. Appropriate applicant proposed measures would be used to reduce impacts to surface water.
The proposed Project would span surface water features and avoid placing structures adjacent to surface waterbodies, where feasible. Construction activities would not be anticipated to result in a change in surface water quantity.

Potential effects related to ephemeral stream crossings of the access roads during operation and maintenance include increased sedimentation, changes in stream morphology including substrate composition, and changes in the ability of the stream to support vegetation and wildlife. Because the majority of drainages within the ROW are ephemeral, with the exception of Mariposa Wash and Nogales Wash, and the access road use would be as needed according to operation and maintenance needs (e.g., emergency repairs or annual vegetation management), roads would generally not need culverts or bridges where they would cross streams. Therefore, stream crossings would not interfere with material transport (wood, fine organic matter, sediment) in ephemeral streams. Should the access roads need to cross the NHD-classified perennial Mariposa Wash (though field visits indicate it is in fact intermittent) and a culvert would be required, material transport may be affected. Operation and maintenance would not be anticipated to result in a change in surface water quantity.

Wetlands

No wetlands as identified by the USFWS National Wetlands Inventory occur within the impact analysis area for direct effects. Portions of two intermittent ponds, identified by USGS NHD waterbody data (USGS 2017), occur within the impact analysis area. The impacts could include direct disturbance of banks, sedimentation from erosion caused by ground disturbance during construction, and an increased risk of the potential for pollutants from construction machinery to enter the water bodies. Applicant proposed measures would reduce the risk of introduction of pollutants, and erosion control measures

would be followed. These impacts would be short-term, and due to the intermittent nature of the hydrologic regime, the potential for direct and indirect impacts would be reduced.

Long-term effects on wetland resources would occur to approximately 0.08 acre of potential wetland habitat, described above, as a result of new access road construction within the ROW across all alternatives. Applicant proposed measures would reduce the risk of introduction of pollutants, and erosion control measures would be implemented. This area would be used as an access road for operation and maintenance activities but due to the intermittent hydrologic regime, the potential for direct and indirect impacts would be reduced.

Short-term impacts to wetland resources would occur to approximately 1.09 acres of habitat characterized as intermittent lake/pond, located in the light industrial-zoned portion of the ROW across all alternatives. Wetland or riparian vegetation could occur in these areas, but due to location and intermittent hydrologic regime, it is unlikely to provide permanent habitat for native wetland plant species. Long-term effects on wetland resources would occur to approximately 0.08 acre of potential wetland habitat, described above, as a result of new access road construction within the ROW. This area would be used as an access road for operation and maintenance activities but due to location (within a light industrial-zoned area) and intermittent hydrologic regime, it is unlikely to provide habitat for native wetland plant species, and therefore significant long-term impacts are not anticipated.

Floodplains

Flood zones are areas that FEMA has defined according to varying levels of flood risk. Encroachment on flood zones can reduce the normal overflow storage and conveyance area, resulting in backing up floodwaters that can affect adjacent areas by displacing floodwaters into areas not typically subject to flooding. EO 11988, Floodplain Management, directs federal agencies, and the activities undertaken or authorized by them, to reduce the risk of flood loss and minimize flood impacts on human safety, health, and welfare.

FEMA floodplain maps indicate that there are flood zones associated with the Mariposa and Nogales Washes in the proposed Project area for all alternatives. Portions of both drainages are considered high-risk areas (‘Floodway’ and Zone “AE”), which are defined as areas with a 1% annual chance of flooding. Moderate- to low-risk areas (Zones “AE,” “O,” and “X”) are also present for Mariposa Wash. Base flood elevations are available for Mariposa Wash. Both 100- and 500-year flooding limits for Mariposa Wash overlap the alternatives.

In addition to the mapped floodplains, unmapped floodplains associated with smaller ephemeral and intermittent streams may exist in the proposed Project area. These unmapped floodplains are generally small and are immediately adjacent to streams. Inundation of these floodplains is typically associated with large rainstorms; because each stream’s drainage basin is small, rainstorms that cause flooding are localized to the immediate area around the streams. Flooding adjacent to these streams would likely be of short duration because of the high permeability of the streambed material (see Section 4.2).

Impacts or encroachment on moderate- to low-risk areas associated with Mariposa Wash are unavoidable given the extent of flood-prone areas. Short-term, erosion potential would increase during construction activities, which could affect regulated floodplains.

The proposed Project would comply with the requirements and procedures for development within mapped flood-prone areas of Santa Cruz County and the City of Nogales. These applicant proposed measures also ensure that the existing hydrologic connectivity would be maintained within all drainage features crossed, i.e., streams, washes, rivers, canyons, etc. Also, federal, state, and local government

would continue to have access to flood-prone areas in order to complete inspections, maintenance, flood fighting, major repairs, and data gathering.

The proposed Project is not anticipated to adversely affect natural and beneficial floodplain values or pose any significant risk. Regulated floodways would be avoided by siting structures outside high-risk areas and by spanning the transmission line over washes to the extent practicable. The ephemeral tributaries are also narrow, linear features that would be avoided. Impacts to floodplains from operations or maintenance are not anticipated, as the footprint of permanent infrastructure would be smaller than the area of construction impacts, and applicant proposed measures would avoid siting structures within high-risk areas.

The existing Valencia Substation is located on approximately 4 acres of floodplains classified as Zone AE and approximately 1 acre classified as Zone X. However, this site is already developed and in use, and the modifications associated with the proposed Project would not create new impacts.

In accordance with DOE regulations contained at 10 CFR 1022, Compliance with Floodplain and Wetlands Environmental Review Requirements, this EA includes a floodplain assessment and statement of findings that analyzes the potential floodplain impacts associated with the proposed Project. See the "Floodplain Statement of Findings" below.

Groundwater

As noted in Section 3.5.2, the proposed Project occurs entirely within the Upper Santa Cruz and Avra Basin Sole Source Aquifer. One private non-domestic well occurs within the impact analysis area for Alternative 4, and other wells in the analysis area for indirect impacts are described in Section 3.5.2. Impacts to the aquifer from construction activities would not be not anticipated, as the well within the ROW and other wells in proximity to the proposed Project range from 360 to 600 feet deep, and any surface disturbance would not occur at those depths.

With respect to groundwater quantity and impacts to local well users, the amount of water needed for construction (i.e., dust control, concrete mixing) is relatively small compared with the municipal use within the analysis area. Water used during construction would be identified by the construction contractor and would likely be an approved city source. However, if groundwater from wells would be used, impacts to groundwater quantity due to withdrawal of construction water would be considered minimal. Damage to any water infrastructure, such as wells, from the proposed Project would not be expected to occur.

Impacts to the aquifer from operations and maintenance of the proposed Project are not anticipated, as the upgraded and new access roads would be dirt roads, which would not create impermeable surfaces in the proposed Project area (compaction of the soil in the access road bed would render the surface slightly less permeable than existing conditions, but for purposes of groundwater recharge, would be a negligible change), and therefore would not impair aquifer recharge. Additionally, the proposed Project transmission line infrastructure would create a total of 0.06 to 0.07 acre (depending on alternative) of additional impermeable surface at the structure foundations (not including the Gateway Substation), which would not increase the amount of impermeable surface area in the proposed Project area to the degree that it would impact water infiltration into the aquifer.

Water Quality

There is potential for increase in sediment from ground disturbance and introduction of pollutants into surface waters from spills during construction activities in the proposed Project area, which would result in direct and indirect impacts to water quality. Impacts could result from increased erosion caused by soil

disturbance (such as grading of access roads, etc.) or vegetation removal, and from inadvertent spills of hazardous materials onto soils, which could be transferred into waterways during precipitation events. Direct impacts would result from construction activities that would occur within or in close proximity to waterways, and indirect impacts would result from construction activities that would occur away from waterways but potentially cause pollutants to be transported into waterways via stormwater. Currently, Nogales Wash is the only 303d-listed impaired waterbody downstream of the impact analysis area; it is monitored for ammonia, chlorine, dissolved copper, and Escherichia coli. An increase in the sediment load or pollutants into waterways, due to construction activities, would have the potential to impair other ephemeral streams within and downstream of the direct impact analysis area.

Applicant proposed measures for the proposed Project would ensure that disturbed ground is stabilized and erosion from disturbed areas is controlled, thereby preventing sediment from entering surface waters. These applicant proposed measures ensure that streams would be avoided to the extent possible, which would reduce the potential for direct impacts, though indirect impacts resulting from the movement of sediment or pollutants into waterways during precipitation events would still potentially occur. In order to comply with AZPDES 2013 Construction General Permit, a SWPPP would need to be prepared, which would identify BMPs for temporary and/or permanent erosion control measures. When implemented properly, as required under Section 402 of the Clean Water Act, these activities minimize the risk for erosion and movement of sediment in stormwater, which would reduce indirect impacts to water quality.

Applicant proposed measures describe how potentially hazardous materials or wastes would be handled to reduce the risk of contamination. Additionally, standard spill-prevention measures would be implemented while construction occurs, and spill clean-up equipment would be available on-site during construction, as identified in the SWPPP. If implemented properly, these applicant proposed measures and activities would minimize the risk of pollutants being introduced into waterways, both directly during construction and by stormwater, thereby reducing direct and indirect impacts to water quality.

As individual features, none of the ephemeral waterways contributes more than a small, incremental volume of water to Nogales Wash during large rainfalls. Mariposa Wash, classified as a perennial stream (but, as described previously, Mariposa Wash appears to be intermittent within the proposed ROW area), contributes a greater volume of water to Nogales Wash than the ephemeral waterways. With the implementation of applicant proposed measures, impacts to Mariposa Wash would be reduced and would not contribute to a change in water quality. As such, and with the implementation of applicant proposed and permit measures, the water quality of Nogales Wash would not be expected to change as a result of the proposed Project.

Potential effects related to stream crossings of the permanent access roads during operation and maintenance include increased sedimentation, changes in stream morphology, including substrate composition, and changes in the ability of the stream to support vegetation and wildlife. The upgraded and new access roads could increase the potential for pollutants (primarily from motorized vehicles) to reach surface waters, when water flow occurs at stream crossings in locations where road drainage flows directly into a stream. However, as the majority of the stream network is ephemeral and expected vehicle use for operation and maintenance would be expected to be infrequent, the potential for pollutants to enter surface waters is anticipated to be negligible.

The Gateway Substation would be designed and constructed to minimize the risk and impacts of oil spills during operation and maintenance, and minimal oil storage would occur on-site. Spill containment protocol would be followed, and additional measures, such as installing a leak containment pit under the transformer, would be taken where the oil-immersed transformer would be located. In the event of an oil leak or rupture, the oil captured in the containment pit would be pumped into tanks or barrels and transported to a disposal facility. Grading would be performed to direct flow of water runoff and/or

minimize runoff of stormwater. The yard would be covered with a layer of gravel to reduce stormwater erosion, and stormwater measures like retention or detention ponds and/or perimeter ditches, would be designed and constructed to control runoff, where necessary. Implementation of these applicant proposed measures would reduce the potential for risk of impact to water quality during operation and maintenance.

Where possible, the short-term and long-term impacts to water quality are quantified by alternative in the following sections.

ALTERNATIVE 1

Tables 4.5-1 and 4.5-2 list streams, washes, and floodplains in the impact analysis area, as well as the amount of disturbance. Table 4.5-1 describes linear feet of streams/washes that occur within the proposed Project area, while Table 4.5-2 describes the areas of floodplain classes that could be disturbed within the proposed Project area. Under Alternative 1, the proposed Project ROW crosses Mariposa Wash eight times and 20 ephemeral streams/washes 25 times. No wells occur in the ROW for Alternative 1.

As shown in Table 4.5-1, Alternative 1 would potentially disturb up to 1.8 miles of streams/washes. The majority of this potential disturbance would involve ephemeral washes (1.1 miles). As described in Chapter 2, since the entire ROW could potentially be used to support operation and maintenance activities such as vegetation management, long-term impacts to up to 1.6 miles (8,557 linear feet) could occur; however, operation and maintenance activities would likely not require the entire ROW.

Table 4.5-1. Disturbance to Streams/Washes – Alternative 1 (in linear feet)

Stream Type	ROW*	Gateway Substation	Access Type C-Upgraded Existing Dirt Roads†, ‡	Access Type D-New Dirt Roads†	Access Type E-Spur Roads†	Total Disturbance (miles)
Perennial (Mariposa Wash)	3,347	0	23	0	0	**3,370 (0.6)**
Ephemeral	4,916	501	240	157	0	**5,814 (1.1)**
Artificial path§	294	0	0	0	0	**294 (0.06)**
Total**	**8,557**	**501**	**263**	**157**	**0**	**9,478 (1.8)**

Source: USGS (2017).

*As noted in Section 4.1.2, 100% disturbance of the ROW is calculated.

** Components may not sum to total due to rounding.

† Permanent access roads (Access Types C, D, and E) outside the ROW.

‡ Type C access road is estimated disturbance of the entire existing road surface and upgrade-associated disturbance.

§ Artificial path is a data type used in NHD data to complete the stream network where there is no obvious channel.

As shown in Table 4.5-2, Alternative 1 would potentially disturb up to 122.28 acres of floodplains. The majority of this potential disturbance would involve Zone "X" (59.61 acres). As described in Chapter 2, since the entire ROW could potentially be used to support operation and maintenance activities such as vegetation management, long-term impacts to up to 115.55 acres of floodplains could occur; however, operation and maintenance activities would likely not require the entire ROW.

Table 4.5-2. Disturbance to Floodplains – Alternative 1 (in acres)

Floodplain Class	ROW*	Gateway Substation	Access Type C-Upgraded Existing Dirt Roads†, ‡	Access Type D-New Dirt Roads†	Access Type E-Spur Roads†	Total Disturbance
A	4.9	0.00	0.53	0.07	0.01	**31.86**
AE	17.2	0.00	0.09	0.13	0.008	**30.81**
X	93.43	10.61	4.64	1.01	0.25	**59.61**
Total**	**115.55**	**10.61**	**5.26**	**1.21**	**0.26**	**122.28**

Source: FEMA (2016).

Floodplain Class definitions:
A: An area inundated by 1% annual chance flooding, for which no Base Flood Elevations have been determined. In the Nogales area, A is also considered a Special Flood Hazard Area.

AE: Areas subject to inundation by the 1%-annual-chance flood event.

X: Areas determined to be outside 500-year floodplain determined to be outside the 1% and 0.2% annual chance floodplains.

* As noted in Section 4.1.2, 100% disturbance of the ROW is calculated.

** Components may not sum to total due to rounding.

† Acres of permanent access roads (Types C, D, and E) outside the ROW.

‡ Type C access road is estimated disturbance of the entire existing road surface and upgrade-associated disturbance.

ALTERNATIVE 2

Tables 4.5-3 and 4.5-4 list streams, washes, and floodplains in the impact analysis area, as well as the amount of disturbance. Table 4.5-3 describes linear feet of streams/washes that occur within the proposed Project area, while Table 4.5-4 describes the areas of floodplain classes that could be disturbed within the proposed Project area. Under Alternative 2, the proposed Project ROW crosses Mariposa Wash six times and 15 ephemeral streams/washes 18 times. No wells occur in the ROW for Alternative 2.

As shown in Table 4.5-3, Alternative 2 would potentially disturb up to 1.5 miles of streams/washes. The majority of this potential disturbance would involve ephemeral washes (1 mile). As described in Chapter 2, since the entire ROW could potentially be used to support operation and maintenance activities such as vegetation management, long-term impacts to up to 1.4 miles (7,406 linear feet) could occur; however, operation and maintenance activities would likely not require the entire ROW.

Table 4.5-3. Disturbance to Streams/Washes – Alternative 2 (in linear feet)

Stream Type	ROW*	Gateway Substation	Access Type C-Upgraded Existing Dirt Roads†, ‡	Access Type D-New Dirt Roads†	Access Type E-Spur Roads†	Total Disturbance (miles)
Perennial (Mariposa Wash)	2,053	0	0	0	0	**2,053 (0.4)**
Ephemeral	5,059	501	112	247	0	**5,919 (1)**
Artificial path§	294	0	0	0	0	**294 (0.06)**
Total**	**7,406**	**501**	**112**	**247**	**0**	**8,266 (1.5)**

Source: USGS (2017).

* As noted in Section 4.1.2, 100% disturbance of the ROW is calculated.

** Components may not sum to total due to rounding.

† Permanent access roads (Access Types C, D, and E) outside the ROW.

‡ Type C access road is estimated disturbance of the entire existing road surface and upgrade-associated disturbance.

§ Artificial path is a data type used in NHD data to complete the stream network where there is no obvious channel.

As shown in Table 4.5-4, Alternative 2 would potentially disturb up to 115.18 acres of floodplains. The majority of this potential disturbance would involve Zone "X" (98.22 acres). As described in Chapter

2, since the entire ROW could potentially be used to support operation and maintenance activities such as vegetation management, long-term impacts to up to 101.73 acres of floodplains could occur; however, operation and maintenance activities would likely not require the entire ROW.

Table 4.5-4. Disturbance to Floodplains – Alternative 2 (in acres)

Floodplain Class	ROW*	Gateway Substation	Access Type C-Upgraded Existing Dirt Roads†, ‡	Access Type D-New Dirt Roads†	Access Type E-Spur Roads†	Total Disturbance
A	0.00	0.00	0.00	00.00	0.00	**0.00**
AE	16.82	0.00	0.08	0.06	0.00	**16.96**
X	84.91	10.61	2.08	0.51	0.11	**98.22**
Total**	**101.73**	**10.61**	**2.16**	**0.57**	**0.11**	**115.18**

Source: FEMA (2016).

Floodplain Class definitions:
A: An area inundated by 1% annual chance flooding, for which no Base Flood Elevations (BFEs) have been determined.

AE: Areas subject to inundation by the 1%-annual-chance flood event.

X: Areas determined to be outside 500-year floodplain determined to be outside the 1% and 0.2% annual chance floodplains.

* As noted in Section 4.1.2, 100% disturbance of the ROW is calculated.

** Components may not sum to total due to rounding.

† Acres of permanent access roads (Types C, D, and E) outside the ROW.

‡ Type C access road is estimated disturbance of the entire existing road surface and upgrade-associated disturbance.

ALTERNATIVE 3

Tables 4.5-5 and 4.5-6 list streams, washes, and floodplains in the impact analysis area, as well as the amount of disturbance. Table 4.5-5 describes linear feet of streams/washes that occur within the proposed Project area, while Table 4.5-6 describes the areas of floodplain classes that could be disturbed within the proposed Project area. Under Alternative 3, the proposed Project ROW crosses Mariposa Wash eight times and 16 ephemeral streams/washes 17 times. No wells occur in the ROW for this alternative.

As shown in Table 4.5-5, Alternative 3 would potentially disturb up to 1.7 miles of streams/washes. The majority of this potential disturbance would involve ephemeral washes (1 mile). As described in Chapter 2, since the entire ROW could potentially be used to support operation and maintenance activities such as vegetation management, long-term impacts to up to 1.5 miles (7,912 linear feet) could occur; however, operation and maintenance activities would likely not require the entire ROW.

Table 4.5-5. Disturbance to Streams/Washes – Alternative 3 (in linear feet)

Stream Type	ROW*	Gateway Substation	Access Type C-Upgraded Existing Dirt Roads†, ‡	Access Type D-New Dirt Roads†	Access Type E-Spur Roads†	Total Disturbance (miles)
Perennial (Mariposa Wash)	3,347	0	23	0	0	**3,370 (0.6)**
Ephemeral	4,271	501	161	130	0	**5,063 (1)**
Artificial path§	294	0	0	0	0	**294 (0.06)**
Total**	**7,912**	**501**	**184**	**130**	**0**	**8,727 (1.7)**

Source: USGS (2017) ftp://rockyftp.cr.usgs.gov/vdelivery/Datasets/Staged/Hydrography/NHD/State/HighResolution/GDB/

* As noted in Section 4.1.2, 100% disturbance of the ROW is calculated.

** Components may not sum to total due to rounding.

† Permanent access roads (Access Types C, D, and E) outside the ROW.

‡ Type C access road is estimated disturbance of the entire existing road surface and upgrade-associated disturbance

§ Artificial path is a data type used in NHD data to complete the stream network where there is no obvious channel.

As shown in Table 4.5-6, Alternative 3 would potentially disturb up to 116.22 acres of floodplains. The majority of this potential disturbance would involve Zone "X" (94.28 acres). As described in Chapter 2, since the entire ROW could potentially be used to support operation and maintenance activities such as vegetation management, long-term impacts to up to 100.27 acres of floodplains could occur; however, operation and maintenance activities would likely not require the entire ROW.

Table 4.5-6. Disturbance to Floodplains – Alternative 3 (in acres)

Floodplain Class	ROW*	Gateway Substation	Access Type C-Upgraded Existing Dirt Roads†, ‡	Access Type D-New Dirt Roads†	Access Type E-Spur Roads†	Total Disturbance
A	4.26	0.00	0.00	0.00	0.00	**4.26**
AE	17.42	0.00	0.19	0.06	0.01	**17.68**
X	78.59	10.61	4.01	0.98	0.09	**94.28**
Total**	**100.27**	**10.61**	**4.2**	**1.04**	**0.10**	**116.22**

Source: FEMA (2016).

Floodplain Class definitions:

A: An area inundated by 1% annual chance flooding, for which no Base Flood Elevations have been determined.

AE: Areas subject to inundation by the 1%-annual-chance flood event.

X: Areas determined to be outside 500-year floodplain determined to be outside the 1% and 0.2% annual chance floodplains.

* As noted in Section 4.1.2, 100% disturbance of the ROW is calculated.

** Components may not sum to total due to rounding.

† Acres of permanent access roads (Type C, D, and E) outside the ROW.

‡ Type C access road is estimated disturbance of the entire existing road surface and upgrade-associated disturbance.

ALTERNATIVE 4

Tables 4.5-7 and 4.5-8 list streams, washes, and floodplains in the impact analysis area, as well as the amount of disturbance. Table 4.5-7 describes linear feet of streams/washes that occur within the proposed Project area, while Table 4.5-8 describes the areas of floodplain classes that could be disturbed within the proposed Project area. Under Alternative 3, the proposed Project ROW crosses Mariposa Wash five times and 15 ephemeral streams/washes 19 times. One privately owned well occurs in the ROW for this alternative. This private, non-domestic well reaches a depth of 360 feet. ADWR well registry data indicate that the well has a 240-foot depth to water. As noted above, impacts to the aquifer from construction activities are not anticipated as the well within the ROW and other wells in proximity to the proposed Project range from 360 to 600 feet deep and any surface disturbance would not occur at those depths.

As shown in Table 4.5-7, Alternative 4 would potentially disturb up to 1.6 miles of streams/washes. The majority of this potential disturbance would involve ephemeral washes (1.1 miles). As described in Chapter 2, since the entire ROW could potentially be used to support operation and maintenance activities such as vegetation management, long-term impacts to up to 1.4 miles (7,416 linear feet) could occur; however, operation and maintenance activities would likely not require the entire ROW.

As shown in Table 4.5-8, Alternative 4 would potentially disturb up to 108.59 acres of floodplains. The majority of this potential disturbance would involve Zone "X" (91.69 acres). As described in Chapter 2, since the entire ROW could potentially be used to support operation and maintenance activities such as vegetation management, long-term impacts to up to 95.42 acres of floodplains could occur; however, operation and maintenance activities would likely not require the entire ROW.

Table 4.5-7. Disturbance to Streams/Washes – Alternative 4 (in linear feet)

Stream Type	ROW*	Gateway Substation	Access Type C-Upgraded Existing Dirt Roads†, ‡	Access Type D-New Dirt Roads†	Access Type E-Spur Roads†	Total Disturbance (miles)
Perennial (Mariposa Wash)	2,154	0	0	0	0	**2,154 (0.4)**
Ephemeral	4,968	501	55	247	0	**5,771 (1.1)**
Artificial path§	294	0	0	0	0	**294 (0.06)**
Total**	**7,416**	**501**	**55**	**247**	**0**	**8,219 (1.6)**

Source: USGS (2017).

* As noted in Section 4.1.2, 100% disturbance of the ROW is calculated.

** Components may not sum to total due to rounding.

† Acres of permanent access roads (Access Types C, D, and E) outside the ROW

‡ Type C access road is estimated disturbance of the entire existing road surface and upgrade-associated disturbance.

§ Artificial path is a data type used in NHD data to complete the stream network where there is no obvious channel.

** Components may not sum to total due to rounding.

† Acres of permanent access roads (Access Types C, D, and E) outside the ROW

‡ Type C access road is estimated disturbance of the entire existing road surface and upgrade-associated disturbance.

Table 4.5-8. Disturbance to Floodplains – Alternative 4 (in acres)

Floodplain Class	ROW*	Gateway Substation	Access Type C-Upgraded Existing Dirt Roads†, ‡	Access Type D-New Dirt Roads†	Access Type E-Spur Roads†	Total Disturbance
A	0.00	0.00	0.00	0.00	0.00	**0.00**
AE	16.83	0.00	0.00	0.06	0.01	**16.9**
X	78.59	10.61	1.80	0.51	0.18	**91.69**
Total**	**95.42**	**10.61**	**1.80**	**0.57**	**0.19**	**108.59**

Source: FEMA (2016).

Floodplain Class definitions:
A: An area inundated by 1% annual chance flooding, for which no Base Flood Elevations have been determined.

AE: Areas subject to inundation by the 1%-annual-chance flood event.

X: Areas determined to be outside 500-year floodplain determined to be outside the 1% and 0.2% annual chance floodplains.

* As noted in Section 4.1.2, 100% disturbance of the ROW is calculated.

** Components may not sum to total due to rounding.

† Acres of permanent access roads (Type C, D, and E) outside the ROW

‡ Type C access road is estimated disturbance of the entire existing road surface and upgrade-associated disturbance.

FLOODPLAIN STATEMENT OF FINDINGS

EOs 11988, Floodplain Management (May 24, 1977), and 11990, Protection of Wetlands (May 24, 1977), direct federal agencies to undertake various actions to protect floodplains and wetlands, including preparing a floodplain or wetland assessment for any action proposed in a floodplain and new construction proposed in a wetland. DOE's regulations implementing these EOs, Compliance with Floodplain and Wetland Environmental Review Requirements (10 CFR 1022), require that any floodplain or wetland assessment normally be included in an EA or environmental impact statement, if one is being prepared (10 CFR 1022.13(b)). A floodplain or wetland assessment includes a description of the proposed Project, a discussion of its potential effects on the floodplain or wetland (including a discussion of floodplain or wetland values), and consideration of alternatives (10 CFR 1022.4), discussed above in Section 4.5.2.2, Action Alternatives.

Overview of Floodplains Present

There are three perennial waterbodies (Nogales Wash, Mariposa Wash, and Potrero Creek) and multiple unnamed ephemeral streams and washes within the proposed Project impact analysis area. Potrero Creek is over 1 mile northwest of the proposed Project at its nearest point, and the topography between Potrero Creek and the proposed Project would not enable surface water flow between the two. Therefore, there would be no impacts to the floodplains of Potrero Creek.

Flow in the ephemeral washes can be substantial during rainfall events and may result in flash flooding in the washes and floodplains. The 100-year floodplains associated with the ephemeral streams are relatively small, but the mapped 100-year floodplains associated with Mariposa Wash and associated (i.e., hydrologically connected) ephemeral drainages, and areas of sheet flow can be substantial throughout the analysis area.

Impacts to Floodplains

For the proposed Project impact analysis areas, all active channels would be spanned completely with the intention of avoiding them. Construction disturbance and access roads would cross and alter three floodplains under any of the action alternatives. These roads would not be hard-surfaced, and appropriate controls on sediment and stormwater would be implemented during construction. Since active channels can be spanned, structures and roads would be located in sheet wash areas, where any potential flooding would be shallow and water velocities low. Proposed Project facilities would not impede flows, collect debris, or cause an increase in flooding area. With respect to permanent structures, the proposed Gateway Substation would be located outside mapped 100-year and 500-year floodplains.

Justification for Locating the Proposed Project in a Floodplain

Pole structures would be placed outside active channels, but it may not be possible to fully span all floodplains in the area. Where floodplains may prohibit spanning, Nogales Transmission would identify areas that would have the least impact, outside of the primary flow channels. The relatively narrow-diameter base of the vertical transmission towers would not have a significant effect in diminishing the capacity of the floodplains, and thus would not exacerbate flood conditions, alter flood patterns, or increase flood risk. This is particularly true for the types of shallow sheet flow experienced throughout the analysis area.

With sediment and erosion control applicant proposed measures in place, construction disturbance and access roads would not be expected to significantly alter runoff conditions on the floodplain, and thus would not worsen flood conditions, change flood patterns, or escalate flood risk.

Conformance with Floodplain Protection

Applicant proposed measures would be implemented to minimize potential harm to or within the floodplains. The proposed Project would conform to applicable floodplain protection standards for construction disturbance, access roads, and pole structures.

4.5.3 Applicant Proposed Measures

When the following applicant proposed measures are incorporated into the construction, operation, and maintenance of the proposed Project, impacts to water resources would be minimized.

- Impacts on perennial, intermittent, or ephemeral streams would be avoided by siting structures outside drainages and by spanning the transmission line over washes to the extent practicable.

- BMPs for stormwater management with associated control of erosion and sedimentation would be developed and implemented.
- Requirements and procedures for development within mapped flood-prone areas of Santa Cruz County and the City of Nogales would be complied with.
- Existing hydrologic connectivity with all drainage features that are crossed would be maintained.
- The on-site storage of oil and the risk and impacts of oil spills, including appropriate spill containment for oil-filled equipment, would be minimized through design.
- Gateway Substation would be graded to direct runoff flow and/or minimize runoff of stormwater and covered with a layer of gravel to reduce erosion.
- Stormwater controls at the Gateway Substation, such as retention or detention ponds and/or perimeter ditches, would be designed and constructed to control runoff where necessary.
- Existing stormwater inlets or pipes not able to be avoided would be restored to previous conditions after construction has been completed.

The following plans would be developed and implemented: Access Road Plan; Erosion, Dust Control, and Air Quality Management Plan; Hazardous Materials Management Plan; Soil Management Plan; SPCC Plan; SWPPP.

4.6 LAND USE AND RECREATION

4.6.1 Impact Analysis Area and Indicators

The direct impact analysis area for land use and recreation is the footprint of each of the action alternatives (as described in Section 4.1.2). The analysis area for indirect impacts is Santa Cruz County.

For the purposes of this analysis, an impact to land use could result if any of the following were to occur from construction or operation and maintenance of the proposed Project (these form the indicators for considering impacts to land use);

- Potential conflicts with applicable land use plans, policies, goals, or regulations (incompatible land uses).
- Potential conflicts with existing land uses, specifically where the proposed Project would create a direct long-term impact:
- Physical conflict with existing or planned residential, commercial, or industrial uses (i.e., displacement of homes or businesses).
- Indirect conflict with residential or commercial uses.
- Potential conflicts with federal or state established, designated, or reasonably foreseeable planned recreation areas.

The following indicators were considered when analyzing potential impacts to recreation:

- Loss or diminishment of developed (e.g., off-highway vehicle, hiking, camping) and undeveloped recreational values and quality in the impact analysis area.

4.6.2 Impact Analysis

4.6.2.1 No Action Alternative

Under the No Action Alternative, DOE would not issue a Presidential permit for the proposed Project, the transmission system would not be authorized to cross the U.S.-Mexico border, the proposed Project would not be constructed in the U.S., and the potential environmental impacts associated with the proposed Project as discussed below would not occur.

4.6.2.2 Action Alternatives

COMMON IMPACTS ACROSS ALL ALTERNATIVES

Many of the impacts to land use and recreation are common to all of the action alternatives. Following is a discussion of those impacts. Discernible differences are then discussed by alternative.

Land Use

General Land Use

Nogales Transmission would need to acquire easements on private lands along each alternative ROW. However, there would be no change to land status. No condemnations for the proposed Project would be anticipated. Nogales Transmission would work with all owners and managers of existing built structures. Nogales Transmission would conduct negotiations with all landowners for the purpose of acquiring legal access across private lands.

In the eastern portion of the impact analysis area (within the developed areas of the City of Nogales), the proposed Project would generally be located within an existing utility corridor where feasible. In the western and southern portions of the impact analysis area (in the less developed areas of the City of Nogales), the proposed Project would generally not be located adjacent to or parallel existing features.

During construction, all action alternatives would have short-term direct and indirect impacts on land use, which include the potential to disrupt residential, recreational, commercial, or light industrial uses in site-specific locations within the impact analysis area as a result of the delivery of construction materials and workers in the area. Where the proposed transmission line would be located within existing utility corridors, and/or within commercial and light industrial areas, the proposed Project would be compatible with current land uses. The proposed Gateway Substation site would be converted from disturbed, undeveloped land to developed land.

The effects of construction vehicles on land use are expected to be relatively minimal, because construction efforts would be dispersed, and the linear-nature of transmission line construction would not result in intense, concentrated activities, except at the Gateway Substation (those impacts are described below). The number of construction vehicles at any one location would not add noticeably to the number of vehicles typically on any given section of roadway. For further information on the effects on transportation, see Section 4.13.

Construction of the proposed new Gateway Substation would affect land use in the impact analysis area in the short-term, but the impact would not be significant, since the Gateway Substation site is already established in an area zoned for light industrial use; the site is bladed and is used by TEP for equipment storage. Construction workers and delivery trucks would access the Gateway Substation via local roads, which would cause a short-term increase in traffic in the area.

Operation, maintenance, and emergency repairs for all of the action alternatives would have no effect on land use in the proposed Project area, except for those impacts as described below, and short-term, intermittent nuisance impacts to the residential areas resulting from maintenance or repair equipment, which are typically incompatible with residential zoning. When periodic inspections of the proposed transmission line ROW would be conducted using passive methods, these methods would not affect land uses. The effects of any emergency repairs would be similar to those described for construction, albeit for a shorter duration and within a smaller footprint.

Land Use Plans, Policies, Zoning, and Ordinances

For all of the action alternatives, there would be no structures, facilities, or physical occupancy of any kind located within the Roosevelt Easement during construction, operation, maintenance, or emergency procedures. The conductors would span the existing fence at the international border, as well as the Roosevelt Easement. No USIBWC monuments would be disturbed; the nearest USIBWC monument is located over 250 feet east of the centerline for all action alternatives, well outside of the direct impact analysis area (USIBWC 2016). During operation and maintenance, as well as any emergency procedures, all structures, facilities, or physical occupancy of any kind would be located at least 60 feet north of the international border with Mexico. Construction, operation, maintenance, and emergency procedures planned adjacent to the Roosevelt Easement would be coordinated in advance with the CBP and the USIBWC.

A review of the City of Nogales' General Plan indicated that none of the action alternatives would conflict with the goals or objectives if implemented. All of the action alternatives would be compatible with its policies. The Santa Cruz County Comprehensive Plan was also reviewed to determine whether the proposed Project would conflict with its goals or objectives. All of the action alternatives would be compatible. None of the direct impact analysis area would occur within the boundaries of the CNF and would thus not conflict with the Forest Plan.

The transmission line facilities proposed adjacent to the residential area near the existing Valencia Substation (i.e., the Villa San Simone subdivision) would be constructed within an existing UNSE utility corridor. Existing zoning regulations are already in place; therefore, the proposed Project would not require any rezoning or land reclassification. Similarly, the transmission line facilities proposed adjacent to general commercial and light industrial areas would not require any rezoning or land classification changes. The transmission line facilities proposed in the currently undeveloped areas west and south of the proposed Gateway Substation would occur on lands currently zoned for light industrial use and slated for future development of the La Loma Grande Industrial Park. The location of the proposed Project within this area was planned to limit the restriction of planned future development of the parcels, at the request of the landowner/developer, by siting the western edge of the proposed ROW exactly on the boundary between private and CNF land (0 feet) (i.e., the ROW being located at the western edge of the parcels would be more preferable than bisecting the center of the parcels). The proposed Project would not result in impacts to federally or state established, designated, or reasonably foreseeable planned land uses.

In summary, construction, operation, and maintenance of the proposed Project is anticipated to be consistent with applicable land use plans and policies. The action alternatives would have minimal, long-term, direct and indirect impacts on existing land use.

Existing Residences and Businesses

Impacts generally common to residences and businesses are discussed below.

One residential area, the Villa San Simone subdivision (which is just west of the existing Valencia Substation), is located directly adjacent to the impact analysis area for a 0.1-mile portion of all of the action alternatives along Route Segment Variation 1. The proposed Project ROW would be directly adjacent to and south of these residences. The six other residential areas that are not located directly adjacent to the proposed Project area (Loma Mariposa Apartments I and II, Santa Rita Apartments, Santa Carolina Apartments, Villa Paraiso Apartments, Mariposa Manor Mobile Home Park, and private residence) are included in the general impact analysis in this section. Private landowners may experience short-term nuisance impacts in the residential area where the intermittent activities involved with construction (i.e., noise, dust, and heavy equipment) is typically incompatible with residential zoning. Private landowners and residents of existing residences could experience short-term impacts related to traffic congestion or temporary road closures due to construction activities that could result in difficulties accessing the residences. The proposed Project would not be anticipated to result in impacts to residential access with the implementation of a Traffic and Transportation Management Plan during construction. The short-term impacts would be intermittent and would cease when construction activities are completed.

Access to the northeast portion of the proposed Project near the Villa San Simone subdivision would originate within the existing Valencia Substation and follow an existing transmission line ROW to the west across North Mastick Way and along the southern portion of the subdivision, where there is an existing dirt road (which would be improved). Access to this area would also occur from the west side of West White Park Drive, where it connects to an existing dirt access road. Access would not occur through the subdivision, thereby minimizing disturbance to these existing residences.

The proposed Project would occur adjacent to a number of businesses across various portions of the impact analysis area. Businesses that are located adjacent to the to the proposed action alternatives include Walmart, China Buffet, City Salads, Safeway, OMG Logistics, JIT Services, Freig Carrillo Forwarding, Agri-Packing Supply, GUZMOR, Crescent Electric Supply Company, Sienco de Nogales, Prestolite Wire, Electronic Southwest, Vidal Export & Import, Fiesta Market, and Port Devanning Services. Existing businesses may experience short-term impacts in the areas where the intermittent activities involved with construction (i.e., noise, dust, and heavy equipment) is typically incompatible with the business type. Industrial-type businesses are anticipated to experience short-term impacts from construction to a lesser degree than commercial, service-based businesses with public frontages. Both types of businesses (commercial and industrial) may experience short-term impacts related to traffic congestion or temporary road closures due to construction activities that could result in difficulties accessing businesses, either by employees or customers. These impacts are not anticipated to result in loss of revenue or closure of businesses, as the implementation of a Transportation and Traffic Management Plan and coordination with businesses would maintain access, and impacts from noise, dust, or heavy machinery would be intermittent and cease when construction activities are completed.

The proposed Project would not be anticipated to result in effects on existing residences and businesses in the proposed Project area during operation and maintenance. Access to the existing residences and businesses would not change as a result of the proposed Project, as the proposed transmission line would be constructed around the existing built environment and would not require the demolition or relocation of existing buildings or roads. Additionally, the proposed Project would not result in a change in existing zoning or land use, as discussed above. Other effects on residences, such as noise, are discussed in the applicable sections.

Livestock Facilities

Construction of the proposed Project and associated new and upgraded access roads could result in temporary, short-term impacts to livestock facilities in the proposed Project area. These impacts could

include noise, vibration, and dust resulting from construction activities that could disturb the livestock housed in the facilities. Route Segment Variation 10 of Alternatives 1 and 3 would occur directly adjacent to the U.S. Border Patrol facilities at Nogales Station, and all alternatives would occur approximately 400 feet west of the U.S. Department of Agriculture contingency verification and inspection point.

Operation and maintenance of the proposed Project could have the potential to disturb the livestock during repair of the transmission line facilities or during vegetation management activities, though the impacts would be short-term and temporary, only occurring while maintenance is being performed. Additionally, the impacts from operation of the proposed Project could include that of EMFs, discussed in more detail in Section 3.14.2.1, Electric and Magnetic Field Safety. Several studies have been conducted on the possible effects of EMF on the health, behavior, and productivity of wild or domestic animals, including cattle (Angell et al. 1990; Burchard et al. 1996; Burchard et al. 1998; Lee et al. 1996; Reimers et al. 2000; Rodriguez et al. 2003; Rodriguez et al. 2004; Stormshak et al. 1992; Thompson et al. 1995). The research does not suggest that electric or magnetic fields result in significant adverse effects on the health, behavior, or productivity of domestic livestock such as cattle, or other mammals such as deer or elk (Amstutz and Miller 1980; Busby et al. 1974; Goodwin 1975; Mahmoud and Zimmerman 1983, 1984; Picton et al. 1985; Rogers et al. 1982; Ware 1974; Williams and Beiler 1979). The proposed Project would not be anticipated to result in long-term impacts to livestock or the facilities used to house them, as the proposed Project transmission line ROW would be located adjacent to existing facilities and transmit power at a lower voltage than those tested in cited research and determined to not result in significant effects on the health or behavior of the study animals. Access to and the facilities would not be impacted.

Recreation

For all action alternatives, there would be minimal direct loss or diminishment of existing recreational values and quality. Construction of any of the action alternatives would not be expected to permanently (i.e., long-term) preclude the use of or access to any existing recreation opportunities or activities, but some short-term impacts to these resources would occur intermittently during the construction phases. Dispersed recreation in the impact analysis area and immediately adjacent areas, such as hiking, hunting, birdwatching, camping, and nature study, would be affected in the short-term, as construction noises, visual disturbances, and/or the presence of other people could detract from these recreation opportunities and activities. The impacts would cease at the end of construction and return to the current condition. Nearby local recreation areas in the City of Nogales, such as Keno and Memorial Park, would not be impacted by any of the action alternatives, as they are located outside of the direct impact analysis area, 0.8 mile to the south of the existing Valencia Substation.

At the western portion of the direct impact analysis area (i.e., Route Segment Variations 11, 13, and 15, which are adjacent to the CNF), the construction of transmission facilities would take place in an area with no existing utilities or roadways. Some new access roads would be constructed in these areas along and within the ROW. The removal of vegetation, structure placement, and conductor stringing activities during construction of the proposed Project could have an indirect impact on adjacent recreational users in the CNF, as this area does not already include existing, similar structures within the impact analysis area. However, recreational users within the eastern portion of the CNF are not likely expecting an entirely natural, scenic area, as the City of Nogales' development dominates the landscape. See Section 4.7 for a description of the impacts of the proposed Project and alternatives on the visual setting of the area. The new access roads (Access Types C, D, and E) would be closed to public use along the CNF, subject to the permission of the landowners.

Hunting opportunities in the western portion of the action alternatives, adjacent to the CNF (both big and small game) that could be displaced by the construction of the transmission line and facilities would be a short-term impact; and if the construction occurred outside the hunting seasons, would not impact hunting

opportunities. Areas of the impact analysis area which are private land require permission from the landowner, and existing roads, structures, and CBP activity limits most hunting to the areas west of the impact analysis area, within the CNF. Other areas within GMU 34A and 36B that are outside of the impact analysis area would remain available for hunting, subject to applicable laws and regulations. Construction could potentially be timed to avoid peak hunting season(s).

There would be no impact to the Anza Trail under any action alternative. The Anza Trail is located approximately 262 feet west of the eastern portion of the direct impact analysis area (i.e., to the east of the Valencia Substation). Construction, operation, and maintenance of any action alternative would not affect the recreation setting of the Anza Trail.

Unauthorized Right-of-Way Use

As stated in Section 3.6.2.7, there is potential for unauthorized land uses such as trespassing and unauthorized motor vehicle use on established roads. All action alternatives would construct new access roads, repair or improve existing access roads, and construct new linear features that have the potential to be accessed illegally and/or used for illegal activities. However, any increase in unauthorized use of right-of-way as a result of the increased mileage of new and improved roads within the analysis area would be low, because of the border fence, Mariposa port of entry, and prominent CBP presence and operations. Furthermore, portions of the new and improved roads that are not on private lands may be used by CBP and other law enforcement agents to assist in border patrol operations.

ALTERNATIVE 1

Six of the 10 NLCD land cover classifications in the analysis area for the affected environment are within the impact analysis area for Alternative 1. Table 4.6-1 lists these six NLCD land use/cover classifications and the amount of long-term disturbance. The NLCD land cover classification that would be most impacted by Alternative 1 is shrub/scrub and, when combined with the barren land cover classification, approximately 84 percent of the land type that would be impacted is undeveloped. Alternative 1 would impact approximately 16 percent developed land cover classifications, of which the majority is the developed open space classification. Therefore, Alternative 1 would have a greater impact on undeveloped land classifications. Impacts to land cover classifications from Alternative 1 would not be significant, because no displacement of existing land use developments would occur and reclassification of land cover classification would not occur.

Table 4.6-1. Disturbance to NLCD Land Cover Classifications – Alternative 1 (in acres)

NLCD Land Cover Class	ROW**	Gateway Substation	Access Type C-Upgraded Existing Dirt Roads*,†	Access Type D-New Dirt Roads*	Access Type E-Spur Roads*	Total Disturbance
Developed, open space	8.69	0.00	0.56	0.01	0.02	9.28
Developed, low intensity	3.68	0.00	0.10	0.03	0.00	3.81
Developed, medium intensity	3.34	0.00	0.01	0.00	0.00	3.35
Developed, high intensity	2.98	0.00	0.00	0.00	0.00	2.98
Barren land	0.03	5.56	0.00	0.00	0.00	5.59
Shrub/scrub	86.10	5.15	4.59	1.17	0.24	97.25

Table 4.6-1. Disturbance to NLCD Land Cover Classifications – Alternative 1 (in acres), Continued

NLCD Land Cover Class	ROW**	Gateway Substation	Access Type C-Upgraded Existing Dirt Roads*,†	Access Type D-New Dirt Roads*	Access Type E-Spur Roads*	Total Disturbance
Unclassified	0.01	0.00	0.00	0.00	0.01	0.02
Total‡	**104.83**	**10.71**	**5.26**	**1.21**	**0.27**	**122.28**

* Acres of permanent access roads (Access Types C, D, and E) outside the ROW.

† Type C access road is estimated disturbance of the entire existing road surface and upgrade-associated disturbance.

‡ Individual values may not sum to total due to rounding or unclassified surface features such as waterways.

**As noted in Section 4.1.2, 100% disturbance of the ROW is calculated.

Two of the three zoning classifications in the analysis area for the affected environment are within the impact analysis area for Alternative 1, light industrial and general commercial, as shown in Table 4.6-2. Of these two zoning classifications, Alternative 1 would be located predominantly within light industrial zoning (approximately 72 percent of the disturbance area). Alternative 1 would be consistent with the land uses of these zoning classifications and would not require rezoning of these areas. Therefore, Alternative 1 would not have direct or indirect impacts on land zoning classifications.

Table 4.6-2. Zoning Classifications – Alternative 1 (in acres)

Zoning Classification	ROW**	Gateway Substation	Access Type C-Upgraded Existing Dirt Roads*,†	Access Type D-New Dirt Roads*	Access Type E-Spur Roads*	Total Disturbance
Light Industrial	70.14	10.71	5.07	1.12	0.11	87.15
General Commercial	17.55	0.00	0.15	0.08	0.11	17.89
Unclassified	17.14	0.00	0.04	0.01	0.05	17.24
Total‡	**104.83**	**10.71**	**5.26**	**1.21**	**0.27**	**122.28**

* Acres of permanent access roads (Access Types C, D, and E) outside the ROW.

† Type C access road is estimated disturbance of the entire existing road surface and upgrade-associated disturbance.

‡ Individual values may not sum to total due to rounding or unclassified surface features such as waterways. ROW calculations were made using the best available information for zoning from the City of Nogales (City of Nogales 2011b).

**As noted in Section 4.1.2, 100% disturbance of the ROW is calculated.

Although not directly within the proposed disturbance area, seven areas zoned for residential use are within the analysis area. Of these residential areas, the proposed transmission line would be adjacent to one residential development—the Villa San Simon condominiums—for 0.1 miles west of the Valencia Substation. This residential area is zoned as multifamily residential; however, the proposed transmission line in this area would be located within an existing easement, utilizing an existing transmission line, and on land zoned for general commercial (this would apply to all action alternatives). Therefore, Alternative 1 would not directly or indirectly impact the residential zoning classification of this residential development and the other six residential areas that are within the analysis area.

ALTERNATIVE 2

Six of the 10 NLCD land cover classifications in the analysis area for the affected environment are within the impact analysis area for Alternative 2. Table 4.6-3 lists these six NLCD land use/cover classifications and the amount of long-term disturbance. The NLCD land cover classification that would be most impacted by Alternative 2 is shrub/scrub and, when combined with the barren land cover classification, approximately 72 percent of the land type that would be impacted is undeveloped. Alternative 2 would

impact approximately 28 percent developed land cover classifications, of which the highest impact would be to the developed open space classification. Therefore, Alternative 2 would have a greater impact on undeveloped land classifications. Impacts to land cover classifications from Alternative 2 would not occur because no displacement of existing land use developments (residences or businesses) would occur and reclassification of land cover type would not be required.

Table 4.6-3. Disturbance to NLCD Land Cover Classifications – Alternative 2 (in acres)

NLCD Land Cover Class	ROW**	Gateway Substation	Access Type C-Upgraded Existing Dirt Roads*,†	Access Type D-New Dirt Roads*	Access Type E-Spur Roads*	Total Disturbance
Developed, open space	11.27	0.00	0.55	0.00	0.00	11.82
Developed, low intensity	6.73	0.00	0.10	0.03	0.00	6.86
Developed, medium intensity	6.68	0.00	0.01	0.00	0.00	6.69
Developed, high intensity	4.26	0.00	0.00	0.00	0.00	4.26
Barren land	0.18	5.56	0.00	0.00	0.00	5.74
Shrub/scrub	62.13	5.15	1.51	0.54	0.11	69.44
Unclassified	0.00	0.00	0.00	0.00	0.00	0.00
Total‡	**91.25**	**10.71**	**2.16**	**0.57**	**0.11**	**104.80**

* Acres of permanent access roads (Access Types C, D, and E) outside the ROW.

† Type C access road is estimated disturbance of the entire existing road surface and upgrade-associated disturbance.

‡ Individual values may not sum to total due to rounding or unclassified surface features such as waterways. ROW calculations were made using the best available information for zoning from the City of Nogales (City of Nogales 2011b).

**As noted in Section 4.1.2, 100% disturbance of the ROW is calculated.

Two of the three zoning classifications in the analysis area for the affected environment are within the impact analysis area for Alternative 2. Table 4.6-4 lists these two zoning classifications and the amount of short- and long-term disturbance.

Table 4.6-4. Zoning Classifications – Alternative 2 (in acres)

Zoning Classification	ROW**	Gateway Substation	Access Type C-Upgraded Existing Dirt Roads*,†	Access Type D-New Dirt Roads*	Access Type E-Spur Roads*	Total Disturbance
Light Industrial	52.00	10.71	1.37	0.50	0.05	64.63
General Commercial	17.87	0.00	0.61	0.07	0.06	18.61
Unclassified	21.38	0.00	0.18	0.00	0.00	21.56
Total‡	**91.25**	**10.71**	**2.16**	**0.57**	**0.11**	**104.80**

* Acres of permanent access roads (Access Types C, D, and E) outside the ROW.

† Type C access road is estimated disturbance of the entire existing road surface and upgrade-associated disturbance.

‡ Individual values may not sum to total due to rounding or unclassified surface features such as waterways. ROW calculations were made using the best available information for zoning from the City of Nogales (City of Nogales 2011b).

**As noted in Section 4.1.2, 100% disturbance of the ROW is calculated.

As shown in Table 4.6-4, two zoning classifications that would be impacted by Alternative 2 are light industrial and general commercial. Of these two zoning classifications, Alternative 2 would be located

predominantly within light industrial zoning (approximately 62 percent of the disturbance area). Alternative 2 would be consistent with the land uses of these zoning classifications and would not require rezoning of these areas. Therefore, Alternative 2 would not have direct or indirect impacts on land zoning classifications.

No residential zoning classifications would be impacted by Alternative 2 including the multifamily residential zone (Villa San Simone condominiums) that is adjacent to the proposed transmission line west of the Valencia Substation (see zoning discussion for Alternative 1 above).

ALTERNATIVE 3

Six of the 10 NLCD land cover classifications in the analysis area for the affected environment are within the impact analysis area for Alternative 3. Table 4.6-5 lists these six NLCD land use/cover classifications and the amount of long-term disturbance. The NLCD land cover classification that would be most impacted by Alternative 3 is shrub/scrub and, when combined with the barren land cover classification, approximately 76 percent of the land type that would be impacted is undeveloped. Alternative 3 would impact approximately 24 percent developed land cover classifications, of which the highest impact would be to the developed open space classification. Therefore, Alternative 3 would have a greater impact on undeveloped land classifications. Impacts to land cover classifications from Alternative 3 would not occur because no displacement of existing land use developments (residences or businesses) would occur and reclassification of land cover type would not be required.

Table 4.6-5. Disturbance to NLCD Land Cover Classifications – Alternative 3 (in acres)

NLCD Land Cover Class	ROW**	Gateway Substation	Access Type C-Upgraded Existing Dirt Roads*,†	Access Type D-New Dirt Roads*	Access Type E-Spur Roads*	Total Disturbance
Developed, open space	13.31	0.00	0.56	0.00	0.00	13.87
Developed, low intensity	4.66	0.00	0.10	0.03	0.00	4.79
Developed, medium intensity	4.49	0.00	0.01	0.00	0.00	4.50
Developed, high intensity	3.30	0.00	0.00	0.00	0.00	3.30
Barren land	0.03	5.56	0.00	0.00	0.00	5.59
Shrub/scrub	66.96	5.15	3.52	1.01	0.10	76.74
Unclassified	0.00	0.00	0.00	0.00	0.00	0.00
Total‡	**92.75**	**10.71**	**4.19**	**1.04**	**0.10**	**108.79**

* Acres of permanent access roads (Access Types C, D, and E) outside the ROW.

† Type C access road is estimated disturbance of the entire existing road surface and upgrade-associated disturbance.

‡ Individual values may not sum to total due to rounding or unclassified surface features such as waterways. ROW calculations were made using the best available information for zoning from the City of Nogales (City of Nogales 2011b).

**As noted in Section 4.1.2, 100% disturbance of the ROW is calculated.

Two of the three zoning classifications in the analysis area for the affected environment are within the impact analysis area for Alternative 3. Table 4.6-6 lists these two zoning classifications and the amount of short- and long-term disturbance. The two zoning classifications that would be impacted by Alternative 3 are light industrial and general commercial. Alternative 3 would be located predominantly within general commercial (approximately 54 percent of the disturbance area). Compared to the other action alternatives, Alternative 3 is the only action alternative that would be located predominantly in general commercial

zoning as opposed to light industrial. Alternative 3 would be consistent with the land uses of these zoning classifications and would not require rezoning of these areas. Therefore, Alternative 3 would not have direct or indirect impacts on land zoning classifications.

No residential zoning classifications would be impacted by Alternative 3 including the multifamily residential zone (Villa San Simone condominiums) that is adjacent to the proposed transmission line west of the Valencia Substation (see zoning discussion for Alternative 1 above).

Table 4.6-6. Zoning Classifications – Alternative 3 (in acres)

Zoning Classification	ROW**	Gateway Substation	Access Type C-Upgraded Existing Dirt Roads*,†	Access Type D-New Dirt Roads*	Access Type E-Spur Roads*	Total Disturbance
Light Industrial	17.14	10.71	3.54	0.97	0.00	32.36
General Commercial	58.51	0.00	0.61	0.07	0.09	59.28
Unclassified	17.10	0.00	0.04	0.00	0.01	17.15
Total	**92.75**	**10.71**	**4.19**	**1.04**	**0.10**	**108.79**

* Acres of permanent access roads (Access Types C, D, and E) outside the ROW.

† Type C access road is estimated disturbance of the entire existing road surface and upgrade-associated disturbance.

‡ Individual values may not sum to total due to rounding or unclassified surface features such as waterways. ROW calculations were made using the best available information for zoning from the City of Nogales (City of Nogales 2011b).

**As noted in Section 4.1.2, 100% disturbance of the ROW is calculated.

ALTERNATIVE 4

Six of the 10 NLCD land cover classifications in the analysis area for the affected environment are within the impact analysis area for Alternative 4. Table 4.6-7 lists these six NLCD land use/cover classifications and the amount of long-term disturbance. The NLCD land cover classification that would be most impacted by Alternative 4 is shrub/scrub and, when combined with the barren land cover classification, approximately 73 percent of the land type that would be impacted is undeveloped. Alternative 3 would impact approximately 27 percent developed land cover classifications, of which the highest impact would be to the developed open space classification. Therefore, Alternative 4 would have a greater impact on undeveloped land classifications. Impacts to land cover classifications from Alternative 4 would not occur because no displacement of existing land use developments (residences or businesses) would occur and reclassification of land cover type would not be required.

Table 4.6-7. Disturbance to NLCD Land Cover Classifications – Alternative 4 (in acres)

NLCD Land Cover Class	ROW**	Gateway Substation	Access Type C-Upgraded Existing Dirt Roads*,†	Access Type D-New Dirt Roads*	Access Type E-Spur Roads*	Total Disturbance
Developed, open space	11.91	0.00	0.46	0.00	0.00	12.37
Developed, low intensity	6.75	0.00	0.01	0.03	0.01	6.80

Table 4.6-7. Disturbance to NLCD Land Cover Classifications – Alternative 4 (in acres), Continued

NLCD Land Cover Class	ROW**	Gateway Substation	Access Type C-Upgraded Existing Dirt Roads*,†	Access Type D-New Dirt Roads*	Access Type E-Spur Roads*	Total Disturbance
Developed, medium intensity	4.23	0.00	0.01	0.00	0.00	4.24
Developed, high intensity	3.46	0.00	0.00	0.00	0.00	3.46
Barren land	0.18	5.56	0.00	0.00	0.00	5.74
Shrub/scrub	58.50	5.15	1.31	0.55	0.18	65.68
Unclassified	0.00	0.00	0.00	0.00	0.00	0.00
Total‡	**85.03**	**10.71**	**1.79**	**0.58**	**0.19**	**98.29**

* Acres of permanent access roads (Access Types C, D, and E) outside the ROW.

† Type C access road is estimated disturbance of the entire existing road surface and upgrade-associated disturbance.

‡ Individual values may not sum to total due to rounding or unclassified surface features such as waterways. ROW calculations were made using the best available information for zoning from the City of Nogales (City of Nogales 2011b).

**As noted in Section 4.1.2, 100% disturbance of the ROW is calculated.

Two of the three zoning classifications in the analysis area for the affected environment are within the impact analysis area for Alternative 4, light industrial and general commercial. Table 4.6-8 lists these two zoning classifications and the amount of long-term disturbance. Alternative 4 would be located predominantly within light industrial (approximately 63 percent of the disturbance area). Alternative 4 would be consistent with the land uses of these zoning classifications and would not require rezoning of these areas. Therefore, Alternative 3 would not have direct or indirect impacts on land zoning classifications.

Table 4.6-8. Zoning Classifications – Alternative 4 (in acres)

Zoning Classification	ROW**	Gateway Substation	Access Type C-Upgraded Existing Dirt Roads*,†	Access Type D-New Dirt Roads*	Access Type E-Spur Roads*	Total Disturbance
Light Industrial	49.09	10.71	1.16	0.47	0.12	61.55
General Commercial	17.14	0.00	0.61	0.10	0.02	17.87
Unclassified	18.80	0.00	0.02	0.01	0.05	18.88
Total‡	**85.03**	**10.71**	**1.79**	**0.58**	**0.19**	**98.30**

* Acres of permanent access roads (Access Types C, D, and E) outside the ROW.

† Type C access road is estimated disturbance of the entire existing road surface and upgrade-associated disturbance.

‡ Individual values may not sum to total due to rounding or unclassified surface features such as waterways. ROW calculations were made using the best available information for zoning from the City of Nogales (City of Nogales 2011b).

**As noted in Section 4.1.2, 100% disturbance of the ROW is calculated.

No residential zoning classifications would be impacted by Alternative 4 including the multifamily residential zone (Villa San Simone condominiums) that is adjacent to the proposed transmission line west of the Valencia Substation (see zoning discussion for Alternative 1 above).

4.6.3 Applicant Proposed Measures

When the following applicant proposed measures are incorporated into the construction, operation, and maintenance of the proposed Project, impacts to land use and recreation would be minimized.

- Transmission structures that do not include ladders for climbing and whose design does not lend itself to climbing would be used. Transmission structures would not be located directly adjacent to the international border, in order to be located outside of the Roosevelt Easement.
- Post-construction restoration activities would include removal and disposal of debris, removal of temporary structures, and employment of appropriate erosion control measures.
- If during transmission line maintenance and monitoring it is determined that new or reconstruction activities should be implemented, the Applicant would notify the property owners and/or other regulatory agencies and obtain proper approvals, as necessary.
- Where feasible (subject to the landowner agreements with Nogales Transmission), all gates would be locked and have signage indicating authorized uses of all access roads.

The following plans would be developed and implemented: Access Road Plan; Fire Protection Plan.

4.7 VISUAL RESOURCES

4.7.1 Impact Analysis Area and Indicators

The impact analysis area for direct impacts to visual resources is the footprint of each of the action alternatives (as described in Section 4.1.2). The impact analysis area for indirect impacts is a 5-mile buffer of the alternatives.

The following indicator was considered when analyzing impacts to visual resources:

- Changes to the existing landscape character (no change, change but consistent with existing landscape, or change and dominates landscape).

4.7.2 Impact Analysis

4.7.2.1 No Action Alternative

Under the No Action Alternative, DOE would not issue a Presidential permit for the proposed Project, the transmission system would not be authorized to cross the U.S.-Mexico border, the proposed Project would not be constructed in the U.S., and the potential environmental impacts associated with the proposed Project as discussed below would not occur.

4.7.2.2 Action Alternatives

COMMON IMPACTS ACROSS ALL ALTERNATIVES

The following section describes impacts common to all of the action alternatives. The visual impact assessment is based on a qualitative evaluation of the action alternatives' potential to result in a visual change to the existing landscape character. The visual impact analysis is based on an evaluation of the

anticipated changes to the existing visual landscape that would result from short-term construction and long-term operation and maintenance of the proposed Project.

Many of the impacts to visual resources are common to all of the action alternatives. Following is a discussion of those impacts. Discernible differences are then discussed by alternative.

Landscape

For approximately 5 miles, each of the action alternatives would cross through or adjacent to a mix of commercial, light industrial, residential, and undeveloped lands (both disturbed and undisturbed). The structures would be 75 and 140 feet tall between the existing Valencia and proposed Gateway Substations for a distance of approximately 3 miles, with structures spaced 600 to 1,000 feet apart. From the proposed Gateway Substation to the international border for a distance of approximately 2 miles, the structures would be up to 140 feet tall and spaced 600 to 1,000 feet apart.

The most visually sensitive portion of the impact analysis area occurs along the western portion of the ROW where all action alternatives would be adjacent to the boundary of the CNF. The proposed Project would be visible from the eastern limits of the CNF in this location, including some Forest Roads and trails. Due to the vegetation being low-lying, viewers looking east from within the CNF would have a direct view of the proposed Project and would likely see the proposed Gateway Substation to the international border crossing location. A view at an inferior viewing position (i.e., a low-lying area, such as a wash or valley), would generally be able to see a lesser extent of the proposed Project. Conversely, a view from a more superior location (i.e., atop a ridge) would likely to be able to see most of the extent of the proposed Project. Similarly, because many CNF users would likely be moving at a slow pace, either hiking or driving, the duration of the view would be extended. This extended view of the project would be a result of little vegetation screening and the low-speed of movement across the landscape that would enable the viewer to see the proposed Project until they are facing an opposite direction (e.g., facing west). As a viewer gets farther from the proposed project, visibility of the proposed transmission system would be reduced by topography and natural or human-made objects.

Generally, natural-appearing landscapes are the most valued (USFS 1995). Viewer concern reflects the importance placed on a given landscape based on the human perceptions of the intrinsic beauty of the existing landforms, rockforms, water features, vegetation patterns, and even cultural features. Viewer concern, or viewer sensitivity, is generally divided into high, moderate, and low categories. Factors considered in assigning categories include viewer activity, view duration, viewing distance, adjacent land use, and special management or planning designation. Viewer concern is based on any known information about the viewing population, existing land uses, and plan or policy designations that might indicate public importance. Viewers' concern level in this portion of CNF is likely low, due to the proximity of the urbanized City of Nogales area, other transmission lines, major roads, and the light industrial nature of the Mariposa port of entry vicinity. Because viewer concern level would be considered low, and the change in the visual landscape would be consistent with urban views, direct visual impacts on the landscape from all action alternatives would be considered minimal.

Human Settlement

The visual impacts from a human settlement perspective would vary greatly depending upon the distance between the viewer and the action alternative, as well as the intervening terrain between the viewer and the action alternative.

For viewers in light industrial and commercial areas (i.e., the impact analysis area between the existing Valencia Substation and proposed Gateway Substation), the transmission lines would be an additional element in the existing landscape but would not represent a new change, since there are already linear

ROWs and utilities, as well as light industrial and commercial facilities, in this portion of the impact analysis area (as well as in the middle ground views). The viewers in these areas generally have low to moderate sensitivity to visual change. Residents within the Villa San Simone subdivision adjacent to Route Segment Variation 1 would be the most sensitive viewers, because they would spend the most time within view of the action alternatives; sensitivity would be low, as there is an existing UNSE easement and transmission line in this area that would be utilized for the proposed Project.

Viewers of the action alternatives from the western portion of the analysis area, facing east and adjacent to the eastern border of the CNF, would have their views interrupted by the construction of any of the action alternatives, since all action alternatives share a common alignment adjacent to the CNF. When facing east toward the City of Nogales, the impact analysis area would include a portion of the proposed transmission line, the City of Nogales' industrial areas including the Mariposa port of entry, State Route 189, and other urban infrastructure in the middle ground and background. Thus, the addition of any of the action alternatives to the landscape would be consistent with the existing landscape and would appear as an additional urban element.

In the areas adjacent to the CNF, facing west toward the forest from the impact analysis area, the view of any of the action alternatives would be in the foreground of undeveloped desert and mountain background views. The proposed Project would represent a moderate change to the existing landscape, and thus human settlement patterns, since implementation of any of the action alternatives would dominate the view from this direction.

Arrangement of Poles within Route Segment Variations 7 and 10

Route Segment Variations 10 and 7, for Alternatives 3 and 4 respectively, would have two parallel pole structures (i.e., two sets of poles). For Alternative 3, Route Segment Variation 10 would include one single-circuit 230-kV conductor on double-circuit capable structures. Within the 150-foot ROW would be another pole for the double-circuit 138-kV conductor on double-circuit poles. For Alternative 4, Route Segment Variation 7 would include one single-circuit 230-kV conductor on double-circuit capable structures. Within the 150-foot ROW would be another pole for the double-circuit 138-kV conductor on double-circuit poles (see Figure 2.4-4).

These configurations would be located in areas of low concern, where human disturbance and existing transmission lines dominate the landscape (i.e., the light industrial areas located immediately south of the proposed Gateway Substation site). Though a view of two conductors generally provides greater contrast than a single alignment, the two separate pole configurations are not anticipated to result in discernible visual resources impacts other than those described above. Viewers' concern level in this portion of Nogales is likely low, due to the proximity of the urbanized City of Nogales area, other transmission lines, major roads, and the light industrial nature of the vicinity. Because viewer concern level would be considered low, and the change in the visual landscape would be consistent with urban views, direct visual impacts on the landscape from Route Segment Variations 7 and 10 would be the same as described for the other alternatives.

4.7.3 Applicant Proposed Measures

When the following applicant proposed measures are incorporated into the construction, operation, and maintenance of the proposed Project, impacts to visual resources would be minimized.

- Disturbed areas would be revegetated following construction, in accordance with agency and landowner requirements.

- Construction waste would be removed on a regular schedule to minimize short-term visual impacts. This would be described in more detail in the Waste Management Plan.
- Transmission lines would parallel existing ROWs, to the extent practicable.
- Towers and structures would have a non-reflective finish (e.g., non-specular wire and self-weathering poles).
- Structures would use self-weathering material to blend with or complement the surrounding landscape.
- The Applicant would continue to coordinate with staff (including their landscape architect) from the USFS CNF to site poles in the least intrusive locations possible where the ROW is adjacent to the CNF (i.e., Route Segment Variations 11, 13, and 15).

4.8 SOCIOECONOMICS

4.8.1 Impact Analysis Area and Indicators

The impact analysis area for impacts to socioeconomics is Santa Cruz County. No changes to population and housing or tourism are anticipated if any of the action alternatives are implemented. Therefore, there are no impact indicators for these socioeconomics components.

In terms of potential socioeconomic impacts, there would be a potential change in local taxes and revenues, as well as employment. Therefore, the following indicators were considered when analyzing impacts to socioeconomics:

- Employment – increase in employment during construction, or operation and maintenance.
- Taxes and Revenue – increase in local government tax revenues (qualitative discussion).

4.8.2 Impact Analysis

4.8.2.1 No Action Alternative

Under the No Action Alternative, DOE would not issue a Presidential permit for the proposed Project, the transmission system would not be authorized to cross the U.S.-Mexico border, the proposed Project would not be constructed in the U.S., and the potential environmental impacts associated with the proposed Project as discussed below would not occur.

4.8.2.2 Action Alternatives

COMMON IMPACTS ACROSS ALL ALTERNATIVES

Population and Housing

Construction of the action alternatives would require approximately 30 to 50 temporary construction workers. Given the availability of workers from the local labor pool in the City of Nogales and Santa Cruz County, construction of the proposed Project for all action alternatives would not likely require workers from outside the region to relocate to the City of Nogales and Santa Cruz County. The operation and maintenance of the proposed Project would not require new, permanent employees, because these activities are anticipated to be provided by a contract with UNSE (or another local utility or service

provider), as determined by Nogales Frontier Operations, L.L.C., and existing employees would be utilized. Therefore, the action alternatives would not impact the population, demographics, or the availability of housing.

Employment and Income

As noted above, construction of the action alternatives would temporarily increase employment with the addition of 30 to 50 construction jobs during the construction phase of the proposed Project. The operation and maintenance of the proposed Project facilities would not require new permanent employees, because these activities would be conducted by existing employees of UNSE (or another local utility service provider), as determined by Nogales Frontier Operations, L.L.C. With the addition of temporary jobs during construction, the action alternatives would have a temporary beneficial impact on employment and income in the analysis area. After construction, operation and maintenance of the facilities would not impact employment or income in the analysis area.

Taxes and Revenue

A new transmission line can directly generate public revenue through property taxes, rent, and taxes on the sale of electricity. Public revenue is also created during the construction phase indirectly through sales and use taxes on equipment and materials, and other taxes such as lodging taxes on construction-related economic activity. Taxes and revenue would be generated by the construction of the action alternatives from the purchase of building materials and other goods and services and the temporary wages paid to construction workers. The injection into the economy of this money has a multiplier effect, supporting additional new spending by the initial recipients (e.g., construction workers, suppliers, and business owners). Wages earned at the businesses who provide the goods, materials, and services are potentially used by business owners and employees for their own subsequent purchases. This direct and indirect economic activity can be a positive contribution to the local community's economic well-being.
In addition, the action alternatives would contribute to local taxes and revenue associated with property taxes, property easement fees, and real estate purchases and transfers. The increase in taxes and revenue generated by the construction and operation of the action alternatives would be a beneficial impact to local governments in the analysis area (City of Nogales and Santa Cruz County) that rely on these sources of tax revenue, such as school districts. However, the beneficial impact would be temporary and likely not significant, because the majority of the taxes and revenue would be generated during construction (Haggerty 2012).

The proposed Project under all action alternatives would have short-term effects on traffic flow. Traffic flow and access are important to the success of retail businesses, because they allow potential customers to view and access businesses. Traffic routed away from businesses or reduced access can negatively affect business revenue. Conversely, traffic routed closer to businesses or providing easier access can increase business revenue. However, access to businesses that are adjacent to the proposed action alternatives (see Section 4.6 above) would remain open throughout construction. Other potential temporary impacts could include daytime construction noise, dust, and reduced visibility of local businesses.

There would be no long-term impacts to businesses or access to businesses, as no business relocations would be required and there would be no changes to current levels of access. Additionally, as no residential relocations would be required, there would be no permanent impacts to the customer base of businesses within the proposed Project area (refer to Sections 3.6.2.3, 3.6.2.4, and 4.6.2.2 for an analysis of existing residences and businesses).

The proposed Project would not have a measurable impact to residential property values. Negative property value impacts resulting from the installation of a transmission line tend to be smaller in size, extent, and duration than may be perceived. A recent summary has observed that the presence of transmission lines generally have small or no effect on the sales price of a property, and in cases where there was an effect, it tended to dissipate with time and distance from the line (Headwaters Economics 2012). Additionally, the majority of residential units that could be affected are rental properties, and the portion of the proposed Project that would occur adjacent to a multifamily residential subdivision would be located in an existing easement that currently contains a UNSE transmission line. Therefore, measurable impacts to residential property values as a result of the proposed Project are not anticipated.

Tourism

The action alternatives are located primarily within and adjacent to light industrial and commercial areas, such as warehouses, which are associated with international trade from the nearby Mariposa and Nogales ports of entry. The construction and operation of the action alternatives would not impact tourists traveling through the Mariposa and Nogales ports of entry. The western portion of each action alternative would parallel the CNF; however, no recreation facilities that would attract tourism are located on the CNF in this area. Similar to the recreation section described in Section 3.6 Land Use and Recreation, this area of the CNF is not conducive to tourism activities due to the proximity of the adjacent urban setting, port of entry, and CBP and law enforcement activities. Therefore, the action alternatives would not impact tourism.

4.8.3 Applicant Proposed Measures

When the following applicant proposed measures are incorporated into the construction, operation, and maintenance of the proposed Project, impacts to socioeconomics would be minimized.

- Maintain access to all businesses, residences, and public facilities during construction.
- Notify local agencies, residences, and business owners of upcoming construction activities and potential disruptions associated with the proposed Project.

The following plan would be developed and implemented: Traffic and Transportation Management Plan.

4.9 ENVIRONMENTAL JUSTICE

4.9.1 Impact Analysis Area and Indicators

The impact analysis area for impacts to environmental justice comprises the two census tracts that the proposed Project intersects—Census Tracts 9662 and 9664.01.

The following indicators are considered when analyzing impacts to environmental justice:

- Proximity of the proposed Project to an environmental justice population (as defined in Section 3.9, Environmental Justice).
- Qualitative discussion describing any anticipated high and disproportionate adverse socioeconomic or environmental effects on environmental justice communities in the analysis area.

4.9.2 Impact Analysis

4.9.2.1 No Action Alternative

Under the No Action Alternative, DOE would not issue a Presidential permit for the proposed Project, the transmission system would not be authorized to cross the U.S.-Mexico border, the proposed Project would not be constructed in the U.S., and the potential environmental impacts associated with the proposed Project as discussed below would not occur.

4.9.2.2 Action Alternatives

COMMON IMPACTS ACROSS ALL ALTERNATIVES

Land Use

As stated in Section 3.9.1, Minority Populations, environmental justice populations are located in the analysis area—Census Tracts 9662 and 9664.01, which are located north and south of SR 189, respectively, and west of Tucson-Nogales Highway/Grand Avenue. The proposed Gateway Substation and the western portions of all of the action alternatives would cross Census Tract 9662. The eastern portions of all the action alternatives would cross Census Tract 9664.01. The minority population percentages in these Census Tracts (92% for Census Tract 9664.01 and 97% for Census Tract 9662) are similar to the minority population percentages for the City of Nogales (95%), the reference population for environmental justice determination.

Within Census Tract 9662, several low income housing apartment complexes, including the Loma Mariposa Apartments I and II, Santa Rita Apartments, Santa Carolina Apartments, and the Villa Paraiso Apartments, are located north of SR 189 within 0.25 mile from the proposed alignments of the action alternatives. The Mariposa Manor Mobile Home Park is located south of SR 189 and approximately 0.1 mile from the proposed alignments of the action alternatives. The proposed Gateway Substation and proposed alignment of Alternative 3 would be located approximately 0.3 mile from the Loma Mariposa Apartments I and II and 0.8 mile from the Mariposa Manor Mobile Home Park. No other known residential areas within Census Tract 9662 are proximate to the proposed Project. No residences or businesses within Census Tract 9662 would be displaced as a result of the action alternatives.

Within Census Tract 9664.01, the closest residential area is the Villa San Simone subdivision on San Simon Drive and West Calle Lupita. The proposed alignments of all action alternatives would be located adjacent to the property lines of 13 condominiums within this development. No other known residential areas within Census Tract 9664.01 are proximate to the proposed Project. No residences or businesses within Census Tract 9664.01 would be displaced as a result of the action alternatives.

Environmental justice impacts associated with the proposed Project would tend to be geographically localized near project activities, such as visual impact or noise associated with construction activities in or adjacent to the areas in which minority or low-income households are concentrated. All persons, regardless of race or income, would experience the same low impacts associated with construction of the proposed Project. These impacts would be expected to be low, because construction would be short-term with temporary inconveniences to the residences and businesses located adjacent or within close proximity to the proposed ROW. No displacements to residences or businesses would occur as a result of the action alternatives. Therefore, no impacts would occur to nearby environmental justice populations within Census Tract 9662 and 9664.01 from the action alternatives with regard to land use.

Visual

As discussed in Section 4.7, Visual Resources, visual impacts resulting from the proposed Project would be low to moderate. Visual impacts specific to the environmental justice populations in Census Tracts 9662 and 9664.01 are analyzed in further detail in this section.

For the environmental justice population in Census Tract 9662, the residential developments closest to the action alternatives are the Loma Mariposa Apartments I and II and the Mariposa Manor Mobile Home Park. When facing generally to the south/southwest toward the CNF from the Loma Mariposa Apartments I and II, views of the Alternative 3 alignment and the proposed Gateway Substation would be possible in the midground that currently consists of undeveloped and partially disturbed desert (dirt roads). The facilities would likely be partially obscured by the hilly topography. Residents of the Mariposa Manor Mobile Home Park would not likely see the transmission lines, because they would be obscured by the existing commercial and light industrial areas that surround the mobile home park. Therefore, the proposed transmission facilities would not likely be a dominant visual feature to environmental justice populations in Census Tract 9662.

For the environmental justice population in Census Tract 9664.01, the residential development closest to the action alternatives is the Villa San Simone condominium subdivision. When facing south, the condominiums south of North San Simon Drive would have direct views in the foreground of the proposed transmission lines under all action alternatives. However, as discussed in Section 4.6, the action alternatives would be constructed within a utility easement; therefore the action alternatives would not constitute a major change to the existing visual character. Because the environmental justice populations in these Census Tracts are consistent with the environmental justice population of the City of Nogales, visual impacts would not constitute a disproportionate impact to environmental justice populations within the analysis area.

Socioeconomics

As discussed in Section 4.8, there would be no displacement of residences or businesses, nor permanent change in existing access via vehicle, bicycle, or foot. Therefore, there would be no impact to neighborhoods or community cohesion as a result of the proposed Project. No adverse impacts to employment opportunities or income would occur. Access to all properties, including public facilities, schools, and social service agencies, would be maintained during construction, and local agencies and residents would be notified of upcoming construction activities.

The residences located closest to the proposed Project within Census Tract 9664, Loma Mariposa Apartments I and II, are a rental community. As a result, the property values of the environmental justice population would not be impacted by the installation of a transmission line and substation. Additionally, the portion of the proposed Project that would be located closest to Loma Mariposa Apartments I and II occurs on land that is currently undeveloped, but is zoned for light industrial use, and there is reasonable expectation that it would be developed for commercial and light industrial use in the future. Thus, land use in this area is consistent with planned uses.

Air Quality

As discussed in Section 4.11, construction activity would generate fugitive dust emissions (PM_{10} and $PM_{2.5}$) over the course of the estimated 6-month construction period. The total emissions of PM_{10} and $PM_{2.5}$ would be between 35.89 to 45.14 tons per year for PM_{10}, and 3.61 to 4.55 tons per year for $PM_{2.5}$. Recommended dust control measures are expected to reduce emissions of fugitive dust by 50% or more, minimizing emissions even lower than the values estimated in Table 4.11-1. Given the relatively small

amount of fugitive dust emissions, in combination with applicant proposed measures, environmental justice populations in Census Tracts 9662 and 9664.01would not be disproportionately impacted in terms of short-term air quality impacts resulting from any of the action alternatives.

Noise

As discussed in Section 4.12, construction would generate noise from equipment, traffic, and other construction activities. There would be a short-term increase in noise levels during construction. During operation, audible noise from the transmission line would decrease with distance away from the ROW, and in fact, corona noise from transmission lines is often lost in the background noise beyond the edge of the ROW, potentially falling to under 14 dBA at a distance of 75 feet from the line (USDA-RUS 2012). In terms of the proposed Gateway Substation, the primary noise sources would originate from converter transformers, air-cooled liquid cooling towers, vibrations associated with magnetic forces inside substation transformers, and cooling fans and pumps. As explained in Section 4.12, it would be anticipated that operational noise Gateway Substation would be near background levels for sensitive receptors at a distance of 2,000 feet. While there would be a permanent increase in background noise levels across the analysis area, the environmental justice populations would not be disproportionately impacted in terms of human health or environmental impacts, because they are outside the area of attenuation for audible background noise.

Infrastructure

As discussed in Section 4.13, during construction, there would be short-term effects from increased construction traffic, temporary lane closures, and/or traffic delays. Access to all properties, including public facilities, schools, and social service agencies, would be maintained during construction, and local agencies and residents would be notified of upcoming construction activities and potential disruptions to transportation facilities. There would be no permanent impacts from operations or maintenance, but the environmental justice populations in Census Tracts 9662 and 9664.01 would not be disproportionately impacted in terms of access to public services during construction.

Human Health and Safety

As discussed in Section 4.14, during construction, public services such as police, fire, and medical facilities would be needed only in cases of emergency. Standard safety procedures would be followed at all times during construction, and the potential for accidents is expected to be low. Also as a result of construction activities and temporary increase in traffic, there is the potential for a short-term increase in the possibility for traffic accidents. There is the potential for temporary increased stress on public services during construction.

In summary, no disproportionately high or adverse impacts to environmental justice communities in the analysis area would be created by the action alternatives.

4.9.3 Applicant Proposed Measures

When the following applicant proposed measures are incorporated into the construction, operation, and maintenance of the proposed Project, impacts to environmental justice populations would be minimized.

- Maintain access to all businesses, residences, and public facilities during construction.
- Notify local agencies, residences, and business owners of upcoming construction activities and potential disruptions associated with the proposed Project.

The following plans would be developed and implemented: Emergency Preparedness and Response Plan; Erosion, Dust Control, and Air Quality Management Plan; Fire Protection Plan; Health and Safety Plan; Traffic and Transportation Management Plan.

4.10 HISTORIC AND CULTURAL RESOURCES

4.10.1 Impact Analysis Area and Indicators

The analysis area for direct impacts to cultural resources is a 100-foot buffer on either side of the ROW centerline (i.e., a 200-foot-wide corridor) and the proposed upgraded access roads (Access Type C) and new-build access roads (Access Types D and E) for each of the action alternatives, as well as the footprint of the Valencia and Gateway Substations. The analysis area is intended to encompass the APE established during the Section 106 consultation process, which consists of a 200-foot-wide corridor along the alignment for Alternative 3 (the Applicant's Preferred Alternative) and its associated Access Types C, D, and E, as well as the Valencia and Gateway Substations. Proposed existing access roads that do not need improvements (Access Types A and B) are not included. The analysis area for indirect impacts is a 0.25-mile buffer around each of the action alternatives.

The following indicators were considered when analyzing impacts to cultural resources:

- Damage, loss, or disturbance from construction, operation, and maintenance that would alter the characteristic(s) which make a historic property or resource of traditional or cultural significance to American Indian tribes eligible for listing in the NRHP.
- Damage, loss, or disturbance from construction, operation, and maintenance that would alter the characteristic(s) which make a place of traditional or cultural significance important to American Indian tribes.
- Visual (indirect) impacts to setting, feeling, or association where setting, feeling, or association is a characteristic which make the resource eligible for listing in the NRHP (Criterion A, B, or C[25] only).

4.10.2 Impact Analysis

4.10.2.1 No Action Alternative

Under the No Action Alternative, DOE would not issue a Presidential permit to the Applicant for the proposed Project; the transmission system would not be authorized to cross the U.S.-Mexico border, the proposed Project would not be constructed in the U.S., and the potential environmental impacts associated with the proposed Project as discussed below would not occur.

[25] Criterion A. Properties that are associated with events that have made a significant contribution to the broad patterns of our history; or Criterion B. Properties that are associated with the lives of significant persons in our past; or Criterion C. Properties that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction.

4.10.2.2 Action Alternatives

COMMON IMPACTS ACROSS ALL ALTERNATIVES

As the cultural setting of the action alternatives is relatively homogeneous with potential for few historic and cultural resources, many of the impacts to cultural resources are common to all of the action alternatives. Discernible differences (i.e., acreage of unsurveyed land) are discussed by alternative in the sections that follow this one.

A Class III survey[26] of the 200-foot-wide corridor buffer of most of the route segment variations was performed as part of the Applicant's Presidential permit application. Of the 276 acres to be surveyed at that time, approximately 70 acres could not be surveyed, because ROE had not yet been obtained from the landowners (HDR 2016b). Also, the I-19 and SR 189 ROWs were not surveyed, because current data were available from ADOT (Brodbeck 2015). During the survey, two previously recorded sites were identified; both sites were recommended not eligible for the NRHP because of their limited information potential, and as such, do not fit the definition of an historic property under Section 106. No new sites were identified (HDR 2016b).

In terms of direct impacts, based on the Class III survey work to date, no known historic properties, i.e., sites, buildings, structures, or districts listed in or eligible for listing in the NRHP, would be directly or indirectly affected by construction activities (temporary impacts).

However, the survey of the proposed action alternatives is incomplete, because ROE to some land parcels was not granted by the landowners. DOE is currently in consultation with the Arizona SHPO and the Section 106 consultation parties for Alternative 3 (the Preferred Alternative). The Applicant will make a good faith effort to acquire ROE for the unsurveyed parcels so that they can be surveyed by qualified archaeologists[27] to determine whether historic properties or other cultural resources are present. If ROE cannot be acquired in some parcels, a Class I inventory[28] and knowledge of the general area would be used by the qualified archaeologist to make a professional judgment and determination. Section 106 consultation will be completed prior to DOE issuing its permit decision. The results of this consultation will be discussed in the Final EA.

Two historic properties that are eligible for the NRHP under Criteria A and C, the New Mexico and Arizona Railroad and the Tucson-Nogales Highway, are within 0.1 mile of the eastern terminus of all the alternatives; however, the proposed transmission line ends within the existing Valencia Substation, which consists of developed transmission infrastructure and would not alter the setting, feeling, or association of the railroad or highway. Therefore, there would be no indirect impacts to known historic properties or other cultural resources.

DOE is currently conducting formal government-to-government and Section 106 consultations. Based on information known to date, no resources important to American Indian tribes have been identified, and activities related to the proposed undertaking or Project are not expected to have a direct adverse impact

[26] A Class III survey is defined by the Arizona SHPO as an intensive, 100% coverage field survey that meets current agency and/or ASM standards, consisting of archaeologists walking parallel transects spaced no more than 20 meters apart. A Class III survey also includes a Class I inventory (background research).

[27] A Secretary of the Interior–qualified archaeologist has a graduate degree in archaeology, anthropology, or a closely related field, a least 1 year of full-time professional experience or equivalent training, at least 4 months of supervised field or analysis in North American archaeology, and demonstrated ability to carry research to completion (36 CFR Appendix A to Part 61).

[28] A Class I inventory is defined by the AZ SHPO as background research consisting of a literature review and site files check that is sufficient to identify past survey coverage and generate expectations about the types and frequencies of cultural resources that might be expected during field survey.

to known historic properties or resources of cultural or religious significance to American Indian tribes. However, because a complete survey of historic properties for all action alternatives has not yet been completed and DOE's government-to-government consultations with American Indian tribes is ongoing, there exists the potential for the identification of resources that may be negatively affected.

In the event that historic artifacts are encountered during construction activities, the procedures outlined in the Construction Monitoring and Unanticipated Cultural Resources Discovery Plan would be followed. Construction activities would cease until project management personnel arrange for a qualified archaeologist to assess the find.

In summary, based on current data, direct and indirect adverse effects to cultural resources is the same for all alternatives; however, because not all of the proposed alternatives have been surveyed, not all impacts (direct or indirect) are known at this time. See Table 4.10-1 for information on the amount of the analysis area (for direct impacts) that has been surveyed and unsurveyed.

Table 4.10-1. Surveyed vs. Unsurveyed Acreage in the Direct Impact Analysis Area by Alternative*

Alternative	Surveyed Acreage (%)	Unsurveyed Acreage (%)	Total Acreage
1	90.28 (58)	65.19 (42)	155.47
2	107.01 (80)	26.17 (20)	133.18
3	96.13 (70)	39.06 (28)	137.46
4	104.32 (83)	20.79 (17)	125.11

* Includes Proposed Transmission Line ROW, Gateway Substation, and Access Roads Needing Improvements [Access Type C] or New Roads [Access Types D and E].

ALTERNATIVE 1

As discussed above, no historic properties or cultural resources important to American Indian tribes have been identified in the analysis area for Alternative 1 based on available information.

Approximately 65 acres, or 42% of the analysis area for potential direct adverse impacts to historic and cultural resources for Alternative 1, has not been surveyed (see Table 4.10-1). Of the 65 unsurveyed acres, the amount of unsurveyed proposed access roads totals approximately 4.66 acres: 0.67 acre of proposed new roads (Access Types D and E) and 3.99 acres of existing roads to be improved (Access Type C).

ALTERNATIVE 2

As discussed above, no historic properties or cultural resources important to American Indian tribes have been identified in the analysis area for Alternative 2 based on available information.

Approximately 26 acres, or 20% of the analysis area for direct impacts for Alternative 2, has not been surveyed (see Table 4.10-1). Of the 26 unsurveyed acres, the amount of unsurveyed proposed access roads totals approximately 0.90 acre; 0.27 acre of proposed new road (Access Types D and E), and 0.63 acre of existing roads to be improved (Access Type C).

ALTERNATIVE 3

As discussed above, no historic properties or cultural resources important to American Indian tribes have been identified in the analysis area for Alternative 3 based on available information.

Approximately 39 acres, or 28% of the analysis area for potential direct adverse impacts for Alternative 3, has not been surveyed (see Table 4.10-1). Of the 39 unsurveyed acres, the amount of unsurveyed proposed access roads totals approximately 2.46 acres; 0.50 acre of proposed new road (Access Types D and E) and 1.96 acres of existing roads to be improved (Access Type C).

Section 106 consultation on Alternative 3 (the Preferred Alternative) will be completed prior to DOE issuing its permit decision. The results of this consultation will be discussed in the Final EA.

ALTERNATIVE 4

As discussed above, no historic properties or cultural resources important to American Indian tribes have been identified in the analysis area for Alternative 4 based on available information.

Approximately 21 acres, or 17% of the analysis area for direct impacts for Alternative 4, has not been surveyed (see Table 4.10-1). Of the 22 unsurveyed acres, the amount of unsurveyed proposed access roads totals approximately 0.79 acre; approximately 0.27 acre of proposed new road (Access Types D and E), and 0.48 acre of existing roads to be improved (Access Type C).

In summary, based on available survey data, no impacts to historic and cultural resources are anticipated from the action alternatives. As such, no further discussion of this topic is included in the cumulative effects analysis.

If significant historic or cultural resources are identified within the survey area that would be adversely affected (directly or indirectly) by the proposed Project, applicant proposed measures would be developed in consultation with the Arizona SHPO and Section 106 consulting parties to minimize the adverse effects. If human remains or funerary objects are discovered, the Arizona State Museum would be notified, as required by ARS 41-865. The Arizona State Museum would then notify the appropriate tribes of the discovery.

4.10.2.3 Applicant Proposed Measures

When the following applicant proposed measures are incorporated into the construction, operation, and maintenance of the proposed Project, impacts to cultural resources would be minimized.

- Ground-disturbing activities and other proposed Project components would be sited to avoid or minimize direct impacts on cultural resources listed as, or potentially eligible for listing as, unique archaeological sites, historical resources, or historic properties, if such resources were found during the Section 106 consultation process.
- Before construction, Nogales Transmission and its construction contractor would provide cultural resources sensitivity training to all construction personnel.

The following plan would be developed and implemented: A Construction Monitoring and Unanticipated Cultural Resources Discovery Plan, as part of the Section 106 Consultation process.

4.11 AIR QUALITY AND CLIMATE CHANGE

4.11.1 Impact Analysis Area and Indicators

The impact analysis area for impacts to air quality and climate change is Santa Cruz County.

The following indicators for determining whether or not the proposed Project emissions would result in a significant impact to air quality and climate change are as follows:

- Increase in ambient pollutant concentrations for a particular area as a result of proposed Project emissions would result in an exceedance of the NAAQS for that area.
- Contribution to change in local or global climate patterns.
- Increase in GHG emissions for a particular area as a result of proposed Project construction or operations.

4.11.2 Impact Analysis

4.11.2.1 No Action Alternative

Under the No Action Alternative, DOE would not issue a Presidential permit to the Applicant for the proposed Project; the transmission system would not be authorized to cross the U.S.-Mexico border, the proposed Project would not be constructed in the U.S., and the potential environmental impacts associated with the proposed Project as discussed below would not occur.

4.11.2.2 Action Alternatives

COMMON IMPACTS ACROSS ALL ALTERNATIVES

Following is a discussion of those impacts in terms of air quality and climate change that are common to all of the action alternatives.

Air Quality

Implementation of any of the action alternatives could affect air quality during construction and operation and maintenance. The assessment of air quality impacts in this document is qualitative, except that estimates of construction PM_{10} and $PM_{2.5}$ emissions are provided to assess the potential applicability of federal General Conformity requirements under 40 CFR 93, Subpart B.

Emissions from construction would originate from exhaust from heavy equipment, including trucks, backhoes, cranes, etc., and fugitive dust emissions from construction equipment and ground-disturbing activities in unpaved, undeveloped areas.

Construction of the proposed Project would result in the temporary disturbance of approximately 83 to 105 acres of ROW for the transmission line, approximately 11 acres for the Gateway Substation, approximately 2.4 to 6.2 acres of upgraded (Access Type C) and approximately 4 to 5 acres of new (Access Types D and E) access roads. As temporary use areas (such as tensioning and pulling sites) would occur within the ROW (with the exception of the staging and construction yard that would occur on previously disturbed land); the total potential area for disturbance that would include the ROW, upgraded or new-build access roads, and the Gateway Substation would range from 98 to 121 acres, depending upon the alternative. Within the context of the analysis area of Santa Cruz County, temporarily disturbing 123 acres of nearly 800,000 acres would not be expected to result in significant impacts to air quality from fugitive dust emissions.

Assuming construction would take place over a 6-month period, the estimated emissions of PM_{10}, and $PM_{2.5}$ for all action alternatives is estimated as shown in Table 4.11-1. For a discussion of construction timeframes, see Section 2.4.2.[29]

Table 4.11-1. Estimated PM, PM_{10}, and $PM_{2.5}$ Emissions

Particle Size	Size Multiplier	Emissions Factor (tons/acre/month)	Distribution Area (acres/month)	Emissions (tons/month)	Emissions (tons/year)
PM	1	1.2	16.3 – 20.5	19.56 – 24.60	117.36 – 147.60
PM_{10}	0.306	0.367	16.3 – 20.5	5.98 – 7.52	35.89 – 45.14
$PM_{2.5}$	0.031	0.037	16.3 – 20.5	0.60 – 0.76	3.61 – 4.55

Source: EPA (2016c).

For purposes of General Conformity rules (40 CFR 93, Subpart B), it is necessary to assess emission quantities of PM (PM_{10} and $PM_{2.5}$) to compare them to the General Conformity applicability emissions thresholds of 40 CFR 93, Subpart B, 93.153 applicability. For direct emissions of both PM_{10} and $PM_{2.5}$, the applicability threshold is 100 tons per year. For $PM_{2.5}$ emissions, there are also General Conformity thresholds for indirect or precursor pollutants, including SO_2 and NO_2, which are set at 100 tons/year. Because only small amounts of exhaust emissions of these precursor pollutants would occur during the construction phase, this assessment focuses on the potentially greater amounts of fugitive dust (as PM_{10} or $PM_{2.5}$) emissions that could be caused by construction.

Estimated emissions of PM_{10} and $PM_{2.5}$ for construction activities are based on EPA Publication AP-42, (Section 13.2.3 of EPA 2016d), which provides a gross emission factor (uncontrolled) for Heavy Construction Operations of 1.2 tons per acre per month for total PM. To estimate PM_{10} and $PM_{2.5}$, the estimation uses particle size multipliers derived from the "k" coefficients for unpaved roads in EPA Publication AP-42 (EPA 2016d: see Section 13.2.2, Table 13.2.2-2 of that publication).

The total emissions of PM_{10} and of $PM_{2.5}$ would be below the applicable General Conformity de minimis threshold of 100 tons per year for each particle size. Therefore, General Conformity requirements do not apply to the proposed Project. Furthermore, recommended dust control measures are expected to reduce emissions of fugitive dust by 50% or more, thus keeping emissions even lower than the uncontrolled values estimated in Table 4.11-1 above.

Operation of the proposed transmission system would not be expected to result in any additional electric generation-related emissions in the air quality of Santa Cruz County. Vehicular travel during operation and maintenance is anticipated to be minimal and not cause measurable impacts to air quality. The proposed Gateway Substation would generate additional operational emissions of air pollutants from potential SF_6 emissions from circuit breakers within the substation. SF_6 is a compound regulated as a GHG. GHG emissions and impacts are addressed in the section below.

Climate Change

As with general air quality, as described above, implementation of any action alternative could affect GHG emissions, and the assessment is qualitative. GHG emissions from construction activities associated with any action alternative would include combustion exhaust emissions (mainly CO_2) from heavy equipment, including trucks, backhoes, cranes, etc., as well as transport of materials and workers to and from the site. From a life-cycle perspective, GHG emissions would also result from mining and

[29] The 6-month construction period does not include the approximately 4 months for the wiring, testing, and start-up at the proposed Gateway Substation.

production of the raw materials used for the proposed Project construction, including concrete, steel, copper, and aluminum.

Direct emissions of GHGs attributed to operation of any action alternative would result primarily from fuel combustion for maintenance vehicles. Another source of direct GHG emissions would be from any SF_6 lost from circuit breakers expected to be used for the substation. The total SF_6 amount contained in the circuit breakers of the proposed substation is expected to be approximately 900 pounds. Two white papers (Bessede et al. 2006; Blackman et al. 2006) estimated leakage rates for modern circuit breakers manufactured after 2000 at less than 0.5% per year. Assuming 900 pounds of SF_6 in the circuit breakers, approximately 4.5 pounds per year of SF_6 would potentially leak. Multiplying by the GWP factor above, total annual CO_2-equivalent emissions of 102,600 pounds, or 51.3 tons per year is estimated.

As a GHG, SF_6 has a GWP 22,800 times that of CO_2. SF_6 is only released as a fugitive emission if equipment is malfunctioning or during maintenance and repair, and most new equipment requires less SF_6 or none at all (EPA 2015). Emissions of SF_6 would be minimized through the application of applicant proposed measures and proper maintenance of construction equipment and vehicles. The EPA has established the SF_6 Emission Reduction Partnership for Electric Power Systems to identify and continuously improve the BMPs for SF_6 emission reductions (EPA 2015). It is difficult to quantify the impact of this reduction, but it is reasonable to assume that this impact would help Arizona meet current GHG reduction goals. Current goals, under EO 2006-13 issued by Governor Janet Napolitano in 2006, include a reduction in Arizona's GHG emissions to 2000 levels by 2020 and 50% below 2000 levels by 2040. Construction activities for all proposed route segment variations would result in similar short-term direct increases in CO_2, CH_4, and N_2O emissions from the combustion of fossil fuels in equipment and vehicle use during construction activities above. During construction, the clearing of the ROW would require clearing of natural vegetation, releasing some CO_2 into the atmosphere. Construction impacts would be adverse, localized, and short-term.

Additionally, air quality compliance requirements and procedures for operations and maintenance of the site would be monitored (as specified by the Erosion, Dust Control, and Air Quality Management Plan). Operational activities would be considerably less on an annual basis than the construction activities.

4.11.3 Applicant Proposed Measures

When the following applicant proposed measures are incorporated into the construction, operation, and maintenance of the proposed Project, impacts to air quality would be minimized.

- Fugitive dust emissions at the staging areas would be minimized by application of water sprays or other best practices for control measures, as required by applicable ADEQ permits required for construction.
- Fugitive dust emissions from construction or use of access roads would be mitigated by application of water sprays or other control measures, as appropriate.
- Dust control during maintenance of the transmission line would be managed the same as during construction.
- Minimize equipment idling.

The following plans would be developed and implemented: Access Road Plan; Erosion, Dust Control, and Air Quality Management Plan.

4.12 NOISE

4.12.1 Impact Analysis Area and Indicators

The analysis area for impacts to noise is the footprint of each of the action alternatives (as described in Section 4.1.2).

The following indicator was considered when analyzing impacts to noise:

- Disturbance of noise sensitive receptors (includes any residential areas, schools, and day-care facilities, hospitals, long-term-care facilities, places of worship, libraries, parks, and recreational areas specifically known for their solitude and tranquility).

4.12.2 Impact Analysis

4.12.2.1 No Action Alternative

Under the No Action Alternative, DOE would not issue a Presidential permit to the Applicant for the proposed Project; the transmission system would not be authorized to cross the U.S.-Mexico border, the proposed Project would not be constructed in the U.S., and the potential environmental impacts associated with the proposed Project as discussed below would not occur.

4.12.2.2 Action Alternatives

COMMON IMPACTS ACROSS ALL ALTERNATIVES

Short-term impacts would primarily consist of noise from activities related to the construction of the proposed Project, during which time the acoustic environment would be impacted. Construction activities would generate noise produced by heavy construction equipment and trucks. Construction noise levels would be variable and intermittent, as equipment is operated on an as-needed basis and would be shut down when not in use. Construction activities normally would be limited to daytime hours, and thus would not impact existing background noise levels at night.

The potential construction noise impacts would primarily affect the sensitive receptors consisting of residences and commercial areas in the immediate vicinity of the ROW and upgraded (Access Type C) or new access roads (Access Types D and E). The existing background noise in residential and commercial areas is typically 45 dBA or higher. Table 4.12-1 presents the peak noise levels (dBA[30]) expected for a single sound event from various equipment during construction. While relatively high peak noise levels in the range of 80 to 108 dBA would occur, these noise levels would be temporary and intermittent.

A portion of the proposed Project ROW would be directly adjacent to existing residential buildings and land zoned as multifamily residential, which are considered to be sensitive receptors, near the existing Valencia Substation (i.e., the Villa San Simone subdivision). Here, the proposed Project would be constructed within an existing UNSE utility corridor. Impacts from construction activities for this receptor would occur but would be limited to conductor installation. The next sensitive receptor (additional apartments north of the Vila San Simone subdivision, an estimated 500 feet away), would experience

[30] The sound level in decibels as measured on a sound level meter using the A-weighted filter network. The A-weighted filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise.

construction noise levels that may be perceived as striking or very loud, comparable to a lawnmower or a leaf blower. These peak noise levels would be localized and intermittent in nature.

Table 4.12-1. Peak Attenuated Noise Levels (dBA) Expected from Construction Equipment

Source	Peak Noise Level	Distance from Source				
		50 feet	100 feet	200 feet	1,000 feet	2,500 feet
Heavy trucks	95	84–89	78–83	72–77	58–63	50–55
Dump trucks	108	88	82	76	62	54
Concrete mixer	108	85	79	73	59	51
Jackhammer	108	88	82	76	62	54
Scraper	93	80–89	74–82	68–77	54–63	46–55
Bulldozer	107	87–102	81–96	75–90	61–76	53–68
Generator	96	76	70	64	50	42
Crane	104	75–88	69–82	63–76	49–62	41–54
Loader	104	73–86	67–80	61–74	47–60	39–52
Grader	108	88–91	82–85	76–79	62–65	54–57
Pile driver	105	95	89	83	69	61
Forklift	100	95	89	83	69	61

Source: Golden et al. (1980).

Note: Attenuation with distance is dependent upon the frequency of the sound, and thus varies as shown for varying frequencies.

It is expected that permanent impacts to background noise levels would occur from the addition of noise from operation of the transmission system; therefore, the dBA level of background noise in the analysis area would be expected to increase.

Long-term proposed Project-related noise sources would include corona noise from the transmission lines. Corona noise usually results from the action of the electric field at the surface of the line conductor and is sometimes audible as a characteristic crackling, frying, or hissing sound or hum, especially in wet or humid weather. Since the noise level depends on the strength of the line's electric field, the potential for perception around an overhead line can be assessed from estimates of the field strengths expected during operation. The typical sound level of a 500-kV transmission line at the source is approximately 49 dBA (during wet or humid conditions), just below that of moderate rainfall on foliage (50 dBA) and above that of a refrigerator (40 dBA) (DOE 1986, 1996). Overhead lines of 345 kV or greater are more likely to produce audible corona noise than those of lower voltages. The conditions that have the potential to cause audible corona noise are expected to occur rarely, given the geographic location in a dry, desert-like climate. Corona noise would be minimized by selecting properly sized conductors.

While there are no noise codes applicable to transmission lines in Arizona, the City of Nogales' noise ordinances are used for comparative purposes. This EA assumes that the City of Nogales noise ordinance is applicable to the substation (see Table 3.12-1 for the City of Nogales noise ordinance dBA limits). Nighttime noise limits in the City of Nogales range from 50 dBA for a hospital setting to 70 dBA in an industrial area. Audible noise would decrease with distance away from the proposed Project. As corona noise from transmission lines is often lost in the background noise at locations beyond the edge of the ROW, corona noise would not be anticipated to exceed these limits. Though the impact analysis area would slightly overlap the closest sensitive receptor—Villa San Simone—no disturbance would occur within the multifamily residential complex, and it would not be used for access, as described in Section 4.6. The ROW for this portion of the proposed Project utilizes an existing UNSE transmission line

corridor. As the proposed Project includes 138- and 230-kV lines, audible corona noise would not be expected to be greater than that of background noise at the edge of the ROW, and effects on sensitive receptors from transmission line noise would not be anticipated.

The primary noise sources at the proposed Gateway Substation include converter transformers, air-cooled liquid cooling towers that include fans, and valve enclosures that house water-cooled thyristors. Operating noise results from vibrations associated with magnetic forces inside substation transformers and cooling fans and pumps that control transformer temperature. Transformer noise is expected to occur continuously while the transformers are in use. National Electrical Manufacturers Association standards for decibels of sound created by transformers between 151 and 300 kilovolt-amperes (kVA) are 55 to 58 decibels, though the size, location, and placement of the transformer affects the sound levels produced while in use. The maximum noise level at the Gateway Substation fence line would be 65 dBA.

The Gateway Substation site and the surrounding land are zoned light industrial. Maximum allowable noise at that distance (and location) is 85 dBA and 70 dBA during daytime and nighttime, respectively (see Table 3.12-1). The nearest residential areas are the Mariposa Manor Mobile Home Park, located approximately 2,700 feet east of the Gateway Substation; the Loma Mariposa Apartments I and II, located approximately 2,000 feet northeast of the Gateway Substation; and a private residence, located approximately 0.5 mile southwest of the Gateway Substation. Other residential areas include the Santa Rita Apartments, and Villa Paraiso Apartments, all located south of SR 189; and the Santa Carolina Apartments, located approximately 3,500 feet northeast of the Gateway Substation. Maximum allowable noise at that distance (and location) is 65 dBA and 55 dBA during daytime and nighttime, respectively (see Table 3.12-1). It is anticipated that Gateway Substation operational noise would be near background levels for sensitive receptors, as the nearest sensitive receptor is located 2,000 feet away from the substation, and noise decreases in dBA with distance. As the location of the proposed Gateway Substation would be the same across all action alternatives, it is expected that impacts from the proposed Project component would remain consistent across all alternatives.

Noise impacts from vehicles used for operation and maintenance travelling along proposed Project access roads are would occur at infrequent intervals, would be short-term in duration, and are not anticipated to exceed the limits set by the City of Nogales noise ordinance, nor contribute to an increase in background noise levels.

4.12.3 Applicant Proposed Measures

When the following Applicant proposed measure would be incorporated into the construction, operation, and maintenance of the proposed Project, impacts to noise would be minimized.

- Minimize noise impacts by designing substation equipment for a maximum noise level of 75 dBA at 3 meters away and 65 dBA at the fence line.

4.13 INFRASTRUCTURE

4.13.1 Impact Analysis Area and Indicators

The analysis area for impacts to infrastructure is the footprint of each of the action alternatives (as described in Section 4.1.2). The analysis area for indirect impacts is 1-mile buffer either side of the centerline of the alternatives.

The following indicators were considered when analyzing impacts to infrastructure:

- Transportation and Traffic
  - Qualitative discussion of any potential increase in the volume of traffic on access roads and major roadways.
  - The number of railroads that are within the analysis area for the proposed Project.
  - The number of existing and planned airports that are within the analysis areas for the proposed Project.
- Utilities: disruption of service for municipal utilities, utility corridors, and/or radio, television, or cellular communications.
- Stormwater Management: destruction of stormwater management infrastructure.
- Emergency Services: disruption of service for hospitals, fire stations, or police stations.

4.13.2 Impact Analysis

4.13.2.1 No Action Alternative

Under the No Action Alternative, DOE would not issue a Presidential permit to the Applicant for the proposed Project; the transmission system would not be authorized to cross the U.S.-Mexico border, the proposed Project would not be constructed in the U.S., and the potential environmental impacts associated with the proposed Project as discussed below would not occur.

4.13.2.2 Action Alternatives

COMMON IMPACTS ACROSS ALL ALTERNATIVES

Following is a discussion of those impacts that are common to all of the action alternatives. Discernible differences are discussed by alternative in the sections that follow this one.

The impact analysis area would not intersect with any freight, passenger, or commercial railroads. The nearest railroad is located approximately 175 feet east of the existing Valencia Substation. The nearest road crossing of this railroad is approximately 1,500 feet north of the impact analysis area.

In addition, due to the distance of the impact analysis area from the nearest airports, there would be no impact from any of the action alternatives to any existing or planned airports. The nearest airport is over 6 miles from the impact analysis area, as illustrated by Figure 3.13-1. The CBP heliport at the Nogales Border Patrol Station is east of Route Segment Variation 10. The Applicant has chosen to use two parallel pole structures for Route Segment Variation 10 for Alternative 3. CBP has indicated that construction and operation activities for Route Segment Variation 10 (which is part of Alternatives 1 and 3) would permanently impact all helicopter traffic approaching from the western side of the Nogales Border Patrol Station Area of Operation and require rerouting of all incoming helicopter traffic from the west to avoid collision with the proposed transmission line. All future take-offs to the west would likely be precluded due to the short distance between the heliport and the proposed transmission lines. CBP has indicated that this permanent impact would not be significant in terms of CBP mission and operational costs.

However, the safety risks to CBP pilots and helicopters would increase. The Applicant would not be required to notify the Federal Aviation Administration (FAA) of its intent to construct transmission facilities in navigable airspace. The proposed towers would be 75–110 feet tall, and the FAA threshold for 14 CFR Part 77, Objects Affecting Navigable Airspace is 200 feet. In most cases, wires and their

supporting structures fall into the discretionary category of structures less than 200 feet above ground level. Therefore, it is anticipated that the FAA would not conduct an aeronautical study.

Proposed construction of the transmission line would require temporary lane closures, road detours, and the presence of construction work areas and equipment. Short-term effects on transportation and traffic would occur during construction of any of the action alternatives. Given the presence of the additional construction-related traffic in the commercial and light industrial areas of the City of Nogales, heavier-than-usual traffic and short delays may be experienced. The temporary traffic effects would occur on the four local, minor roads (i.e., West White Park Drive, North Mastick Way, West La Quinta Road, and North Industrial Park Avenue). The temporary traffic effects would also occur primarily on two of the major roads: Grand Avenue and SR 189. Effects on traffic are anticipated to be greatest along SR 189, because this roadway is a primary access route to most of the proposed Project site. However, given the large light industrial presence and existing high volume of truck traffic along SR 189, there would not be noticeable additional effects from construction traffic. Encroachment permits from ADOT are required for transmission lines crossing SR 189 and I-19, and utility permits may be needed to cross city roads and streets. A Traffic and Transportation Management Plan would be developed and implemented in coordination with local authorities. An Emergency Preparedness and Response Plan would also be developed and implemented.

Most of the effects would result from construction crews, equipment, and haul trucks using the roadways to access the proposed Project, where new access roads are constructed (as opposed to existing or upgraded access roads). In locations where the access roads would intersect with existing paved roads, steel or gravel pads (track-outs) would be installed to prevent soils on construction equipment from collecting on the paved roadway. The upgraded and new access roads would be located primarily in undeveloped parcels where existing roads are not available for operation and maintenance of the proposed Project. Access roads associated with the proposed Project are discussed in more detail by alternative below. Effects from the proposed construction of any of the action alternatives would be temporary and transitory, lasting only about 3 to 7 days at any one location and moving as installation progresses along the impact analysis area. More than one work area may be open at a time if simultaneous crews are used. Construction is anticipated to occur during daytime hours, unless otherwise requested. Short-term, temporary traffic delays resulting from stringing lines across I-19 and SR 189 may occur but would occur only once at each location. The proposed location to span I-19 would be the same for all action alternatives. Between the action alternatives, there would be two locations to span SR 189, which is discussed below within each Alternative analysis. The method of stringing lines across the roadways has yet to be determined, but an encroachment permit application would be required through coordination with ADOT.

Vehicles and equipment that would be used for construction of transmission lines (e.g., overhead line cranes, concrete trucks, construction equipment, and material delivery trucks) generally are heavier than lighter passenger vehicles and may cause more damage to road surfaces. Oversized/overweight load permits must be obtained from ADOT and the City of Nogales when size and/or weight limits would be exceeded. Any temporary road closures would be coordinated with the City of Nogales and/or ADOT. The temporary road closures would be short in duration—namely, enough time for heavy equipment and supply trucks to cross intersections or travel down a street (i.e., only a few minutes). Access to private driveways would be maintained at all times.

Maintenance and operation of any of the action alternatives would not affect transportation and traffic. The transmission line portion of the proposed Project would be designed to require minimal maintenance, regardless of the alternative that would be implemented. Additionally, maintenance activities at the proposed new Gateway Substation would be confined to the station site and would therefore not affect existing access roads or major roadways.

Emergency repairs would affect traffic and transportation similarly to the initial construction; however, activity associated with emergency repairs is likely to be brief and less extensive than initial construction. An Emergency Preparedness and Response Plan would identify procedures necessary to perform maintenance and emergency repairs.

On the western portion of the impact analysis area (adjacent to the CNF), following construction activities, the presence of new access roads could contribute to illegal off-highway-vehicle use and create an opportunity for user-created trail proliferation. An increase in user-created trails would conflict with the CNF's travel management plan, creating management challenges and potentially increasing user conflicts. The resultant impact from increased off-highway vehicle use would minimally impact recreation opportunities/activities. Applicant proposed measures would include locked gates and signage indicating the designated use of the access roads. Also, illegal and/or unauthorized use of access roads would be enforceable by law enforcement. It should be noted that authorized use (by vehicular or other means) of the access roads may only be permitted on privately owned lands with the permission of the landowner.

Construction of the proposed Project would result in changes to the existing utility infrastructure, which currently includes the 138-kV UNSE Vail to Valencia line. A portion of the proposed Project would be located in an existing UNSE utility corridor near the existing Valencia Substation, as previously discussed.

Additionally, the ROW would also be located on land under which portions of several underground natural gas pipelines are located. Construction activities for the proposed Project could disrupt service to these lines in the event of an accident. Underground utilities would be identified and located in cooperation with local utility companies to minimize conflicts with existing utilities, and the development of a Health and Safety Plan and Emergency Preparedness and Response Plan would mitigate the potential for an accident. Therefore, no impacts to existing electric or gas infrastructure are anticipated from construction activities.

One groundwater well occurs within the ROW, but because of the depths of the aquifer and associated wells, no impacts from construction operations, and maintenance are anticipated to water quality (see Section 4.5). Therefore, no impacts to water supply systems are anticipated from construction, maintenance, or operations of the proposed Project. Construction activities would generate solid waste, such as excavated soil, brush, slash, and stumps. If contaminated excavated soils were discovered, they would be disposed of at an approved landfill facility. Operation, maintenance, and repairs are anticipated to produce very small amounts of solid waste over the life of the proposed Project, the amounts of which not expected to affect solid waste management infrastructure. No adverse impacts to solid waste management infrastructure are anticipated. Therefore, no additional impacts to existing utility infrastructure would be expected from implementation of the proposed Project.

Stormwater management infrastructure could be affected during construction activities where the proposed Project would cross existing stormwater inlets or pipes, primarily along portions of the ROW that are developed. Features that would not be able to be avoided would be restored to previous conditions after construction has been completed. A Stormwater Pollution Prevention Plan would be developed and implemented. No permanent impacts are anticipated.

No communication towers occur in the proposed Project ROW; therefore, construction would not directly affect any communication towers. Indirect impacts may occur during operation and maintenance.

No indirect impacts on omnidirectional communications are anticipated, as the transmission line hardware would be designed and maintained to minimize gap and corona discharges. Radio frequency noise is

generally not an issue for cellular phones, because it is nearly non-existent in their frequency range, and the technology is superior to that of two-way mobile radio units.

Interference from transmission line corona discharges associated with the proposed Project could occur for an amplitude modulation (AM) radio station within its primary coverage area. That situation is unlikely, however, because AM radio frequency interference typically occurs immediately under a transmission line and dissipates rapidly with increasing distance from the line.

Frequency modulation (FM) radio receivers usually do not pick up interference from transmission lines, because corona-generated radio frequency noise currents decrease in magnitude with increasing frequency and are quite small in the FM broadcast band (88–108 Megahertz).The interference rejection properties inherent in FM radio systems make them virtually immune to amplitude type disturbances.

Television reception could be impacted by the structures or transmission line conductors, as they may cause a shadowing effect that could cause reception interferences. Although this occurrence is rare, a transmission structure or the conductor can create a shadow on adjoining properties that can obstruct or reduce the transmitted signal. Structures may cause a reflection or scattering of the signal. Reflected signals from a structure result in the original signal breaking into two or more signals. Due to the large spaces between individual structures, the proposed Project's structures would not create one large obstacle, and broadcast signals would travel between the structures, minimizing the likelihood of shadowing and reflection effects.

In addition, corona-generated radio frequency noise and transmission line structure placement could cause interference with television broadcast signals. Because digital reception is, in most cases, considerably more tolerant of noise and somewhat less resistant to multipath reflections (i.e., reflections from structures) than analog broadcasts, interference would not be anticipated. However, if the noise level or reflections are great enough, they would impact digital television reception. Due to the higher frequencies of television broadcast signals (i.e., 54 Megahertz and above), a transmission line seldom causes reception problems within a station's primary coverage area. Usually, any reception problem can be corrected with the addition of an outside antenna.

Existing hospitals, fire stations, and police stations are located outside the proposed Project ROW, and therefore operation of these facilities would not be affected by construction, maintenance, or operations. Applicant proposed measures, including the development of a Health and Safety Plan and an Emergency Preparedness and Response Plan, would minimize the potential for an accident during construction, maintenance, and operations. The Applicant would respond to emergency situations (e.g., ambulance, police, or firetruck use) in coordination with the local authorities, as outlined in the Emergency Preparedness and Response Plan. Therefore, the proposed Project would not be anticipated to stress existing emergency infrastructure. No additional impacts to emergency services would be expected from implementation of the proposed Project.

ALTERNATIVE 1

Alternative 1 would span I-19 approximately 0.4 mile south of the SR 189/I-19 interchange. Alternative 1 would span SR 189 approximately 330 feet south of West La Quinta Road. At the SR 189 (Mariposa Road) span location, the impact analysis area follows an existing distribution line.

Table 4.13-1 describes the mileage and estimated total disturbance of all access roads for Alternative 1 associated with the proposed Project, including estimated acres of disturbance within the ROW.

Table 4.13-1. Alternative 1 Access Roads

	Access Type A-Existing Private Dirt Roads	Access Type B-Existing Public Paved Roads	Access Type C-Upgraded Existing Roads *	Access Type D-New Dirt Roads	Access Type E-Spur Roads	Total
Length (miles)	3.08	0.24	3.22	2.27	0.49	**9.30**
Disturbance (acres)	0.00	0.00	6.25	4.40	0.71	**11.36**

* Access Type C includes estimated disturbance of the entire existing road surface and upgrade-associated disturbance.

Access Type C would be the longest stretch of access roads under Alternative 1, at 3.22 miles. The next longest, Access Type A at 3.08 miles, would be existing private dirt roads, thus the impact would be reduced, because no new construction or upgrades would be required for Access Type A.

ALTERNATIVE 2

Alternative 2 would also span I-19 approximately 0.4 mile south of the SR 189/I-19 interchange. Alternative 2 would span SR 189 in two locations, because the alignment would enter and exit the proposed Gateway Substation in different locations. Alternative 2 would span SR 189 at the intersection of West Industrial Park Drive. Alternative 2 would also span SR 189 approximately 330 feet south of West La Quinta Road; this span would be located approximately 1,500 feet south of the first SR 189 spanning location.

Table 4.13-2 describes the mileage and estimated total disturbance of all access roads for Alternative 2 associated with the proposed Project, including estimated acres of disturbance within the ROW.

Table 4.13-2. Alternative 2 Access Roads

	Access Type A-Existing Private Dirt Roads	Access Type B-Existing Public Paved Roads	Access Type C-Upgraded Existing Roads*	Access Type D-New Dirt Roads	Access Type E-Spur Roads	Total
Length (miles)	1.57	0.86	1.60	2.00	0.38	**6.41**
Disturbance (acres)	0.00	0.00	3.10	3.87	0.56	**7.53**

* Access Type C includes estimated disturbance of the entire existing road surface and upgrade-associated disturbance.

Access Type D would be the longest stretch of access roads under Alternative 2, at 2 miles. The next longest, Access Type C at 1.6 miles, would be existing private dirt roads. Access Types D and C require upgrades and new construction, respectively.

ALTERNATIVE 3

Alternative 3 would also span I-19 approximately 0.4 mile south of the SR 189/I-19 interchange. Alternative 3 would span SR 189 approximately 330 feet south of West La Quinta Road. At the SR 189 span location, the impact analysis area follows an existing electric distribution line.

Table 4.13-3 describes the mileage and estimated total disturbance of all access roads for Alternative 3 associated with the proposed Project, including estimated acres of disturbance within the ROW.

Table 4.13-3. Alternative 3 Access Roads

	Access Type A-Existing Private Dirt Roads	Access Type B-Existing Public Paved Roads	Access Type C-Upgraded Existing Roads*	Access Type D-New Dirt Roads	Access Type E-Spur Roads	Total
Length (miles)	2.23	0.76	2.60	1.97	0.26	**7.82**
Disturbance (acres)	0.00	0.00	5.03	3.81	0.37	**9.21**

* Access Type C includes estimated disturbance of the entire existing road surface and upgrade-associated disturbance.

Access Type C would be the longest stretch of access roads under Alternative 3, at 2.60 miles. The next longest, Access Type A at 2.23 miles, would be existing private dirt roads.

ALTERNATIVE 4

Alternative 4 would also span I-19 at an area where there is an existing transmission line crossing, approximately 0.4 mile south of the SR 189/I-19 interchange. Alternative 4 would span SR 189 approximately 330 feet south of West La Quinta Road. At the SR 189 span location, the impact analysis area follows an existing electric distribution line.

Table 4.13-4 describes the mileage and estimated total disturbance of all access roads for Alternative 4 associated with the proposed Project, including estimated acres of disturbance within the ROW.

Table 4.13-4. Alternative 4 Access Roads

	Access Type A-Existing Private Dirt Roads	Access Type B-Existing Public Paved Roads	Access Type C-Upgraded Existing Roads*	Access Type D-New Dirt Roads	Access Type E-Spur Roads	Total
Miles	1.60	1.15	1.26	2.04	0.26	**6.31**
Acres disturbance	0.00	0.00	2.44	3.88	0.43	**6.75**

* Access Type C includes estimated disturbance of the entire existing road surface and upgrade-associated disturbance.

Access Type D would be the longest stretch of access roads under Alternative 4, at 2.04 miles. The next longest, Access Type A at 1.60 miles, would be all existing private dirt roads.

4.13.3 Applicant Proposed Measures

When the following applicant proposed measures are incorporated into the construction, operation, and maintenance of the proposed Project, impacts to infrastructure would be minimized.

- Coordinate with utility providers to determine the exact locations of utilities and minimize service disruptions to other utility lines.

The following plans would be developed and implemented: A Traffic and Transportation Management Plan; Access Road Plan; Helicopter Flight and Safety Plan.

4.14 HUMAN HEALTH AND SAFETY

4.14.1 Impact Analysis Area and Indicators

The analysis area for impacts to human health and safety is a 1,000-foot buffer of the centerline of the action alternatives.

The following indicators were considered when analyzing impacts to human health and safety:

- Potential for contamination of soils and groundwater within the ROW.
- Potential impacts from electromagnetic fields and corona.

4.14.2 Impact Analysis

4.14.2.1 No Action Alternative

Under the No Action Alternative, DOE would not issue a Presidential permit to the Applicant for the proposed Project; the transmission system would not be authorized to cross the U.S.-Mexico border, the proposed Project would not be constructed in the U.S., and the potential environmental impacts associated with the proposed Project as discussed below would not occur.

4.14.2.2 Action Alternatives

COMMON IMPACTS ACROSS ALL ALTERNATIVES

Following is a discussion of those impacts that are common to all of the action alternatives. There are no differences affecting public health and safety between each alternative, therefore impacts by alternative are not presented.

Soil Contamination and Groundwater

The transmission lines do not contain hazardous fluids. Therefore, no soil or groundwater contamination would be anticipated from these elements of the proposed Project. The fuel tanks of construction, operation, and maintenance equipment (e.g., dump trucks, graders, backhoe) are not anticipated to crack or leak and release fuel into the soil or water. Circuit breakers at the proposed substation would include SF_6 (as discussed in Section 4.11), leaks would not be anticipated. However, standard engineering controls would be in place to reduce the likelihood of exposure and release into soil and water. Implementation of applicant proposed measures would minimize the potential for the public or workers to be exposed to any contaminants during construction.

While considered unlikely, it is possible that areas of contamination would be encountered during construction, such as from the two CERCLIS sites or LUSTs within the analysis area (see Tables 3.14-1 and 3.14-2). If suspected contamination is encountered during construction (as indicated by field observation or odor), project work would cease at the subject location until the potential contamination is sampled and characterized and a management strategy is developed.

If contamination is discovered in excess soils after-the-fact, the rejected soils would be redirected to an appropriate disposal facility based on the type of contamination discovered. Furthermore, the soils in the proposed Project area where the unanticipated contaminated soil originated would be sampled,

characterized, and the boundaries of any contamination would be delineated prior to commencing any off-site transport and disposal activities along the affected portion of the ROW.

Based on the analysis area, groundwater within the proposed Project ROWs does not contain any contaminants above the applicable state thresholds. As a result, when encountered during construction, groundwater can be pumped from the excavation and placed in a settling (fractionization, or "frac") tank or basin, filtered, and discharged back to the ground.

Contractors would conduct such activities pursuant to the ADEQ Construction General Permit and a SWPPP for the discharge of stormwater and dewatering wastewaters from construction activities (Permit No. AZG2013-001). If discharge back to the ground would not be desirable, the dewatering waters could be discharged directly into municipal stormwater catch basins as long as the discharge meets the permit conditions and if municipal stormwater sewers are located in the vicinity. Residual silt/sediment collected at the bottom of any fractionization tanks would be disposed of off-site at an appropriately designated disposal facility or spread back on the ground surface in the vicinity from which it was generated.

EMF and Corona Effect

The proposed transmission lines would not be powered during construction; therefore, they would pose no exposure to EMFs for contractors or the public. Additionally, no short-term impacts from corona effects are anticipated, as the transmission lines would not be active during construction.

Decades of scientific studies are inconclusive regarding whether magnetic fields can potentially cause health effects. Scientific studies and reviews of research on the potential health effects of power line EMFs have found that there is insufficient evidence to conclude that exposure to either field leads to long-term health effects, such as adult cancer, neurodegenerative diseases (such as Alzheimer's or Lou Gehrig's disease), or deleterious effects on reproduction, pregnancy, or growth and development of an embryo. While some studies have suggested a link, the bulk of the scientific literature on the subject of electric and magnetic fields fails to conclude that exposure is a health threat. Additionally, no effects extend beyond the transmission line ROW.

Corona discharges are a potential issue with all transmission lines. The energy loss from corona discharges is minimized through the design process by selecting conductors properly sized for the operating voltage of the line.

The proposed Project, therefore, is not expected to cause adverse health effects related to EMFs or corona.

4.14.3 Applicant Proposed Measures

When the following applicant proposed measures are incorporated into the construction, operation, and maintenance of the proposed Project, impacts to human health and safety would be minimized.

- Corona discharges (and associated audible noise, radio noise, light, heat, and small amounts of ozone) would be minimized in the design process by selecting conductors appropriately sized for the operating voltage of the line and in accordance with Federal Energy Regulatory Commission standards.
- Local seismic risk would be considered in the design of the transmission line infrastructure.
- Structures and poles would be designed so that climbing or scaling by hand would not be possible.

The following plans would be developed and implemented: Emergency Preparedness and Response Plan; Hazardous Materials Management Plan; Health and Safety Plan; Fire Protection Plan; Helicopter Flight and Safety Plan; Traffic and Transportation Management Plan.

In summary, based on available data, no impacts to human health and safety are anticipated from the action alternatives. As such, no further discussion of this topic is included in the cumulative effects analysis.

4.15 HAZARDOUS MATERIALS AND WASTE

4.15.1 Impact Analysis Area and Indicators

The analysis area for impacts hazardous materials and wastes is the footprint of each of the action alternatives (as described in Section 4.1.2).

The following indicators were considered when analyzing impacts to hazardous materials and wastes:

- The presence of known hazardous materials sites within the analysis area and the type, nature, status, and proximity of those sites to the proposed Project.
- The presence, transportation, storage, use, and disposal of hazardous materials during construction and operation/maintenance of the proposed Project.

4.15.2 Impact Analysis

4.15.2.1 No Action Alternative

Under the No Action Alternative, DOE would not issue a Presidential permit to the Applicant for the proposed Project; the transmission system would not be authorized to cross the U.S.-Mexico border, the proposed Project would not be constructed in the U.S., and the potential environmental impacts associated with the proposed Project as discussed below would not occur.

4.15.2.2 Action Alternatives

COMMON IMPACTS ACROSS ALL ALTERNATIVES

As the setting of the action alternatives is relatively homogeneous, many of the impacts to hazardous wastes and materials are common to all of the action alternatives, as discussed below. A search of the publicly available data did not identify any hazardous materials sites, LUSTs, or any other potential concerns related to hazardous materials within the impact analysis area for all action alternatives. Therefore, there were no discernible differences between alternatives to discuss. All impacts to hazardous materials and wastes are common to all of the action alternatives.

While considered unlikely, it is possible that areas of contamination would be encountered during construction, such as from the two CERCLIS sites or LUSTs within the analysis area. If suspected contamination is encountered during construction (as indicated by field observation or odor), project work would cease at the subject location until the potential contamination is sampled and characterized and a management strategy is developed.

If contamination is discovered in excess soils after-the-fact, the rejected soils would be redirected to an appropriate disposal facility based on the type of contamination discovered. Furthermore, the soils in the proposed Project area where the unanticipated contaminated soil originated would be sampled, characterized, and the boundaries of any contamination would be delineated prior to commencing any off-site transport and disposal activities along the affected portion of the ROW.

Construction equipment would require small amounts of liquid fuels, solvents, oils, lubricants, and hydraulic fluids for operation. Spill response procedures and clean-up equipment would be available to construction crews. An SPCC, SWPPP, Hazardous Material Management Plan, and Waste Management Plan would be developed and implemented.

Construction equipment would be inspected frequently to ensure hydraulic systems and oil pans are in good condition and free of leaks. Portable spill containment materials would be required for each piece of construction equipment with the potential to discharge a significant amount of oil into the environment. Operators would be present at the nozzle at all times when refueling. In the event of a spill, the source of the spill would be identified and contained as quickly and safely as possible upon discovery.

The spill and contaminated soils would be managed in accordance with all applicable federal, state, and local requirements. An emergency response contractor would be secured, if necessary, to further contain and clean up a severe spill. Applicants, contractors, and operators would adhere to the hazardous materials–related laws, ordinances, regulations, and standards.

Additionally, the proposed new Gateway Substation has the potential to generate small amounts of oil, wastewater, or other hazardous wastes during operation. Oils or hazardous waste would be managed and disposed of according to applicable regulations. Non-hazardous wastewater generated at the proposed Gateway Substation would be disposed of at an approved site.

With adherence to laws, ordinances, regulations, and standards and the implementation of applicant proposed measures, no unavoidable adverse impacts are anticipated from pre-existing hazardous materials or the use of hazardous materials under any of the action alternatives. In summary, with the implementation of applicant proposed measures, no impacts from hazardous materials are anticipated from the action alternatives. As such, no further discussion of this topic is included in the cumulative effects analysis.

4.15.3 Applicant Proposed Measures

When the following applicant proposed measures are incorporated into the construction, operation, and maintenance of the proposed Project, impacts to hazardous materials and wastes would be minimized.

- Concrete truck wash water would be discharged only in specially designated disposal areas or at the concrete batch plant.
- Portable spill containment materials would be required for each piece of construction equipment with the potential to discharge a significant amount of oil into the environment. Operators would be present at the nozzle at all times when refueling. In the event of a spill, the source of the spill would be identified and contained as quickly and safely as possible upon discovery. The spill and contaminated soils would be managed in accordance with all applicable federal, state, and local requirements. An emergency response contractor would be secured, if necessary, to further contain and clean up a severe spill.

The following plans would be developed and implemented: Hazardous Materials Management Plan; Health and Safety Plan; SPCC Plan; SWPPP; Waste Management Plan.

4.16 CUMULATIVE IMPACTS

4.16.1 Introduction

Cumulative impacts are defined in 40 CFR 1508.7 as the "incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time."

4.16.2 Cumulative Impacts Analysis Area

Both spatial and temporal factors within the environment affect the potential for cumulative impacts. Spatial boundaries for the cumulative impacts analysis area include the analysis areas established for each resource in Section 3.1.2, Analysis Area (for the affected environment). Temporal boundaries include the proposed Project construction period, estimated to start in late 2017, through the end of the Project's expected operational lifespan, which is assumed to be 50 years.

4.16.3 Actions Considered for Potential Cumulative Impacts

Past and present actions are those actions and their associated impacts that occurred within the analysis area for each resource and have shaped the current affected environment of the proposed Project area, including changes brought about by community settlement, development, and other land uses. For example, past actions include the construction of roads and the establishment of zoning classifications. Past actions and their impacts are part of the existing environment, and are therefore considered to be included in the affected environment as described in Chapter 3.

Reasonably foreseeable future actions are considered when there is an existing decision (e.g., a Record of Decision or an issued permit), a commitment of resources or funding, or a formal proposal (e.g., a permit request). Actions that are highly probable based on known opportunities or trends (e.g., industrial development) are also considered. Speculative future developments (e.g., changes in potential land use planning scenarios) are not considered.

Table 4.16-1 provides a list of present actions and reasonably foreseeable future actions that are considered when analyzing the incremental impact of the proposed Project. The many past developments that form the City of Nogales' existing built environment in the analysis area are evidence of its continuing development into a more urbanized area. This draft EA assumes that the City of Nogales and Santa Cruz County general and comprehensive plans would continue to generally direct the type of development that would occur in the analysis area. Future development within the City is anticipated to occur, regardless of whether or not the proposed Project would be developed. Any actions identified during the public review and comment period, which have not already been analyzed herein (as listed in Table 4.16-1), will be analyzed in the final EA.

4.16.4 Cumulative Impacts Analysis

The cumulative impacts analysis consists of two parts: 1) identification of other present and reasonably foreseeable future actions that are similar in kind and impact as the proposed Project, or would have considerable impact to the environmental resources to which the proposed Project's impacts would cumulatively contribute, and 2) a description of the potential cumulative impacts of those actions.

The following sections describe cumulative impacts from the proposed Project (all action alternatives) and other present actions and/or reasonably foreseeable future actions. Past actions and their impacts are part of the existing environment and are therefore considered to be included in the affected environment as described in Chapter 3. For any resource (or sub-resource) where no direct and indirect effects are anticipated (as discussed in Sections 4.2–4.15), no cumulative impacts would occur. Therefore, these resources are not analyzed in this section. Please note that for historic properties and cultural resources, no specific cumulative impacts have been identified; however, Section 106 consultation is ongoing.

Due to varying types, sizes, and known details of the projects (reasonably foreseeable future actions) listed in Table 4.16-1, the following analysis of cumulative impacts is qualitative. Like the direct and indirect impacts described throughout this chapter, the cumulative impacts are also considered in the context of beneficial or adverse and long-term (permanent) or short-term (temporary).

4.16.4.1 Geology and Soils

The cumulative impacts analysis area for Geology and Soils is a 1-mile buffer of the centerline of the action alternatives. As there are no direct or indirect impacts to geology anticipated, there is no further discussion of cumulative impacts to geology in this section. As discussed in Section 4.2.2, however, there would be potential direct and indirect impacts to soils from the proposed Project. The potential cumulative impacts of the proposed Project, in combination with other reasonably foreseeable future actions, are described in this section.

In terms of soils, past uses in the analysis area have had a direct effect on the soils, as described in Section 3.2 of this EA. Development of, and urbanization within, the City of Nogales has historically impacted soils in the region, specifically in the analysis area. A number of reasonably foreseeable future projects have been identified, which, when combined with the proposed Project, may potentially result in cumulative impacts. Reasonably foreseeable future actions considered for cumulative impacts to soils include: La Loma Grande Industrial Park development and various warehouse and commercial projects in the City of Nogales. See Table 4.16-1 for more information on these projects.

The impacts of past and present development and actions in the analysis area would be very similar to the potential cumulative impacts of reasonably foreseeable future actions, in combination with the direct and indirect impacts from construction, operation, maintenance, and emergency activities associated with the proposed Project (see Section 4.2.2). Cumulative impacts to soils would result from vegetation clearing, grading, and compaction from construction vehicles. These soil disturbances could lead to additional opportunities for soil and water erosion. The timing of the construction of other reasonably foreseeable future actions in the analysis area would influence the extent of the potential cumulative impacts to soils. If all reasonably foreseeable future actions were under construction at the same time as the construction of the proposed Project, there could be some temporary cumulative impacts to soils, as soil disturbances would occur simultaneously in the analysis area. However, more than likely, these construction efforts would be staggered and not occurring simultaneously; therefore, the potential temporary cumulative impacts anticipated during construction would be negligible. Further, with the addition of legally mandated or industry-accepted BMPs, or applicant proposed measures, cumulative impacts to soils would be further minimized.

Potential permanent cumulative impacts during operation and maintenance would likely be localized; the other reasonably foreseeable future actions include industrial, commercial, and residential development, which would likely include paved parking lots and paved access from existing roads. Once those developments are operational, in combination with the proposed Project, there are not likely to be measurable cumulative impacts to soils in the analysis area during operation and maintenance.

In summary, in general both the construction and operation and maintenance phases of the proposed Project, in combination with the construction and operation of other reasonably foreseeable future projects, would result in temporary and permanent cumulative disturbance to, and loss of, soils. However, the overall disturbance acreage would be relatively small and located within an area that is already fairly urbanized and disturbed in terms of soils.

4.16.4.2 Vegetation

The cumulative impacts analysis area for Vegetation is a 1-mile buffer of the centerline of the action alternatives. As with soils described above, past uses have had a direct effect on vegetation in the analysis area, as described in Section 3.3. Development of, and urbanization within, the City of Nogales has transformed the largely native vegetation in the analysis area. Reasonably foreseeable future actions considered for cumulative impacts to vegetation are the same as those considered above for soils: La Loma Grande Industrial Park development, along with various warehouse and commercial projects in the City of Nogales. See Table 4.16-1 for more information on these projects.

Cumulative impacts to vegetation in the Madrean Encinal Woodland, Apacherian-Chihuahuan, and Mesquite Upland Scrub vegetation communities would result from the same soil-disturbing activities described above in Geology and Soils. Special status plant species that may be cumulatively impacted include large-flowered blue star, Santa Cruz beehive cactus, supine bean, and Pima pineapple cactus. Noxious and other invasive exotic weeds present within the cumulative impact analysis area include Lehman's lovegrass, Johnsongrass, buffelgrass, Bermudagrass, and Russian thistle. There are no rare or sensitive vegetation communities identified in the analysis area for the affected environment (see Section 3.3); therefore, no rare or sensitive vegetation communities would be cumulatively impacted.

Cumulative impacts to the general vegetation and special status plants during construction could include loss of vegetation from construction equipment and construction activities such as grading and vegetation removal. As noted above, the timing of the construction of other reasonably foreseeable future actions in the analysis area would influence the extent of the potential cumulative impacts to vegetation. Regardless of timing, cumulative impacts to vegetation resources in the analysis area would be additive and proportional to the amount of ground disturbance for each individual project, which would be determined by the area of construction disturbance, the vegetative associations and special status species present in each of these disturbance areas, and the extent of permanent facilities associated with each project. In addition, the quality of the vegetation of areas adjacent to future development would be cumulatively impacted by surface disturbance, dust, wind dispersal of exotic invasive weed seeds and wildfire, and other off-site intrusions. Soil disturbance, vegetation removal and grading, and the use of, and activity associated with, construction vehicles for the industrial, commercial, and residential development within the City of Nogales could lead to a cumulative increase in the proliferation of invasive and noxious weeds in the analysis area.

As noted above in Geology and Soils, the other reasonably foreseeable future actions include industrial, commercial, and residential development, which will likely include paved parking lots and paved access from existing roads. Once those developments are operational, in combination with the proposed Project, potential cumulative impacts to vegetation during operation and maintenance could lead to further fragmentation of plant communities. Operation and maintenance activities could contribute to the ongoing spread of invasive plant species within areas of project disturbance and into vegetation that is adjacent to the disturbance areas of other reasonably foreseeable future actions.

Table 4.16-1. List of Actions (Present and Reasonably Foreseeable Future) Considered in the Cumulative Impacts Analysis

Project/Action Name	Project Proponent	Project Size	Project/Action Location	Project/Action Description	Anticipated Project/Action Schedule	Sources
Future upgrade of an existing UNSE 138 kV transmission line	UNS Electric, Inc.	138 kV transmission line	Approximately 30 miles north of the proposed Project between the Kantor Substation and Vail Substation	Future upgrade of UNSE existing 138 kV line; increase the wire size during Phase I of the proposed Project and add a second circuit to accommodate the increased capacity requirement during Phase II (the time of which is currently not known) of the proposed Project.	Would coincide with the proposed Project	UNSE. 2016. Nogales Transmission 2016. Personal communication with the Applicant.
La Loma Grande Industrial Park	La Loma Grande (private developer)	215 acres	Located within the city limits of the City of Nogales, 0.15 mile southwest of the proposed Gateway Substation	Light Industrial Zoned land to be subdivided into 5-acre and larger industrial and commercial lots. Intended to provide large lots for produce distributors, manufacturers, logistics, and other light industrial industries.	Ongoing	La Loma Grande. 2016. La Loma Grande Industrial Park: Project Information.
Grazing Permit Reauthorization, Mowry Allotment	USFS Mowry Permittee	~4,000 acres	Located in the western Huachuca Mountains, 22 miles east of the proposed project in Santa Cruz County	USFS proposes to authorize continued livestock grazing on the Mowry Allotment using an adaptive management strategy.	On hold	U.S. Forest Service. 2016a. Mowry Allotment Analysis.
Plan of Operations, Humboldt Exploratory Drilling Project	USFS, Regal Resources, Inc.	Six exploratory holes	Located in the Sierra Vista Ranger District portion of the Patagonia Mountains, 11 miles east of the proposed project	The USFS proposes to approve a Plan of Operations that would authorize the proponent to drill six exploratory holes to obtain evidence of mineralization of copper, molybdenum, and silver. This project was formerly known as Sunnyside.	On hold	U.S. Forest Service. 2016b. Plan of Operations, Humboldt Exploratory Drilling Project.
Grazing Permit Reauthorization, Gardner Allotment	USFS Gardner Permittee	10,271 acres	Gardner Canyon area on the west side of the Santa Rita Mountains, 33 miles northeast of the proposed project in Santa Cruz County	USFS proposes to reauthorize the grazing permit for the Gardner Allotment	On hold	U.S. Forest Service. 2016c. Grazing Permit Reauthorization, Gardner Allotment.

Table 4.16-1. List of Actions (Present and Reasonably Foreseeable Future) Considered in the Cumulative Impacts Analysis (Continued)

Project/Action Name	Project Proponent	Project Size	Project/Action Location	Project/Action Description	Anticipated Project/Action Schedule	Sources
Gardner Brush Control	USFS, Nogales Ranger District, CNF	~250 acres	Gardner Canyon area on the west side of the Santa Rita Mountains, 33 miles northeast of the proposed project in Santa Cruz and Pima Counties	Reduce woody species (juniper) canopy cover up to 25% through physical removal by mechanical means, piling slash, and conducting a prescribed burn to remove slash and sprouts, which will improve forest health by maintaining grasslands.	April 2017	U.S. Forest Service. 2016d. Gardner Brush Control.
Revision of Coronado National Forest Land and Resource Management Plan Environmental Impact Statement	USFS, CNF	~300,000 acres	Portions of Cochise, Graham, Pima, Pinal, Santa Cruz Counties, Arizona, and a portion of Hidalgo County, New Mexico; adjacent to western portion of proposed project	The current Coronado Forest Plan became effective in 1986, and it has been amended. To update its content and direction, the CNF has prepared a Draft Revised Forest Plan that is undergoing NEPA review.	Spring 2017	U.S. Forest Service. 2016e. Coronado National Forest – Forest Plan Revision.
Tubac – West Arivaca Road	ADOT	11 acres	Tubac, Santa Cruz County, Arizona, 25 miles northwest of proposed project	Pavement preservation, which may consist of milling the existing roadway, resurfacing and adding rubberized asphalt to the pavement, drainage basin construction, and median concrete barrier modifications, installation of signing and pavement marking, grading for drainage, concrete curb bridge rail modification, guardrail improvements, glare screen removal, and other related work.	2019	ADOT. 2016a. Arizona Department of Transportation Design List Fiscal Year 2016 – Subject to Change: Revised 6/30/2016.

Table 4.16-1. List of Actions (Present and Reasonably Foreseeable Future) Considered in the Cumulative Impacts Analysis (Continued)

Project/Action Name	Project Proponent	Project Size	Project/Action Location	Project/Action Description	Anticipated Project/Action Schedule	Sources
Milepost 28 – Junction SR 83	ADOT	1 acre	SR 82, Santa Cruz County, Arizona, 29 miles northeast of proposed project	Pavement preservation, which may consist of milling the existing roadway, resurfacing and adding rubberized asphalt to the pavement, drainage basin construction, and median concrete barrier modifications, installation of signing and pavement marking, grading for drainage, concrete curb bridge rail modification, guardrail improvements, glare screen removal, and other related work.	2017	ADOT. 2016b. ADOT FY 2017 Future Construction Projects: Anticipated Advertisement Dates
SR 189 Study: International Border to Grand Avenue	ADOT	3.75 miles	SR 189 between the Mariposa Port of Entry and Grand Avenue; intersected by proposed Project	Develop a long-range plan for future roadway and traffic improvements between the U.S. and Mexico to meet increased travel demand along the route that would result from the expansion of the Mariposa Port of Entry.	2019	ADOT. 2016c. State Route 189 Study: International Border to Grand Avenue Draft Environmental Assessment.
I-11 Corridor – Nogales to Wickenburg, Arizona (Tier 1 Environmental Impact Statement)	ADOT	280 miles	I-19 alignment in Santa Cruz County; intersected by east end of proposed Project	ADOT launched a 3-year environmental study to consider possible routes and select route corridor alternatives to be analyzed in the environmental impact statement.	2019	ADOT. 2016d. Interstate 11 Corridor Tier 1 Environmental Impact Statement, Nogales to Wickenburg.
Airport Runway Protection Zone	Santa Cruz County, Arizona	~10 acres	Nogales International Airport, 6 miles northeast of proposed Project	Acquire land for safety areas at the airport	2017	ADOT. 2016e. Nogales International Airport: Airport Master Plan.

Table 4.16-1. List of Actions (Present and Reasonably Foreseeable Future) Considered in the Cumulative Impacts Analysis (Continued)

Project/Action Name	Project Proponent	Project Size	Project/Action Location	Project/Action Description	Anticipated Project/Action Schedule	Sources
Airport Runway Reconstruction – Apron	Santa Cruz County, Arizona	1.88 acres	Nogales International Airport, 6 miles northeast of proposed Project	Rehabilitation of the airport runway: connect towers, repair helipad, etc.	2017	ADOT. 2016e. Nogales International Airport: Airport Master Plan.
Vegetation Treatments Using Aminopyralid, Fluroxypyr, and Rimsulfuron on Bureau of Land Management Lands in 17 Western States	BLM	~932,000 acres	BLM land in northeast Santa Cruz County, located 30 miles northeast of proposed Project	Three herbicides would be added to the BLM's list of approved active ingredients and integrated into the vegetation management program that was analyzed in an earlier programmatic environmental impact statement released in 2007.	Ongoing	BLM. 2016b. Final Programmatic Environmental Impact Statement.
Airport Runway Installation	Santa Cruz County, Arizona	2 acres	Nogales International Airport, 6 miles northeast of proposed Project	Installation of new runway	2018	ADOT. 2016e. Nogales International Airport: Airport Master Plan.
City of Nogales Planning and Zoning Warehouse Projects	City of Nogales, Arizona	4–6 acres	Northwest corner of SR 189 and Target Range Road, located 0.18 mile south of proposed Project	1 warehouse under construction, 3 warehouses under review	Summer/Fall 2017	City of Nogales. 2016. Personal communication with Frank Dillon, Assistant Public Works Director, City of Nogales.
City of Nogales Planning and Zoning Subdivision Projects	City of Nogales, Arizona	20 total acres	East side of I-19, located 2 miles east of proposed Project	1 subdivision under construction, 1 subdivision under review, 2 upcoming subdivisions	Summer 2017	City of Nogales. 2016. Personal communication with Frank Dillon, Assistant Public Works Director, City of Nogales.
City of Nogales Planning and Zoning Commercial Projects	City of Nogales, Arizona	2 acres	Along Grand Avenue, 1 mile south of proposed Project	3 businesses under construction	Completion in Spring 2017	City of Nogales. 2016. Personal communication with Frank Dillon, Assistant Public Works Director, City of Nogales.

In summary, in general, both the construction and operation and maintenance phases of the proposed Project, in combination with the construction and operation of other reasonably foreseeable future projects, would result in temporary and permanent cumulative impacts in terms of loss of vegetation and added fragmentation of plant communities. However, the vegetation community types that would be impacted are common and geographically widespread. Additionally, the overall disturbance acreage would be relatively small and located within an area that is already fairly urbanized and devoid of native vegetation, except along the western portion of the analysis area near the CNF.

4.16.4.3 Wildlife

The cumulative impacts analysis area for Wildlife is a 1-mile buffer of the centerline of the action alternatives. Historic livestock grazing, proliferation of roadways and developments, electric transmission lines and substations, pipelines, conversion of land for development, and the introduction and spread of non-native plant and wildlife species have affected wildlife resources in the analysis area. In particular, the urbanization of the City of Nogales and the more developed parts of Santa Cruz County has had a direct effect on wildlife in the analysis area, as described in Section 3.4. The cumulative impacts of these past actions include habitat loss, fragmentation, and degradation; a decrease in the numbers and range of some species; increased mortality; decreased reproductive success; and decreased genetic interchange between isolated populations (Theobald et al. 1997).

Reasonably foreseeable future actions considered for cumulative impacts to wildlife are the same as those considered above for soils and vegetation: La Loma Grande Industrial Park development and various warehouse and commercial projects in the City of Nogales. See Table 4.16-1 for more information on these projects.

In general, temporary impacts to wildlife and special status species from construction of the proposed Project, along with reasonably foreseeable future actions, would incrementally alter individual animal behavior and contribute to individual animal displacement, habitat loss, degradation, and fragmentation, as well as a potential for increased mortality for some species. Increased mortality to wildlife species during construction would be greatest for burrowing and non-mobile species; the intensity of this cumulative impact would depend on the timing of construction activities for the proposed project and the other reasonably foreseeable future projects. Additionally, species such as coyotes, skunks, doves, etc., which are habitat generalists and are readily adaptable to human activities, could see beneficial, long-term cumulative impacts. Those species with limited ranges or specialized habitats, such as lesser long-nosed bat, riparian-obligate birds, etc., could experience permanent cumulative impacts that tend to be more adverse.

Permanent cumulative impacts could result from ongoing industrialization and development in the analysis area, leading to more habitat fragmentation. Development, in general, can be a barrier to wildlife movement and genetic interchange. However, while development within the analysis area would likely increase and therefore continue to increase habitat fragmentation within the City of Nogales, the adjacent CNF includes over 1.78 million acres of National Forest System lands and wildlife habitat, which is relatively undeveloped and unfragmented.

In summary, in general both the construction as well as operation and maintenance phases of the proposed Project, in combination with the construction and operation of other reasonably foreseeable future projects, would result in temporary and permanent cumulative impacts to wildlife. However, these impacts would be localized within an area that is already fairly urbanized, except along the west side of the analysis area near the CNF, where wildlife have access to over 1.7 million acres of potential habitat.

4.16.4.4 Water Resources and Quality

The cumulative impacts analysis area for Water Resources and Quality is a 1-mile buffer of the centerline of the action alternatives. As described in Section 3.5, past and present uses of the analysis area have impacted surface water, wetlands, floodplains, groundwater, and water quality. Reasonably foreseeable future actions considered for cumulative impacts to water resources and quality include: grazing on the CNF along the western portion of the analysis area and the La Loma Grande Industrial Park development, along with various warehouse and commercial projects in the City of Nogales. See Table 4.16-1 for more information on these projects.

As no direct or direct impacts to water resources and quality are anticipated from operation and maintenance, there would be no cumulative impacts. As discussed in Section 4.5.2, however, there would be potential direct and indirect impacts to water resources and quality from construction of the proposed Project. The potential cumulative impacts of the proposed Project, in combination with other reasonably foreseeable future actions, are described below.

Like the proposed Project, construction of reasonably foreseeable future actions could result in the increased potential for erosion and runoff into surface waterbodies, sedimentation, changes in stream morphology, and changes in the ability of these streams to support vegetation and wildlife. Cumulative impacts to wetlands could result in changes to wetland banks and ability of the wetlands to support wetland habitat. The timing of the construction of other reasonably foreseeable future actions in the analysis area would influence the extent of the potential cumulative impacts to these resources. However, in general, potential surface water quality impacts would be controlled by implementation of BMPs and Santa Cruz County and City of Nogales requirements to minimize impacts to water quality. In addition, all of the reasonably foreseeable future actions considered for this analysis to water resources are located in urbanized areas, where surface water runoff would likely be handled by the City of Nogales' municipal stormwater system, thereby limiting impacts from both runoff quantity and quality. Even with the application of BMPs and other City and County requirements, there could be small cumulative impacts during construction to downstream waters in the Mariposa Wash watershed if all cumulative actions were to occur at the same time; however, that would be extremely unlikely. Cumulative impacts to groundwater are not anticipated, as no direct or indirect impacts to the aquifer are likely.

As noted in Chapter 3, there are several high risk flood zone areas in the analysis area associated with the Mariposa and Al Harrison washes. Construction of the Project, in combination with the reasonably foreseeable future actions for water resources, could cumulatively impact these high risk flood zone areas; however, these impacts are not anticipated to adversely affect natural and beneficial floodplain values or pose a significant flood zone risk. Additionally, the Project and reasonably foreseeable future actions are not anticipated to impede flows, cause the collection of debris, or cause an increase in flooding in the area. In combination with the application of development requirements for flood-prone areas of Santa Cruz County and the City of Nogales, cumulative impacts to water resources during construction would be localized.

In summary, only the construction phase of the proposed Project, in combination with the construction of other reasonably foreseeable future projects, would result in very minor temporary and permanent cumulative impacts to water resources and quality.

4.16.4.5 Land Use and Recreation

The cumulative impacts analysis area for Land Use and Recreation is Santa Cruz County. Past uses in the analysis area have directly altered land use and recreation opportunities, particularly in the urbanized parts of Santa Cruz County within the City of Nogales. However, the analysis area also includes large

swaths of undeveloped land, much of which is located on lands managed by the USFS for the CNF. Reasonably foreseeable future actions considered for cumulative impacts to land use and recreation include: the SR 189 Mexico to Grand Avenue project, the I-11 corridor from Nogales to Wickenburg, CBP activity and roads, revision of the CNF Forest Plan, Nogales International Airport projects (runway protection zone and runway and apron reconstruction), La Loma Grande Industrial Park development, and warehouse and commercial projects in the City of Nogales. See Table 4.16-1 for more information on these projects.

Construction, operation, and maintenance of the proposed Project, in combination with the noted reasonably foreseeable future projects, would result in the continued conversion of undeveloped lands within the analysis area to a more developed, urbanized environment and change land use in the region. One exception is the federal lands managed by the USFS, as guided by the CNF Forest Plan. Lands on the CNF are likely to continue to be largely undeveloped across the landscape. The transportation, aviation, industrial, commercial and residential developments are all consistent with area management plans (ADOT planning documents, Nogales International Airport Master Plan, Santa Cruz County General Plan, City of Nogales General Plan, etc.).

In terms of recreation, land use changes and urbanization in particular, as well as ranching and other uses on the CNF, have had a cumulative impact on the types and amount of recreation opportunities in Santa Cruz County. Construction, operation, and maintenance of the proposed Project, in combination with the noted reasonably foreseeable future projects, could result in very minor cumulative impacts to recreation. However, as noted above, the type and location of these developments is generally consistent with the long-term management planning documents for the City of Nogales, Santa Cruz County, and the CNF. Individuals looking for recreation opportunities will still have access to the CNF and other undeveloped lands in the analysis area and would likely continue to avoid urban and industrial parts of the city of Nogales.

In summary, in general, both the construction and operation and maintenance phases of the proposed Project, in combination with the construction and operation of other reasonably foreseeable future projects, would continue to permanently change the landscape in the analysis area. However, these changes are anticipated to continue to occur in the developed parts of the City of Nogales and Santa Cruz County and be consistent with long range planning documents for the region. Further, these changes are not anticipated to displace individuals looking for recreation opportunities or alter recreation opportunities in the region.

4.16.4.6 Visual Resources

The cumulative impacts analysis area for Visual Resources is a 5-mile buffer of the centerline of the action alternatives. The general setting of the analysis area is a mix of large, undeveloped tracts of land in undeveloped Santa Cruz County and on the CNF, as well as developed and industrialized parts of Santa Cruz County and the City of Nogales. As noted in Section 4.7, the most visually sensitive part of the analysis area is the CNF. Reasonably foreseeable future actions considered for cumulative impacts to visual resources include: the SR 189 Mexico to Grand Avenue project, the I-11 corridor from Nogales to Wickenburg, CBP activity and roads, La Loma Grande Industrial Park development, and warehouse and commercial projects in the City of Nogales. See Table 4.16-1 for more information on these projects.

Construction, operation, and maintenance of the proposed Project, in combination with the noted reasonably foreseeable future projects, would result cumulative impacts to visual resources. As with the direct and indirect impacts of the proposed Project, the potential visual impacts are relative, depending on the viewer perspective. For viewers from the urban and industrialized part of the City of Nogales, the additional visual modification of the landscape from new projects would not represent a new visual

change since the area is already developed. Viewers in residential areas might be slightly more sensitive to these changes. However, as with the industrial setting, the reasonably foreseeable future projects are consistent with past and present uses and with long range planning for these areas.

For viewers from the CNF in the western portion of the analysis area, the construction, operation, and maintenance of the proposed Project, in combination with the noted reasonably foreseeable future projects, may result in a more intense visual impact. This could be particularly true for those projects closer to the CNF, and especially if all cumulative actions were to be developed at the same time; however, that would be extremely unlikely. Although the lands within the CNF are undeveloped, viewers looking toward the City of Nogales would not experience a major new visual change, as the area is already developed.

In summary, in general, both the construction and operation and maintenance phases of the proposed Project, in combination with the construction and operation of other reasonably foreseeable future projects, would result in permanent cumulative visual impacts. As noted with other resources, if all of the reasonably foreseeable future projects are under construction at the same time, or "appearing" on the landscape at the same time, these visual impacts could be exacerbated by timing. However, the potential permanent visual changes would be consistent with the current land use and visual settings and relevant land use plans, and the overall degree of visual change is expected to be fairly low.

4.16.4.7 Socioeconomics

The cumulative impacts analysis area for Socioeconomics is Santa Cruz County. As noted above in the Land Use and Recreation cumulative impacts discussion, the general setting of the analysis area is a mix of large, undeveloped tracts of land, as well as developed and industrialized parts of Santa Cruz County and the City of Nogales. Past and present projects and activities have largely defined the socioeconomic setting of Santa Cruz County, particularly the development of the City of Nogales, which has evolved into an international trade, manufacturing, and tourism destination. Reasonably foreseeable future actions considered for cumulative impacts to socioeconomics include: the SR 189 Mexico to Grand Avenue project, the I-11 corridor from Nogales to Wickenburg, CBP activity and roads, La Loma Grande Industrial Park development, and warehouse and commercial projects in the City of Nogales. See Table 4.16-1 for more information on these projects.

Construction of the proposed Project, in combination with the noted reasonably foreseeable future actions, has the potential to cumulatively increase employment opportunities with the temporary increase in demand for construction workers. Additional cumulative impacts to socioeconomics could result from increased construction related spending, as well as added property taxes and increased sales and use taxes on equipment and materials in the County. The timing of the construction of other reasonably foreseeable future actions in the analysis area would influence the extent of the potential cumulative impacts to socioeconomics in terms of employment, taxes, and revenues. If the proposed Project and the noted reasonably foreseeable future actions were all under construction at the same time, there could be a boom of construction and economic activity, similar to the economic boost that resulted from the Mariposa port of entry construction in 2014, although this scenario is unlikely. The cumulative increase in tax revenue from construction companies and materials suppliers would be a beneficial impact the City of Nogales and Santa Cruz County, regardless of the timing of construction.

Construction of the proposed Project, in combination with the noted reasonably foreseeable future actions, also has the potential to cumulatively impact traffic flow. Although unlikely, if all of the reasonably foreseeable future projects were under construction at the same time, there could be a more intense impact to traffic flow in the analysis area if each project requires traffic restrictions at the same time.

Operation and maintenance of the proposed Project would not be likely to result in any noticeable permanent socioeconomics impacts, as typically only the construction phase of a transmission project generates noticeable economic activity. However, many of the other reasonably foreseeable future actions in the analysis area are industrial, commercial, and residential projects that would generate property and sales tax revenues. Property and sales tax revenues from these other actions would be a beneficial cumulative impact for the City of Nogales and Santa Cruz County.

In summary, beneficial temporary and permanent cumulative impacts to employment and income, as well as taxes and revenues, are anticipated.

4.16.4.8 Environmental Justice

The cumulative impacts analysis area for Environmental Justice includes Census Tracts 9662 and 9664.01. As noted in Section 4.8, both of these tracts is considered an environmental justice community. Reasonably foreseeable future actions considered for cumulative impacts to environmental justice include: the SR 189 Mexico to Grand Avenue project, the I-11 corridor from Nogales to Wickenburg, CBP activity and roads, La Loma Grande Industrial Park development, and warehouse and commercial projects in the City of Nogales. See Table 4.16-1 for more information on these projects.

Construction, operation, and maintenance of the proposed Project, in combination with the noted reasonably foreseeable future actions, have the potential to temporarily and permanently impact land use, visual resources, socioeconomics, air quality, noise, infrastructure, and human health and safety (as described in Section 4.8, and herein in the cumulative impacts to those resources).

The analysis area is primarily characterized by warehousing/distribution, manufacturing, light industrial, and commercial uses, with some small pockets of residential development. No residential or commercial displacements are planned for the proposed Project or any of the other reasonably foreseeable actions in the analysis area. The direct, indirect, and cumulative impacts anticipated from the proposed Project are anticipated to be incrementally minor and localized, unless all reasonably foreseeable future actions were under construction at the same time. In the unlikely event that the proposed Project and the reasonably foreseeable future projects were under construction at the same time, the environmental justice population could be disproportionately impacted if the localized impacts are exacerbated by timing and concentration. However, the proposed Project, in combination with other reasonably foreseeable future projects, is not anticipated to result in disproportionate impacts to the environmental justice population.

4.16.4.9 Air Quality and Climate Change

The cumulative impacts analysis area for Air Quality and Climate Change is Santa Cruz County. As noted in Section 3.11, within Santa Cruz County, the City of Nogales is in the Nogales Planning Area, which is designated as a nonattainment area for the 24-hour PM_{10} and $PM_{2.5}$ NAAQS, pending EPA approval the state-submitted $PM_{2.5}$ maintenance plan for the area. As with other resources, past uses in the analysis area have had a direct effect air quality. However, it is worth noting that EPA and ADEQ, in a 2012 study, determined that the City of Nogales would be able to meet PM_{10} standards except for emissions that are blown across the border from Mexico. The study concluded that days when both $PM_{2.5}$ and PM_{10} exceedances are recorded typically coincide with days when there is a clear pattern of low wind from the south (coming from Mexico) (ADEQ 2012).

Reasonably foreseeable future actions considered for cumulative impacts to air quality and climate change include: the SR 189 Mexico to Grand Avenue project, the I-11 corridor from Nogales to Wickenburg, CBP activity and roads, La Loma Grande Industrial Park development, and warehouse and commercial projects in the City of Nogales. See Table 4.16-1 for more information on these projects.

Temporary cumulative impacts to air quality would result during construction from ground-disturbing activities (e.g., vegetation clearing, site grading, and improving or building new roads,), as well as vehicular travel on unpaved roads. All of these activities are dust-generating activities that would increase PM_{10} emissions. Additional temporary cumulative impacts to air quality could result from on-road mobile sources such as construction vehicles (gasoline and diesel), and paved road dust, which could all increase $PM_{2.5}$ emissions. Construction of the proposed Project could also result in GHG emissions (see Section 4.11).

As with other potential cumulative impacts, if all reasonably foreseeable future actions were under construction at the same time as the construction of the proposed Project, potential cumulative impacts to air quality could be exacerbated. However, more than likely, these construction efforts would be staggered and not occurring simultaneously. Therefore, the potential temporary cumulative impacts anticipated during construction would be localized to each construction area, and fairly minor. Further, with the addition of legally mandated or industry-accepted BMPs and applicant proposed measures, cumulative impacts to air quality would be further minimized.

Potential permanent cumulative impacts during operation and maintenance would likely be minor and result from on-road mobile sources, such as routine commercial and residential vehicular traffic, in combination with maintenance vehicle traffic for the proposed Project. As with construction, gasoline and diesel vehicles and paved road dust can generate $PM_{2.5}$ emissions. Additionally, as described in Section 4.11, a small amount of SF_6 could potentially be emitted from circuit breakers during substation operations.

In summary, in general, both the construction and operation and maintenance phases of the proposed project, in combination with the construction and operation of other reasonably foreseeable future projects, would result in temporary and permanent cumulative impacts to air quality and climate change. These impacts are not expected to exceed any general conformity threshold levels or federal, state, or local ambient air quality standards and would generally be temporary and localized in nature.

4.16.4.10 Noise

The cumulative impacts analysis area for Noise is a 1-mile buffer of the centerline of the action alternatives. As described in Section 3.11, local noise conditions in the analysis area are influenced by casual and commercial vehicular traffic, CBP helicopter activities, and trains. Topography and winds characteristic of the region can alter background noise conditions. Reasonably foreseeable future actions considered for cumulative impacts to noise include: the SR 189 Mexico to Grand Avenue project, the I-11 corridor from Nogales to Wickenburg, CBP activity and roads, La Loma Grande Industrial Park development, and warehouse and commercial projects in the City of Nogales. See Table 4.16-1 for more information on these projects.

Temporary cumulative impacts to noise would result from construction activity, including both construction vehicles and the operation of actual construction equipment (e.g., graders, jackhammers, etc.). The timing of the construction of other reasonably foreseeable future actions in the analysis area would influence the extent of the potential cumulative impacts to noise. If all reasonably foreseeable future actions were under construction at the same time as the construction of the proposed Project, there could more intense temporary, cumulative impacts to noise, as these activities would occur simultaneously in the analysis area. However, more than likely, these construction efforts would be staggered and not occurring simultaneously; therefore, the potential temporary cumulative impacts anticipated during construction would be localized and fairly minor.

Potential permanent cumulative impacts during operation and maintenance would likely be very minor. Maintenance activities for the proposed Project would be similar in noise level to construction-related activities, but would be anticipated to occur less frequently, include fewer individual noise point sources such as pieces of equipment and vehicles, and be of shorter duration. Corona noise from transmission line and substation operation would be expected to be below regulatory thresholds. Reasonably foreseeable future actions (commercial, industrial, and residential) are not likely to have operational noise emissions. With the addition of legally mandated or industry-accepted BMPs and applicant proposed measures, temporary and permanent cumulative impacts to noise would be minimized. For example, as noted in Section 3.11, the City of Nogales, Arizona, regulates environmental noise through its noise ordinance.

In summary, in general, both the construction and operation and maintenance phases of the proposed Project, in combination with the construction and operation of other reasonably foreseeable future projects, would result in temporary and permanent cumulative impacts (increases) to noise. However, these are likely to generally be localized in nature and minimized by local ordinances, BMPs, and other applicant proposed measures.

4.16.4.11 Infrastructure

The cumulative impacts analysis area for Infrastructure is a 1-mile buffer of the centerline of the action alternatives. Reasonably foreseeable future actions considered for cumulative impacts to infrastructure include: the SR 189 Mexico to Grand Avenue project, the I-11 corridor from Nogales to Wickenburg, CBP activity and roads, La Loma Grande Industrial Park development, and warehouse and commercial projects in the City of Nogales. See Table 4.16-1 for more information on these projects. None of these projects are likely to cumulatively impact radio, television, and cellular telephone communications; therefore, there is no further discussion of those herein.

Cumulative impacts to infrastructure during construction of the proposed Project, in combination with other reasonably foreseeable future projects, could result in multiple, temporary lane closures and restrictions, detours, and the presence of construction work areas across the analysis area. Additional cumulative impacts could result from numerous construction crews, equipment, and haul trucks using area roadways to access different construction areas. As noted above in Socioeconomics, although unlikely, if all of the reasonably foreseeable future projects were under construction at the same time, there could be a more intense impact to area infrastructure and roadways.

Construction activities associated with the proposed Project and other future projects could cumulatively disrupt service to utility assets in the analysis area. However, as above, it is extremely unlikely that all of the area projects would be under construction at the same time, and disruption is only likely to occur if there is an emergency or accident. There are unlikely to be cumulative impacts during operation and maintenance. None of the reasonably foreseeable future projects are anticipated to generate a noticeable amount of traffic or place a burden on area infrastructure.

In summary, the construction phase of the proposed Project, in combination with the construction of other reasonably foreseeable future projects, could result in minor cumulative impacts to area infrastructure. However, the extent of those impacts depends in large part on the timing of those construction activities. Operation and maintenance are unlikely to result in cumulative impacts to infrastructure.

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Chapter 5

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Chapter 6

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Chapter 7

LIST OF PREPARERS/REVIEWERS

Chapter 7 provides the list of individuals who filled primary roles in the preparation of this EA. Table 7.1-1 below identifies the agency and individuals involved with the preparation and review of this EA.

Table 7.1-1. Preparers/Reviewers of the Nogales Interconnection EA

Name	Title	Responsibility
Department of Energy		
Brian Mills	NEPA Compliance Officer, Office of Electricity Delivery and Energy Reliability	NEPA Compliance Review
Melissa Pauley	Electricity Policy Analyst, Office of Electricity Delivery and Energy Reliability	NEPA Document Manager
Ed Le Duc	Lead Attorney-Advisor, Office of the General Counsel for Environment & Compliance	NEPA Adequacy Review
Kari Twaite	Attorney-Advisor, Office of the General Counsel for Environment & Compliance	NEPA Adequacy Review
Name and Title	**Education/Experience**	**Responsibility**
SWCA Environmental Consultants		
Cara Bellavia, Senior NEPA Planner	**Education:** BA, Anthropology, Arizona State University (1998); MUEP, Arizona State University (2009) **Experience:** 19 years of professional experience	Project Manager
Ryan Rausch, Environmental Planner	**Education:** MELP, Vermont Law School (2004); BS, Biology, Lees McRae College (2002) **Experience:** 12 years of professional experience	Land Use and Recreation, Visual Resources, Infrastructure, Cumulative Impacts
Meggan Dugan, Environmental Planner/Biologist	**Education:** BS, Ecology and Evolution, Arizona State University (2010); MAS, GIS, Arizona State University (2015) **Experience:** 4 years of professional experience	Vegetation, Wildlife, Geology and Soils, Water Resources and Quality, Noise
Adrienne Tremblay, Senior Archaeologist	**Education:** BA, Anthropology, New York University (1996); MA, Anthropology, Tulane University (2003); PhD, Tulane University (2007) **Experience:** 12 years of professional experience	Historic and Cultural Resources
Jonathan Rigg, Environmental Planner	**Education:** BA, Russian Studies, University of Colorado (2002); BA, International Affairs, University of Colorado (2002); MA, Russian and Slavic Studies, University of Arizona (2006) **Experience:** 10 years of professional experience	Socioeconomics and Environmental Justice
Matthew Ritter, Environmental Specialist	**Education:** BS, Conservation Biology, Arizona State University (2007); MS, Environmental Policy, Evergreen State College (2012) **Experience:** 4 years of professional experience	Water Resources and Quality, Air Quality and Climate Change, Human Health and Safety, Hazardous Materials and Waste

Table 7.1-1. Preparers/Reviewers of the Nogales Interconnection EA (Continued)

Name	Title	Responsibility
SWCA Environmental Consultants, cont'd.		
Heidi Orcutt-Gachiri, Senior Editor	**Education:** MA, Linguistics, University of Arizona (2001); PhD, Linguistics, University of Arizona (2009) **Experience:** 17 years of professional experience	Technical Editing
Danielle Desruisseaux, Editor	**Education:** BA, Anthropology, Binghamton University (1987) **Experience:** 29 years of professional experience	Technical Editing
Shari Bell, Formatter	**Education:** BS, Business Administration, Chapman University (1990) **Experience:** 26 years of professional experience	Formatting and Section 508 Compliance Specialist
Scott Woods, Senior GIS Specialist	**Education:** BS, Geography and Environmental Planning, Arizona State University (1991) **Experience:** 25 years of professional experience	Maps and figures
Chris Query, GIS Specialist	**Education:** BS, Worcester State College (1995); MAS, GIS, Arizona State University (2010) **Experience:** 19 years of professional experience	Maps and figures

Appendix A

COOPERATING AGENCY CORRESPONDENCE

Department of Energy

Washington, DC 20585

September 2, 2016

Mr. Kerwin Dewberry
Forest Supervisor
Coronado National Forest
U.S. Department of Agriculture, U.S. Forest Service
Federal Building
300 W. Congress Street
Tucson, AZ 85701-1371

Subject: Nogales Interconnection Project Environmental Assessment
Docket No. DOE/EA-2042

Dear Mr. Dewberry:

On April 8, 2016, Nogales Transmission LLC (Nogales Transmission or the Applicant) applied to the Department of Energy's (DOE) Office of Electricity Delivery and Energy Reliability pursuant to Executive Order 10485, as amended by Executive Order 12038, for a Presidential permit[1] to construct, operate, maintain, and connect a new high-voltage direct current (HVDC) transmission line across the U.S.-Mexico border in southern Arizona. A copy of DOE's *Notice of Application for Presidential Permit; Nogales Interconnection Project* is included with this letter (81 FR 31622; May 19, 2016).

The decision to prepare an Environmental Assessment (EA) on the proposed Federal action of granting a Presidential permit to the Applicant was made in accordance with the requirements of the National Environmental Policy Act (NEPA), the Council on Environmental Quality (CEQ) regulations for implementing the procedural provisions of NEPA (40 CFR Parts 1500-1508), and DOE's implementing procedures for compliance with NEPA (10 CFR Part 1021).

The purpose of this letter is to invite the U.S. Forest Service to participate as a cooperating agency in DOE's preparation of the Nogales Interconnection Project EA, pursuant to NEPA. The CEQ NEPA regulations (40 CFR Parts 1500-1508) outline the process for inviting other Federal agencies to participate in the NEPA process. Section 1501.6 explains that such involvement is based on another Federal agency having either jurisdiction by law or possessing special expertise regarding any environmental issue to be addressed in the NEPA document.

The approximately five-mile U.S. portion of the proposed transmission line would be capable of transmitting up to 300 megawatts (MW) of power. From the existing Valencia Substation to the proposed Gateway Substation, a three-mile, 138 kilovolt (kV) line would be constructed. A 300 MW bi-directional back-to-back HVDC converter would be located at the proposed Gateway substation, connecting the Western Electric Coordinating Council (WECC) system to the Mexico system. The back-to-back HVDC converter would have two phases, with each phase capable of 150 MW of bi-directional flow between the WECC and Mexico systems. From the Gateway

[1] In accordance with Executive Order (EO) 10485, as amended by EO 12038, and the regulations at 10 CFR 205.320 et seq. (2000), "Application for Presidential Permit Authorizing the Construction, Connection, Operation, and Maintenance of Facilities for Transmission of Electric Energy at International Boundaries."

Substation, a 230 kV line would run approximately two miles south to the Mexico border. The U.S. portion of the proposed project would cross the U.S.-Mexico border west of the Mariposa Point of Entry in Nogales, Arizona. Two of the proposed route segments for the 230 kV line would parallel a portion of the eastern border of the Coronado National Forest. Please refer to the enclosure for two project location maps that were provided by Nogales Transmission as part of their Presidential permit application.

The Nogales Transmission application, including associated maps and drawings, can be viewed and downloaded in its entirety from the DOE Office of Electricity and Energy Reliability program website at: http://energy.gov/oe/downloads/application-presidential-permit-oe-docket-no-pp-420-nogales-transmission-llc.

If you are interested in being a cooperating agency for the development of this EA, please reply in writing to me: Melissa Pauley, Electricity Policy Analyst, Nogales Interconnection Project EA, Office of Electricity Delivery and Energy Reliability, U.S. Department of Energy, 1000 Independence Avenue, SW, Washington, DC 20585. If you have any questions or issues concerning the EA, please contact me directly at 202-586-2942 or Melissa.Pauley@hq.doe.gov.

Sincerely,

Melissa Pauley

Melissa Pauley
Electricity Policy Analyst
Transmission Permitting & Technical Assistance
Division, OE-20
Office of Electricity Delivery and Energy
Reliability
U.S. Department of Energy

Enclosures:
Notice of Application
Project Location Maps

cc: Mr. Cal Joyner, USFS

Department of Energy

Washington, DC 20585

September 2, 2016

Mr. Steve Spangle
Field Supervisor
Arizona Ecological Services Field Office
Southwest Region (2)
U.S. Department of Interior, U.S. Fish and Wildlife Service
9828 North 31st Avenue, #C3
Phoenix, Arizona 85051-2517

Subject: Nogales Interconnection Project Environmental Assessment
Docket No. DOE/EA-2042

Dear Mr. Spangle:

On April 8, 2016, Nogales Transmission LLC (Nogales Transmission or the Applicant) applied to the Department of Energy's (DOE) Office of Electricity Delivery and Energy Reliability pursuant to Executive Order 10485, as amended by Executive Order 12038, for a Presidential permit[1] to construct, operate, maintain, and connect a new high-voltage direct current (HVDC) transmission line across the U.S.-Mexico border in southern Arizona. A copy of DOE's *Notice of Application for Presidential Permit; Nogales Interconnection Project* is included with this letter (81 FR 31622; May 19, 2016).

The decision to prepare an Environmental Assessment (EA) on the proposed Federal action of granting a Presidential permit to the Applicant was made in accordance with the requirements of the National Environmental Policy Act (NEPA), the Council on Environmental Quality (CEQ) regulations for implementing the procedural provisions of NEPA (40 CFR Parts 1500-1508), and DOE's implementing procedures for compliance with NEPA (10 CFR Part 1021).

The purpose of this letter is to invite the U.S. Fish and Wildlife Service to participate as a cooperating agency in DOE's preparation of the Nogales Interconnection Project EA, pursuant to NEPA. The CEQ NEPA regulations (40 CFR Parts 1500-1508) outline the process for inviting other Federal agencies to participate in the NEPA process. Section 1501.6 explains that such involvement is based on another Federal agency having either jurisdiction by law or possessing special expertise regarding any environmental issue to be addressed in the NEPA document.

The approximately five-mile U.S. portion of the proposed transmission line would be capable of transmitting up to 300 megawatts (MW) of power. From the existing Valencia Substation to the proposed Gateway Substation, a three-mile, 138 kilovolt (kV) line would be constructed. A 300 MW bi-directional back-to-back HVDC converter would be located at the proposed Gateway substation, connecting the Western Electric Coordinating Council (WECC) system to the Mexico system. The back-to-back HVDC converter would have two phases, with each phase capable of 150 MW of bi-directional flow between the WECC and Mexico systems. From the Gateway

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Substation, a 230 kV line would run approximately two miles south to the Mexico border. The U.S. portion of the proposed project would cross the U.S.-Mexico border west of the Mariposa Point of Entry in Nogales, Arizona. Please refer to the enclosure for two project location maps that were provided by Nogales Transmission as part of their Presidential permit application.

The Nogales Transmission application, including associated maps and drawings, can be viewed and downloaded in its entirety from the DOE Office of Electricity and Energy Reliability program website at: http://energy.gov/oe/downloads/application-presidential-permit-oe-docket-no-pp-420-nogales-transmission-llc.

If you are interested in being a cooperating agency for the development of this EA, please reply in writing to me: Melissa Pauley, Electricity Policy Analyst, Nogales Interconnection Project EA, Office of Electricity Delivery and Energy Reliability, U.S. Department of Energy, 1000 Independence Avenue, SW, Washington, DC 20585. If you have any questions or issues concerning the EA, please contact me directly at 202-586-2942 or Melissa.Pauley@hq.doe.gov.

Sincerely,

Melissa Pauley

Melissa Pauley
Electricity Policy Analyst
Transmission Permitting & Technical Assistance Division, OE-20
Office of Electricity Delivery and Energy Reliability
U.S. Department of Energy

Enclosures:
Notice of Application
Project Location Maps

cc: Ms. Joyce Francis, Arizona Game and Fish Department

Department of Energy

Washington, DC 20585

September 2, 2016

Ms. Sallie Diebolt
Chief, Arizona Section
Regulatory Division
Department of the Army
U.S. Army Corps of Engineers
Los Angeles District, Phoenix Office
3636 N. Central Ave., Suite 900
Phoenix, AZ 85012-1939

Subject: Nogales Interconnection Project Environmental Assessment
Docket No. DOE/EA-2042

Dear Ms. Diebolt:

On April 8, 2016, Nogales Transmission LLC (Nogales Transmission or the Applicant) applied to the Department of Energy's (DOE) Office of Electricity Delivery and Energy Reliability pursuant to Executive Order 10485, as amended by Executive Order 12038, for a Presidential permit[1] to construct, operate, maintain, and connect a new high-voltage direct current (HVDC) transmission line across the U.S.-Mexico border in southern Arizona. A copy of DOE's *Notice of Application for Presidential Permit; Nogales Interconnection Project* is included with this letter (81 FR 31622; May 19, 2016).

The decision to prepare an Environmental Assessment (EA) on the proposed Federal action of granting a Presidential permit to the Applicant was made in accordance with the requirements of the National Environmental Policy Act (NEPA), the Council on Environmental Quality (CEQ) regulations for implementing the procedural provisions of NEPA (40 CFR Parts 1500-1508), and DOE's implementing procedures for compliance with NEPA (10 CFR Part 1021).

The purpose of this letter is to invite the U.S. Army Corps of Engineers to participate as a cooperating agency in DOE's preparation of the Nogales Interconnection Project EA, pursuant to NEPA. The CEQ NEPA regulations (40 CFR Parts 1500-1508) outline the process for inviting other Federal agencies to participate in the NEPA process. Section 1501.6 explains that such involvement is based on another Federal agency having either jurisdiction by law or possessing special expertise regarding any environmental issue to be addressed in the NEPA document.

The approximately five-mile U.S. portion of the proposed transmission line would be capable of transmitting up to 300 megawatts (MW) of power. From the existing Valencia Substation to the proposed Gateway Substation, a three-mile, 138 kilovolt (kV) line would be constructed. A 300 MW bi-directional back-to-back HVDC converter would be located at the proposed Gateway substation, connecting the Western Electric Coordinating Council (WECC) system to the Mexico system. The back-to-back HVDC converter would have two phases, with each phase capable of

[1] In accordance with Executive Order (EO) 10485, as amended by EO 12038, and the regulations at 10 CFR 205.320 et seq. (2000), "Application for Presidential Permit Authorizing the Construction, Connection, Operation, and Maintenance of Facilities for Transmission of Electric Energy at International Boundaries."

150 MW of bi-directional flow between the WECC and Mexico systems. From the Gateway Substation, a 230 kV line would run approximately two miles south to the Mexico border. The U.S. portion of the proposed project would cross the U.S.-Mexico border west of the Mariposa Point of Entry in Nogales, Arizona. Please refer to the enclosure for two project location maps that were provided by Nogales Transmission as part of their Presidential permit application.

The Nogales Transmission application, including associated maps and drawings, can be viewed and downloaded in its entirety from the DOE Office of Electricity and Energy Reliability program website at: http://energy.gov/oe/downloads/application-presidential-permit-oe-docket-no-pp-420-nogales-transmission-llc.

If you are interested in being a cooperating agency for the development of this EA, please reply in writing to me: Melissa Pauley, Electricity Policy Analyst, Nogales Interconnection Project EA, Office of Electricity Delivery and Energy Reliability, U.S. Department of Energy, 1000 Independence Avenue, SW, Washington, DC 20585. If you have any questions or issues concerning the EA, please contact me directly at 202-586-2942 or Melissa.Pauley@hq.doe.gov.

Sincerely,

Melissa Pauley

Melissa Pauley
Electricity Policy Analyst
Transmission Permitting & Technical Assistance
Division, OE-20
Office of Electricity Delivery and Energy
Reliability
U.S. Department of Energy

Enclosures:
Notice of Application
Project Location Maps

cc: Mr. Theodore Brown, U.S. Army Corps of Engineers

Department of Energy

Washington, DC 20585

September 2, 2016

Mr. Gary Widner
Patrol Agent in Charge
U.S. Customs and Border Protection
Nogales Station
1500 West La Quinta Road
Nogales, AZ 85621-4532

Subject: Nogales Interconnection Project Environmental Assessment
Docket No. DOE/EA-2042

Dear Mr. Widner:

On April 8, 2016, Nogales Transmission LLC (Nogales Transmission or the Applicant) applied to the Department of Energy's (DOE) Office of Electricity Delivery and Energy Reliability pursuant to Executive Order 10485, as amended by Executive Order 12038, for a Presidential permit[1] to construct, operate, maintain, and connect a new high-voltage direct current (HVDC) transmission line across the U.S.-Mexico border in southern Arizona. A copy of DOE's *Notice of Application for Presidential Permit; Nogales Interconnection Project* is included with this letter (81 FR 31622; May 19, 2016).

The decision to prepare an Environmental Assessment (EA) on the proposed Federal action of granting a Presidential permit to the Applicant was made in accordance with the requirements of the National Environmental Policy Act (NEPA), the Council on Environmental Quality (CEQ) regulations for implementing the procedural provisions of NEPA (40 CFR Parts 1500-1508), and DOE's implementing procedures for compliance with NEPA (10 CFR Part 1021).

The purpose of this letter is to invite U.S. Customs and Border Protection to participate as a cooperating agency in DOE's preparation of the Nogales Interconnection Project EA, pursuant to NEPA. The CEQ NEPA regulations (40 CFR Parts 1500-1508) outline the process for inviting other Federal agencies to participate in the NEPA process. Section 1501.6 explains that such involvement is based on another Federal agency having either jurisdiction by law or possessing special expertise regarding any environmental issue to be addressed in the NEPA document.

The approximately five-mile U.S. portion of the proposed transmission line would be capable of transmitting up to 300 megawatts (MW) of power. From the existing Valencia Substation to the proposed Gateway Substation, a three-mile, 138 kilovolt (kV) line would be constructed. A 300 MW bi-directional back-to-back HVDC converter would be located at the proposed Gateway substation, connecting the Western Electric Coordinating Council (WECC) system to the Mexico system. The back-to-back HVDC converter would have two phases, with each phase capable of 150 MW of bi-directional flow between the WECC and Mexico systems. From the Gateway Substation, a 230 kV line would run approximately two miles south to the Mexico border. The

[1] In accordance with Executive Order (EO) 10485, as amended by EO 12038, and the regulations at 10 CFR 205.320 et seq. (2000), "Application for Presidential Permit Authorizing the Construction, Connection, Operation, and Maintenance of Facilities for Transmission of Electric Energy at International Boundaries."

U.S. portion of the proposed project would cross the U.S.-Mexico border west of the Mariposa Point of Entry in Nogales, Arizona. Please refer to the enclosure for two project location maps that were provided by Nogales Transmission as part of their Presidential permit application.

The Nogales Transmission application, including associated maps and drawings, can be viewed and downloaded in its entirety from the DOE Office of Electricity and Energy Reliability program website at: http://energy.gov/oe/downloads/application-presidential-permit-oe-docket-no-pp-420-nogales-transmission-llc.

If you are interested in being a cooperating agency for the development of this EA, please reply in writing to me: Melissa Pauley, Electricity Policy Analyst, Nogales Interconnection Project EA, Office of Electricity Delivery and Energy Reliability, U.S. Department of Energy, 1000 Independence Avenue, SW, Washington, DC 20585. If you have any questions or issues concerning the EA, please contact me directly at 202-586-2942 or Melissa.Pauley@hq.doe.gov.

Sincerely,

Melissa Pauley

Melissa Pauley
Electricity Policy Analyst
Transmission Permitting & Technical Assistance Division, OE-20
Office of Electricity Delivery and Energy Reliability
U.S. Department of Energy

Enclosures:
Notice of Application
Project Location Maps

Department of Energy

Washington, DC 20585

September 2, 2016

Mr. Gilbert Anaya
International Boundary and Water Commission
United States and Mexico
U.S. Section, Building C
4171 North Mesa Street, Suite 100
El Paso, TX 79902-1441

Subject: Nogales Interconnection Project Environmental Assessment
Docket No. DOE/EA-2042

Dear Mr. Anaya:

On April 8, 2016, Nogales Transmission LLC (Nogales Transmission or the Applicant) applied to the Department of Energy's (DOE) Office of Electricity Delivery and Energy Reliability pursuant to Executive Order 10485, as amended by Executive Order 12038, for a Presidential permit[1] to construct, operate, maintain, and connect a new high-voltage direct current (HVDC) transmission line across the U.S.-Mexico border in southern Arizona. A copy of DOE's *Notice of Application for Presidential Permit; Nogales Interconnection Project* is included with this letter (81 FR 31622; May 19, 2016).

The decision to prepare an Environmental Assessment (EA) on the proposed Federal action of granting a Presidential permit to the Applicant was made in accordance with the requirements of the National Environmental Policy Act (NEPA), the Council on Environmental Quality (CEQ) regulations for implementing the procedural provisions of NEPA (40 CFR Parts 1500-1508), and DOE's implementing procedures for compliance with NEPA (10 CFR Part 1021).

The purpose of this letter is to invite the International Boundary and Water Commission to participate as a cooperating agency in DOE's preparation of the Nogales Interconnection Project EA, pursuant to NEPA. The CEQ NEPA regulations (40 CFR Parts 1500-1508) outline the process for inviting other Federal agencies to participate in the NEPA process. Section 1501.6 explains that such involvement is based on another Federal agency having either jurisdiction by law or possessing special expertise regarding any environmental issue to be addressed in the NEPA document.

The approximately five-mile U.S. portion of the proposed transmission line would be capable of transmitting up to 300 megawatts (MW) of power. From the existing Valencia Substation to the proposed Gateway Substation, a three-mile, 138 kilovolt (kV) line would be constructed. A 300 MW bi-directional back-to-back HVDC converter would be located at the proposed Gateway substation, connecting the Western Electric Coordinating Council (WECC) system to the Mexico system. The back-to-back HVDC converter would have two phases, with each phase capable of 150 MW of bi-directional flow between the WECC and Mexico systems. From the Gateway

[1] In accordance with Executive Order (EO) 10485, as amended by EO 12038, and the regulations at 10 CFR 205.320 et seq. (2000), "Application for Presidential Permit Authorizing the Construction, Connection, Operation, and Maintenance of Facilities for Transmission of Electric Energy at International Boundaries."

Substation, a 230 kV line would run approximately two miles south to the Mexico border. The U.S. portion of the proposed project would cross the U.S.-Mexico border west of the Mariposa Point of Entry in Nogales, Arizona. Please refer to the enclosure for two project location maps that were provided by Nogales Transmission as part of their Presidential permit application.

The Nogales Transmission application, including associated maps and drawings, can be viewed and downloaded in its entirety from the DOE Office of Electricity and Energy Reliability program website at: http://energy.gov/oe/downloads/application-presidential-permit-oe-docket-no-pp-420-nogales-transmission-llc.

If you are interested in being a cooperating agency for the development of this EA, please reply in writing to me: Melissa Pauley, Electricity Policy Analyst, Nogales Interconnection Project EA, Office of Electricity Delivery and Energy Reliability, U.S. Department of Energy, 1000 Independence Avenue, SW, Washington, DC 20585. If you have any questions or issues concerning the EA, please contact me directly at 202-586-2942 or Melissa.Pauley@hq.doe.gov.

Sincerely,

Melissa Pauley

Melissa Pauley
Electricity Policy Analyst
Transmission Permitting & Technical Assistance Division, OE-20
Office of Electricity Delivery and Energy Reliability
U.S. Department of Energy

Enclosures:
Notice of Application
Project Location Maps

Department of Energy

Washington, DC 20585

September 8, 2016

Mr. Thomas Chenal
Chairman
Arizona Power Plant and Transmission Line Siting Committee
Arizona Corporation Commission
1200 West Washington
Phoenix, AZ 85007-2996

Subject: Nogales Interconnection Project Environmental Assessment
Docket No. DOE/EA-2042

Dear Chairman Chenal:

On April 8, 2016, Nogales Transmission, LLC (Nogales Transmission or the Applicant) applied to the Department of Energy's (DOE) Office of Electricity Delivery and Energy Reliability pursuant to Executive Order 10485, as amended by Executive Order 12038, for a Presidential permit[1] to construct, operate, maintain, and connect a new high-voltage direct current (HVDC) transmission line across the U.S.-Mexico border in southern Arizona. A copy of DOE's *Notice of Application for Presidential Permit; Nogales Interconnection Project* is included with this letter (81 FR 31622; May 19, 2016).

The decision to prepare an Environmental Assessment (EA) on the proposed Federal action of granting a Presidential permit to the Applicant was made in accordance with the requirements of the National Environmental Policy Act (NEPA), the Council on Environmental Quality (CEQ) regulations for implementing the procedural provisions of NEPA (40 CFR Parts 1500-1508), and DOE's implementing procedures for compliance with NEPA (10 CFR Part 1021).

The purpose of this letter is to invite the Arizona Corporation Commission to participate as a cooperating agency in DOE's preparation of the Nogales Interconnection Project EA, pursuant to NEPA. The CEQ NEPA regulations (40 CFR Parts 1500-1508) outline the process for inviting other agencies to participate in the NEPA process. Section 1508.5 states that a state or local agency of similar qualifications may by agreement with the lead agency become a cooperating agency.

The approximately five-mile U.S. portion of the proposed transmission line would be capable of transmitting up to 300 megawatts (MW) of power. From the existing Valencia Substation to the proposed Gateway Substation, a three-mile, 138 kilovolt (kV) line would be constructed. A 300 MW bi-directional back-to-back HVDC converter would be located at the proposed Gateway substation, connecting the Western Electric Coordinating Council (WECC) system to the Mexico system. The back-to-back HVDC converter would have two phases, with each phase capable of 150 MW of bi-directional flow between the WECC and Mexico systems. From the Gateway Substation, a 230 kV line would run approximately two miles south to the Mexico border. The

[1] In accordance with Executive Order (EO) 10485, as amended by EO 12038, and the regulations at 10 CFR 205.320 et seq. (2000), "Application for Presidential Permit Authorizing the Construction, Connection, Operation, and Maintenance of Facilities for Transmission of Electric Energy at International Boundaries."

U.S. portion of the proposed project would cross the U.S.-Mexico border west of the Mariposa Point of Entry in Nogales, Arizona. Please refer to the enclosure for two project location maps that were provided by Nogales Transmission as part of their Presidential permit application.

The Nogales Transmission application, including associated maps and drawings, can be viewed and downloaded in its entirety from the DOE Office of Electricity and Energy Reliability program website at: http://energy.gov/oe/downloads/application-presidential-permit-oe-docket-no-pp-420-nogales-transmission-llc.

If you are interested in being a cooperating agency for the development of this EA, please reply in writing to me: Meghan Conklin, Deputy Assistant Secretary, Office of Electricity Delivery and Energy Reliability, U.S. Department of Energy, 1000 Independence Avenue, SW, Washington, DC 20585. I may also be reached by phone at 202-586-0334 or email at Meghan.Conklin@hq.doe.gov.

Sincerely,

Meghan Conklin
Deputy Assistant Secretary
Transmission Permitting & Technical Assistance
Division, OE-20
Office of Electricity Delivery and Energy
Reliability
U.S. Department of Energy

Enclosures:
Notice of Application
Project Location Maps

cc: Mr. Doug Little, Arizona Corporation Commission

Figure 2-4. Route Segments – October 2015

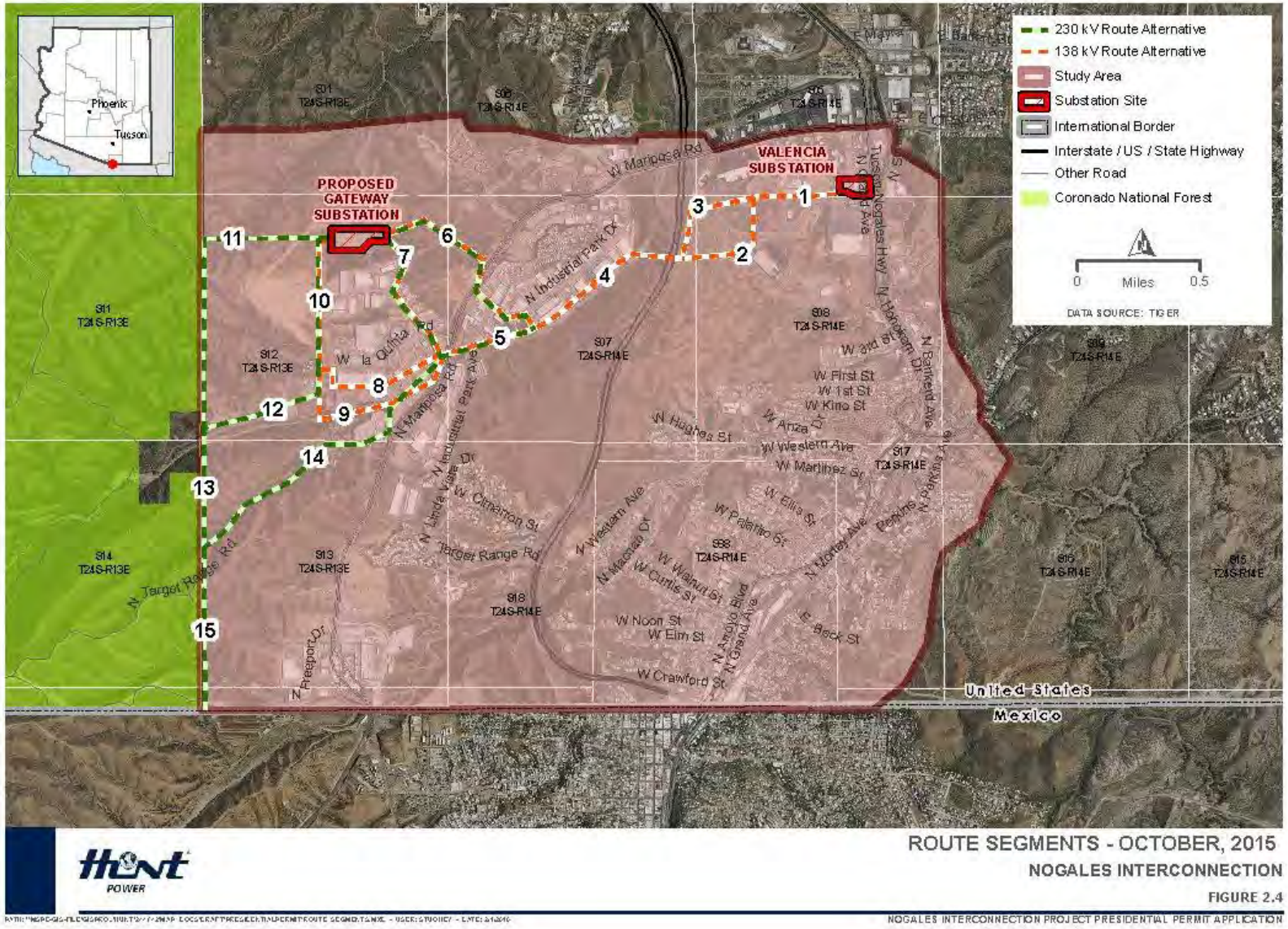
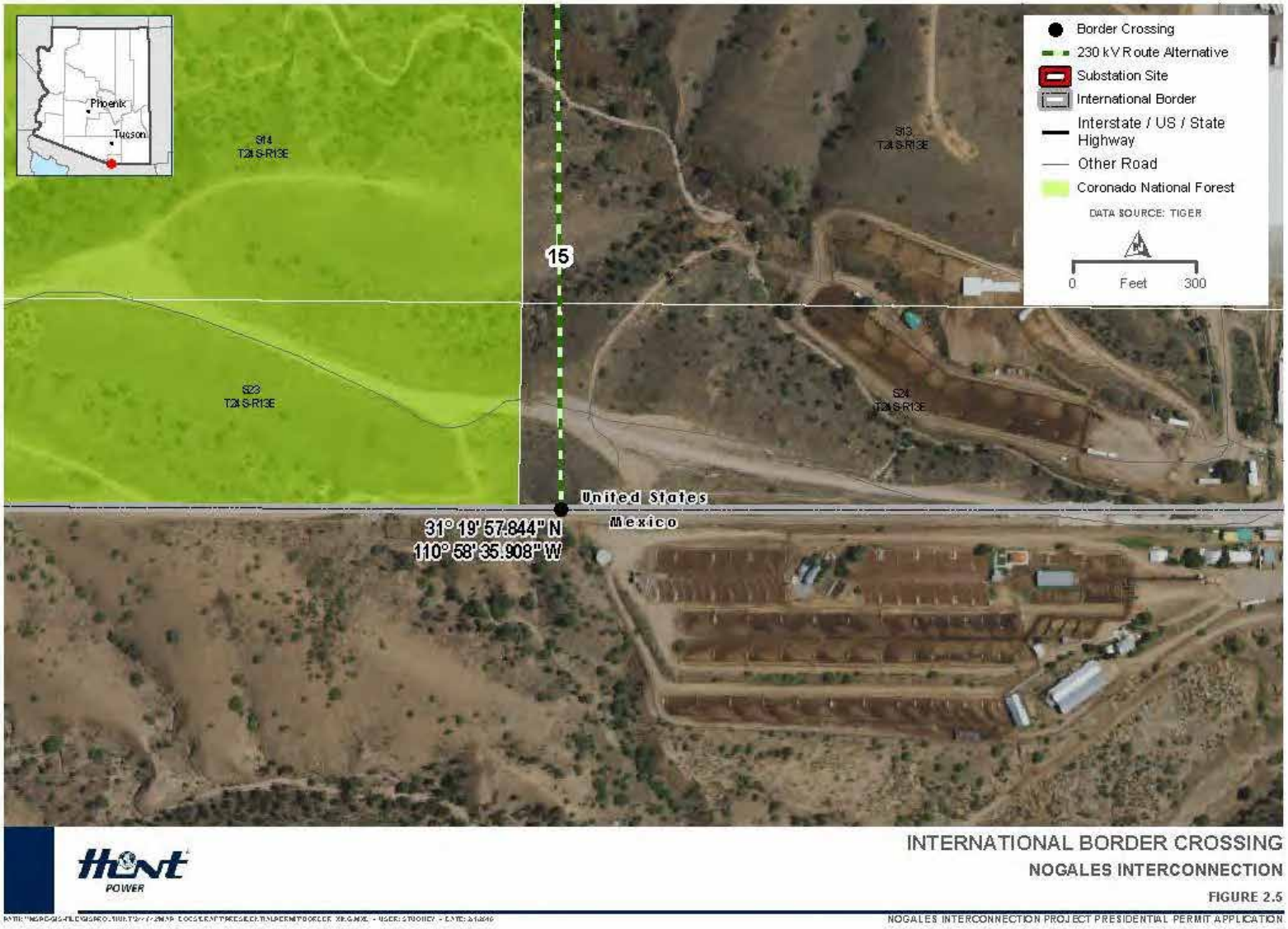


Figure 2-5. International Border Crossing



http://www.fe.doe.gov/programs/gasregulation/index.html.

Issued in Washington, DC, on May 13, 2016.

John A. Anderson,

Director, Office of Regulation and International Engagement, Office of Oil and Natural Gas.

[FR Doc. 2016–11812 Filed 5–18–16; 8:45 am]

BILLING CODE 6450–01–P

DEPARTMENT OF ENERGY

[OE Docket No. PP–420]

Application for Presidential Permit; Nogales Interconnection Project

AGENCY: Office of Electricity Delivery and Energy Reliability, DOE.

ACTION: Notice of application.

SUMMARY: Nogales Transmission, L.L.C., (Nogales Transmission) has applied for a Presidential permit to construct, operate, maintain, and connect an electric transmission line across the United States border with Mexico.

DATES: Comments or motions to intervene must be submitted on or before June 20, 2016.

ADDRESSES: Comments or motions to intervene should be addressed as follows: Office of Electricity Delivery and Energy Reliability (OE–20), U.S. Department of Energy, 1000 Independence Avenue SW., Washington, DC 20585.

FOR FURTHER INFORMATION CONTACT: Christopher Lawrence (Program Office) at 202–586–5260 or via electronic mail at *Christopher.Lawrence@hq.doe.gov,* Rishi Garg (Program Attorney) at 202–586–0258.

SUPPLEMENTARY INFORMATION: The construction, operation, maintenance, and connection of facilities at the international border of the United States for the transmission of electric energy between the United States and a foreign country is prohibited in the absence of a Presidential permit issued pursuant to Executive Order (EO) 10485, as amended by EO 12038.

On April 8, 2016, Nogales Transmission filed an application with the Office of Electricity Delivery and Energy Reliability of the Department of Energy (DOE) for a Presidential permit. Nogales Transmission has it principal place of business in Dallas, Texas. Nogales Transmission is owned by Hunt Power, L.P., a Delaware limited partnership (Hunt Power), which in turn is a subsidiary of Hunt Consolidated, Inc.

Nogales Transmission proposes to construct and operate the Nogales Interconnection Project (the Project), an approximately five mile long overhead transmission system originating at the Valencia Substation in Nogales, Arizona, connecting to the proposed Gateway Substation three miles to the West and then crossing the U.S. border two miles to the south of the Gateway Substation. The proposed project facilities would be capable of transmitting up to 300 megawatts (MW) of power.

The U.S. portion of the proposed project would cross the U.S.-Mexico border west of the Mariposa Point of Entry. From the Valencia Substation to the Gateway Substation, a three mile, 138 kV line would be constructed. A 300 MW bi-directional Back-to-Back HVDC Converter will be located at the Gateway substation, connecting the WECC system to the Mexico system. The Back-to-Back HVDC Converter will have two phases with each phase capable of 150 MW of bi-directional flow between the WECC and Mexico systems. From the Gateway Substation to the border, a 230 kV line would run approximately two miles to the Mexico border.

The Project will be operated in accordance with the established engineering and technical criteria of the Western Electric Coordinating Council. System impact studies are being conducted to analyze the effect of importing and exporting the entire 300 MWs across the Back-to-Back HVDC system.

Since the restructuring of the electric industry began, resulting in the introduction of different types of competitive entities into the marketplace, DOE has consistently expressed its policy that cross-border trade in electric energy should be subject to the same principles of comparable open access and non-discrimination that apply to transmission in interstate commerce. DOE has stated that policy in export authorizations granted to entities requesting authority to export over international transmission facilities. Specifically, DOE expects transmitting utilities owning border facilities to provide access across the border in accordance with the principles of comparable open access and non-discrimination contained in the Federal Power Act and articulated in Federal Energy Regulatory Commission (FERC) Order No. 888 (Promoting Wholesale Competition Through Open Access Non-Discriminatory Transmission Services by Public Utilities; FERC Stats. & Regs. ¶31,036 (1996)), as amended.

Procedural Matters: Any person may comment on this application by filing such comment at the address provided above. Any person seeking to become a party to this proceeding must file a motion to intervene at the address provided above in accordance with Rule 214 of FERC's Rules of Practice and Procedure (18 CFR 385.214). Two copies of each comment or motion to intervene should be filed with DOE on or before the date listed above.

Additional copies of such motions to intervene also should be filed directly with: Enrique Marroquin, Nogales Transmission, LLC, 1900 North Akard Street, Dallas, TX 75201.

Before a Presidential permit may be issued or amended, DOE must determine that the proposed action is in the public interest. In making that determination, DOE considers the environmental impacts of the proposed project pursuant to the National Environmental Policy Act of 1969, determines the project's impact on electric reliability by ascertaining whether the proposed project would adversely affect the operation of the U.S. electric power supply system under normal and contingency conditions, and any other factors that DOE may also consider relevant to the public interest. Also, DOE must obtain the concurrences of the Secretary of State and the Secretary of Defense before taking final action on a Presidential permit application.

Copies of this application will be made available, upon request, for public inspection and copying at the address provided above, by accessing the program Web site at *http://energy.gov/oe/services/electricity-policy-coordination-and-implementation/international-electricity-regulatio-2*.

Issued in Washington, DC, on May 13, 2016.

Christopher A. Lawrence,

Electricity Policy Analyst, National Electricity Delivery Division, Office of Electricity Delivery and Energy Reliability.

[FR Doc. 2016–11810 Filed 5–18–16; 8:45 am]

BILLING CODE 6450–01–P

DEPARTMENT OF ENERGY

Energy Efficiency and Renewable Energy

State Energy Advisory Board (STEAB) Meeting

AGENCY: Energy Efficiency and Renewable Energy, Department of Energy.

ACTION: Notice of open live board meeting.

INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO

September 12, 2016

Melissa Pauley
Electricity Policy Analyst
Transmission Permitting & Technical Assistance
Division, OE-20
Office of Electricity Delivery and Energy Reliability
U.S. Department of Energy
Washington, DC 20585

Re: DOE Nogales Interconnection Project Environmental Assessment
Docket No. DOE/EA-2042

Dear Ms. Pauley:

The International Boundary and Water Commission, United States Section (USIBWC), accepts the opportunity to participate as a cooperating agency in the Department of Energy (DOE) preparation of the Nogales Interconnection Project Environmental Assessment (EA). Pursuant to the Council on Environmental Quality (CEQ) regulations for implementing the National Environmental Policy Act (NEPA) for cooperating agencies under Section 1501.6, the USIBWC has specific expertise and responsibilities for applying the various Treaties with the Republic of Mexico along the U.S. – Mexico border. The EA will evaluate environmental effects for the proposed action as part of the Presidential permit application process to construct, operate, maintain, and connect a new high-voltage direct current (HVDC) transmission line across the U.S.-Mexico border in southern Arizona.

The project area lies along the border in Southern Arizona in Nogales, Arizona and includes the cross border connection of electric power lines. This project falls within the USIBWC jurisdiction, and as such we have interest in providing comments, information, or direction as necessary to ensure the project does not significantly impact the environment or treaties with Mexico.

Our point of contact for this effort will be Mr. Wayne Belzer. He can be reached at (915) 832-4703 or to wayne.belzer@ibwc.gov. If you have any questions, please call me at (915) 832-4702.

Sincerely,

Gilbert Anaya
Division Chief
Environmental Management Division

The Commons, Building C, Suite 100 • 4171 N. Mesa Street • El Paso, Texas 79902-1441
(915) 832-4701 • Fax: (915) 832-4166 • http://www.ibwc.gov

MARK BRNOVICH
ATTORNEY GENERAL

OFFICE OF THE ARIZONA ATTORNEY GENERAL
STATE GOVERNMENT DIVISION
AGENCY COUNSEL SECTION

THOMAS K. CHENAL
ASSISTANT ATTORNEY GENERAL
DIRECT PHONE NO. (602) 542-8323
THOMAS.CHENAL@AZAG.GOV

September 29, 2016

Meghan Conklin
Deputy Assistant Secretary
Office of Electricity Delivery and Energy Reliability
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585

Re: Nogales Interconnection Project Environmental Assessment
DOE Docket No. DOE/EA-2042

Dear Deputy Assistant Secretary Conklin:

This is in response to your letter to me dated September 8, 2016, with respect to the above-reference project ("Nogales Interconnection Project"). Your correspondence was addressed to me as Chairman of the Arizona Power Plant and Transmission Line Siting Committee ("LSC") and invites the Arizona Corporation Commission ("ACC") to participate as a cooperating agency in the Department of Energy's preparation of the Nogales Interconnection Project Environmental Assessment ("EA"). Since your correspondence invites the ACC to act as a cooperating agency, which is separate from the LSC, and due to the lack of Arizona statutory authority authorizing the LSC to act as a cooperating agency in such a case, I believe it would be inappropriate for the LSC to participate as a cooperating agency in the EA and wanted to advise you of this decision. I note that the application filed in connection with the Nogales Interconnection Project states that the applicant will be seeking a Certificate of Environment Compatibility which will result in the Nogales Interconnection Project coming before the LSC and the ACC.

Please let me know if you have any questions or wish to discuss this matter.

Sincerely,

Thomas K. Chenal
Assistant Attorney General
Chairman, Arizona Power Plant and
Transmission Line Siting Committee

TKC/lr
cc: Chairman Doug Little, Arizona Corporation Commission
Enclosure: as stated
#5341425

Pauley, Melissa

From: Tucker, Kathleen A SPL <Kathleen.A.Tucker@usace.army.mil>
Sent: Monday, October 03, 2016 6:39 PM
To: Pauley, Melissa
Cc: Tucker, Kathleen A SPL
Subject: Receipt of DOE letter?

Hi,
I received your letter and am the assigned project manager. Based on the invitation letter we don't feel we need to be a cooperating agency. We realize you potentially will cross Section 404 waters and may need a permit from us and at that time we can coordinate again with a pre-application meeting.
Please let me know if you have questions or require any further information from me.
Thanks.

Kathleen A. Tucker
Senior Project Manager
Arizona Branch, Regulatory Division
Los Angeles District
U.S. Army Corps of Engineers
3636 North Central Avenue, Suite 900
Phoenix, Arizona 85012-1939
Phone: 602.230.6956 Cell: 602.526.0183
Internet: http://www.spl.usace.army.mil/Missions/Regulatory.aspx
FTP: https://safe.amrdec.army.mil/safe/

Assist us in better serving you!
You are invited to complete our customer survey, located at the following
link: http://corpsmapu.usace.army.mil/cm_apex/f?p=regulatory_survey

"From there to here, and here to there, funny things are everywhere." -- Dr. Seuss

-----Original Message-----
From: Pauley, Melissa [mailto:Melissa.Pauley@hq.doe.gov]
Sent: Thursday, September 29, 2016 7:49 AM
To: Diebolt, Sallie SPL <Sallie.Diebolt@usace.army.mil>
Subject: [EXTERNAL] Receipt of DOE letter?

Dear Ms. Diebolt,

In early September, I sent a cooperating agency invitation letter to you for the Nogales Interconnection project, a proposed electric transmission line and substation in Nogales, AZ. It was mailed via USPS Certified mail on September 2, 2016. I have not received the green postcard back, so I wanted to make sure that you are in receipt of the letter. If not, I can provide it to you electronically. My understanding is that the project proponent, Nogales Transmission, LLC (a

subsidiary of Hunt Power), has spoken with Robert Drummer and Leanne Van Tuyl of your agency at a pre-application public meeting that Nogales Transmission hosted last year. After contacting your office, I learned that Mr. Drummer has since retired and that you are the correct contact person for correspondence regarding this project.

Please let me know if you have received the invitation letter, and if I can provide any further information. Thank you in advance.

Sincerely,

Melissa Pauley

Melissa Pauley

Electricity Policy Analyst

Office of Electricity Delivery and Energy Reliability

U.S. Department of Energy

1000 Independence Avenue, SW | Washington, DC 20585

Office: 202-586-2942 | DOE Cell: 202-705-1447 | Fax: 202-586-8008

USDA United States Department of Agriculture | Forest Service | Coronado National Forest Supervisor's Office

300 West Congress St.
Tucson, AZ 85701
520-388-8300
Fax: 520-388-8305

File Code: 1900
Date: October 19, 2016

Ms. Melissa Pauley
Electricity Policy Analyst
Nogales Interconnection Project EA
Office of Electricity Delivery and Energy Reliability
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585

Dear Ms. Pauley:

The Coronado National Forest (CNF) appreciates the opportunity to be a cooperating agency with the Department of Energy (DOE) for the Nogales Interconnection Project Environmental Analysis (EA). As currently understood, the two proposed route segments for the 230 kV line would parallel a portion of the eastern border of the Coronado National Forest.

We hereby request to become a cooperating agency with DOE on this proposed project to better understand associated potential indirect effects to CNF. It is our anticipation that roles and responsibilities for each agency will be clearly defined and documented through a memorandum of understanding (MOU) or an equivalent alternative document.

I, along with my staff, appreciate the opportunity and look forward to future coordination with the DOE. We support your efforts to conduct environmental analysis for the proposed transmission line.

Should you have any questions, please work with our Environmental Coordinator Rachael Hohl to address them. Rachael may be reached via electronic mail at rhohl@fs.fed.us or telephone at 520-388-8352.

Sincerely,

DL Bumpus

FOR KERWIN S. DEWBERRY
Forest Supervisor

THOMAS M. BRODERICK
Director of Utilities
Division

ARIZONA CORPORATION COMMISSION

October 31, 2016

Meghan Conklin
Deputy Assistant Secretary
Office of Electricity Delivery and Energy Reliability
U. S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585

RE: Nogales Interconnection Project Environmental Assessment
Docket No. DOE/EA-3042

Cooperating Agency Status for Staff of the Arizona Corporation Commission

Dear Ms. Conklin:

On September 8, 2016 you sent a letter to Thomas Chenal, Chairman of the Arizona Power Plant and Transmission Line Siting Committee ("Committee"), inviting the Arizona Corporation Commission ("ACC") to participate as a cooperating agency in DOE's preparation of an EA for the project described above. I understand that Chairman Chenal has advised you that the Committee will not participate as a cooperating agency. Chairman Chenal forwarded the letter to the ACC Chairman Doug Little. Chairman Little has directed that Staff of the Utilities Division of the ACC act as a cooperating agency in this matter. Accordingly, this letter requests that Staff of the Utilities Division of the ACC participate as a cooperating agency for the project.

The Staff person assigned to this matter is Laurie A. Woodall, Executive Consultant III. She can be reached at (602) 542-0831, 1200 W. Washington, Phoenix AZ 85007 and at lawoodall@azcc.gov if you have any questions and/or additional information.

Sincerely,

Thomas M. Broderick
Director
Utilities Division
Arizona Corporation Commission

Cc: Chairman, Doug Little

Appendix B

NATIONAL HISTORIC PRESERVATION ACT SECTION 106 CONSULTATION DOCUMENTATION

Table B.1. Section 106 Consultation List for the Nogales Interconnection Environmental Assessment

Name and Title	Date	Response
Tohono O'odham Nation	September 19, 2016 and October 21, 2016	Accepted as a consulting party on December 12, 2016.
Pascua Yaqui Tribe	September 19, 2016 and October 21, 2016	*No response*
Ak-Chin Indian Community	September 19, 2016	*No response*
Cocopah Indian Tribe	September 19, 2016	*No response*
Colorado River Indian Tribes	September 19, 2016	*No response*
Fort McDowell Yavapai Nation	September 19, 2016	*No response*
Fort Mohave Indian Tribe	September 19, 2016	*No response*
Fort Yuma-Quechan Tribe	September 19, 2016	*No response*
Gila River Indian Community	September 19, 2016	*No response*
Havasupai Tribe	September 19, 2016	*No response*
Hopi Tribe	September 19, 2016	*No response*
Hualapai Tribe	September 19, 2016	*No response*
Kaibab Band of Paiutes	September 19, 2016	*No response*
The Navajo Nation	September 19, 2016	Declined to consult on December 28, 2016
Pueblo of Zuni	September 19, 2016	*No response*
Salt River Pima-Maricopa Indian Community	September 19, 2016	*No response*
San Carlos Apache Tribe	September 19, 2016	Declined to consult on October 13, 2016
San Juan Southern Paiute	September 19, 2016	*No response*
San Juan Southern Paiute – sent to revised address	November 22, 2016	*No response*
Tonto Apache Tribe	September 19, 2016	*No response*
White Mountain Apache Tribe	September 19, 2016	*No response*
Yavapai-Apache Nation	September 19, 2016	*No response*
Yavapai-Prescott Indian Tribe	September 19, 2016	*No response*
Arizona State Historic Preservation Office	September 19, 2016	Accepted as a consulting party on October 6, 2016
Advisory Council on Historic Preservation	September 19, 2016	Available to consult as needed on October 17, 2016
Arizona Commission of Indian Affairs	September 19, 2016	*No response*
Arizona Historical Society	September 19, 2016	*No response*
Bureau of Indian Affairs		*No response*
City of Nogales, Arizona – Mayor's Office	September 19, 2016	*No response*
City of Nogales, Arizona – City Manager Office	September 19, 2016	*No response*
National Association of Tribal Historic Preservation Officers	September 19, 2016	*No response*
National Trust for Historic Preservation	September 19, 2016	*No response*
Nogales Transmission, L.L.C.	September 19, 2016	Accepted as a consulting party on September 30, 2016
Pima Alta Historical Society and Museum	September 19, 2016	*No response*
Santa Cruz County, Arizona – Board of Supervisors	September 19, 2016	*No response*
Santa Cruz County, Arizona – Community Development Department	September 19, 2016	*No response*
Santa Cruz Valley Heritage Alliance	September 19, 2016	*No response*

Department of Energy

Washington, DC 20585

September 13, 2016

Mr. Edward Manuel
Chairman
Tohono O'odham Nation
P.O. Box 837
Sells, AZ 85634-0837

Subject: Nogales Interconnection Project Environmental Assessment,
Docket No. DOE/EA-2042,
Initiation of Government-to-Government and Section 106 Consultations

Dear Chairman Manuel:

On April 8, 2016, Nogales Transmission, LLC (Nogales Transmission or the Applicant) applied to the Department of Energy's (DOE) Office of Electricity Delivery and Energy Reliability for a Presidential permit to construct, operate, maintain, and connect a new high-voltage direct current (HVDC) transmission line across the U.S.-Mexico border in southern Arizona.[1] A copy of DOE's *Notice of Application for Presidential Permit; Nogales Interconnection Project* is included with this letter (81 FR 31622; May 19, 2016).

Initiation of Consultations

DOE would like to initiate government-to-government consultation with the Tohono O'odham Nation for this project. In accordance with its responsibilities under Section 106 of the National Historic Preservation Act (NHPA), the National Environmental Policy Act (NEPA), the American Indian Religious Freedom Act (42 U.S.C. 1996), the Archeological Resources Protection Act (16 U.S.C. 470aa-mm), the Native American Graves Protection and Repatriation Act (25 U.S.C. 3001, et. seq.), Executive Order 13175 "Consultation and Coordination with Indian Tribal Governments" (November 6, 2000), President Obama's "Presidential Memorandum on Tribal Consultation" (November 5, 2009), and DOE's "American Indian and Alaska Native Tribal Government Policy," as set forth in DOE Order 144.1 (January, 2006), DOE invites the Tohono O'odham Nation to consult on a government-to-government basis to identify any concerns that uniquely or significantly affect your Nation related to the proposed project and to assure that potential effects are fully addressed. The goals of the consultation are to identify concerns early in the environmental review process and to reach mutually agreeable decisions while taking into account the interests of the Tribal, State, and Federal governments.

Pursuant to Section 106 of the NHPA and 36 CFR Part 800, DOE would like to initiate the Section 106 consultation process to determine any potential adverse effects on Tribal properties of traditional religious and cultural significance. DOE invites the Tohono O'odham Nation to participate as a consulting party by providing information to help identify historic properties in

[1] In accordance with Executive Order (EO) 10485, as amended by EO 12038, and the regulations at 10 CFR 205.320 et seq. (2000), "Application for Presidential Permit Authorizing the Construction, Connection, Operation, and Maintenance of Facilities for Transmission of Electric Energy at International Boundaries."

the project area that may have religious and cultural significance to your Nation, and if such properties exist, to help assess how the project might affect them.

Project Information

The approximately five-mile U.S. portion of the proposed transmission line would be capable of transmitting up to 300 megawatts (MW) of power. From the existing Valencia Substation to the proposed Gateway Substation, a three-mile, 138 kilovolt (kV) line would be constructed. A 300 MW bi-directional back-to-back HVDC converter would be located at the proposed Gateway substation, connecting the Western Electric Coordinating Council (WECC) system to the Mexico system. The back-to-back HVDC converter would have two phases, with each phase capable of 150 MW of bi-directional flow between the WECC and Mexico systems. From the Gateway Substation, a 230 kV line would run approximately two miles south to the Mexico border. The U.S. portion of the proposed project would cross the U.S.-Mexico border west of the Mariposa Point of Entry in Nogales, Arizona. Please refer to the enclosure for two project location maps provided by Nogales Transmission as part of the Presidential permit application.

The Nogales Transmission application, including associated maps and drawings, can be viewed and downloaded in its entirety from the DOE Office of Electricity and Energy Reliability program website at: http://energy.gov/oe/downloads/application-presidential-permit-oe-docket-no-pp-420-nogales-transmission-llc. Information specific to cultural resources can be found in "Chapter IV, Part C. Cultural Resources" of the application, as well as in the associated environmental report (*see* "Section 3.6 Cultural Resources" and "Appendix B: Class III Cultural Resources Survey for the Nogales Interconnection Project").

DOE has recently started its environmental review and plans to prepare an environmental assessment (EA) pursuant to the requirements of NEPA, the Council on Environmental Quality (CEQ) regulations for implementing the procedural provisions of NEPA (40 CFR Parts 1500-1508), and DOE's implementing procedures for compliance with NEPA (10 CFR Part 1021). The EA will describe all potential impacts of the proposed project on the environment, including those that could be related to:

- Historic and Cultural Resources
- Geology and Soils
- Vegetation and Wildlife
- Water Resources and Quality
- Land Use and Recreation
- Visual Resources
- Socioeconomics and Environmental Justice
- Air Quality and Noise
- Transportation, Traffic, and Infrastructure
- Human Health and Safety
- Hazardous Materials and Waste

DOE is meeting its obligations under the NHPA concurrently with the preparation of the EA.

Confidentiality

We understand that you may have concerns regarding the confidentiality of information on areas or resources of religious, traditional, and cultural importance. We are happy to discuss these concerns and develop procedures to ensure the confidentiality of such information is maintained.

We respectfully request that you respond within 30 days of your receipt of this letter to facilitate the consultation process and to ensure that DOE can promptly begin to address your comments and concerns. If you would like to participate as a consulting party, please send a letter that accepts this invitation in an attachment to an email to Melissa.Pauley@doe.hq.gov, by fax to 202-586-8008, or by postal mail to the address listed below. In the meantime, if you have any questions, please contact me directly via email or by phone at 202-586-2942. Thank you for taking the time to consider this request.

Sincerely,

Melissa Pauley

Melissa Pauley
Electricity Policy Analyst
Transmission Permitting & Technical Assistance Division
Office of Electricity Delivery and Energy Reliability
Mail Stop: OE-20
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585

Enclosures:
Notice of Application
Project Location Maps

Department of Energy

Washington, DC 20585

September 13, 2016

Mr. Robert Valencia
Chairman
Pascua Yaqui Tribe
7474 S. Camino DeOeste
Tucson, AZ 85746-9308

Subject: Nogales Interconnection Project Environmental Assessment,
Docket No. DOE/EA-2042,
Initiation of Government-to-Government and Section 106 Consultations

Dear Chairman Valencia:

On April 8, 2016, Nogales Transmission, LLC (Nogales Transmission or the Applicant) applied to the Department of Energy's (DOE) Office of Electricity Delivery and Energy Reliability for a Presidential permit to construct, operate, maintain, and connect a new high-voltage direct current (HVDC) transmission line across the U.S.-Mexico border in southern Arizona.[1] A copy of DOE's *Notice of Application for Presidential Permit; Nogales Interconnection Project* is included with this letter (81 FR 31622; May 19, 2016).

Initiation of Consultations

DOE would like to initiate government-to-government consultation with the Pascua Yaqui Tribe for this project. In accordance with its responsibilities under Section 106 of the National Historic Preservation Act (NHPA), the National Environmental Policy Act (NEPA), the American Indian Religious Freedom Act (42 U.S.C. 1996), the Archeological Resources Protection Act (16 U.S.C. 470aa-mm), the Native American Graves Protection and Repatriation Act (25 U.S.C. 3001, et. seq.), Executive Order 13175 "Consultation and Coordination with Indian Tribal Governments" (November 6, 2000), President Obama's "Presidential Memorandum on Tribal Consultation" (November 5, 2009), and DOE's "American Indian and Alaska Native Tribal Government Policy," as set forth in DOE Order 144.1 (January, 2006), DOE invites the Pascua Yaqui Tribe to consult on a government-to-government basis to identify any concerns that uniquely or significantly affect your Tribe related to the proposed project and to assure that potential effects are fully addressed. The goals of the consultation are to identify concerns early in the environmental review process and to reach mutually agreeable decisions while taking into account the interests of the Tribal, State, and Federal governments.

Pursuant to Section 106 of the NHPA and 36 CFR Part 800, DOE would like to initiate the Section 106 consultation process to determine any potential adverse effects on Tribal properties of traditional religious and cultural significance. DOE invites the Pascua Yaqui Tribe to participate as a consulting party by providing information to help identify historic properties in

[1] In accordance with Executive Order (EO) 10485, as amended by EO 12038, and the regulations at 10 CFR 205.320 et seq. (2000), "Application for Presidential Permit Authorizing the Construction, Connection, Operation, and Maintenance of Facilities for Transmission of Electric Energy at International Boundaries."

the project area that may have religious and cultural significance to your Tribe, and if such properties exist, to help assess how the project might affect them.

Project Information

The approximately five-mile U.S. portion of the proposed transmission line would be capable of transmitting up to 300 megawatts (MW) of power. From the existing Valencia Substation to the proposed Gateway Substation, a three-mile, 138 kilovolt (kV) line would be constructed. A 300 MW bi-directional back-to-back HVDC converter would be located at the proposed Gateway substation, connecting the Western Electric Coordinating Council (WECC) system to the Mexico system. The back-to-back HVDC converter would have two phases, with each phase capable of 150 MW of bi-directional flow between the WECC and Mexico systems. From the Gateway Substation, a 230 kV line would run approximately two miles south to the Mexico border. The U.S. portion of the proposed project would cross the U.S.-Mexico border west of the Mariposa Point of Entry in Nogales, Arizona. Please refer to the enclosure for two project location maps provided by Nogales Transmission as part of the Presidential permit application.

The Nogales Transmission application, including associated maps and drawings, can be viewed and downloaded in its entirety from the DOE Office of Electricity and Energy Reliability program website at: http://energy.gov/oe/downloads/application-presidential-permit-oe-docket-no-pp-420-nogales-transmission-llc. Information specific to cultural resources can be found in "Chapter IV, Part C. Cultural Resources" of the application, as well as in the associated environmental report (*see* "Section 3.6 Cultural Resources" and "Appendix B: Class III Cultural Resources Survey for the Nogales Interconnection Project").

DOE has recently started its environmental review and plans to prepare an environmental assessment (EA) pursuant to the requirements of NEPA, the Council on Environmental Quality (CEQ) regulations for implementing the procedural provisions of NEPA (40 CFR Parts 1500-1508), and DOE's implementing procedures for compliance with NEPA (10 CFR Part 1021). The EA will describe all potential impacts of the proposed project on the environment, including those that could be related to:

- Historic and Cultural Resources
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- Vegetation and Wildlife
- Water Resources and Quality
- Land Use and Recreation
- Visual Resources
- Socioeconomics and Environmental Justice
- Air Quality and Noise
- Transportation, Traffic, and Infrastructure
- Human Health and Safety
- Hazardous Materials and Waste

DOE is meeting its obligations under the NHPA concurrently with the preparation of the EA.

Confidentiality

We understand that you may have concerns regarding the confidentiality of information on areas or resources of religious, traditional, and cultural importance. We are happy to discuss these concerns and develop procedures to ensure the confidentiality of such information is maintained.

We respectfully request that you respond within 30 days of your receipt of this letter to facilitate the consultation process and to ensure that DOE can promptly begin to address your comments and concerns. If you would like to participate as a consulting party, please send a letter that accepts this invitation in an attachment to an email to Melissa.Pauley@doe.hq.gov, by fax to 202-586-8008, or by postal mail to the address listed below. In the meantime, if you have any questions, please contact me directly via email or by phone at 202-586-2942. Thank you for taking the time to consider this request.

Sincerely,

Melissa Pauley

Melissa Pauley
Electricity Policy Analyst
Transmission Permitting & Technical Assistance Division
Office of Electricity Delivery and Energy Reliability
Mail Stop: OE-20
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585

Enclosures:
Notice of Application
Project Location Maps

Department of Energy

Washington, DC 20585

September 19, 2016

Mr. Robert Miguel
Chairman
Ak-Chin Indian Community
42507 W. Peters and Nall Road
Maricopa, AZ 85138-3940

Subject: Invitation to Consult under the National Historic Preservation Act for the proposed Nogales Interconnection Project; Docket No. DOE/EA-2042

Dear Chairman Miguel:

Nogales Transmission, LLC (Nogales Transmission or the Applicant) applied to the U.S. Department of Energy's (DOE's) Office of Electricity Delivery and Energy Reliability pursuant to Executive Order 10485, as amended by Executive Order 12038, for a Presidential permit[1] (the Federal action) to construct, operate, maintain, and connect a new high-voltage direct current (HVDC) transmission line across the U.S.-Mexico border in southern Arizona.

Pursuant to Section 106 of the National Historic Preservation Act (NHPA) and 36 CFR Part 800, "Protection of Historic Resources," DOE is initiating the Section 106 consultation process to determine any potential adverse effects of the proposed Nogales Interconnection project (the project) on historic properties. DOE invites you to participate as a consulting party, as provided for by Section 106 and its implementing regulations, by providing information about historic properties in or near the project area, sharing your concerns about such properties, and identifying potential mitigation measures. DOE is coordinating its compliance with Section 106 of the NHPA with its review under the National Environmental Policy Act (NEPA) according to the process set forth in 36 CFR §800.3(b). DOE is the lead federal agency in the preparation of an environmental assessment (EA) for the project.

On April 8, 2016, Nogales Transmission applied to DOE pursuant to Executive Order 10485, as amended by Executive Order 12038, for a Presidential permit. A copy of DOE's *Notice of Application for Presidential Permit; Nogales Interconnection Project* is included with this letter (81 FR 31622; May 19, 2016).

The approximately five-mile U.S. portion of the proposed transmission line would be capable of transmitting up to 300 megawatts (MW) of power. From the existing Valencia Substation to the proposed Gateway Substation, a three-mile, 138 kilovolt (kV) line would be constructed. A 300 MW bi-directional back-to-back HVDC converter would be located at the proposed Gateway substation, connecting the Western Electric Coordinating Council (WECC) system to the Mexico system. The back-to-back HVDC converter would have two phases, with each phase capable of 150 MW of bi-directional flow between the WECC and Mexico systems. From the Gateway Substation, a 230 kV line would run approximately two miles south to the Mexico border. The U.S. portion of the proposed project would cross the U.S.-Mexico border west of the Mariposa

[1] In accordance with Executive Order (EO) 10485, as amended by EO 12038, and the regulations at 10 CFR 205.320 et seq. (2000), "Application for Presidential Permit Authorizing the Construction, Connection, Operation, and Maintenance of Facilities for Transmission of Electric Energy at International Boundaries."

Point of Entry in Nogales, Arizona. Please refer to the enclosure for two project location maps that were provided by the Applicant as part of the Presidential permit application.

The Nogales Transmission application can be viewed and downloaded in its entirety from the DOE Office of Electricity and Energy Reliability program website at: http://energy.gov/oe/downloads/application-presidential-permit-oe-docket-no-pp-420-nogales-transmission-llc. Information specific to cultural resources can be found in "Chapter IV, Part C. Cultural Resources" of the application, as well as in the associated environmental report (*see* "Section 3.6 Cultural Resources" and "Appendix B: Class III Cultural Resources Survey for the Nogales Interconnection Project, Nogales").

Under Section 106, DOE must identify and consider the potential effects of its actions on historic properties through a collaborative framework (consultation) to identify historic properties potentially affected by the project, assess effects, and seek ways to avoid, minimize, or mitigate any adverse effects (36 CFR §800.1(a)). In addition to the State Historic Preservation Office (SHPO), federally recognized Indian tribes, and the Advisory Council on Historic Preservation (ACHP), Section 106 consulting parties may include certain individuals and organizations with a demonstrated interest in the undertaking due to the nature of their legal or economic relation to the undertaking or affected properties, or their concern with the undertaking's effects on historic properties (36 CFR §800.2).

As a consulting party, your assistance in the identification and evaluation of historic properties will provide us with the opportunity to resolve any adverse effects the project may have on these properties. If available, we welcome any additional information on the location and importance of archaeological sites, historic structures, and any other localities of interest to you that are known to occur in or near the project area.

If you would like to participate as a Section 106 consulting party, please send a letter that accepts this invitation in an attachment to an email to Melissa.Pauley@doe.hq.gov, by fax to 202-586-8008, or by postal mail to the address listed below. We respectfully request that you respond within 30 days of your receipt of this letter to facilitate the consultation process and to ensure that DOE can promptly begin to address your comments and concerns. In the meantime, if you have any questions, please contact me directly via email or by phone at 202-586-2942. Thank you for taking the time to consider this request.

Sincerely,

Melissa Pauley

Melissa Pauley
Electricity Policy Analyst
Transmission Permitting & Technical Assistance Division, OE-20
Office of Electricity Delivery and Energy Reliability
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585

Enclosures:
Notice of Application
Project Location Maps

Department of Energy

Washington, DC 20585

September 19, 2016

Ms. Sherry Cordova
Chairwoman
Cocopah Indian Tribe
14515 S. Veterans Dr.
Somerton, AZ 85350-7001

Subject: Invitation to Consult under the National Historic Preservation Act for the proposed Nogales Interconnection Project; Docket No. DOE/EA-2042

Dear Chairwoman Cordova:

Nogales Transmission, LLC (Nogales Transmission or the Applicant) applied to the U.S. Department of Energy's (DOE's) Office of Electricity Delivery and Energy Reliability pursuant to Executive Order 10485, as amended by Executive Order 12038, for a Presidential permit[1] (the Federal action) to construct, operate, maintain, and connect a new high-voltage direct current (HVDC) transmission line across the U.S.-Mexico border in southern Arizona.

Pursuant to Section 106 of the National Historic Preservation Act (NHPA) and 36 CFR Part 800, "Protection of Historic Resources," DOE is initiating the Section 106 consultation process to determine any potential adverse effects of the proposed Nogales Interconnection project (the project) on historic properties. DOE invites you to participate as a consulting party, as provided for by Section 106 and its implementing regulations, by providing information about historic properties in or near the project area, sharing your concerns about such properties, and identifying potential mitigation measures. DOE is coordinating its compliance with Section 106 of the NHPA with its review under the National Environmental Policy Act (NEPA) according to the process set forth in 36 CFR §800.3(b). DOE is the lead federal agency in the preparation of an environmental assessment (EA) for the project.

On April 8, 2016, Nogales Transmission applied to DOE pursuant to Executive Order 10485, as amended by Executive Order 12038, for a Presidential permit. A copy of DOE's *Notice of Application for Presidential Permit; Nogales Interconnection Project* is included with this letter (81 FR 31622; May 19, 2016).

The approximately five-mile U.S. portion of the proposed transmission line would be capable of transmitting up to 300 megawatts (MW) of power. From the existing Valencia Substation to the proposed Gateway Substation, a three-mile, 138 kilovolt (kV) line would be constructed. A 300 MW bi-directional back-to-back HVDC converter would be located at the proposed Gateway substation, connecting the Western Electric Coordinating Council (WECC) system to the Mexico system. The back-to-back HVDC converter would have two phases, with each phase capable of 150 MW of bi-directional flow between the WECC and Mexico systems. From the Gateway Substation, a 230 kV line would run approximately two miles south to the Mexico border. The U.S. portion of the proposed project would cross the U.S.-Mexico border west of the Mariposa

[1] In accordance with Executive Order (EO) 10485, as amended by EO 12038, and the regulations at 10 CFR 205.320 et seq. (2000), "Application for Presidential Permit Authorizing the Construction, Connection, Operation, and Maintenance of Facilities for Transmission of Electric Energy at International Boundaries."

Point of Entry in Nogales, Arizona. Please refer to the enclosure for two project location maps that were provided by the Applicant as part of the Presidential permit application.

The Nogales Transmission application can be viewed and downloaded in its entirety from the DOE Office of Electricity and Energy Reliability program website at: http://energy.gov/oe/downloads/application-presidential-permit-oe-docket-no-pp-420-nogales-transmission-llc. Information specific to cultural resources can be found in "Chapter IV, Part C. Cultural Resources" of the application, as well as in the associated environmental report (*see* "Section 3.6 Cultural Resources" and "Appendix B: Class III Cultural Resources Survey for the Nogales Interconnection Project, Nogales").

Under Section 106, DOE must identify and consider the potential effects of its actions on historic properties through a collaborative framework (consultation) to identify historic properties potentially affected by the project, assess effects, and seek ways to avoid, minimize, or mitigate any adverse effects (36 CFR §800.1(a)). In addition to the State Historic Preservation Office (SHPO), federally recognized Indian tribes, and the Advisory Council on Historic Preservation (ACHP), Section 106 consulting parties may include certain individuals and organizations with a demonstrated interest in the undertaking due to the nature of their legal or economic relation to the undertaking or affected properties, or their concern with the undertaking's effects on historic properties (36 CFR §800.2).

As a consulting party, your assistance in the identification and evaluation of historic properties will provide us with the opportunity to resolve any adverse effects the project may have on these properties. If available, we welcome any additional information on the location and importance of archaeological sites, historic structures, and any other localities of interest to you that are known to occur in or near the project area.

If you would like to participate as a Section 106 consulting party, please send a letter that accepts this invitation in an attachment to an email to Melissa.Pauley@doe.hq.gov, by fax to 202-586-8008, or by postal mail to the address listed below. We respectfully request that you respond within 30 days of your receipt of this letter to facilitate the consultation process and to ensure that DOE can promptly begin to address your comments and concerns. In the meantime, if you have any questions, please contact me directly via email or by phone at 202-586-2942. Thank you for taking the time to consider this request.

Sincerely,

Melissa Pauley

Melissa Pauley
Electricity Policy Analyst
Transmission Permitting & Technical Assistance Division, OE-20
Office of Electricity Delivery and Energy Reliability
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585

Enclosures:
Notice of Application
Project Location Maps

Department of Energy

Washington, DC 20585

September 19, 2016

Mr. Dennis Patch
Chairman
Colorado River Indian Tribes
26600 Mohave Road
Parker, AZ 85344-7737

Subject: Invitation to Consult under the National Historic Preservation Act for the proposed Nogales Interconnection Project; Docket No. DOE/EA-2042

Dear Chairman Patch:

Nogales Transmission, LLC (Nogales Transmission or the Applicant) applied to the U.S. Department of Energy's (DOE's) Office of Electricity Delivery and Energy Reliability pursuant to Executive Order 10485, as amended by Executive Order 12038, for a Presidential permit[1] (the Federal action) to construct, operate, maintain, and connect a new high-voltage direct current (HVDC) transmission line across the U.S.-Mexico border in southern Arizona.

Pursuant to Section 106 of the National Historic Preservation Act (NHPA) and 36 CFR Part 800, "Protection of Historic Resources," DOE is initiating the Section 106 consultation process to determine any potential adverse effects of the proposed Nogales Interconnection project (the project) on historic properties. DOE invites you to participate as a consulting party, as provided for by Section 106 and its implementing regulations, by providing information about historic properties in or near the project area, sharing your concerns about such properties, and identifying potential mitigation measures. DOE is coordinating its compliance with Section 106 of the NHPA with its review under the National Environmental Policy Act (NEPA) according to the process set forth in 36 CFR §800.3(b). DOE is the lead federal agency in the preparation of an environmental assessment (EA) for the project.

On April 8, 2016, Nogales Transmission applied to DOE pursuant to Executive Order 10485, as amended by Executive Order 12038, for a Presidential permit. A copy of DOE's *Notice of Application for Presidential Permit; Nogales Interconnection Project* is included with this letter (81 FR 31622; May 19, 2016).

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[1] In accordance with Executive Order (EO) 10485, as amended by EO 12038, and the regulations at 10 CFR 205.320 et seq. (2000), "Application for Presidential Permit Authorizing the Construction, Connection, Operation, and Maintenance of Facilities for Transmission of Electric Energy at International Boundaries."

Point of Entry in Nogales, Arizona. Please refer to the enclosure for two project location maps that were provided by the Applicant as part of the Presidential permit application.

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As a consulting party, your assistance in the identification and evaluation of historic properties will provide us with the opportunity to resolve any adverse effects the project may have on these properties. If available, we welcome any additional information on the location and importance of archaeological sites, historic structures, and any other localities of interest to you that are known to occur in or near the project area.

If you would like to participate as a Section 106 consulting party, please send a letter that accepts this invitation in an attachment to an email to Melissa.Pauley@doe.hq.gov, by fax to 202-586-8008, or by postal mail to the address listed below. We respectfully request that you respond within 30 days of your receipt of this letter to facilitate the consultation process and to ensure that DOE can promptly begin to address your comments and concerns. In the meantime, if you have any questions, please contact me directly via email or by phone at 202-586-2942. Thank you for taking the time to consider this request.

Sincerely,

Melissa Pauley

Melissa Pauley
Electricity Policy Analyst
Transmission Permitting & Technical Assistance Division, OE-20
Office of Electricity Delivery and Energy Reliability
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585

Enclosures:
Notice of Application
Project Location Maps

Department of Energy

Washington, DC 20585

September 19, 2016

Ms. Bernadine Burnette
President
Fort McDowell Yavapai Nation
P.O. Box 17779
Fountain Hills, AZ 85269-7779

Subject: Invitation to Consult under the National Historic Preservation Act for the proposed Nogales Interconnection Project; Docket No. DOE/EA-2042

Dear President Burnette:

Nogales Transmission, LLC (Nogales Transmission or the Applicant) applied to the U.S. Department of Energy's (DOE's) Office of Electricity Delivery and Energy Reliability pursuant to Executive Order 10485, as amended by Executive Order 12038, for a Presidential permit[1] (the Federal action) to construct, operate, maintain, and connect a new high-voltage direct current (HVDC) transmission line across the U.S.-Mexico border in southern Arizona.

Pursuant to Section 106 of the National Historic Preservation Act (NHPA) and 36 CFR Part 800, "Protection of Historic Resources," DOE is initiating the Section 106 consultation process to determine any potential adverse effects of the proposed Nogales Interconnection project (the project) on historic properties. DOE invites you to participate as a consulting party, as provided for by Section 106 and its implementing regulations, by providing information about historic properties in or near the project area, sharing your concerns about such properties, and identifying potential mitigation measures. DOE is coordinating its compliance with Section 106 of the NHPA with its review under the National Environmental Policy Act (NEPA) according to the process set forth in 36 CFR §800.3(b). DOE is the lead federal agency in the preparation of an environmental assessment (EA) for the project.

On April 8, 2016, Nogales Transmission applied to DOE pursuant to Executive Order 10485, as amended by Executive Order 12038, for a Presidential permit. A copy of DOE's *Notice of Application for Presidential Permit; Nogales Interconnection Project* is included with this letter (81 FR 31622; May 19, 2016).

The approximately five-mile U.S. portion of the proposed transmission line would be capable of transmitting up to 300 megawatts (MW) of power. From the existing Valencia Substation to the proposed Gateway Substation, a three-mile, 138 kilovolt (kV) line would be constructed. A 300 MW bi-directional back-to-back HVDC converter would be located at the proposed Gateway substation, connecting the Western Electric Coordinating Council (WECC) system to the Mexico system. The back-to-back HVDC converter would have two phases, with each phase capable of 150 MW of bi-directional flow between the WECC and Mexico systems. From the Gateway Substation, a 230 kV line would run approximately two miles south to the Mexico border. The U.S. portion of the proposed project would cross the U.S.-Mexico border west of the Mariposa

[1] In accordance with Executive Order (EO) 10485, as amended by EO 12038, and the regulations at 10 CFR 205.320 et seq. (2000), "Application for Presidential Permit Authorizing the Construction, Connection, Operation, and Maintenance of Facilities for Transmission of Electric Energy at International Boundaries."

Point of Entry in Nogales, Arizona. Please refer to the enclosure for two project location maps that were provided by the Applicant as part of the Presidential permit application.

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Under Section 106, DOE must identify and consider the potential effects of its actions on historic properties through a collaborative framework (consultation) to identify historic properties potentially affected by the project, assess effects, and seek ways to avoid, minimize, or mitigate any adverse effects (36 CFR §800.1(a)). In addition to the State Historic Preservation Office (SHPO), federally recognized Indian tribes, and the Advisory Council on Historic Preservation (ACHP), Section 106 consulting parties may include certain individuals and organizations with a demonstrated interest in the undertaking due to the nature of their legal or economic relation to the undertaking or affected properties, or their concern with the undertaking's effects on historic properties (36 CFR §800.2).

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Sincerely,

Melissa Pauley

Melissa Pauley
Electricity Policy Analyst
Transmission Permitting & Technical Assistance Division, OE-20
Office of Electricity Delivery and Energy Reliability
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585

Enclosures:
Notice of Application
Project Location Maps

Department of Energy

Washington, DC 20585

September 19, 2016

Mr. Timothy Williams
Chairman
Fort Mojave Indian Tribe
500 Merriman Street
Needles, CA 92363-2229

Subject: Invitation to Consult under the National Historic Preservation Act for the proposed Nogales Interconnection Project; Docket No. DOE/EA-2042

Dear Chairman Williams:

Nogales Transmission, LLC (Nogales Transmission or the Applicant) applied to the U.S. Department of Energy's (DOE's) Office of Electricity Delivery and Energy Reliability pursuant to Executive Order 10485, as amended by Executive Order 12038, for a Presidential permit[1] (the Federal action) to construct, operate, maintain, and connect a new high-voltage direct current (HVDC) transmission line across the U.S.-Mexico border in southern Arizona.

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Sincerely,

Melissa Pauley

Melissa Pauley
Electricity Policy Analyst
Transmission Permitting & Technical Assistance Division, OE-20
Office of Electricity Delivery and Energy Reliability
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585

Enclosures:
Notice of Application
Project Location Maps

Department of Energy

Washington, DC 20585

September 19, 2016

Mr. Mike Jackson
President
Fort Yuma-Quechan Tribe
P.O. Box 1899
Yuma, AZ 85366-2386

Subject: Invitation to Consult under the National Historic Preservation Act for the proposed Nogales Interconnection Project; Docket No. DOE/EA-2042

Dear President Jackson:

Nogales Transmission, LLC (Nogales Transmission or the Applicant) applied to the U.S. Department of Energy's (DOE's) Office of Electricity Delivery and Energy Reliability pursuant to Executive Order 10485, as amended by Executive Order 12038, for a Presidential permit[1] (the Federal action) to construct, operate, maintain, and connect a new high-voltage direct current (HVDC) transmission line across the U.S.-Mexico border in southern Arizona.

Pursuant to Section 106 of the National Historic Preservation Act (NHPA) and 36 CFR Part 800, "Protection of Historic Resources," DOE is initiating the Section 106 consultation process to determine any potential adverse effects of the proposed Nogales Interconnection project (the project) on historic properties. DOE invites you to participate as a consulting party, as provided for by Section 106 and its implementing regulations, by providing information about historic properties in or near the project area, sharing your concerns about such properties, and identifying potential mitigation measures. DOE is coordinating its compliance with Section 106 of the NHPA with its review under the National Environmental Policy Act (NEPA) according to the process set forth in 36 CFR §800.3(b). DOE is the lead federal agency in the preparation of an environmental assessment (EA) for the project.

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Sincerely,

Melissa Pauley

Melissa Pauley
Electricity Policy Analyst
Transmission Permitting & Technical Assistance Division, OE-20
Office of Electricity Delivery and Energy Reliability
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585

Enclosures:
Notice of Application
Project Location Maps

Department of Energy

Washington, DC 20585

September 19, 2016

Mr. Stephen R. Lewis
Governor
Gila River Indian Community
P.O. Box 97
Sacaton, AZ 85147-0001

Subject: Invitation to Consult under the National Historic Preservation Act for the proposed Nogales Interconnection Project; Docket No. DOE/EA-2042

Dear Governor Lewis:

Nogales Transmission, LLC (Nogales Transmission or the Applicant) applied to the U.S. Department of Energy's (DOE's) Office of Electricity Delivery and Energy Reliability pursuant to Executive Order 10485, as amended by Executive Order 12038, for a Presidential permit[1] (the Federal action) to construct, operate, maintain, and connect a new high-voltage direct current (HVDC) transmission line across the U.S.-Mexico border in southern Arizona.

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Melissa Pauley

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Office of Electricity Delivery and Energy Reliability
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585

Enclosures:
Notice of Application
Project Location Maps

Department of Energy

Washington, DC 20585

September 19, 2016

Mr. Don Watahomogie
Chairman
Havasupai Tribe
P.O. Box 10
Supai, AZ 86435-0010

Subject: Invitation to Consult under the National Historic Preservation Act for the proposed Nogales Interconnection Project; Docket No. DOE/EA-2042

Dear Chairman Watahomogie:

Nogales Transmission, LLC (Nogales Transmission or the Applicant) applied to the U.S. Department of Energy's (DOE's) Office of Electricity Delivery and Energy Reliability pursuant to Executive Order 10485, as amended by Executive Order 12038, for a Presidential permit[1] (the Federal action) to construct, operate, maintain, and connect a new high-voltage direct current (HVDC) transmission line across the U.S.-Mexico border in southern Arizona.

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1000 Independence Avenue, SW
Washington, DC 20585

Enclosures:
Notice of Application
Project Location Maps

Department of Energy

Washington, DC 20585

September 19, 2016

Mr. Herman Honanie
Chairman
Hope Tribe
P.O. Box 123
Kykotsmovi, AZ 86039-0123

Subject: Invitation to Consult under the National Historic Preservation Act for the proposed Nogales Interconnection Project; Docket No. DOE/EA-2042

Dear Chairman Honanie:

Nogales Transmission, LLC (Nogales Transmission or the Applicant) applied to the U.S. Department of Energy's (DOE's) Office of Electricity Delivery and Energy Reliability pursuant to Executive Order 10485, as amended by Executive Order 12038, for a Presidential permit[1] (the Federal action) to construct, operate, maintain, and connect a new high-voltage direct current (HVDC) transmission line across the U.S.-Mexico border in southern Arizona.

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U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585

Enclosures:
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Project Location Maps

Department of Energy

Washington, DC 20585

September 19, 2016

Mr. Damon Clarke
Chairman
Hualapai Tribe
P.O. Box 179
Peach Springs, AZ 86434-0179

Subject: Invitation to Consult under the National Historic Preservation Act for the proposed Nogales Interconnection Project; Docket No. DOE/EA-2042

Dear Chairman Clarke:

Nogales Transmission, LLC (Nogales Transmission or the Applicant) applied to the U.S. Department of Energy's (DOE's) Office of Electricity Delivery and Energy Reliability pursuant to Executive Order 10485, as amended by Executive Order 12038, for a Presidential permit[1] (the Federal action) to construct, operate, maintain, and connect a new high-voltage direct current (HVDC) transmission line across the U.S.-Mexico border in southern Arizona.

Pursuant to Section 106 of the National Historic Preservation Act (NHPA) and 36 CFR Part 800, "Protection of Historic Resources," DOE is initiating the Section 106 consultation process to determine any potential adverse effects of the proposed Nogales Interconnection project (the project) on historic properties. DOE invites you to participate as a consulting party, as provided for by Section 106 and its implementing regulations, by providing information about historic properties in or near the project area, sharing your concerns about such properties, and identifying potential mitigation measures. DOE is coordinating its compliance with Section 106 of the NHPA with its review under the National Environmental Policy Act (NEPA) according to the process set forth in 36 CFR §800.3(b). DOE is the lead federal agency in the preparation of an environmental assessment (EA) for the project.

On April 8, 2016, Nogales Transmission applied to DOE pursuant to Executive Order 10485, as amended by Executive Order 12038, for a Presidential permit. A copy of DOE's *Notice of Application for Presidential Permit; Nogales Interconnection Project* is included with this letter (81 FR 31622; May 19, 2016).

The approximately five-mile U.S. portion of the proposed transmission line would be capable of transmitting up to 300 megawatts (MW) of power. From the existing Valencia Substation to the proposed Gateway Substation, a three-mile, 138 kilovolt (kV) line would be constructed. A 300 MW bi-directional back-to-back HVDC converter would be located at the proposed Gateway substation, connecting the Western Electric Coordinating Council (WECC) system to the Mexico system. The back-to-back HVDC converter would have two phases, with each phase capable of 150 MW of bi-directional flow between the WECC and Mexico systems. From the Gateway Substation, a 230 kV line would run approximately two miles south to the Mexico border. The U.S. portion of the proposed project would cross the U.S.-Mexico border west of the Mariposa

[1] In accordance with Executive Order (EO) 10485, as amended by EO 12038, and the regulations at 10 CFR 205.320 et seq. (2000), "Application for Presidential Permit Authorizing the Construction, Connection, Operation, and Maintenance of Facilities for Transmission of Electric Energy at International Boundaries."

Point of Entry in Nogales, Arizona. Please refer to the enclosure for two project location maps that were provided by the Applicant as part of the Presidential permit application.

The Nogales Transmission application can be viewed and downloaded in its entirety from the DOE Office of Electricity and Energy Reliability program website at: http://energy.gov/oe/downloads/application-presidential-permit-oe-docket-no-pp-420-nogales-transmission-llc. Information specific to cultural resources can be found in "Chapter IV, Part C. Cultural Resources" of the application, as well as in the associated environmental report (*see* "Section 3.6 Cultural Resources" and "Appendix B: Class III Cultural Resources Survey for the Nogales Interconnection Project, Nogales").

Under Section 106, DOE must identify and consider the potential effects of its actions on historic properties through a collaborative framework (consultation) to identify historic properties potentially affected by the project, assess effects, and seek ways to avoid, minimize, or mitigate any adverse effects (36 CFR §800.1(a)). In addition to the State Historic Preservation Office (SHPO), federally recognized Indian tribes, and the Advisory Council on Historic Preservation (ACHP), Section 106 consulting parties may include certain individuals and organizations with a demonstrated interest in the undertaking due to the nature of their legal or economic relation to the undertaking or affected properties, or their concern with the undertaking's effects on historic properties (36 CFR §800.2).

As a consulting party, your assistance in the identification and evaluation of historic properties will provide us with the opportunity to resolve any adverse effects the project may have on these properties. If available, we welcome any additional information on the location and importance of archaeological sites, historic structures, and any other localities of interest to you that are known to occur in or near the project area.

If you would like to participate as a Section 106 consulting party, please send a letter that accepts this invitation in an attachment to an email to Melissa.Pauley@doe.hq.gov, by fax to 202-586-8008, or by postal mail to the address listed below. We respectfully request that you respond within 30 days of your receipt of this letter to facilitate the consultation process and to ensure that DOE can promptly begin to address your comments and concerns. In the meantime, if you have any questions, please contact me directly via email or by phone at 202-586-2942. Thank you for taking the time to consider this request.

Sincerely,

Melissa Pauley

Melissa Pauley
Electricity Policy Analyst
Transmission Permitting & Technical Assistance Division, OE-20
Office of Electricity Delivery and Energy Reliability
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585

Enclosures:
Notice of Application
Project Location Maps

Department of Energy

Washington, DC 20585

September 19, 2016

Mr. Roland Maldonado
Chairman
Kaibab Band of Paiutes
Tribal Affairs Building
#1 North Pipe Spring Road
Fredonia, AZ 86022

Subject: Invitation to Consult under the National Historic Preservation Act for the proposed Nogales Interconnection Project; Docket No. DOE/EA-2042

Dear Chairman Maldonado:

Nogales Transmission, LLC (Nogales Transmission or the Applicant) applied to the U.S. Department of Energy's (DOE's) Office of Electricity Delivery and Energy Reliability pursuant to Executive Order 10485, as amended by Executive Order 12038, for a Presidential permit[1] (the Federal action) to construct, operate, maintain, and connect a new high-voltage direct current (HVDC) transmission line across the U.S.-Mexico border in southern Arizona.

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U.S. portion of the proposed project would cross the U.S.-Mexico border west of the Mariposa Point of Entry in Nogales, Arizona. Please refer to the enclosure for two project location maps that were provided by the Applicant as part of the Presidential permit application.

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Sincerely,

Melissa Pauley

Melissa Pauley
Electricity Policy Analyst
Transmission Permitting & Technical Assistance Division, OE-20
Office of Electricity Delivery and Energy Reliability
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585

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Project Location Maps

Department of Energy

Washington, DC 20585

September 19, 2016

Mr. Russell Begaye
President
Navajo Nation
P.O. Drawer 9000
Window Rock, AZ 86515-9000

Subject: Invitation to Consult under the National Historic Preservation Act for the proposed Nogales Interconnection Project; Docket No. DOE/EA-2042

Dear President Begaye:

Nogales Transmission, LLC (Nogales Transmission or the Applicant) applied to the U.S. Department of Energy's (DOE's) Office of Electricity Delivery and Energy Reliability pursuant to Executive Order 10485, as amended by Executive Order 12038, for a Presidential permit[1] (the Federal action) to construct, operate, maintain, and connect a new high-voltage direct current (HVDC) transmission line across the U.S.-Mexico border in southern Arizona.

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Melissa Pauley

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Office of Electricity Delivery and Energy Reliability
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585

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Department of Energy

Washington, DC 20585

September 19, 2016

Mr. Val R. Panteah, Sr.
Governor
Pueblo of Zuni
P.O. Box 339
Zuni, NM 87327-0339

Subject: Invitation to Consult under the National Historic Preservation Act for the proposed Nogales Interconnection Project; Docket No. DOE/EA-2042

Dear Governor Panteah:

Nogales Transmission, LLC (Nogales Transmission or the Applicant) applied to the U.S. Department of Energy's (DOE's) Office of Electricity Delivery and Energy Reliability pursuant to Executive Order 10485, as amended by Executive Order 12038, for a Presidential permit[1] (the Federal action) to construct, operate, maintain, and connect a new high-voltage direct current (HVDC) transmission line across the U.S.-Mexico border in southern Arizona.

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Transmission Permitting & Technical Assistance Division, OE-20
Office of Electricity Delivery and Energy Reliability
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585

Enclosures:
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Project Location Maps

Department of Energy

Washington, DC 20585

September 19, 2016

Mr. Delbert Ray, Sr.
President
Salt River Pima-Maricopa Indian Community
10005 E. Osborn Road
Scottsdale, AZ 85256-4019

Subject: Invitation to Consult under the National Historic Preservation Act for the proposed Nogales Interconnection Project; Docket No. DOE/EA-2042

Dear President Ray:

Nogales Transmission, LLC (Nogales Transmission or the Applicant) applied to the U.S. Department of Energy's (DOE's) Office of Electricity Delivery and Energy Reliability pursuant to Executive Order 10485, as amended by Executive Order 12038, for a Presidential permit[1] (the Federal action) to construct, operate, maintain, and connect a new high-voltage direct current (HVDC) transmission line across the U.S.-Mexico border in southern Arizona.

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Washington, DC 20585

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Project Location Maps

Department of Energy

Washington, DC 20585

September 19, 2016

Mr. Terry Rambler
Chairman
San Carlos Apache Tribe
P.O. Box 0
San Carlos, AZ 85550

Subject: Invitation to Consult under the National Historic Preservation Act for the proposed Nogales Interconnection Project; Docket No. DOE/EA-2042

Dear Chairman Rambler:

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September 19, 2016

Ms. Tiffany Williams
President
San Juan Southern Paiute
P.O. Box 1989
Tuba City, AZ 86045-1989

Subject: Invitation to Consult under the National Historic Preservation Act for the proposed Nogales Interconnection Project; Docket No. DOE/EA-2042

Dear President Williams:

Nogales Transmission, LLC (Nogales Transmission or the Applicant) applied to the U.S. Department of Energy's (DOE's) Office of Electricity Delivery and Energy Reliability pursuant to Executive Order 10485, as amended by Executive Order 12038, for a Presidential permit[1] (the Federal action) to construct, operate, maintain, and connect a new high-voltage direct current (HVDC) transmission line across the U.S.-Mexico border in southern Arizona.

Pursuant to Section 106 of the National Historic Preservation Act (NHPA) and 36 CFR Part 800, "Protection of Historic Resources," DOE is initiating the Section 106 consultation process to determine any potential adverse effects of the proposed Nogales Interconnection project (the project) on historic properties. DOE invites you to participate as a consulting party, as provided for by Section 106 and its implementing regulations, by providing information about historic properties in or near the project area, sharing your concerns about such properties, and identifying potential mitigation measures. DOE is coordinating its compliance with Section 106 of the NHPA with its review under the National Environmental Policy Act (NEPA) according to the process set forth in 36 CFR §800.3(b). DOE is the lead federal agency in the preparation of an environmental assessment (EA) for the project.

On April 8, 2016, Nogales Transmission applied to DOE pursuant to Executive Order 10485, as amended by Executive Order 12038, for a Presidential permit. A copy of DOE's *Notice of Application for Presidential Permit; Nogales Interconnection Project* is included with this letter (81 FR 31622; May 19, 2016).

The approximately five-mile U.S. portion of the proposed transmission line would be capable of transmitting up to 300 megawatts (MW) of power. From the existing Valencia Substation to the proposed Gateway Substation, a three-mile, 138 kilovolt (kV) line would be constructed. A 300 MW bi-directional back-to-back HVDC converter would be located at the proposed Gateway substation, connecting the Western Electric Coordinating Council (WECC) system to the Mexico system. The back-to-back HVDC converter would have two phases, with each phase capable of 150 MW of bi-directional flow between the WECC and Mexico systems. From the Gateway Substation, a 230 kV line would run approximately two miles south to the Mexico border. The U.S. portion of the proposed project would cross the U.S.-Mexico border west of the Mariposa

[1] In accordance with Executive Order (EO) 10485, as amended by EO 12038, and the regulations at 10 CFR 205.320 et seq. (2000), "Application for Presidential Permit Authorizing the Construction, Connection, Operation, and Maintenance of Facilities for Transmission of Electric Energy at International Boundaries."

Point of Entry in Nogales, Arizona. Please refer to the enclosure for two project location maps that were provided by the Applicant as part of the Presidential permit application.

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Under Section 106, DOE must identify and consider the potential effects of its actions on historic properties through a collaborative framework (consultation) to identify historic properties potentially affected by the project, assess effects, and seek ways to avoid, minimize, or mitigate any adverse effects (36 CFR §800.1(a)). In addition to the State Historic Preservation Office (SHPO), federally recognized Indian tribes, and the Advisory Council on Historic Preservation (ACHP), Section 106 consulting parties may include certain individuals and organizations with a demonstrated interest in the undertaking due to the nature of their legal or economic relation to the undertaking or affected properties, or their concern with the undertaking's effects on historic properties (36 CFR §800.2).

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If you would like to participate as a Section 106 consulting party, please send a letter that accepts this invitation in an attachment to an email to Melissa.Pauley@doe.hq.gov, by fax to 202-586-8008, or by postal mail to the address listed below. We respectfully request that you respond within 30 days of your receipt of this letter to facilitate the consultation process and to ensure that DOE can promptly begin to address your comments and concerns. In the meantime, if you have any questions, please contact me directly via email or by phone at 202-586-2942. Thank you for taking the time to consider this request.

Sincerely,

Melissa Pauley

Melissa Pauley
Electricity Policy Analyst
Transmission Permitting & Technical Assistance Division, OE-20
Office of Electricity Delivery and Energy Reliability
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585

Enclosures:
Notice of Application
Project Location Maps

Department of Energy

Washington, DC 20585

November 22, 2016

Ms. Carlene Yellowhair
President
San Juan Southern Paiute
P.O. Box 2950
Tuba City, AZ 86045-1989

Subject: Invitation to Consult under the National Historic Preservation Act for the proposed Nogales Interconnection Project; Docket No. DOE/EA-2042

Dear President Yellowhair:

Nogales Transmission, LLC (Nogales Transmission or the Applicant) applied to the U.S. Department of Energy's (DOE's) Office of Electricity Delivery and Energy Reliability pursuant to Executive Order 10485, as amended by Executive Order 12038, for a Presidential permit[1] (the Federal action) to construct, operate, maintain, and connect a new high-voltage direct current (HVDC) transmission line across the U.S.-Mexico border in southern Arizona.

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Sincerely,

Melissa Pauley

Melissa Pauley
Electricity Policy Analyst
Transmission Permitting & Technical Assistance Division, OE-20
Office of Electricity Delivery and Energy Reliability
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585

Enclosures:
Notice of Application
Project Location Maps

Department of Energy

Washington, DC 20585

September 19, 2016

Ms. Vivian Burdette
Chairwoman
Tonto Apache Tribe
Tonto Apache Reservation #30
Payson, AZ 85541-5670

Subject: Invitation to Consult under the National Historic Preservation Act for the proposed Nogales Interconnection Project; Docket No. DOE/EA-2042

Dear Chairwoman Burdette:

Nogales Transmission, LLC (Nogales Transmission or the Applicant) applied to the U.S. Department of Energy's (DOE's) Office of Electricity Delivery and Energy Reliability pursuant to Executive Order 10485, as amended by Executive Order 12038, for a Presidential permit[1] (the Federal action) to construct, operate, maintain, and connect a new high-voltage direct current (HVDC) transmission line across the U.S.-Mexico border in southern Arizona.

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Sincerely,

Melissa Pauley

Melissa Pauley
Electricity Policy Analyst
Transmission Permitting & Technical Assistance Division, OE-20
Office of Electricity Delivery and Energy Reliability
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585

Enclosures:
Notice of Application
Project Location Maps

Department of Energy

Washington, DC 20585

September 19, 2016

Mr. Ronnie Lupe
Chairman
White Mountain Apache Tribe
P.O. Box 700
Whiteriver, AZ 85941-0700

Subject: Invitation to Consult under the National Historic Preservation Act for the proposed Nogales Interconnection Project; Docket No. DOE/EA-2042

Dear Chairman Lupe:

Nogales Transmission, LLC (Nogales Transmission or the Applicant) applied to the U.S. Department of Energy's (DOE's) Office of Electricity Delivery and Energy Reliability pursuant to Executive Order 10485, as amended by Executive Order 12038, for a Presidential permit[1] (the Federal action) to construct, operate, maintain, and connect a new high-voltage direct current (HVDC) transmission line across the U.S.-Mexico border in southern Arizona.

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Office of Electricity Delivery and Energy Reliability
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585

Enclosures:
Notice of Application
Project Location Maps

Department of Energy

Washington, DC 20585

September 19, 2016

Mr. Thomas Beauty
Chairman
Yavapai-Apache Nation
2400 W. Datsi St.
Camp Verde, AZ 86322-8412

Subject: Invitation to Consult under the National Historic Preservation Act for the proposed Nogales Interconnection Project; Docket No. DOE/EA-2042

Dear Chairman Beauty:

Nogales Transmission, LLC (Nogales Transmission or the Applicant) applied to the U.S. Department of Energy's (DOE's) Office of Electricity Delivery and Energy Reliability pursuant to Executive Order 10485, as amended by Executive Order 12038, for a Presidential permit[1] (the Federal action) to construct, operate, maintain, and connect a new high-voltage direct current (HVDC) transmission line across the U.S.-Mexico border in southern Arizona.

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1000 Independence Avenue, SW
Washington, DC 20585

Enclosures:
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Project Location Maps

Department of Energy

Washington, DC 20585

September 19, 2016

Mr. Ernie Jones, Sr.
President
Yavapai-Prescott Indian Tribe
530 E. Merritt Street
Prescott, AZ 86301-2038

Subject: Invitation to Consult under the National Historic Preservation Act for the proposed Nogales Interconnection Project; Docket No. DOE/EA-2042

Dear President Jones:

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Department of Energy

Washington, DC 20585

September 19, 2016

Mr. James Garrison
State Historic Preservation Officer
Arizona State Historic Preservation Office
Arizona State Parks
23751 N. 23rd Ave., Suite 190
Phoenix, AZ 85085-1863

Subject: Request to Initiate 106 Consultation under the National Historic Preservation Act for the proposed Nogales Interconnection Project, Docket No. DOE/EA-2042

Dear Mr. Garrison:

Nogales Transmission, LLC (Nogales Transmission or the Applicant) applied to the U.S. Department of Energy's (DOE's) Office of Electricity Delivery and Energy Reliability pursuant to Executive Order 10485, as amended by Executive Order 12038, for a Presidential permit[1] (the Federal action) to construct, operate, maintain, and connect a new high-voltage direct current (HVDC) transmission line across the U.S.-Mexico border in southern Arizona.

Pursuant to Section 106 of the National Historic Preservation Act (NHPA) and 36 CFR Part 800, "Protection of Historic Resources," DOE is initiating the Section 106 consultation process to determine any potential adverse effects of the Nogales Interconnection project (the project) on historic properties. DOE invites you to participate as a consulting party, as provided for by Section 106 and its implementing regulations, by providing information about historic properties in or near the project area, sharing your concerns about such properties, and developing potential mitigation measures.

DOE is coordinating its compliance with Section 106 of the NHPA with its review under the National Environmental Policy Act (NEPA) according to the process set forth in 36 CFR §800.3(b). DOE is the lead federal agency in the preparation of an environmental assessment (EA) for the project. DOE has extended invitations to relevant federal and state agencies to act as cooperating agencies with DOE and is awaiting their response. DOE has also initiated Government-to-Government and Section 106 consultations with the Tohono O'odham Nation and the Pascua Yaqui Tribe. Per standing policy, DOE will explicitly solicit information from the public regarding cultural and historic resources through its Notice of Availability of the draft EA when published in the Federal Register. Agencies and the public will have 30 days to review and comment on the draft EA.

Project Information

On April 8, 2016, Nogales Transmission applied to DOE pursuant to Executive Order 10485, as amended by Executive Order 12038, for a Presidential permit. A copy of DOE's *Notice of Application for Presidential Permit; Nogales Interconnection Project* is included with this letter (81 FR 31622; May 19, 2016).

[1] In accordance with Executive Order (EO) 10485, as amended by EO 12038, and the regulations at 10 CFR 205.320 et seq. (2000), "Application for Presidential Permit Authorizing the Construction, Connection, Operation, and Maintenance of Facilities for Transmission of Electric Energy at International Boundaries."

The approximately five-mile U.S. portion of the proposed transmission line would be capable of transmitting up to 300 megawatts (MW) of power. From the existing Valencia Substation to the proposed Gateway Substation, a three-mile, 138 kilovolt (kV) line would be constructed. A 300 MW bi-directional back-to-back HVDC converter would be located at the proposed Gateway substation, connecting the Western Electric Coordinating Council (WECC) system to the Mexico system. The back-to-back HVDC converter would have two phases, with each phase capable of 150 MW of bi-directional flow between the WECC and Mexico systems. From the Gateway Substation, a 230 kV line would run approximately two miles south to the Mexico border. The U.S. portion of the proposed project would cross the U.S.-Mexico border west of the Mariposa Point of Entry in Nogales, Arizona. Please refer to the enclosure for two project location maps that were provided by the Applicant as part of the Presidential permit application.

The application, including associated maps and an initial cultural resources study, can be viewed and downloaded in its entirety from the DOE Office of Electricity and Energy Reliability program website at: http://energy.gov/oe/downloads/application-presidential-permit-oe-docket-no-pp-420-nogales-transmission-llc. Information specific to cultural resources can be found in "Chapter IV, Part C. Cultural Resources" of the application, as well as in the associated environmental report (*see* "Section 3.6 Cultural Resources" and "Appendix B: Class III Cultural Resources Survey for the Nogales Interconnection Project").

Identification Efforts to Date

A Class III Cultural Resources Survey was conducted by the Applicant and submitted with their Presidential permit application. The area surveyed included a 200-foot-wide corridor and a 0.25-mile buffer along the transmission line route segments, as well as the existing Valencia Substation and the new Gateway Substation site, totaling nearly 207 acres. Right-of-entry was not obtained from all of the landowners, so approximately 70 acres were not surveyed along Route Segments 10, 11, 13, and 14. The survey documented two previously recorded sites; no new sites were identified. One site is a sparse prehistoric artifact scatter; the other site is a set of rock piles. The surveyor recommended that both sites were ineligible for listing on the National Register of Historic Places because of their limited information potential. Based on the areas surveyed, the surveyor recommended a Finding of Project Effect of No Adverse Effect. The Applicant stated that all unsurveyed areas will be surveyed by qualified archaeologists after a route is approved by the Arizona Corporation Commission and prior to construction disturbance.

Initiation of Consultation

Under Section 106, DOE must identify and consider the potential effects of its actions on historic properties through a collaborative framework (consultation) to identify historic properties potentially affected by the project, assess effects, and seek ways to avoid, minimize, or mitigate any adverse effects (36 CFR §800.1(a)). In addition to the State Historic Preservation Office (SHPO), federally recognized Indian tribes, and the Advisory Council on Historic Preservation (ACHP), Section 106 consulting parties may include certain individuals and organizations with a demonstrated interest in the undertaking due to the nature of their legal or economic relation to the undertaking or affected properties, or their concern with the undertaking's effects on historic properties (36 CFR §800.2).

As a consulting party, your assistance in the identification and evaluation of historic properties will provide us with the opportunity to resolve any adverse effects the project may have on these properties. If available, we welcome any additional information on the location and importance of archaeological sites, historic structures, and any other localities of interest to you that are known to occur in or near the project area.

Consulting Parties

DOE has identified the list of contacts provided in the attached *Draft List of Nogales Interconnection Project Section 106 Consulting Parties* as potential consulting parties. DOE seeks any information or suggestions that your office may have with regard to potential consulting parties or tribes that are included in the attached consulting parties list, as well as any additional information that should be considered at this time.

DOE Contact Information

If you would like to participate as a Section 106 consulting party, please send a letter that accepts this invitation in an attachment to an email to Melissa.Pauley@doe.hq.gov, by fax to 202-586-8008, or by postal mail to the address listed below. We respectfully request that you respond within 30 days of your receipt of this letter to facilitate the consultation process and to ensure that DOE can promptly begin to address your comments and concerns.

In the meantime, if you have questions, please contact me at any time at the above email address or at 202-586-2942. Thank you for taking the time to consider this request.

Sincerely,

Melissa Pauley

Melissa Pauley
Electricity Policy Analyst
Transmission Permitting & Technical Assistance Division, OE-20
Office of Electricity Delivery and Energy Reliability
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585

Enclosures:
Section 106 Consulting Party List
Notice of Application
Project Location Maps

cc: Mr. Reid Nelson, Advisory Council on Historic Preservation

List of Nogales Interconnection Project
Section 106 Consulting Parties

Federal Agencies
Department of Energy (Lead Section 106 Federal Agency)
Advisory Council on Historic Preservation
Bureau of Indian Affairs

National Groups/Entities (not Federal agencies)
National Trust for Historic Preservation
National Association of Tribal Historic Preservation Officers

State Agencies
Arizona State Historic Preservation Office
Arizona Commission of Indian Affairs

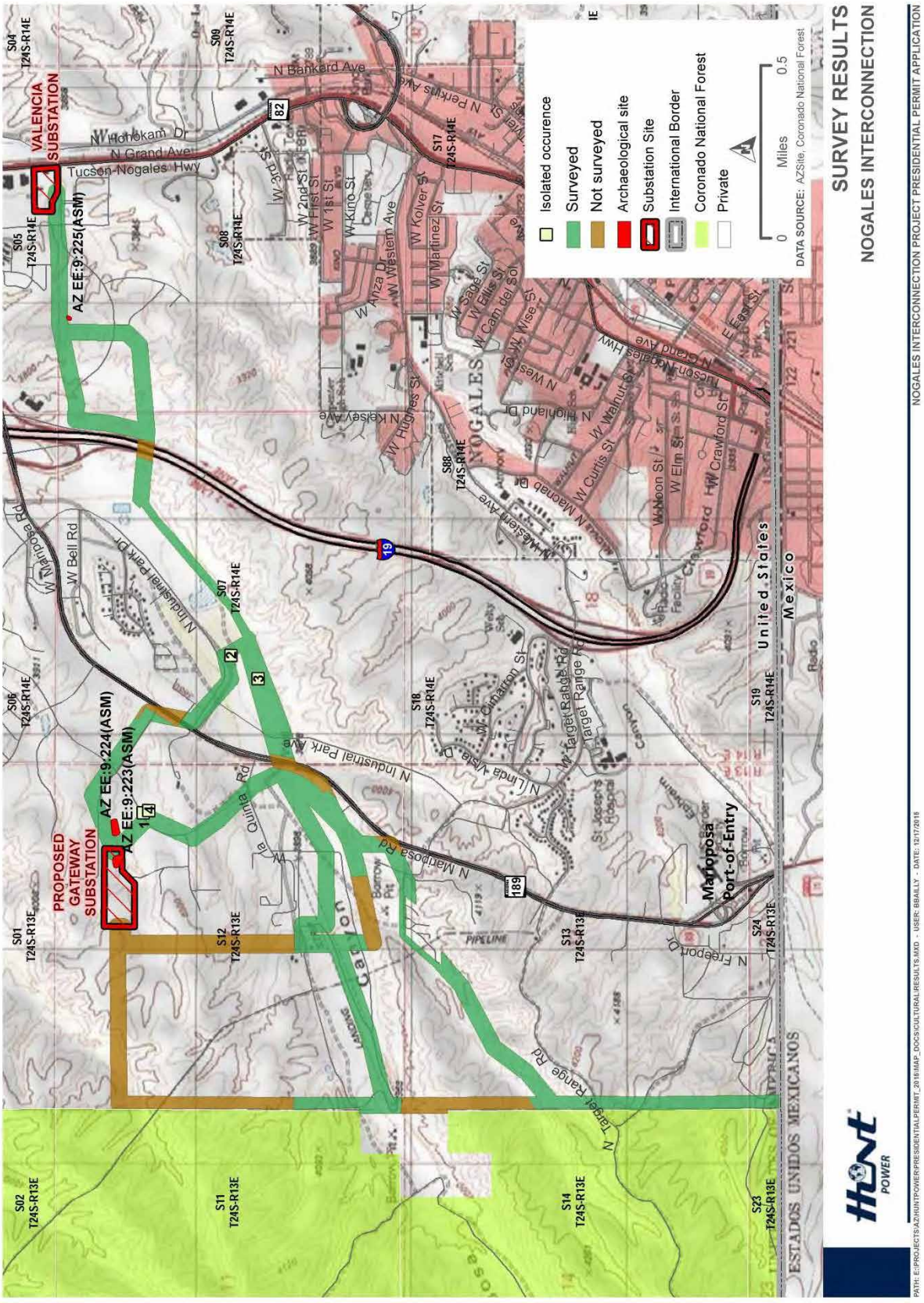
Statewide Groups/Entities (not State agencies)
Arizona Historical Society

Representatives of Local Government
City of Nogales, Arizona - Mayor's Office
City of Nogales, Arizona - Planning and Zoning Department
Santa Cruz County, Arizona - Board of Supervisors
Santa Cruz County, Arizona - Community Development Department

Local Historic Societies/Agencies
Santa Cruz Valley Heritage Alliance
Pima Alta Historical Society and Museum

Federally Recognized American Indian Tribes
Tohono O'odham Nation
Pascua Yaqui Tribe
Ak-Chin Indian Community
Cocopah Indian Tribe
Colorado River Indian Tribes
Fort McDowell Yavapai Nation
Fort Mojave Indian Tribe
Fort Yuma-Quechan Tribe
Gila River Indian Community
Havasupai Tribe
Hope Tribe
Hualapai Tribe
Kaibab Band of Paiutes
Navajo Nation
Salt River Pima-Maricopa Indian Community
San Carlos Apache Tribe
San Juan Southern Paiute
Tonto Apache Tribe
White Mountain Apache Tribe
Yavapai-Apache Nation
Yavapai-Prescott Indian Tribe
Pueblo of Zuni

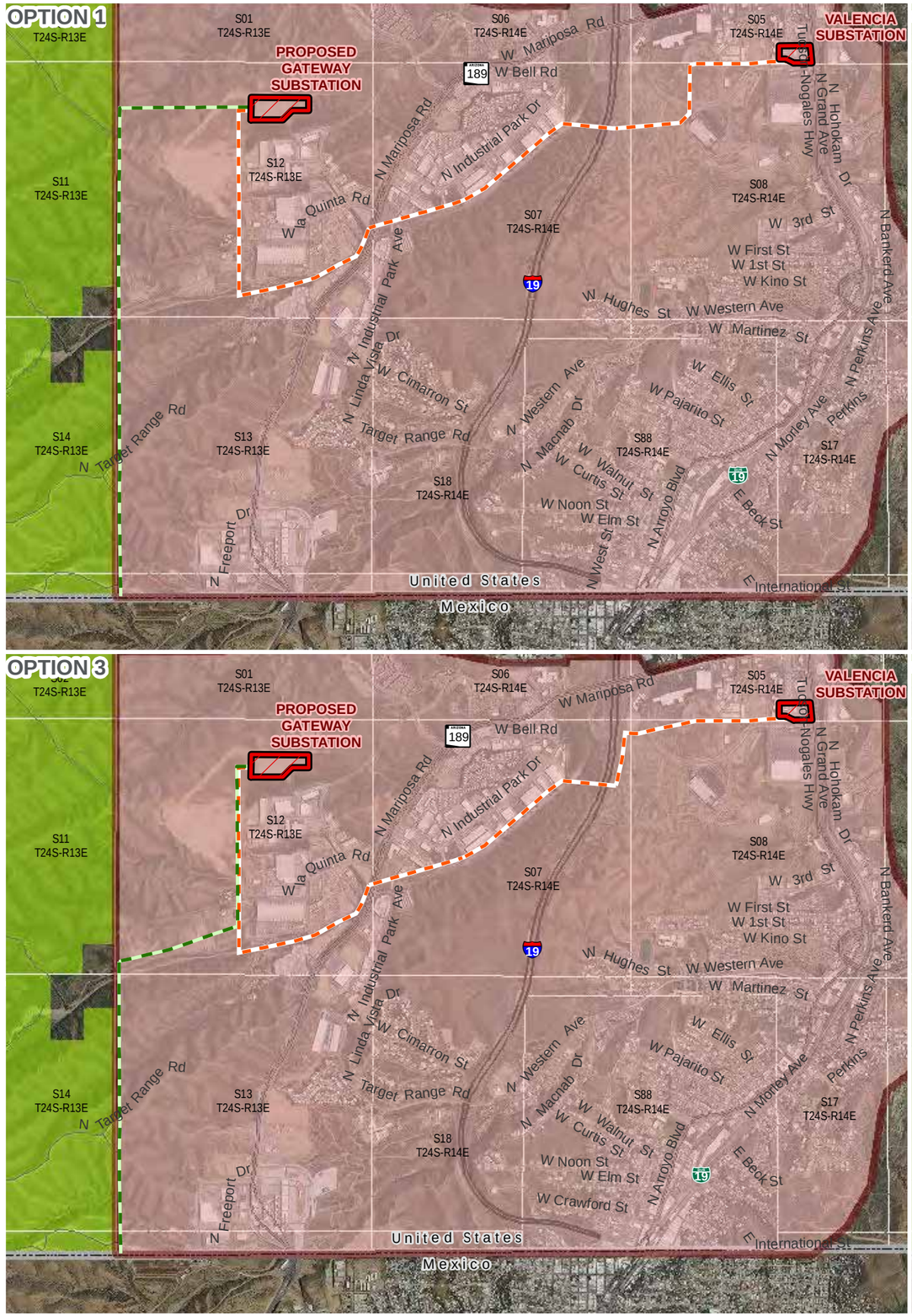
Applicant
Nogales Transmission, LLC

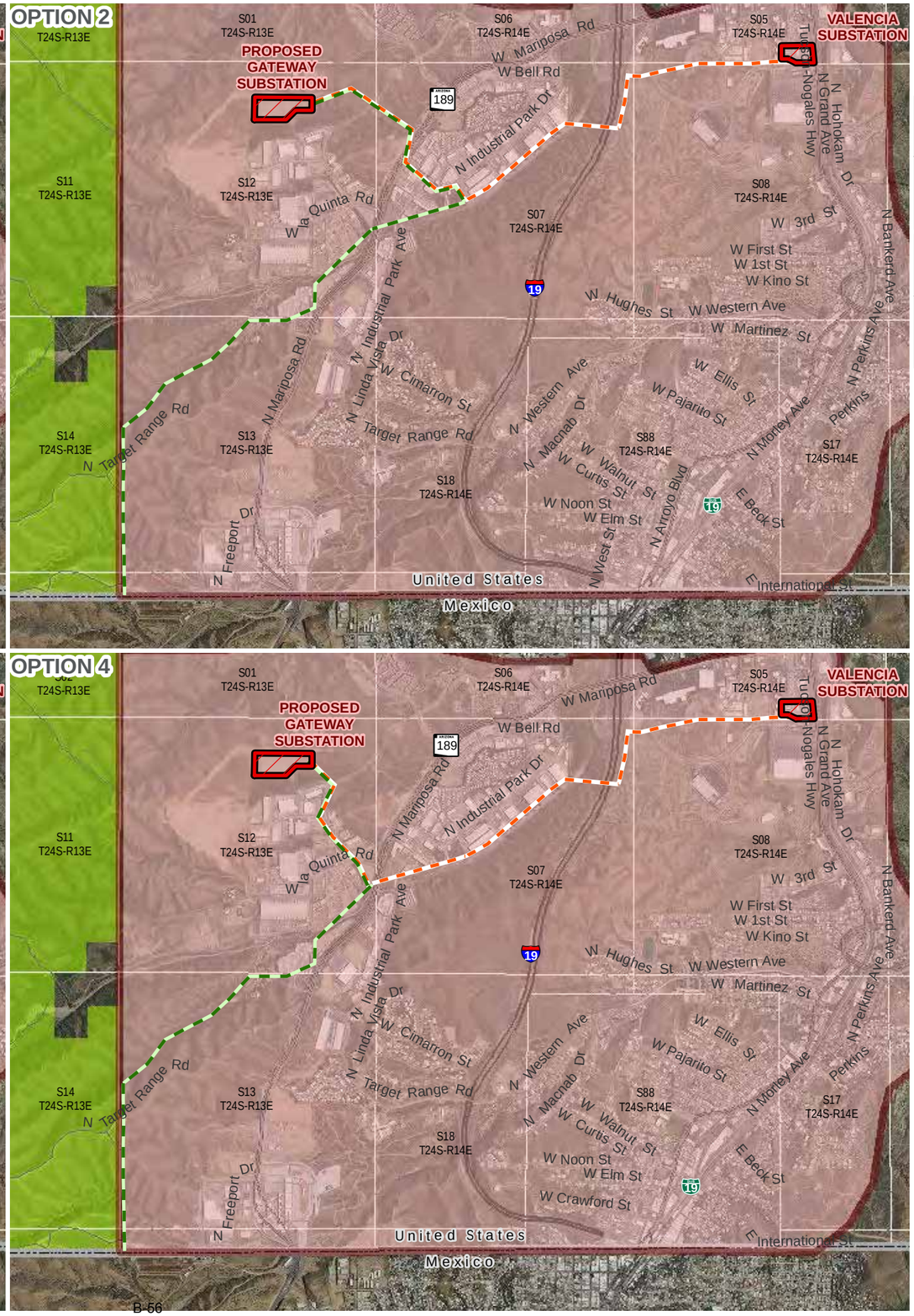


Survey results

ROUTE ALTERNATIVES SEPTEMBER, 2016

NOGALES INTERCONNECTION





- 230 kV Route Alternative
- 138 kV Route Alternative
- Study Area
- Substation Site
- International Border
- Interstate / US / State Highway
- Other Road
- Coronado National Forest

0 Miles 0.5

PATH: \\MSPE-GIS-FILE\GISPROJ\HUNT\244842\MAP_DOCS\DRAFT\DOE\ROUTE_ALTS11X17L.MXD - USER: STUOHEY - DATE: 9/20/2016

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Department of Energy

Washington, DC 20585

September 19, 2016

Mr. Reid Nelson
Director, Office of Federal Agency Programs
Advisory Council on Historic Preservation
401 F Street NW, Suite 308
Washington, DC 20001-2637

Subject: Invitation to Consult under the National Historic Preservation Act for the proposed Nogales Interconnection Project; Docket No. DOE/EA-2042

Dear Mr. Nelson:

Nogales Transmission, LLC (Nogales Transmission or the Applicant) applied to the U.S. Department of Energy's (DOE's) Office of Electricity Delivery and Energy Reliability pursuant to Executive Order 10485, as amended by Executive Order 12038, for a Presidential permit[1] (the Federal action) to construct, operate, maintain, and connect a new high-voltage direct current (HVDC) transmission line across the U.S.-Mexico border in southern Arizona.

Pursuant to Section 106 of the National Historic Preservation Act (NHPA) and 36 CFR Part 800, "Protection of Historic Resources," DOE is initiating the Section 106 consultation process to determine any potential adverse effects of the proposed Nogales Interconnection project (the project) on historic properties. DOE invites you to participate as a consulting party, as provided for by Section 106 and its implementing regulations, by providing information about historic properties in or near the project area, sharing your concerns about such properties, and identifying potential mitigation measures. DOE is coordinating its compliance with Section 106 of the NHPA with its review under the National Environmental Policy Act (NEPA) according to the process set forth in 36 CFR §800.3(b). DOE is the lead federal agency in the preparation of an environmental assessment (EA) for the project.

On April 8, 2016, Nogales Transmission applied to DOE pursuant to Executive Order 10485, as amended by Executive Order 12038, for a Presidential permit. A copy of DOE's *Notice of Application for Presidential Permit; Nogales Interconnection Project* is included with this letter (81 FR 31622; May 19, 2016).

The approximately five-mile U.S. portion of the proposed transmission line would be capable of transmitting up to 300 megawatts (MW) of power. From the existing Valencia Substation to the proposed Gateway Substation, a three-mile, 138 kilovolt (kV) line would be constructed. A 300 MW bi-directional back-to-back HVDC converter would be located at the proposed Gateway substation, connecting the Western Electric Coordinating Council (WECC) system to the Mexico system. The back-to-back HVDC converter would have two phases, with each phase capable of 150 MW of bi-directional flow between the WECC and Mexico systems. From the Gateway Substation, a 230 kV line would run approximately two miles south to the Mexico border. The U.S. portion of the proposed project would cross the U.S.-Mexico border west of the Mariposa

[1] In accordance with Executive Order (EO) 10485, as amended by EO 12038, and the regulations at 10 CFR 205.320 et seq. (2000), "Application for Presidential Permit Authorizing the Construction, Connection, Operation, and Maintenance of Facilities for Transmission of Electric Energy at International Boundaries."

Point of Entry in Nogales, Arizona. Please refer to the enclosure for two project location maps that were provided by the Applicant as part of the Presidential permit application.

The Nogales Transmission application can be viewed and downloaded in its entirety from the DOE Office of Electricity and Energy Reliability program website at: http://energy.gov/oe/downloads/application-presidential-permit-oe-docket-no-pp-420-nogales-transmission-llc. Information specific to cultural resources can be found in "Chapter IV, Part C. Cultural Resources" of the application, as well as in the associated environmental report (*see* "Section 3.6 Cultural Resources" and "Appendix B: Class III Cultural Resources Survey for the Nogales Interconnection Project, Nogales").

Under Section 106, DOE must identify and consider the potential effects of its actions on historic properties through a collaborative framework (consultation) to identify historic properties potentially affected by the project, assess effects, and seek ways to avoid, minimize, or mitigate any adverse effects (36 CFR §800.1(a)). In addition to the State Historic Preservation Office (SHPO), federally recognized Indian tribes, and the Advisory Council on Historic Preservation (ACHP), Section 106 consulting parties may include certain individuals and organizations with a demonstrated interest in the undertaking due to the nature of their legal or economic relation to the undertaking or affected properties, or their concern with the undertaking's effects on historic properties (36 CFR §800.2).

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If you would like to participate as a Section 106 consulting party, please send a letter that accepts this invitation in an attachment to an email to Melissa.Pauley@doe.hq.gov, by fax to 202-586-8008, or by postal mail to the address listed below. We respectfully request that you respond within 30 days of your receipt of this letter to facilitate the consultation process and to ensure that DOE can promptly begin to address your comments and concerns. In the meantime, if you have any questions, please contact me directly via email or by phone at 202-586-2942. Thank you for taking the time to consider this request.

Sincerely,

Melissa Pauley

Melissa Pauley
Electricity Policy Analyst
Transmission Permitting & Technical Assistance Division, OE-20
Office of Electricity Delivery and Energy Reliability
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585

Enclosures:
Notice of Application
Project Location Maps

Department of Energy

Washington, DC 20585

September 19, 2016

Ms. Kristine FireThunder
Director
Arizona Commission of Indian Affairs
1700 W. Washington St., Suite 235
Phoenix, AZ 85007-2817

Subject: Invitation to Consult under the National Historic Preservation Act for the proposed Nogales Interconnection Project; Docket No. DOE/EA-2042

Dear Ms. FireThunder:

Nogales Transmission, LLC (Nogales Transmission or the Applicant) applied to the U.S. Department of Energy's (DOE's) Office of Electricity Delivery and Energy Reliability pursuant to Executive Order 10485, as amended by Executive Order 12038, for a Presidential permit[1] (the Federal action) to construct, operate, maintain, and connect a new high-voltage direct current (HVDC) transmission line across the U.S.-Mexico border in southern Arizona.

Pursuant to Section 106 of the National Historic Preservation Act (NHPA) and 36 CFR Part 800, "Protection of Historic Resources," DOE is initiating the Section 106 consultation process to determine any potential adverse effects of the proposed Nogales Interconnection project (the project) on historic properties. DOE invites you to participate as a consulting party, as provided for by Section 106 and its implementing regulations, by providing information about historic properties in or near the project area, sharing your concerns about such properties, and identifying potential mitigation measures. DOE is coordinating its compliance with Section 106 of the NHPA with its review under the National Environmental Policy Act (NEPA) according to the process set forth in 36 CFR §800.3(b). DOE is the lead federal agency in the preparation of an environmental assessment (EA) for the project.

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[1] In accordance with Executive Order (EO) 10485, as amended by EO 12038, and the regulations at 10 CFR 205.320 et seq. (2000), "Application for Presidential Permit Authorizing the Construction, Connection, Operation, and Maintenance of Facilities for Transmission of Electric Energy at International Boundaries."

Point of Entry in Nogales, Arizona. Please refer to the enclosure for two project location maps that were provided by the Applicant as part of the Presidential permit application.

The Nogales Transmission application can be viewed and downloaded in its entirety from the DOE Office of Electricity and Energy Reliability program website at: http://energy.gov/oe/downloads/application-presidential-permit-oe-docket-no-pp-420-nogales-transmission-llc. Information specific to cultural resources can be found in "Chapter IV, Part C. Cultural Resources" of the application, as well as in the associated environmental report (*see* "Section 3.6 Cultural Resources" and "Appendix B: Class III Cultural Resources Survey for the Nogales Interconnection Project, Nogales").

Under Section 106, DOE must identify and consider the potential effects of its actions on historic properties through a collaborative framework (consultation) to identify historic properties potentially affected by the project, assess effects, and seek ways to avoid, minimize, or mitigate any adverse effects (36 CFR §800.1(a)). In addition to the State Historic Preservation Office (SHPO), federally recognized Indian tribes, and the Advisory Council on Historic Preservation (ACHP), Section 106 consulting parties may include certain individuals and organizations with a demonstrated interest in the undertaking due to the nature of their legal or economic relation to the undertaking or affected properties, or their concern with the undertaking's effects on historic properties (36 CFR §800.2).

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Sincerely,

Melissa Pauley

Melissa Pauley
Electricity Policy Analyst
Transmission Permitting & Technical Assistance Division, OE-20
Office of Electricity Delivery and Energy Reliability
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585

Enclosures:
Notice of Application
Project Location Maps

Department of Energy

Washington, DC 20585

September 19, 2016

Ms. Anne I. Woosley, Ph.D.
Executive Director
Arizona Historical Society
949 E. 2nd Street
Tucson, AZ 85719-4840

Subject: Invitation to Consult under the National Historic Preservation Act for the proposed Nogales Interconnection Project; Docket No. DOE/EA-2042

Dear Ms. Woosley:

Nogales Transmission, LLC (Nogales Transmission or the Applicant) applied to the U.S. Department of Energy's (DOE's) Office of Electricity Delivery and Energy Reliability pursuant to Executive Order 10485, as amended by Executive Order 12038, for a Presidential permit[1] (the Federal action) to construct, operate, maintain, and connect a new high-voltage direct current (HVDC) transmission line across the U.S.-Mexico border in southern Arizona.

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Point of Entry in Nogales, Arizona. Please refer to the enclosure for two project location maps that were provided by the Applicant as part of the Presidential permit application.

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If you would like to participate as a Section 106 consulting party, please send a letter that accepts this invitation in an attachment to an email to Melissa.Pauley@doe.hq.gov, by fax to 202-586-8008, or by postal mail to the address listed below. We respectfully request that you respond within 30 days of your receipt of this letter to facilitate the consultation process and to ensure that DOE can promptly begin to address your comments and concerns. In the meantime, if you have any questions, please contact me directly via email or by phone at 202-586-2942. Thank you for taking the time to consider this request.

Sincerely,

Melissa Pauley

Melissa Pauley
Electricity Policy Analyst
Transmission Permitting & Technical Assistance Division, OE-20
Office of Electricity Delivery and Energy Reliability
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585

Enclosures:
Notice of Application
Project Location Maps

Department of Energy

Washington, DC 20585

September 19, 2016

Mr. Terry McClung
NEPA Coordinator, Division of Environmental and Cultural Resources Management
Bureau of Indian Affairs
1849 C Street, NW, MS 4637
Washington, DC 20240-0001

Subject: Invitation to Consult under the National Historic Preservation Act for the proposed Nogales Interconnection Project; Docket No. DOE/EA-2042

Dear Mr. McClung:

Nogales Transmission, LLC (Nogales Transmission or the Applicant) applied to the U.S. Department of Energy's (DOE's) Office of Electricity Delivery and Energy Reliability pursuant to Executive Order 10485, as amended by Executive Order 12038, for a Presidential permit[1] (the Federal action) to construct, operate, maintain, and connect a new high-voltage direct current (HVDC) transmission line across the U.S.-Mexico border in southern Arizona.

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Sincerely,

Melissa Pauley

Melissa Pauley
Electricity Policy Analyst
Transmission Permitting & Technical Assistance Division, OE-20
Office of Electricity Delivery and Energy Reliability
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585

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Project Location Maps

Department of Energy

Washington, DC 20585

September 19, 2016

Mr. John Doyle
Mayor
City of Nogales, Arizona
777 N. Grand Avenue
Nogales, AZ 85621-2262

Subject: Invitation to Consult under the National Historic Preservation Act for the proposed Nogales Interconnection Project; Docket No. DOE/EA-2042

Dear Mayor Doyle:

Nogales Transmission, LLC (Nogales Transmission or the Applicant) applied to the U.S. Department of Energy's (DOE's) Office of Electricity Delivery and Energy Reliability pursuant to Executive Order 10485, as amended by Executive Order 12038, for a Presidential permit[1] (the Federal action) to construct, operate, maintain, and connect a new high-voltage direct current (HVDC) transmission line across the U.S.-Mexico border in southern Arizona.

Pursuant to Section 106 of the National Historic Preservation Act (NHPA) and 36 CFR Part 800, "Protection of Historic Resources," DOE is initiating the Section 106 consultation process to determine any potential adverse effects of the proposed Nogales Interconnection project (the project) on historic properties. DOE invites you to participate as a consulting party, as provided for by Section 106 and its implementing regulations, by providing information about historic properties in or near the project area, sharing your concerns about such properties, and identifying potential mitigation measures. DOE is coordinating its compliance with Section 106 of the NHPA with its review under the National Environmental Policy Act (NEPA) according to the process set forth in 36 CFR §800.3(b). DOE is the lead federal agency in the preparation of an environmental assessment (EA) for the project.

On April 8, 2016, Nogales Transmission applied to DOE pursuant to Executive Order 10485, as amended by Executive Order 12038, for a Presidential permit. A copy of DOE's *Notice of Application for Presidential Permit; Nogales Interconnection Project* is included with this letter (81 FR 31622; May 19, 2016).

The approximately five-mile U.S. portion of the proposed transmission line would be capable of transmitting up to 300 megawatts (MW) of power. From the existing Valencia Substation to the proposed Gateway Substation, a three-mile, 138 kilovolt (kV) line would be constructed. A 300 MW bi-directional back-to-back HVDC converter would be located at the proposed Gateway substation, connecting the Western Electric Coordinating Council (WECC) system to the Mexico system. The back-to-back HVDC converter would have two phases, with each phase capable of 150 MW of bi-directional flow between the WECC and Mexico systems. From the Gateway Substation, a 230 kV line would run approximately two miles south to the Mexico border. The U.S. portion of the proposed project would cross the U.S.-Mexico border west of the Mariposa

[1] In accordance with Executive Order (EO) 10485, as amended by EO 12038, and the regulations at 10 CFR 205.320 et seq. (2000), "Application for Presidential Permit Authorizing the Construction, Connection, Operation, and Maintenance of Facilities for Transmission of Electric Energy at International Boundaries."

Point of Entry in Nogales, Arizona. Please refer to the enclosure for two project location maps that were provided by the Applicant as part of the Presidential permit application.

The Nogales Transmission application can be viewed and downloaded in its entirety from the DOE Office of Electricity and Energy Reliability program website at: http://energy.gov/oe/downloads/application-presidential-permit-oe-docket-no-pp-420-nogales-transmission-llc. Information specific to cultural resources can be found in "Chapter IV, Part C. Cultural Resources" of the application, as well as in the associated environmental report (*see* "Section 3.6 Cultural Resources" and "Appendix B: Class III Cultural Resources Survey for the Nogales Interconnection Project, Nogales").

Under Section 106, DOE must identify and consider the potential effects of its actions on historic properties through a collaborative framework (consultation) to identify historic properties potentially affected by the project, assess effects, and seek ways to avoid, minimize, or mitigate any adverse effects (36 CFR §800.1(a)). In addition to the State Historic Preservation Office (SHPO), federally recognized Indian tribes, and the Advisory Council on Historic Preservation (ACHP), Section 106 consulting parties may include certain individuals and organizations with a demonstrated interest in the undertaking due to the nature of their legal or economic relation to the undertaking or affected properties, or their concern with the undertaking's effects on historic properties (36 CFR §800.2).

As a consulting party, your assistance in the identification and evaluation of historic properties will provide us with the opportunity to resolve any adverse effects the project may have on these properties. If available, we welcome any additional information on the location and importance of archaeological sites, historic structures, and any other localities of interest to you that are known to occur in or near the project area.

If you would like to participate as a Section 106 consulting party, please send a letter that accepts this invitation in an attachment to an email to Melissa.Pauley@doe.hq.gov, by fax to 202-586-8008, or by postal mail to the address listed below. We respectfully request that you respond within 30 days of your receipt of this letter to facilitate the consultation process and to ensure that DOE can promptly begin to address your comments and concerns. In the meantime, if you have any questions, please contact me directly via email or by phone at 202-586-2942. Thank you for taking the time to consider this request.

Sincerely,

Melissa Pauley

Melissa Pauley
Electricity Policy Analyst
Transmission Permitting & Technical Assistance Division, OE-20
Office of Electricity Delivery and Energy Reliability
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585

Enclosures:
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Project Location Maps

Department of Energy

Washington, DC 20585

September 19, 2016

Mr. Edward Delgado
Planning & Zoning/Building Director
City of Nogales, Arizona
Planning and Zoning Department
1450 N. Hohokam Drive
Nogales, AZ 85621-1367

Subject: Invitation to Consult under the National Historic Preservation Act for the proposed Nogales Interconnection Project; Docket No. DOE/EA-2042

Dear Mr. Delgado:

Nogales Transmission, LLC (Nogales Transmission or the Applicant) applied to the U.S. Department of Energy's (DOE's) Office of Electricity Delivery and Energy Reliability pursuant to Executive Order 10485, as amended by Executive Order 12038, for a Presidential permit[1] (the Federal action) to construct, operate, maintain, and connect a new high-voltage direct current (HVDC) transmission line across the U.S.-Mexico border in southern Arizona.

Pursuant to Section 106 of the National Historic Preservation Act (NHPA) and 36 CFR Part 800, "Protection of Historic Resources," DOE is initiating the Section 106 consultation process to determine any potential adverse effects of the proposed Nogales Interconnection project (the project) on historic properties. DOE invites you to participate as a consulting party, as provided for by Section 106 and its implementing regulations, by providing information about historic properties in or near the project area, sharing your concerns about such properties, and identifying potential mitigation measures. DOE is coordinating its compliance with Section 106 of the NHPA with its review under the National Environmental Policy Act (NEPA) according to the process set forth in 36 CFR §800.3(b). DOE is the lead federal agency in the preparation of an environmental assessment (EA) for the project.

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The approximately five-mile U.S. portion of the proposed transmission line would be capable of transmitting up to 300 megawatts (MW) of power. From the existing Valencia Substation to the proposed Gateway Substation, a three-mile, 138 kilovolt (kV) line would be constructed. A 300 MW bi-directional back-to-back HVDC converter would be located at the proposed Gateway substation, connecting the Western Electric Coordinating Council (WECC) system to the Mexico system. The back-to-back HVDC converter would have two phases, with each phase capable of 150 MW of bi-directional flow between the WECC and Mexico systems. From the Gateway Substation, a 230 kV line would run approximately two miles south to the Mexico border. The

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U.S. portion of the proposed project would cross the U.S.-Mexico border west of the Mariposa Point of Entry in Nogales, Arizona. Please refer to the enclosure for two project location maps that were provided by the Applicant as part of the Presidential permit application.

The Nogales Transmission application can be viewed and downloaded in its entirety from the DOE Office of Electricity and Energy Reliability program website at: http://energy.gov/oe/downloads/application-presidential-permit-oe-docket-no-pp-420-nogales-transmission-llc. Information specific to cultural resources can be found in "Chapter IV, Part C. Cultural Resources" of the application, as well as in the associated environmental report (*see* "Section 3.6 Cultural Resources" and "Appendix B: Class III Cultural Resources Survey for the Nogales Interconnection Project, Nogales").

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Sincerely,

Melissa Pauley

Melissa Pauley
Electricity Policy Analyst
Transmission Permitting & Technical Assistance Division, OE-20
Office of Electricity Delivery and Energy Reliability
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585

Enclosures:
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Washington, DC 20585

September 19, 2016

Mr. Carlos Rivera
City Manager
City of Nogales, Arizona
777 N. Grand Avenue
Nogales, AZ 85621-2262

Subject: Invitation to Consult under the National Historic Preservation Act for the proposed Nogales Interconnection Project; Docket No. DOE/EA-2042

Dear Mr. Rivera:

Nogales Transmission, LLC (Nogales Transmission or the Applicant) applied to the U.S. Department of Energy's (DOE's) Office of Electricity Delivery and Energy Reliability pursuant to Executive Order 10485, as amended by Executive Order 12038, for a Presidential permit[1] (the Federal action) to construct, operate, maintain, and connect a new high-voltage direct current (HVDC) transmission line across the U.S.-Mexico border in southern Arizona.

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Sincerely,

Melissa Pauley

Melissa Pauley
Electricity Policy Analyst
Transmission Permitting & Technical Assistance Division, OE-20
Office of Electricity Delivery and Energy Reliability
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585

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Department of Energy

Washington, DC 20585

September 19, 2016

Ms. D. Bambi Kraus
President
National Association of Tribal Historic Preservation Officers
P.O. Box 19189
Washington, DC 20036-9189

Subject: Invitation to Consult under the National Historic Preservation Act for the proposed Nogales Interconnection Project; Docket No. DOE/EA-2042

Dear Ms. Kraus:

Nogales Transmission, LLC (Nogales Transmission or the Applicant) applied to the U.S. Department of Energy's (DOE's) Office of Electricity Delivery and Energy Reliability pursuant to Executive Order 10485, as amended by Executive Order 12038, for a Presidential permit[1] (the Federal action) to construct, operate, maintain, and connect a new high-voltage direct current (HVDC) transmission line across the U.S.-Mexico border in southern Arizona.

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Point of Entry in Nogales, Arizona. Please refer to the enclosure for two project location maps that were provided by the Applicant as part of the Presidential permit application.

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Sincerely,

Melissa Pauley

Melissa Pauley
Electricity Policy Analyst
Transmission Permitting & Technical Assistance Division, OE-20
Office of Electricity Delivery and Energy Reliability
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585

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Washington, DC 20585

September 19, 2016

Ms. Elizabeth Merritt
Deputy General Counsel
National Trust for Historic Preservation
2600 Virginia Avenue, Suite 1100
Washington, DC 20037-1905

Subject: Invitation to Consult under the National Historic Preservation Act for the proposed Nogales Interconnection Project; Docket No. DOE/EA-2042

Dear Ms. Merritt:

Nogales Transmission, LLC (Nogales Transmission or the Applicant) applied to the U.S. Department of Energy's (DOE's) Office of Electricity Delivery and Energy Reliability pursuant to Executive Order 10485, as amended by Executive Order 12038, for a Presidential permit[1] (the Federal action) to construct, operate, maintain, and connect a new high-voltage direct current (HVDC) transmission line across the U.S.-Mexico border in southern Arizona.

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Sincerely,

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Transmission Permitting & Technical Assistance Division, OE-20
Office of Electricity Delivery and Energy Reliability
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585

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Department of Energy

Washington, DC 20585

September 19, 2016

Ms. Gabriela Canales
Senior Project Development Analyst
Hunt Power, LP
1900 North Akard Street
Dallas, TX 75201-2300

Subject: Invitation to Consult under the National Historic Preservation Act for the proposed Nogales Interconnection Project; Docket No. DOE/EA-2042

Dear Ms. Canales:

As you are aware, Nogales Transmission, LLC (Nogales Transmission or the Applicant) applied to the U.S. Department of Energy's (DOE's) Office of Electricity Delivery and Energy Reliability pursuant to Executive Order 10485, as amended by Executive Order 12038, for a Presidential permit[1] (the Federal action) to construct, operate, maintain, and connect a new high-voltage direct current (HVDC) transmission line across the U.S.-Mexico border in southern Arizona.

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Melissa Pauley

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Electricity Policy Analyst
Transmission Permitting & Technical Assistance Division, OE-20
Office of Electricity Delivery and Energy Reliability
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585

cc: Mr. Enrique Marroquin, Nogales Transmission, LLC

Department of Energy

Washington, DC 20585

September 19, 2016

Mr. Jose Ramon Garcia
President
Pima Alta Historical Society and Museum
136 N. Grand Avenue
Nogales, AZ 85621-3211

Subject: Invitation to Consult under the National Historic Preservation Act for the proposed Nogales Interconnection Project; Docket No. DOE/EA-2042

Dear Mr. Garcia:

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The approximately five-mile U.S. portion of the proposed transmission line would be capable of transmitting up to 300 megawatts (MW) of power. From the existing Valencia Substation to the proposed Gateway Substation, a three-mile, 138 kilovolt (kV) line would be constructed. A 300 MW bi-directional back-to-back HVDC converter would be located at the proposed Gateway substation, connecting the Western Electric Coordinating Council (WECC) system to the Mexico system. The back-to-back HVDC converter would have two phases, with each phase capable of 150 MW of bi-directional flow between the WECC and Mexico systems. From the Gateway Substation, a 230 kV line would run approximately two miles south to the Mexico border. The U.S. portion of the proposed project would cross the U.S.-Mexico border west of the Mariposa

[1] In accordance with Executive Order (EO) 10485, as amended by EO 12038, and the regulations at 10 CFR 205.320 et seq. (2000), "Application for Presidential Permit Authorizing the Construction, Connection, Operation, and Maintenance of Facilities for Transmission of Electric Energy at International Boundaries."

Point of Entry in Nogales, Arizona. Please refer to the enclosure for two project location maps that were provided by the Applicant as part of the Presidential permit application.

The Nogales Transmission application can be viewed and downloaded in its entirety from the DOE Office of Electricity and Energy Reliability program website at: http://energy.gov/oe/downloads/application-presidential-permit-oe-docket-no-pp-420-nogales-transmission-llc. Information specific to cultural resources can be found in "Chapter IV, Part C. Cultural Resources" of the application, as well as in the associated environmental report (*see* "Section 3.6 Cultural Resources" and "Appendix B: Class III Cultural Resources Survey for the Nogales Interconnection Project, Nogales").

Under Section 106, DOE must identify and consider the potential effects of its actions on historic properties through a collaborative framework (consultation) to identify historic properties potentially affected by the project, assess effects, and seek ways to avoid, minimize, or mitigate any adverse effects (36 CFR §800.1(a)). In addition to the State Historic Preservation Office (SHPO), federally recognized Indian tribes, and the Advisory Council on Historic Preservation (ACHP), Section 106 consulting parties may include certain individuals and organizations with a demonstrated interest in the undertaking due to the nature of their legal or economic relation to the undertaking or affected properties, or their concern with the undertaking's effects on historic properties (36 CFR §800.2).

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If you would like to participate as a Section 106 consulting party, please send a letter that accepts this invitation in an attachment to an email to Melissa.Pauley@doe.hq.gov, by fax to 202-586-8008, or by postal mail to the address listed below. We respectfully request that you respond within 30 days of your receipt of this letter to facilitate the consultation process and to ensure that DOE can promptly begin to address your comments and concerns. In the meantime, if you have any questions, please contact me directly via email or by phone at 202-586-2942. Thank you for taking the time to consider this request.

Sincerely,

Melissa Pauley

Melissa Pauley
Electricity Policy Analyst
Transmission Permitting & Technical Assistance Division, OE-20
Office of Electricity Delivery and Energy Reliability
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585

Enclosures:
Notice of Application
Project Location Maps

Department of Energy

Washington, DC 20585

September 19, 2016

Mr. Rudy Molera
Chairman, Santa Cruz County Board of Supervisors
County Complex
2150 N. Congress Drive
Nogales, AZ 85621-1090

Subject: Invitation to Consult under the National Historic Preservation Act for the proposed Nogales Interconnection Project; Docket No. DOE/EA-2042

Dear Chairman Molera:

Nogales Transmission, LLC (Nogales Transmission or the Applicant) applied to the U.S. Department of Energy's (DOE's) Office of Electricity Delivery and Energy Reliability pursuant to Executive Order 10485, as amended by Executive Order 12038, for a Presidential permit[1] (the Federal action) to construct, operate, maintain, and connect a new high-voltage direct current (HVDC) transmission line across the U.S.-Mexico border in southern Arizona.

Pursuant to Section 106 of the National Historic Preservation Act (NHPA) and 36 CFR Part 800, "Protection of Historic Resources," DOE is initiating the Section 106 consultation process to determine any potential adverse effects of the proposed Nogales Interconnection project (the project) on historic properties. DOE invites you to participate as a consulting party, as provided for by Section 106 and its implementing regulations, by providing information about historic properties in or near the project area, sharing your concerns about such properties, and identifying potential mitigation measures. DOE is coordinating its compliance with Section 106 of the NHPA with its review under the National Environmental Policy Act (NEPA) according to the process set forth in 36 CFR §800.3(b). DOE is the lead federal agency in the preparation of an environmental assessment (EA) for the project.

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The approximately five-mile U.S. portion of the proposed transmission line would be capable of transmitting up to 300 megawatts (MW) of power. From the existing Valencia Substation to the proposed Gateway Substation, a three-mile, 138 kilovolt (kV) line would be constructed. A 300 MW bi-directional back-to-back HVDC converter would be located at the proposed Gateway substation, connecting the Western Electric Coordinating Council (WECC) system to the Mexico system. The back-to-back HVDC converter would have two phases, with each phase capable of 150 MW of bi-directional flow between the WECC and Mexico systems. From the Gateway Substation, a 230 kV line would run approximately two miles south to the Mexico border. The U.S. portion of the proposed project would cross the U.S.-Mexico border west of the Mariposa

[1] In accordance with Executive Order (EO) 10485, as amended by EO 12038, and the regulations at 10 CFR 205.320 et seq. (2000), "Application for Presidential Permit Authorizing the Construction, Connection, Operation, and Maintenance of Facilities for Transmission of Electric Energy at International Boundaries."

Point of Entry in Nogales, Arizona. Please refer to the enclosure for two project location maps that were provided by the Applicant as part of the Presidential permit application.

The Nogales Transmission application can be viewed and downloaded in its entirety from the DOE Office of Electricity and Energy Reliability program website at: http://energy.gov/oe/downloads/application-presidential-permit-oe-docket-no-pp-420-nogales-transmission-llc. Information specific to cultural resources can be found in "Chapter IV, Part C. Cultural Resources" of the application, as well as in the associated environmental report (*see* "Section 3.6 Cultural Resources" and "Appendix B: Class III Cultural Resources Survey for the Nogales Interconnection Project, Nogales").

Under Section 106, DOE must identify and consider the potential effects of its actions on historic properties through a collaborative framework (consultation) to identify historic properties potentially affected by the project, assess effects, and seek ways to avoid, minimize, or mitigate any adverse effects (36 CFR §800.1(a)). In addition to the State Historic Preservation Office (SHPO), federally recognized Indian tribes, and the Advisory Council on Historic Preservation (ACHP), Section 106 consulting parties may include certain individuals and organizations with a demonstrated interest in the undertaking due to the nature of their legal or economic relation to the undertaking or affected properties, or their concern with the undertaking's effects on historic properties (36 CFR §800.2).

As a consulting party, your assistance in the identification and evaluation of historic properties will provide us with the opportunity to resolve any adverse effects the project may have on these properties. If available, we welcome any additional information on the location and importance of archaeological sites, historic structures, and any other localities of interest to you that are known to occur in or near the project area.

If you would like to participate as a Section 106 consulting party, please send a letter that accepts this invitation in an attachment to an email to Melissa.Pauley@doe.hq.gov, by fax to 202-586-8008, or by postal mail to the address listed below. We respectfully request that you respond within 30 days of your receipt of this letter to facilitate the consultation process and to ensure that DOE can promptly begin to address your comments and concerns. In the meantime, if you have any questions, please contact me directly via email or by phone at 202-586-2942. Thank you for taking the time to consider this request.

Sincerely,

Melissa Pauley

Melissa Pauley
Electricity Policy Analyst
Transmission Permitting & Technical Assistance Division, OE-20
Office of Electricity Delivery and Energy Reliability
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585

Enclosures:
Notice of Application
Project Location Maps

Department of Energy

Washington, DC 20585

September 19, 2016

Mr. Manuel Ruiz
Vice-Chairman - District 1
Santa Cruz County Board of Supervisors
County Complex
2150 N. Congress Drive
Nogales, AZ 85621-1090

Subject: Invitation to Consult under the National Historic Preservation Act for the proposed Nogales Interconnection Project; Docket No. DOE/EA-2042

Dear Vice-Chairman Ruiz:

Nogales Transmission, LLC (Nogales Transmission or the Applicant) applied to the U.S. Department of Energy's (DOE's) Office of Electricity Delivery and Energy Reliability pursuant to Executive Order 10485, as amended by Executive Order 12038, for a Presidential permit[1] (the Federal action) to construct, operate, maintain, and connect a new high-voltage direct current (HVDC) transmission line across the U.S.-Mexico border in southern Arizona.

Pursuant to Section 106 of the National Historic Preservation Act (NHPA) and 36 CFR Part 800, "Protection of Historic Resources," DOE is initiating the Section 106 consultation process to determine any potential adverse effects of the proposed Nogales Interconnection project (the project) on historic properties. DOE invites you to participate as a consulting party, as provided for by Section 106 and its implementing regulations, by providing information about historic properties in or near the project area, sharing your concerns about such properties, and identifying potential mitigation measures. DOE is coordinating its compliance with Section 106 of the NHPA with its review under the National Environmental Policy Act (NEPA) according to the process set forth in 36 CFR §800.3(b). DOE is the lead federal agency in the preparation of an environmental assessment (EA) for the project.

On April 8, 2016, Nogales Transmission applied to DOE pursuant to Executive Order 10485, as amended by Executive Order 12038, for a Presidential permit. A copy of DOE's *Notice of Application for Presidential Permit; Nogales Interconnection Project* is included with this letter (81 FR 31622; May 19, 2016).

The approximately five-mile U.S. portion of the proposed transmission line would be capable of transmitting up to 300 megawatts (MW) of power. From the existing Valencia Substation to the proposed Gateway Substation, a three-mile, 138 kilovolt (kV) line would be constructed. A 300 MW bi-directional back-to-back HVDC converter would be located at the proposed Gateway substation, connecting the Western Electric Coordinating Council (WECC) system to the Mexico system. The back-to-back HVDC converter would have two phases, with each phase capable of 150 MW of bi-directional flow between the WECC and Mexico systems. From the Gateway Substation, a 230 kV line would run approximately two miles south to the Mexico border. The

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U.S. portion of the proposed project would cross the U.S.-Mexico border west of the Mariposa Point of Entry in Nogales, Arizona. Please refer to the enclosure for two project location maps that were provided by the Applicant as part of the Presidential permit application.

The Nogales Transmission application can be viewed and downloaded in its entirety from the DOE Office of Electricity and Energy Reliability program website at: http://energy.gov/oe/downloads/application-presidential-permit-oe-docket-no-pp-420-nogales-transmission-llc. Information specific to cultural resources can be found in "Chapter IV, Part C. Cultural Resources" of the application, as well as in the associated environmental report (*see* "Section 3.6 Cultural Resources" and "Appendix B: Class III Cultural Resources Survey for the Nogales Interconnection Project, Nogales").

Under Section 106, DOE must identify and consider the potential effects of its actions on historic properties through a collaborative framework (consultation) to identify historic properties potentially affected by the project, assess effects, and seek ways to avoid, minimize, or mitigate any adverse effects (36 CFR §800.1(a)). In addition to the State Historic Preservation Office (SHPO), federally recognized Indian tribes, and the Advisory Council on Historic Preservation (ACHP), Section 106 consulting parties may include certain individuals and organizations with a demonstrated interest in the undertaking due to the nature of their legal or economic relation to the undertaking or affected properties, or their concern with the undertaking's effects on historic properties (36 CFR §800.2).

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Sincerely,

Melissa Pauley

Melissa Pauley
Electricity Policy Analyst
Transmission Permitting & Technical Assistance Division, OE-20
Office of Electricity Delivery and Energy Reliability
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585

Enclosures:
Notice of Application
Project Location Maps

Department of Energy

Washington, DC 20585

September 19, 2016

Mr. Jesse Drake
Community Development Director & Chief Zoning Inspector
Santa Cruz County Community Development Department
275 Rio Rico Drive
Rio Rico, AZ 85648-3243

Subject: Invitation to Consult under the National Historic Preservation Act for the proposed Nogales Interconnection Project; Docket No. DOE/EA-2042

Dear Mr. Drake:

Nogales Transmission, LLC (Nogales Transmission or the Applicant) applied to the U.S. Department of Energy's (DOE's) Office of Electricity Delivery and Energy Reliability pursuant to Executive Order 10485, as amended by Executive Order 12038, for a Presidential permit[1] (the Federal action) to construct, operate, maintain, and connect a new high-voltage direct current (HVDC) transmission line across the U.S.-Mexico border in southern Arizona.

Pursuant to Section 106 of the National Historic Preservation Act (NHPA) and 36 CFR Part 800, "Protection of Historic Resources," DOE is initiating the Section 106 consultation process to determine any potential adverse effects of the proposed Nogales Interconnection project (the project) on historic properties. DOE invites you to participate as a consulting party, as provided for by Section 106 and its implementing regulations, by providing information about historic properties in or near the project area, sharing your concerns about such properties, and identifying potential mitigation measures. DOE is coordinating its compliance with Section 106 of the NHPA with its review under the National Environmental Policy Act (NEPA) according to the process set forth in 36 CFR §800.3(b). DOE is the lead federal agency in the preparation of an environmental assessment (EA) for the project.

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The approximately five-mile U.S. portion of the proposed transmission line would be capable of transmitting up to 300 megawatts (MW) of power. From the existing Valencia Substation to the proposed Gateway Substation, a three-mile, 138 kilovolt (kV) line would be constructed. A 300 MW bi-directional back-to-back HVDC converter would be located at the proposed Gateway substation, connecting the Western Electric Coordinating Council (WECC) system to the Mexico system. The back-to-back HVDC converter would have two phases, with each phase capable of 150 MW of bi-directional flow between the WECC and Mexico systems. From the Gateway Substation, a 230 kV line would run approximately two miles south to the Mexico border. The U.S. portion of the proposed project would cross the U.S.-Mexico border west of the Mariposa

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Point of Entry in Nogales, Arizona. Please refer to the enclosure for two project location maps that were provided by the Applicant as part of the Presidential permit application.

The Nogales Transmission application can be viewed and downloaded in its entirety from the DOE Office of Electricity and Energy Reliability program website at: http://energy.gov/oe/downloads/application-presidential-permit-oe-docket-no-pp-420-nogales-transmission-llc. Information specific to cultural resources can be found in "Chapter IV, Part C. Cultural Resources" of the application, as well as in the associated environmental report (*see* "Section 3.6 Cultural Resources" and "Appendix B: Class III Cultural Resources Survey for the Nogales Interconnection Project, Nogales").

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Sincerely,

Melissa Pauley

Melissa Pauley
Electricity Policy Analyst
Transmission Permitting & Technical Assistance Division, OE-20
Office of Electricity Delivery and Energy Reliability
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585

Enclosures:
Notice of Application
Project Location Maps

Department of Energy

Washington, DC 20585

September 19, 2016

Mr. Marty McCune
President
Santa Cruz Valley Heritage Alliance
P.O. Box 561
Tucson, AZ 85702-0561

Subject: Invitation to Consult under the National Historic Preservation Act for the proposed Nogales Interconnection Project; Docket No. DOE/EA-2042

Dear Mr. McCune:

Nogales Transmission, LLC (Nogales Transmission or the Applicant) applied to the U.S. Department of Energy's (DOE's) Office of Electricity Delivery and Energy Reliability pursuant to Executive Order 10485, as amended by Executive Order 12038, for a Presidential permit[1] (the Federal action) to construct, operate, maintain, and connect a new high-voltage direct current (HVDC) transmission line across the U.S.-Mexico border in southern Arizona.

Pursuant to Section 106 of the National Historic Preservation Act (NHPA) and 36 CFR Part 800, "Protection of Historic Resources," DOE is initiating the Section 106 consultation process to determine any potential adverse effects of the proposed Nogales Interconnection project (the project) on historic properties. DOE invites you to participate as a consulting party, as provided for by Section 106 and its implementing regulations, by providing information about historic properties in or near the project area, sharing your concerns about such properties, and identifying potential mitigation measures. DOE is coordinating its compliance with Section 106 of the NHPA with its review under the National Environmental Policy Act (NEPA) according to the process set forth in 36 CFR §800.3(b). DOE is the lead federal agency in the preparation of an environmental assessment (EA) for the project.

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Point of Entry in Nogales, Arizona. Please refer to the enclosure for two project location maps that were provided by the Applicant as part of the Presidential permit application.

The Nogales Transmission application can be viewed and downloaded in its entirety from the DOE Office of Electricity and Energy Reliability program website at: http://energy.gov/oe/downloads/application-presidential-permit-oe-docket-no-pp-420-nogales-transmission-llc. Information specific to cultural resources can be found in "Chapter IV, Part C. Cultural Resources" of the application, as well as in the associated environmental report (*see* "Section 3.6 Cultural Resources" and "Appendix B: Class III Cultural Resources Survey for the Nogales Interconnection Project, Nogales").

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Transmission Permitting & Technical Assistance Division, OE-20
Office of Electricity Delivery and Energy Reliability
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585

Enclosures:
Notice of Application
Project Location Maps

http://www.fe.doe.gov/programs/gasregulation/index.html.

Issued in Washington, DC, on May 13, 2016.

John A. Anderson,

Director, Office of Regulation and International Engagement, Office of Oil and Natural Gas.

[FR Doc. 2016–11812 Filed 5–18–16; 8:45 am]

BILLING CODE 6450–01–P

DEPARTMENT OF ENERGY

[OE Docket No. PP–420]

Application for Presidential Permit; Nogales Interconnection Project

AGENCY: Office of Electricity Delivery and Energy Reliability, DOE.

ACTION: Notice of application.

SUMMARY: Nogales Transmission, L.L.C., (Nogales Transmission) has applied for a Presidential permit to construct, operate, maintain, and connect an electric transmission line across the United States border with Mexico.

DATES: Comments or motions to intervene must be submitted on or before June 20, 2016.

ADDRESSES: Comments or motions to intervene should be addressed as follows: Office of Electricity Delivery and Energy Reliability (OE–20), U.S. Department of Energy, 1000 Independence Avenue SW., Washington, DC 20585.

FOR FURTHER INFORMATION CONTACT: Christopher Lawrence (Program Office) at 202–586–5260 or via electronic mail at *Christopher.Lawrence@hq.doe.gov,* Rishi Garg (Program Attorney) at 202–586–0258.

SUPPLEMENTARY INFORMATION: The construction, operation, maintenance, and connection of facilities at the international border of the United States for the transmission of electric energy between the United States and a foreign country is prohibited in the absence of a Presidential permit issued pursuant to Executive Order (EO) 10485, as amended by EO 12038.

On April 8, 2016, Nogales Transmission filed an application with the Office of Electricity Delivery and Energy Reliability of the Department of Energy (DOE) for a Presidential permit. Nogales Transmission has it principal place of business in Dallas, Texas. Nogales Transmission is owned by Hunt Power, L.P., a Delaware limited partnership (Hunt Power), which in turn is a subsidiary of Hunt Consolidated, Inc.

Nogales Transmission proposes to construct and operate the Nogales Interconnection Project (the Project), an approximately five mile long overhead transmission system originating at the Valencia Substation in Nogales, Arizona, connecting to the proposed Gateway Substation three miles to the West and then crossing the U.S. border two miles to the south of the Gateway Substation. The proposed project facilities would be capable of transmitting up to 300 megawatts (MW) of power.

The U.S. portion of the proposed project would cross the U.S.-Mexico border west of the Mariposa Point of Entry. From the Valencia Substation to the Gateway Substation, a three mile, 138 kV line would be constructed. A 300 MW bi-directional Back-to-Back HVDC Converter will be located at the Gateway substation, connecting the WECC system to the Mexico system. The Back-to-Back HVDC Converter will have two phases with each phase capable of 150 MW of bi-directional flow between the WECC and Mexico systems. From the Gateway Substation to the border, a 230 kV line would run approximately two miles to the Mexico border.

The Project will be operated in accordance with the established engineering and technical criteria of the Western Electric Coordinating Council. System impact studies are being conducted to analyze the effect of importing and exporting the entire 300 MWs across the Back-to-Back HVDC system.

Since the restructuring of the electric industry began, resulting in the introduction of different types of competitive entities into the marketplace, DOE has consistently expressed its policy that cross-border trade in electric energy should be subject to the same principles of comparable open access and non-discrimination that apply to transmission in interstate commerce. DOE has stated that policy in export authorizations granted to entities requesting authority to export over international transmission facilities. Specifically, DOE expects transmitting utilities owning border facilities to provide access across the border in accordance with the principles of comparable open access and non-discrimination contained in the Federal Power Act and articulated in Federal Energy Regulatory Commission (FERC) Order No. 888 (Promoting Wholesale Competition Through Open Access Non-Discriminatory Transmission Services by Public Utilities; FERC Stats. & Regs. ¶31,036 (1996)), as amended.

Procedural Matters: Any person may comment on this application by filing such comment at the address provided above. Any person seeking to become a party to this proceeding must file a motion to intervene at the address provided above in accordance with Rule 214 of FERC's Rules of Practice and Procedure (18 CFR 385.214). Two copies of each comment or motion to intervene should be filed with DOE on or before the date listed above.

Additional copies of such motions to intervene also should be filed directly with: Enrique Marroquin, Nogales Transmission, LLC, 1900 North Akard Street, Dallas, TX 75201.

Before a Presidential permit may be issued or amended, DOE must determine that the proposed action is in the public interest. In making that determination, DOE considers the environmental impacts of the proposed project pursuant to the National Environmental Policy Act of 1969, determines the project's impact on electric reliability by ascertaining whether the proposed project would adversely affect the operation of the U.S. electric power supply system under normal and contingency conditions, and any other factors that DOE may also consider relevant to the public interest. Also, DOE must obtain the concurrences of the Secretary of State and the Secretary of Defense before taking final action on a Presidential permit application.

Copies of this application will be made available, upon request, for public inspection and copying at the address provided above, by accessing the program Web site at *http://energy.gov/oe/services/electricity-policy-coordination-and-implementation/international-electricity-regulatio-2*.

Issued in Washington, DC, on May 13, 2016.

Christopher A. Lawrence,

Electricity Policy Analyst, National Electricity Delivery Division, Office of Electricity Delivery and Energy Reliability.

[FR Doc. 2016–11810 Filed 5–18–16; 8:45 am]

BILLING CODE 6450–01–P

DEPARTMENT OF ENERGY

Energy Efficiency and Renewable Energy

State Energy Advisory Board (STEAB) Meeting

AGENCY: Energy Efficiency and Renewable Energy, Department of Energy.

ACTION: Notice of open live board meeting.

Figure 2-4. Route Segments – October 2015

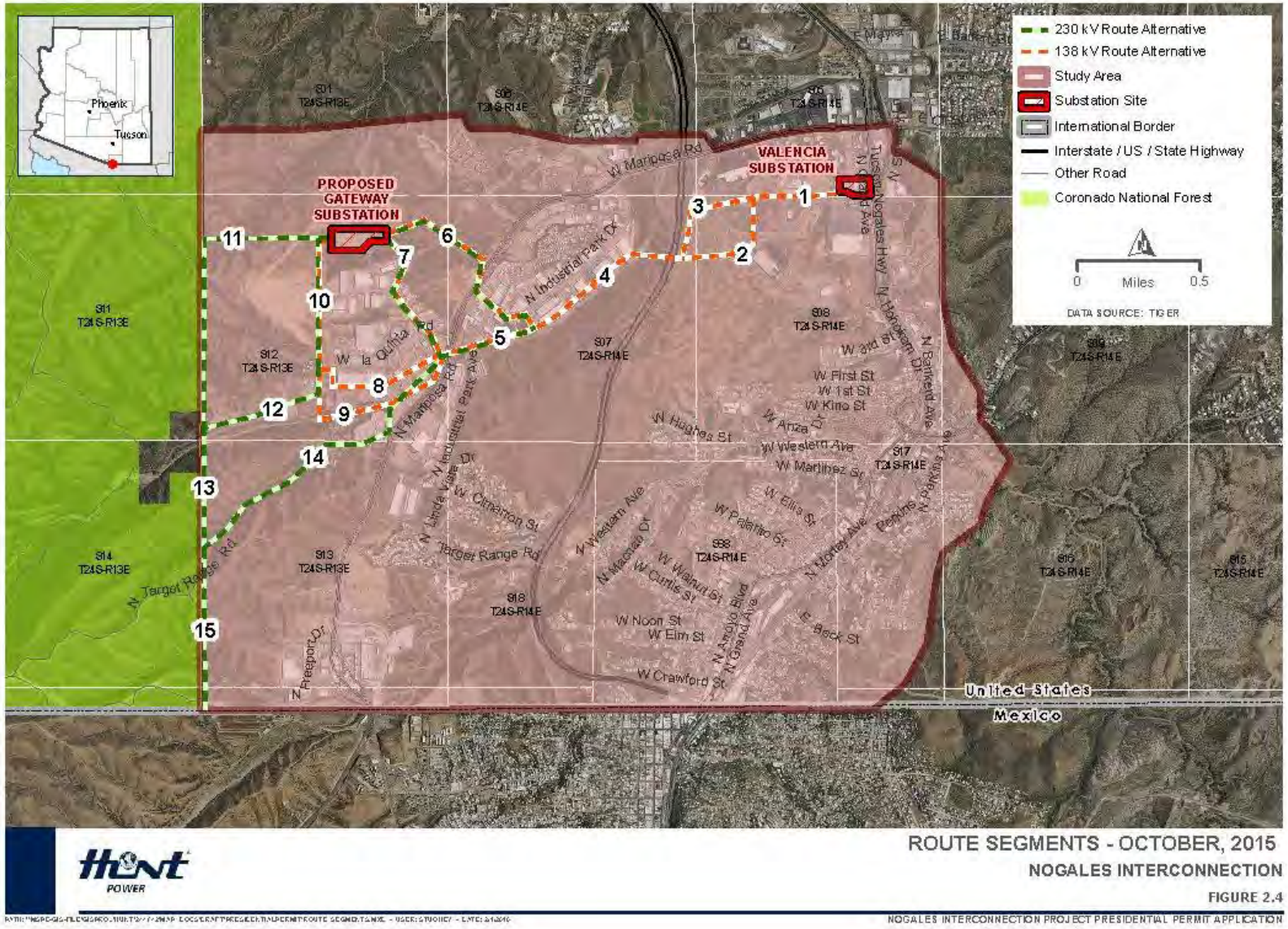
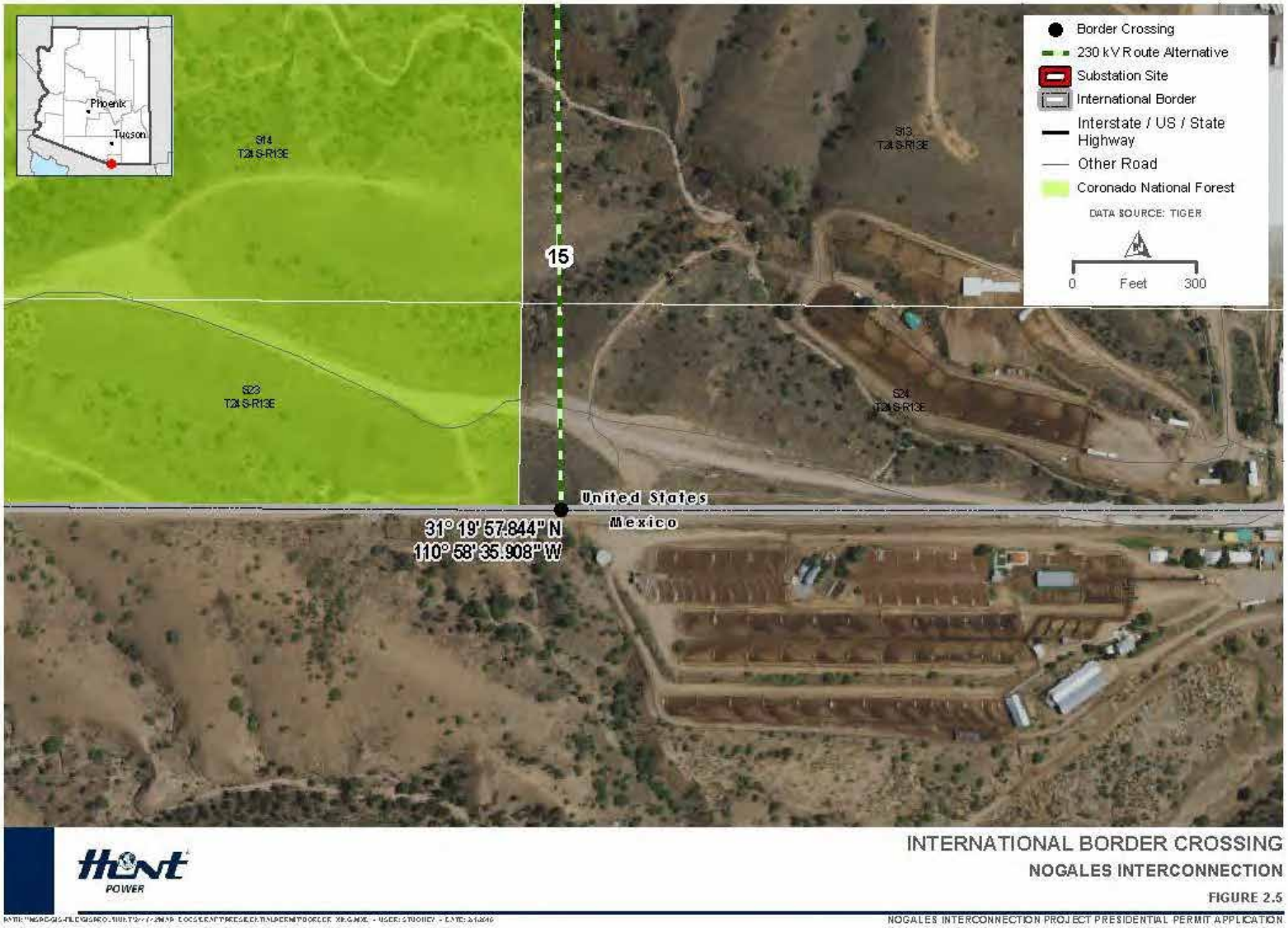


Figure 2-5. International Border Crossing



December 28, 2016

Melissa Pauley
Transmission Permitting & Technical Assistance Division
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585

RE: **PROPOSED NOGALES INTERCONNECTION PROJECT; DOCKET NO. DOE/EA-2042**

Dear Ms. Pauley,

The Navajo Nation Historic Preservation Department, hereafter (HPD) is in receipt of consultation pursuant to 36 CFR 800.16(y) for the *proposed construction, operation, maintenance, and connection of a new high-voltage direct current transmission line across the U.S. Mexico border in Southern Arizona.*

Traditional Culture Program Staff reviewed the informational documents, and have provided the comments herein, HPD has no concerns at this time as this project initiation is located outside of the Navajo Nation aboriginal land boundaries, therefore there are no foreseeable affects to Traditional Cultural Properties or places of cultural significance to the Navajo Nation within the project proposed area.

If the proposed project within the area inadvertently discovers Traditional Cultural Properties such as habitation sites, plant gathering areas, human remains or objects of cultural patrimony, HPD request that we be notified in accordance with 36 CFR 800 as a Consulting Party, and per the Native American Graves Protection and Repatriation Act (NAGPRA).

The Navajo Nation HPD appreciates the U.S. Department of Energy's efforts regarding this undertaking. Should you have any additional concerns and/or questions do not hesitate to contact our department at 928-871-7198.

Sincerely,

Melinda Arviso-Ciocco
Navajo Cultural Specialist
Traditional Culture Program
Historic Preservation Department
TCP File: 16-S188

Concurred,

Tamara Billie, Senior Archaeologist
Acting Tribal Historic Preservation Officer
Historic Preservation Department
Division of Natural Resources

Received from Tribal Admin: 11/10/16 (VG)

Entered ________ (initial & date)

Scanned ________ (initial & date)

SAN CARLOS APACHE TRIBE
Historic Preservation & Archaeology Department
P.O. Box 0
San Carlos Arizona 85550
Tel. (928) 475-5797, apachevern@yahoo.com

Tribal Consultation Response Letter

Date: October 13, 2016

Contact Name: Melissa Pauley Melissa.Pauley@doe.hq.gov

Company: Department of Energy

Address: 1000 Independence Avenue, SW Washington DC.20585

Project Name/#: Invitation to Consult under the National Historic Preservation Act for the Proposed Nogales Interconnection Project; Docket No. DOE/EA-2042

Dear Sir or Madam:

Under Section 106 and 110 of the National Historic Preservation Act, we are replying to the above referenced project. Please see the appropriate marked circle, including the signatures of Vernelda Grant, Tribal Historic Preservation Officer (THPO), and the concurrence of the Chairman of the San Carlos Apache Tribe:

☒ **NO INTEREST/NO FURTHER CONSULTATION/NO FUTURE UPDATES**
We defer to the Tribe located nearest to the project area.

☒ **CONCURRENCE WITH REPORT FINDINGS & THANK YOU**

○ **REQUEST ADDITIONAL INFORMATION**
I require additional information in order to provide a finding of effect for this proposed undertaking, i.e. Project description ___ Map ___ Photos ___ Other ____________________

☒ **NO EFFECT**
I have determined that there are no properties of religious and cultural significance to the San Carlos Apache Tribe that are listed on the National Register within the area of potential effect or that the proposed project will have no effect on any such properties that may be present.

○ **NO ADVERSE EFFECT**
Properties of cultural and religious significance within the area of effect have been identified that are eligible for listing in the National Register for which there would be no adverse effect as a result of the proposed project.

○ **ADVERSE EFFECT**
I have identified properties of cultural and religious significance within the area of potential effect that are eligible for listing in the National Register. I believe the proposed project would cause an adverse effect on these properties. Please contact the THPO for further discussion.

We were taught traditionally not to disturb the natural world in a significant way, and that to do so may cause harm to oneself or one's family. Apache resources can be best protected by managing the land to be as natural as it was in pre-1870s settlement times. Please contact the THPO, if there is a change in any portion of the project, especially if Apache cultural resources are found at any phase of planning and construction. Thank you for contacting the San Carlos Apache Tribe, your time and effort is greatly appreciated.

DIRECTOR/THPO: [signature] 11/07/2016
Vernelda J. Grant, Tribal Historic Preservation Officer — Date

CONCURRENCE: [signature] 11/7/16
Terry Rambler, Tribal Chairman — Date

Department of Energy
Washington, DC 20585

10/6/16
To Vern Grant
Alex Ritchie
F41
TR, Chairman

September 19, 2016

Mr. Terry Rambler
Chairman
San Carlos Apache Tribe
P.O. Box 0
San Carlos, AZ 85550

Subject: Invitation to Consult under the National Historic Preservation Act for the proposed Nogales Interconnection Project: Docket No. DOE/EA-2042

Dear Chairman Rambler:

Nogales Transmission, LLC (Nogales Transmission or the Applicant) applied to the U.S. Department of Energy's (DOE's) Office of Electricity Delivery and Energy Reliability pursuant to Executive Order 10485, as amended by Executive Order 12038, for a Presidential permit[1] (the Federal action) to construct, operate, maintain, and connect a new high-voltage direct current (HVDC) transmission line across the U.S.-Mexico border in southern Arizona.

Pursuant to Section 106 of the National Historic Preservation Act (NHPA) and 36 CFR Part 800, "Protection of Historic Resources," DOE is initiating the Section 106 consultation process to determine any potential adverse effects of the proposed Nogales Interconnection project (the project) on historic properties. DOE invites you to participate as a consulting party, as provided for by Section 106 and its implementing regulations, by providing information about historic properties in or near the project area, sharing your concerns about such properties, and identifying potential mitigation measures. DOE is coordinating its compliance with Section 106 of the NHPA with its review under the National Environmental Policy Act (NEPA) according to the process set forth in 36 CFR §800.3(b). DOE is the lead federal agency in the preparation of an environmental assessment (EA) for the project.

On April 8, 2016, Nogales Transmission applied to DOE pursuant to Executive Order 10485, as amended by Executive Order 12038, for a Presidential permit. A copy of DOE's *Notice of Application for Presidential Permit; Nogales Interconnection Project* is included with this letter (81 FR 31622; May 19, 2016).

The approximately five-mile U.S. portion of the proposed transmission line would be capable of transmitting up to 300 megawatts (MW) of power. From the existing Valencia Substation to the proposed Gateway Substation, a three-mile, 138 kilovolt (kV) line would be constructed. A 300 MW bi-directional back-to-back HVDC converter would be located at the proposed Gateway substation, connecting the Western Electric Coordinating Council (WECC) system to the Mexico system. The back-to-back HVDC converter would have two phases, with each phase capable of 150 MW of bi-directional flow between the WECC and Mexico systems. From the Gateway Substation, a 230 kV line would run approximately two miles south to the Mexico border. The U.S. portion of the proposed project would cross the U.S.-Mexico border west of the Mariposa

[1] In accordance with Executive Order (EO) 10485, as amended by EO 12038, and the regulations at 10 CFR 205.320 et seq. (2000), "Application for Presidential Permit Authorizing the Construction, Connection, Operation, and Maintenance of Facilities for Transmission of Electric Energy at International Boundaries."

Department of Energy
Washington, DC 20585

September 19, 2016

Mr. James Garrison
State Historic Preservation Officer
Arizona State Historic Preservation Office
Arizona State Parks
23751 N. 23rd Ave., Suite 190
Phoenix, AZ 85085-1863

Subject: Request to Initiate 106 Consultation under the National Historic Preservation Act for the proposed Nogales Interconnection Project, Docket No. DOE/EA-2042

Dear Mr. Garrison:

Nogales Transmission, LLC (Nogales Transmission or the Applicant) applied to the U.S. Department of Energy's (DOE's) Office of Electricity Delivery and Energy Reliability pursuant to Executive Order 10485, as amended by Executive Order 12038, for a Presidential permit[1] (the Federal action) to construct, operate, maintain, and connect a new high-voltage direct current (HVDC) transmission line across the U.S.-Mexico border in southern Arizona.

Pursuant to Section 106 of the National Historic Preservation Act (NHPA) and 36 CFR Part 800, "Protection of Historic Resources," DOE is initiating the Section 106 consultation process to determine any potential adverse effects of the Nogales Interconnection project (the project) on historic properties. DOE invites you to participate as a consulting party, as provided for by Section 106 and its implementing regulations, by providing information about historic properties in or near the project area, sharing your concerns about such properties, and developing potential mitigation measures.

DOE is coordinating its compliance with Section 106 of the NHPA with its review under the National Environmental Policy Act (NEPA) according to the process set forth in 36 CFR §800.3(b). DOE is the lead federal agency in the preparation of an environmental assessment (EA) for the project. DOE has extended invitations to relevant federal and state agencies to act as cooperating agencies with DOE and is awaiting their response. DOE has also initiated Government-to-Government and Section 106 consultations with the Tohono O'odham Nation and the Pascua Yaqui Tribe. Per standing policy, DOE will explicitly solicit information from the public regarding cultural and historic resources through its Notice of Availability of the draft EA when published in the Federal Register. Agencies and the public will have 30 days to review and comment on the draft EA.

Project Information

On April 8, 2016, Nogales Transmission applied to DOE pursuant to Executive Order 10485, as amended by Executive Order 12038, for a Presidential permit. A copy of DOE's *Notice of Application for Presidential Permit; Nogales Interconnection Project* is included with this letter (81 FR 31622; May 19, 2016).

[1] In accordance with Executive Order (EO) 10485, as amended by EO 12038, and the regulations at 10 CFR 205.320 et seq. (2000), "Application for Presidential Permit Authorizing the Construction, Connection, Operation, and Maintenance of Facilities for Transmission of Electric Energy at International Boundaries."

The approximately five-mile U.S. portion of the proposed transmission line would be capable of transmitting up to 300 megawatts (MW) of power. From the existing Valencia Substation to the proposed Gateway Substation, a three-mile, 138 kilovolt (kV) line would be constructed. A 300 MW bi-directional back-to-back HVDC converter would be located at the proposed Gateway substation, connecting the Western Electric Coordinating Council (WECC) system to the Mexico system. The back-to-back HVDC converter would have two phases, with each phase capable of 150 MW of bi-directional flow between the WECC and Mexico systems. From the Gateway Substation, a 230 kV line would run approximately two miles south to the Mexico border. The U.S. portion of the proposed project would cross the U.S.-Mexico border west of the Mariposa Point of Entry in Nogales, Arizona. Please refer to the enclosure for two project location maps that were provided by the Applicant as part of the Presidential permit application.

The application, including associated maps and an initial cultural resources study, can be viewed and downloaded in its entirety from the DOE Office of Electricity and Energy Reliability program website at: http://energy.gov/oe/downloads/application-presidential-permit-oe-docket-no-pp-420-nogales-transmission-llc. Information specific to cultural resources can be found in "Chapter IV, Part C. Cultural Resources" of the application, as well as in the associated environmental report (*see* "Section 3.6 Cultural Resources" and "Appendix B: Class III Cultural Resources Survey for the Nogales Interconnection Project").

Identification Efforts to Date

A Class III Cultural Resources Survey was conducted by the Applicant and submitted with their Presidential permit application. The area surveyed included a 200-foot-wide corridor and a 0.25-mile buffer along the transmission line route segments, as well as the existing Valencia Substation and the new Gateway Substation site, totaling nearly 207 acres. Right-of-entry was not obtained from all of the landowners, so approximately 70 acres were not surveyed along Route Segments 10, 11, 13, and 14. The survey documented two previously recorded sites; no new sites were identified. One site is a sparse prehistoric artifact scatter; the other site is a set of rock piles. The surveyor recommended that both sites were ineligible for listing on the National Register of Historic Places because of their limited information potential. Based on the areas surveyed, the surveyor recommended a Finding of Project Effect of No Adverse Effect. The Applicant stated that all unsurveyed areas will be surveyed by qualified archaeologists after a route is approved by the Arizona Corporation Commission and prior to construction disturbance.

Initiation of Consultation

Under Section 106, DOE must identify and consider the potential effects of its actions on historic properties through a collaborative framework (consultation) to identify historic properties potentially affected by the project, assess effects, and seek ways to avoid, minimize, or mitigate any adverse effects (36 CFR §800.1(a)). In addition to the State Historic Preservation Office (SHPO), federally recognized Indian tribes, and the Advisory Council on Historic Preservation (ACHP), Section 106 consulting parties may include certain individuals and organizations with a demonstrated interest in the undertaking due to the nature of their legal or economic relation to the undertaking or affected properties, or their concern with the undertaking's effects on historic properties (36 CFR §800.2).

As a consulting party, your assistance in the identification and evaluation of historic properties will provide us with the opportunity to resolve any adverse effects the project may have on these properties. If available, we welcome any additional information on the location and importance of archaeological sites, historic structures, and any other localities of interest to you that are known to occur in or near the project area.

Consulting Parties

DOE has identified the list of contacts provided in the attached *Draft List of Nogales Interconnection Project Section 106 Consulting Parties* as potential consulting parties. DOE seeks any information or suggestions that your office may have with regard to potential consulting parties or tribes that are included in the attached consulting parties list, as well as any additional information that should be considered at this time.

DOE Contact Information

If you would like to participate as a Section 106 consulting party, please send a letter that accepts this invitation in an attachment to an email to Melissa.Pauley@doe.hq.gov, by fax to 202-586-8008, or by postal mail to the address listed below. We respectfully request that you respond within 30 days of your receipt of this letter to facilitate the consultation process and to ensure that DOE can promptly begin to address your comments and concerns.

In the meantime, if you have questions, please contact me at any time at the above email address or at 202-586-2942. Thank you for taking the time to consider this request.

Sincerely,

Melissa Pauley

participate as Section 106 consulting party

Melissa Pauley
Electricity Policy Analyst
Transmission Permitting & Technical Assistance Division, OE-20
Office of Electricity Delivery and Energy Reliability
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585

CONCUR

6 OCT 16

Arizona State Historic Preservation Office

Enclosures:
Section 106 Consulting Party List
Notice of Application
Project Location Maps

cc: Mr. Reid Nelson, Advisory Council on Historic Preservation

Preserving America's Heritage

October 17, 2016

Ms. Melissa Pauley
Electricity Policy Analyst
U.S. Department of Energy
Office of Electricity Delivery and Energy Reliability
Transmission Permitting &Technical Assistance Division
1000 Independence Ave SW (OE-20)
Washington, DC 20585

Ref: *Proposed Nogales Interconnection Project*
Arizona

Dear Ms. Pauley:

On September 22, 2016, the Advisory Council on Historic Preservation (ACHP) received notification from the U.S. Department of Energy (DOE) regarding the proposed Nogales Interconnection Project in Arizona, which will require compliance with Section 106 of the National Historic Preservation Act (NHPA; 54 U.S.C. 306108) and its implementing regulations, "Protection of Historic Properties" (36 CFR Part 800). As the proposed undertaking involves the issuance of a Presidential permit, DOE initiated consultation with the Arizona State Historic Preservation Officer (SHPO) on September 19, 2016, and through its applicant, has begun identifying historic properties within the undertaking's Area of Potential Effects (APE). DOE also has identified consulting parties, including federally recognized Indian tribes, to participate in the Section 106 review.

While we greatly appreciate the early notification regarding DOE's undertaking, we are unable to determine if our participation in consultation is needed in accordance with Appendix A of our regulations. As DOE has just initiated consultation with the SHPO, we recommend that DOE obtain the input of SHPO and the other consulting parties regarding how this undertaking may affect historic properties. DOE can then provide the ACHP with a summary of the views provided by the consulting parties so it can inform the need for our participation. This information will allow you to complete the documentation requirements of 36 CFR Section 800.11(e).

Upon receipt of this information, the ACHP will determine if our participation in consultation is necessary. If DOE believes the ACHP's early participation is needed or if there are procedural or policy questions that we can help DOE address, please advise us accordingly so we can help develop the appropriate consultation strategy.

We look forward to working with DOE on this important project. If you have any questions regarding our guidance, please contact Ms. Jaime Loichinger at (202) 517-0219 or via email at jloichinger@achp.gov.

Sincerely,

Charlene Dwin Vaughn, AICP
Assistant Director
Office of Federal Agency Programs
Federal Permitting, Licensing and Assistance Section

September 30, 2016

Melissa Pauley
Electricity Policy Analyst
Transmission Permitting & Technical Assistance Division – OE20
Office of Electricity Delivery and Energy Reliability
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585

Dear Ms. Pauley,

We have received your letter dated September 19, 2016 with an invitation to consult under the National Historic Preservation Act on any potential adverse effects of the proposed Nogales Interconnection Project (Docket No. DOE/EA-2042) on historic properties. Hunt Power, L.P. would like to accept this invitation and participate as a Section 106 consulting party.

Yours Truly,

Gabriela Canales
Hunt Power, L.P.
1900 North Akard Street
Dallas, TX 75201-2300

Department of Energy

Washington, DC 20585

April 13, 2017

Ms. Kathryn Leonard
State Historic Preservation Officer
Arizona State Historic Preservation Office
1100 W. Washington Street
Phoenix, AZ 85007-2935

Subject: Section 106 Consultation under the National Historic Preservation Act for the proposed Nogales Interconnection Project, Docket No. DOE/EA-2042

Dear Ms. Leonard:

The U.S. Department of Energy (DOE) is in the process of preparing its draft Environmental Assessment (EA) for the proposed Nogales Interconnection Project pursuant to its obligations under the National Environmental Policy Act (NEPA). The EA will evaluate the potential environmental impacts of the issuance of a Presidential permit to Nogales Transmission, L.L.C. (Nogales Transmission or the Applicant) for the construction, operation, maintenance, and connection of a new high-voltage direct current (HVDC) transmission line across the United States-Mexico border in southern Arizona.

The proposed DOE action is the issuance of a Presidential permit for the international border crossing. DOE has determined to treat this action as an undertaking that has potential to cause adverse effects on historic properties, per the Advisory Council on Historic Preservation's (ACHP's) National Historic Preservation Act (NHPA) implementing regulations at 36 CFR 800.3(a). DOE submitted a *Request to Initiate 106 Consultation* letter to your office on September 19, 2016, as well as a follow-up letter on February 9, 2017 regarding DOE's engagement with consulting parties.

Area of Potential Effect

For the proposed project, DOE defined the area of potential effect (APE) as a 200-foot-wide corridor along the proposed transmission line route segment variations; the existing Valencia substation; the proposed Gateway substation; and access roads that would require ground disturbing activity (Access Type C – existing, to-be-improved dirt roads, Access Type D – new dirt roads, and Access Type E – new dirt spur roads). DOE defined an indirect APE to be approximately 0.25 miles on either side of the proposed transmission line centerline. The Applicant has indicated that the width of the right-of-way (ROW) would be 150 feet; however, in some areas where a 150-foot ROW would impact the existing built environment, the ROW would be narrower.

Identification Efforts to Date

As explained in DOE's September 19, 2016 letter to your office, a Cultural Resources Survey was conducted in November 2015 by the Applicant and submitted with their Presidential permit application in April 2016. The area surveyed for direct effects included a 200-foot-wide corridor along the proposed transmission line route segment variations, as well as the existing Valencia Substation and the proposed Gateway Substation site, totaling approximately 207 acres. This survey included fourteen route segment variations, which have subsequently been consolidated into four route alternatives.

Right-of-entry was not obtained from all of the private landowners, so approximately 70 acres were not surveyed at that time. The Applicant has also subsequently identified the location of access roads. Also, portions of the alignment within the Arizona Department of Transportation (ADOT) highway ROW for I-19 and SR 189 were not surveyed, because current data were available from ADOT. No sites were identified in the ADOT ROW within the proposed transmission line corridor.

The 2015 survey documented two previously recorded sites; no new sites were identified. One site is a sparse prehistoric artifact scatter (Site AZ EE: 9:224 (ASM)); the other site is a set of rock piles (AZ EE: 9:225 (ASM)). Both sites have limited information potential and are recommended as being ineligible for listing on the National Register of Historic Places. Four isolated occurrences were recorded; the isolates are of limited information potential and do not qualify for National Register listing as objects.

Scope of Future Identification Efforts under Section 106

The Applicant has identified a Preferred Alternative, which will be presented in the draft EA as Alternative 3. Approximately 39 acres of the APE for direct effects for Alternative 3 have not been surveyed, including a portion of some parcels where right-of-entry has not been obtained by the Applicant from private landowners. This acreage includes approximately 36.6 acres of the 200-foot-wide corridor along the proposed transmission line centerline, 1.96 acres of existing, to-be-improved, dirt roads (Type C), and 0.5 acres of proposed new roads (new dirt roads - Type D and new, dirt spur roads - Type E).

The Applicant has indicated that they are still working with private landowners regarding right-of-entry and expect to be complete with this effort by late April 2017, at which time, the additional cultural resources survey will commence. Additional surveys will be completed for all additional areas for Alternative 3 (the Preferred Alternative) where right-of-entry has been granted. The cultural resources report will be amended after permissions have been obtained and surveys have been completed. At this time, DOE will also provide its determination.

The following steps were discussed during a February 21, 2017 call between Mr. David Jacobs at AZ SHPO, DOE, DOE's contractor (SWCA Environmental Consultants), and representatives from the Applicant. Mr. Jacobs concurred with these steps via email on March 3, 2017.

- The Applicant will make a good faith effort to obtain right-of-entry from remaining private landowners who have not yet allowed access to their parcels for survey.
- A Class III survey will be completed in all areas (including ROW and access roads) that would sustain ground disturbance and that have not been previously surveyed, where right-of-entry has been obtained for Alternative 3.
- By "not previously surveyed," we are referring to the survey presented in the cultural resources report that the Applicant submitted with their Presidential permit application and which DOE shared with you in our consultation initiation letter. This previous survey will be vetted in the field by DOE's contractor for Alternative 3.
- In areas where right-of-entry has not been able to be obtained by the Applicant for Alternative 3, the qualified archaeologist who completes the Class III survey will identify the specific areas not surveyed and render a professional opinion regarding the likelihood of the location of an historic property within the unsurveyed areas.
- The archaeologist will rely upon a Class I Inventory (literature review and site files check), their knowledge and investigation of the project area around the unsurveyed portions, and their professional judgment to render this opinion.

- Upon completion of the above, DOE will provide a supplemental cultural resources survey report and our determination to AZ SHPO.
- A "Construction Monitoring and Unanticipated Cultural Resources Discovery Plan" will be included in this report (and the EA), which will detail procedures to be followed in the event of an unanticipated discovery of a potentially significant (and previously unknown) historic property (including human remains).
- This discovery clause will be included when DOE provides its determination to you.
- The Applicant will also provide best management practices and procedures used by crews during operations and maintenance, including vegetation management.
- Survey and reporting will follow AZ SHPO and Arizona State Museum (ASM) guidelines and requirements for a Class I Inventory and a Class III Survey and will be conducted by a qualified archaeologist, as defined by AZ SHPO/ASM.

Request for your input

In closing, DOE currently seeks your concurrence on its scope of efforts to identify historic properties and archaeological resources and its proposed direct and indirect APE's. Please provide your concurrence and any material information that you may have in writing so that it may be added to the administrative record.

DOE greatly appreciates your assistance with this project. You may reach me at any time by email at Melissa.Pauley@hq.doe.gov, by phone at 202-586-2942, by fax at 202-586-8008, or by postal mail to the address listed below.

Sincerely,

Melissa Pauley

Melissa Pauley
Electricity Policy Analyst
U.S. Department of Energy
Office of Electricity Delivery and Energy Reliability
(Mail Stop: OE-20)
1000 Independence Avenue, SW
Washington, DC 20585

cc:
Mr. David Jacobs, Arizona SHPO

Department of Energy
Washington, DC 20585

April 13, 2017

Ms. Kathryn Leonard
State Historic Preservation Officer
Arizona State Historic Preservation Office
1100 W. Washington Street
Phoenix, AZ 85007-2935

Subject: Section 106 Consultation under the National Historic Preservation Act for the proposed Nogales Interconnection Project, Docket No. DOE/EA-2042

Dear Ms. Leonard:

The U.S. Department of Energy (DOE) is in the process of preparing its draft Environmental Assessment (EA) for the proposed Nogales Interconnection Project pursuant to its obligations under the National Environmental Policy Act (NEPA). The EA will evaluate the potential environmental impacts of the issuance of a Presidential permit to Nogales Transmission, L.L.C. (Nogales Transmission or the Applicant) for the construction, operation, maintenance, and connection of a new high-voltage direct current (HVDC) transmission line across the United States-Mexico border in southern Arizona.

The proposed DOE action is the issuance of a Presidential permit for the international border crossing. DOE has determined to treat this action as an undertaking that has potential to cause adverse effects on historic properties, per the Advisory Council on Historic Preservation's (ACHP's) National Historic Preservation Act (NHPA) implementing regulations at 36 CFR 800.3(a). DOE submitted a *Request to Initiate 106 Consultation* letter to your office on September 19, 2016, as well as a follow-up letter on February 9, 2017 regarding DOE's engagement with consulting parties.

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Identification Efforts to Date

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The Applicant has indicated that they are still working with private landowners regarding right-of-entry and expect to be complete with this effort by late April 2017, at which time, the additional cultural resources survey will commence. Additional surveys will be completed for all additional areas for Alternative 3 (the Preferred Alternative) where right-of-entry has been granted. The cultural resources report will be amended after permissions have been obtained and surveys have been completed. At this time, DOE will also provide its determination.

The following steps were discussed during a February 21, 2017 call between Mr. David Jacobs at AZ SHPO, DOE, DOE's contractor (SWCA Environmental Consultants), and representatives from the Applicant. Mr. Jacobs concurred with these steps via email on March 3, 2017.

- The Applicant will make a good faith effort to obtain right-of-entry from remaining private landowners who have not yet allowed access to their parcels for survey.
- A Class III survey will be completed in all areas (including ROW and access roads) that would sustain ground disturbance and that have not been previously surveyed, where right-of-entry has been obtained for Alternative 3.
- By "not previously surveyed," we are referring to the survey presented in the cultural resources report that the Applicant submitted with their Presidential permit application and which DOE shared with you in our consultation initiation letter. This previous survey will be vetted in the field by DOE's contractor for Alternative 3.
- In areas where right-of-entry has not been able to be obtained by the Applicant for Alternative 3, the qualified archaeologist who completes the Class III survey will identify the specific areas not surveyed and render a professional opinion regarding the likelihood of the location of an historic property within the unsurveyed areas.
- The archaeologist will rely upon a Class I Inventory (literature review and site files check), their knowledge and investigation of the project area around the unsurveyed portions, and their professional judgment to render this opinion.

- Upon completion of the above, DOE will provide a supplemental cultural resources survey report and our determination to AZ SHPO.
- A "Construction Monitoring and Unanticipated Cultural Resources Discovery Plan" will be included in this report (and the EA), which will detail procedures to be followed in the event of an unanticipated discovery of a potentially significant (and previously unknown) historic property (including human remains).
- This discovery clause will be included when DOE provides its determination to you.
- The Applicant will also provide best management practices and procedures used by crews during operations and maintenance, including vegetation management.
- Survey and reporting will follow AZ SHPO and Arizona State Museum (ASM) guidelines and requirements for a Class I Inventory and a Class III Survey and will be conducted by a qualified archaeologist, as defined by AZ SHPO/ASM.

Request for your input

In closing, DOE currently seeks your concurrence on its scope of efforts to identify historic properties and archaeological resources and its proposed direct and indirect APE's. Please provide your concurrence and any material information that you may have in writing so that it may be added to the administrative record.

DOE greatly appreciates your assistance with this project. You may reach me at any time by email at Melissa.Pauley@hq.doe.gov, by phone at 202-586-2942, by fax at 202-586-8008, or by postal mail to the address listed below.

Sincerely,

Melissa Pauley

Melissa Pauley
Electricity Policy Analyst
U.S. Department of Energy
Office of Electricity Delivery and Energy Reliability
(Mail Stop: OE-20)
1000 Independence Avenue, SW
Washington, DC 20585

CONCUR

24 APR 17

Arizona State Historic Preservation Office

cc:
Mr. David Jacobs, Arizona SHPO

Appendix C

ENDANGERED SPECIES ACT SECTION 7 CONSULTATION DOCUMENTATION

Department of Energy

Washington, DC 20585

September 23, 2016

Ms. Jean Calhoun
Assistant Field Supervisor for Southern Arizona
Tucson Office - Arizona Ecological Services
U.S. Fish and Wildlife Service
201 N Bonita Avenue, Suite 141
Tucson, AZ 85745

Subject: Request to Initiate Informal Consultation under Section 7 of the Endangered Species Act, Nogales Interconnection Project Environmental Assessment; Docket No. DOE/EA-2042

Dear Ms. Calhoun:

The purpose of this letter is to initiate informal consultation with the U.S. Fish and Wildlife Service (USFWS) under section 7(a)(2) of the Endangered Species Act (ESA) for the proposed Nogales Interconnection Project. On April 8, 2016, Nogales Transmission, LLC (Nogales Transmission or the Applicant) applied to the U.S. Department of Energy's (DOE's) Office of Electricity Delivery and Energy Reliability pursuant to Executive Order 10485, as amended by Executive Order 12038, for a Presidential permit[1] to construct, operate, maintain, and connect a new high-voltage direct current (HVDC) transmission line across the U.S.-Mexico border in southern Arizona.

Project Information

The approximately five-mile U.S. portion of the proposed transmission line would be capable of transmitting up to 300 megawatts (MW) of power. From the existing Valencia Substation to the proposed Gateway Substation, a three-mile, 138 kilovolt (kV) line would be constructed. A 300 MW bi-directional back-to-back HVDC converter would be located at the proposed Gateway substation, connecting the Western Electric Coordinating Council (WECC) system to the Mexican system. The back-to-back HVDC converter would have two phases, with each phase capable of 150 MW of bi-directional flow. From the Gateway Substation, a 230 kV line would run approximately two miles south to the Mexico border. The U.S. portion of the proposed project would cross the U.S.-Mexico border west of the Mariposa Point of Entry in Nogales, Arizona. Two of the proposed route segments for the 230 kV line would parallel a portion of the eastern border of the Coronado National Forest.

The Nogales Transmission application, including associated maps and drawings, can be viewed and downloaded in its entirety from the DOE Office of Electricity and Energy Reliability program website at: http://energy.gov/oe/downloads/application-presidential-permit-oe-docket-no-pp-420-nogales-transmission-llc.

[1] In accordance with Executive Order (EO) 10485, as amended by EO 12038, and the regulations at 10 CFR 205.320 et seq. (2000), "Application for Presidential Permit Authorizing the Construction, Connection, Operation, and Maintenance of Facilities for Transmission of Electric Energy at International Boundaries."

DOE is preparing an environmental assessment (EA) for this project pursuant to the requirements of the National Environmental Policy Act (NEPA). At this time, a preferred route alternative has not been identified. In their application, the Applicant indicated that they were evaluating 15 potential route segments (see the enclosed "Figure 2-4: Route Segments, October 2015" figure). Route Segment 8 was subsequently removed from the project. These route segments have been refined to four route options (Options 1 through 4), which are comprised of combinations of the route segments identified in the application (see the enclosed "Route Alternatives, September 2016" figure).

Species List

The Applicant completed a desktop survey using the USFWS Environmental Conservation Online System – Information for Planning and Conservation (ECOS-IPaC) tool and the Arizona Game and Fish Department (AZGFD) online environmental review tool.

The following list of endangered and threatened species under the jurisdiction of the USFWS are potentially located within the project area and its vicinity:

Endangered Species

- Gila Topminnow (*Poeciliopsis occidentalis*)
- Jaguar (*Panthera onca)*
- Lesser Long-nosed Bat (*Leptonycteris curasoae yerbabuenae*)
- Ocelot (*Leopardus pardalis*)
- Pima Pineapple Cactus (*Coryphantha scheeri var. robustispina*)
- Sonoran Pronghorn (*Antilocarpa Americana*)
- Southwestern Willow Flycatcher (*Empidonax traillii extimus*)

Threatened Species

- Chiricahua Leopard Frog (*Rana chiricahuensis*)
- Northern Mexican Gartersnake (*Thamnophis eques megalops*)
- Yellow-billed Cuckoo (*Coccyzus americanus*)

In addition to the above list of species, Candidate Species include:

- Arizona Treefrog (*Hyla wrightorum*)
- Huachuca Springsnail (*Pyrgulopsis thompsoni*)
- Sprague's Pipet (*Anthus spragueii*)
- Stephan's Riffle Beetle (*Heterelmis stephani*)

Species of Concern include:

- American Peregrine Falcon (*Falco peregrinus anatum*)
- Arizona Myotis (*Myotis occultus*)
- Bald Eagle (*Haliaeetus leucocephalus*)
- California Leaf-nosed Bat (*Macrotus californicus*)
- Cave Myotis (*Myotis velifer*)
- Desert Sucker (*Catostomus clarkia*)
- Ferruginous Hawk (*Buteo regalis*)
- Giant Spotted Whiptail (*Aspidoscelis stictogramma*)
- Gila Longfin Dace (*Agosia chrysogaster chrysogaster*)
- Gray Hawk (*Buteo plagiatus*)
- Greater Western Bonneted Bat (*Eumops perotis californicus*)
- Large-flowered Blue Star (*Amsonia grandiflora*)
- Longfin Dace (*Agosia chrysogaster*)

- Lowland Leopard Frog (*Lithobates yavapaiensis*)
- Pale Townsend's Big-eared Bat (*Corynorhinus townsendii pallescens*)
- Spotted Bat (*Euderma maculatum*)
- Supine Bean (*Macroptilium supinum*)
- Tarahumara Frog (*Lithobates tarahumarae*)
- Yuma Myotis (*Myotis yumanensis*)

Birds of Conservation Concern include:

- Baird's Sparrow (*Ammodramus bairdii*)
- Bell's Vireo (*Vireo bellii*)
- Bendire's Thrasher (*Toxostoma bendirei*)
- Black-chinned Sparrow (*Spizella atrogularis*)
- Black-throated Gray Warbler (*Dendroica nigrescens*)
- Brewer's Sparrow (*Spizella breweri*)
- Burrowing Owl (*Athene cunicularia*)
- Canyon Towhee (*Pipilo fuscus*)
- Common Black-hawk (*Buteogallus anthracinus*)
- Elegant Trogon (*Trogon elegans*)
- Elf Owl (*Micrathene whitneyi*)
- Gilded Flicker (*Colaptes chrysoides*)
- Golden Eagle (*Aquila chrysaetos*)
- Grasshopper Sparrow (*Ammodramus savannarum ammolegus*)
- Lark Bunting (*Calamospiza melanocorys*)
- Loggerhead Shrike (*Lanius ludovicianus*)
- Lucy's Warbler (*Vermivora luciae*)
- Mccown's Longspur (*Calcarius mccownii*)
- Mountain Plover (*Charadrius montanus*)
- Northern Beardless-tyrannulet (*Camptostoma imberbe*)
- Peregrine Falcon (*Falco peregrinus*)
- Red-faced Warbler (*Cardellina rubrifrons*)
- Rose-throated Becard (*Pachyramphus aglaiae*)
- Rufous-winged Sparrow (*Aimophila carpalis*)
- Sonoran Yellow Warbler (*Dendroica petechia ssp. Sonorana*)
- Sprague's Pipit (*Anthus spragueii*)
- Swainson's Hawk (*Buteo swainsoni*)
- Varied Bunting (*Passerina versicolor*)
- Williamson's Sapsucker (*Sphyrapicus thyroideus*)
- Phainopepla (*phainopepla nitens*)

Identification Efforts to Date

A biological survey was completed in November and December 2015 by the Applicant and submitted as part of their Presidential permit application. The biological field report can be found within the permit application at the DOE website provided above. Four special status plant species, the large-flowered blue star, Santa Cruz beehive cactus, Pima pineapple cactus, and supine bean, were surveyed. Agave species were also surveyed because of their potential as a forage resource for the lesser long-nosed bat. The study area consisted of a 250-foot-wide corridor along six sections of the proposed route segments. The entire length of each potential route segment was not surveyed.

Protected native plants were documented mainly in the undisturbed and undeveloped habitat in the western portion of the proposed project, which is suitable habitat for the lesser long-nosed bat. Santa Cruz beehive cactus, supine bean, and agaves were documented in the area studied; no Pima pineapple cacti were documented. "Figure 1: Area Surveyed and Results" from the biological field report, which identifies the surveyed route segments and the findings, is attached for your reference.

Request for Consultation

We request that you review and approve the above list of potentially affected species, or provide a list of additional species that might be affected. Please also provide any concerns relative to impacts of the proposed project on federally listed species. In the meantime, if you have any questions, or if I can provide additional information, please contact me directly at any time by phone at 202-586-2942 or by email at Melissa.Pauley@hq.doe.gov. Thank you for your time and review.

Sincerely,

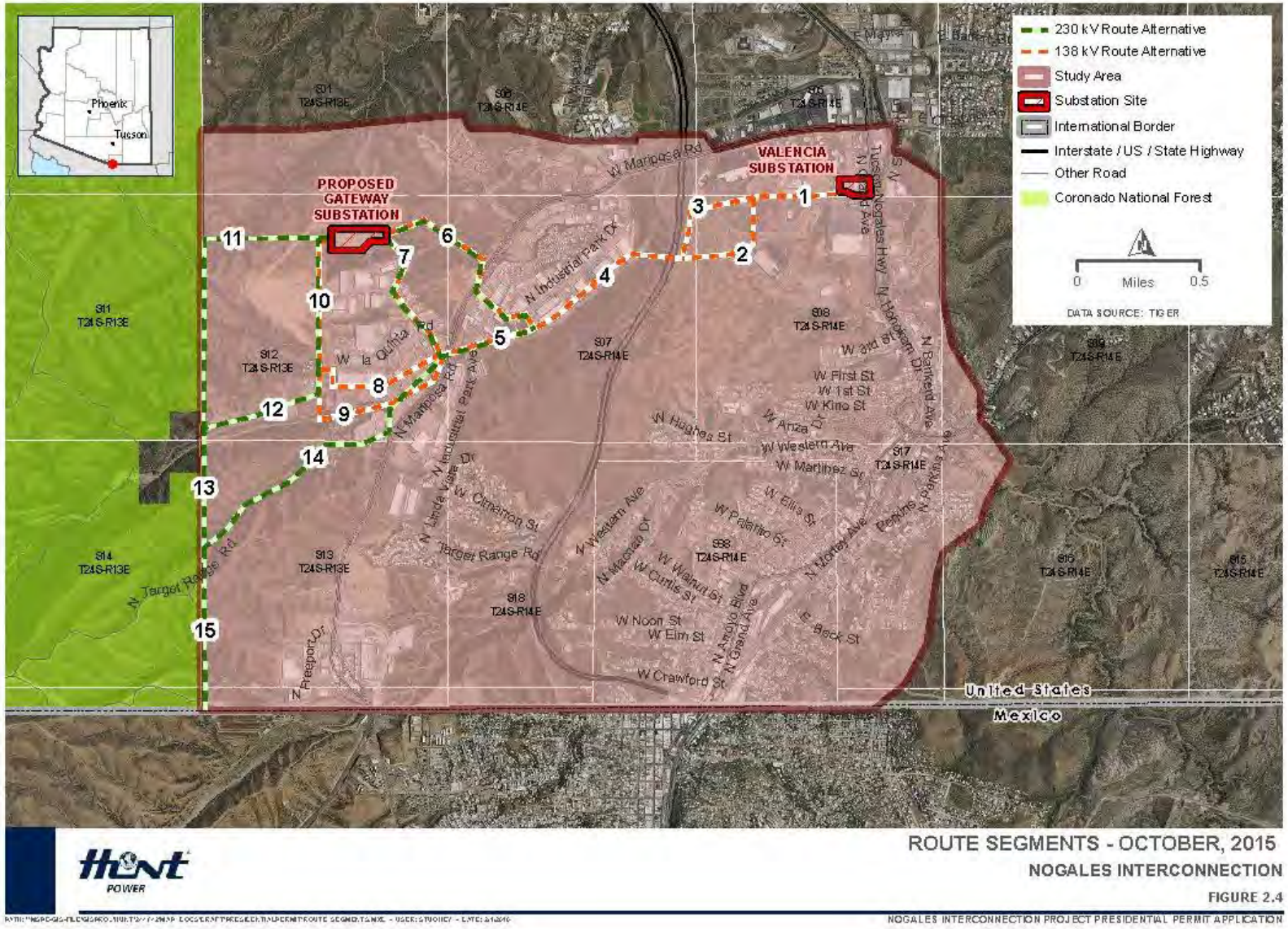
Melissa Pauley

Melissa Pauley
Electricity Policy Analyst
Transmission Permitting & Technical Assistance Division, OE-20
Office of Electricity Delivery and Energy Reliability
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585

Enclosures
Figure 2-4: Route Segments, October 2015
Route Alternatives, September 2016 figure
Figure 1: Area Surveyed and Results

cc:
Mr. Steve Spangle, USFWS Region 2
Dr. Benjamin Tuggle, USFWS Region 2
Electronic copy to incomingazcorr@fws.gov for routing purposes

Figure 2-4. Route Segments – October 2015



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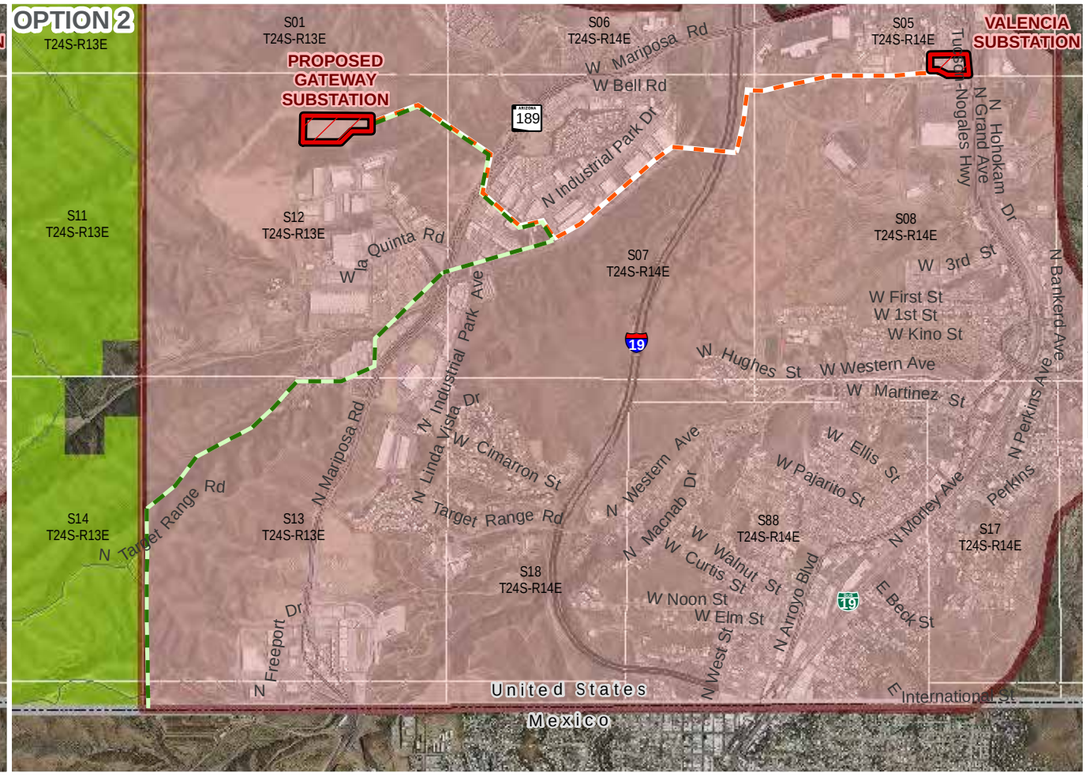

ROUTE ALTERNATIVES SEPTEMBER, 2016

NOGALES INTERCONNECTION

- 230 kV Route Alternative
- 138 kV Route Alternative
- Study Area
- Substation Site
- International Border
- Interstate / US / State Highway
- Other Road
- Coronado National Forest

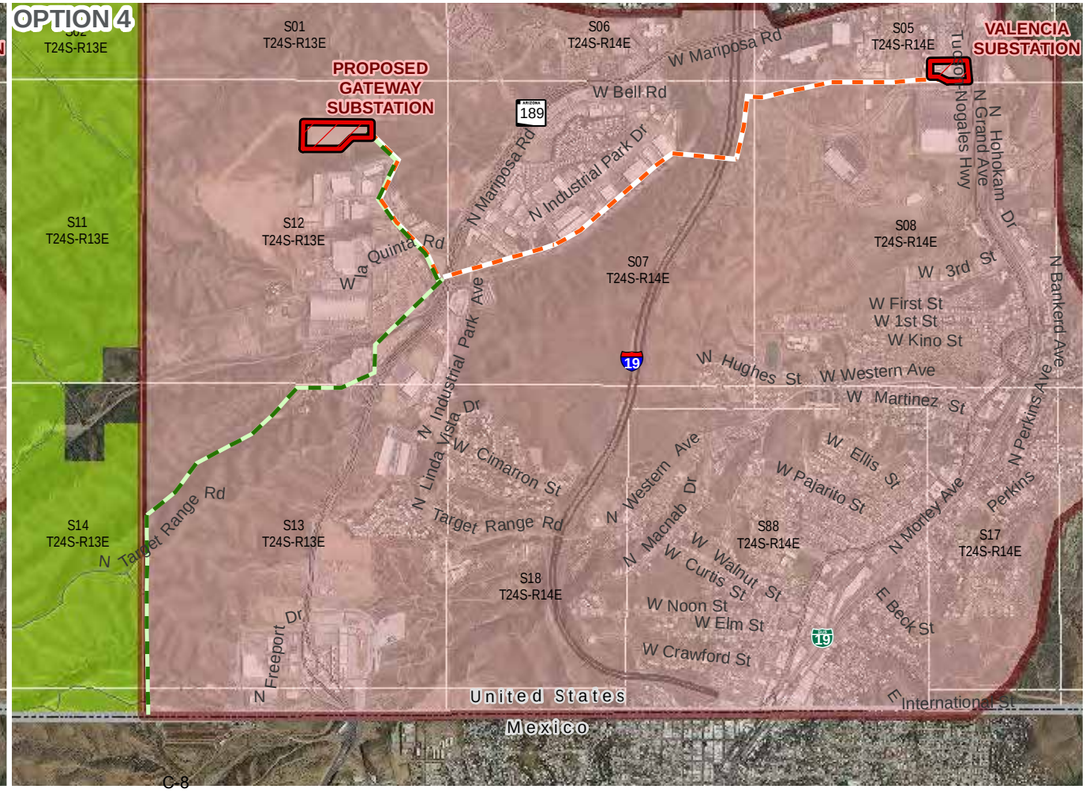

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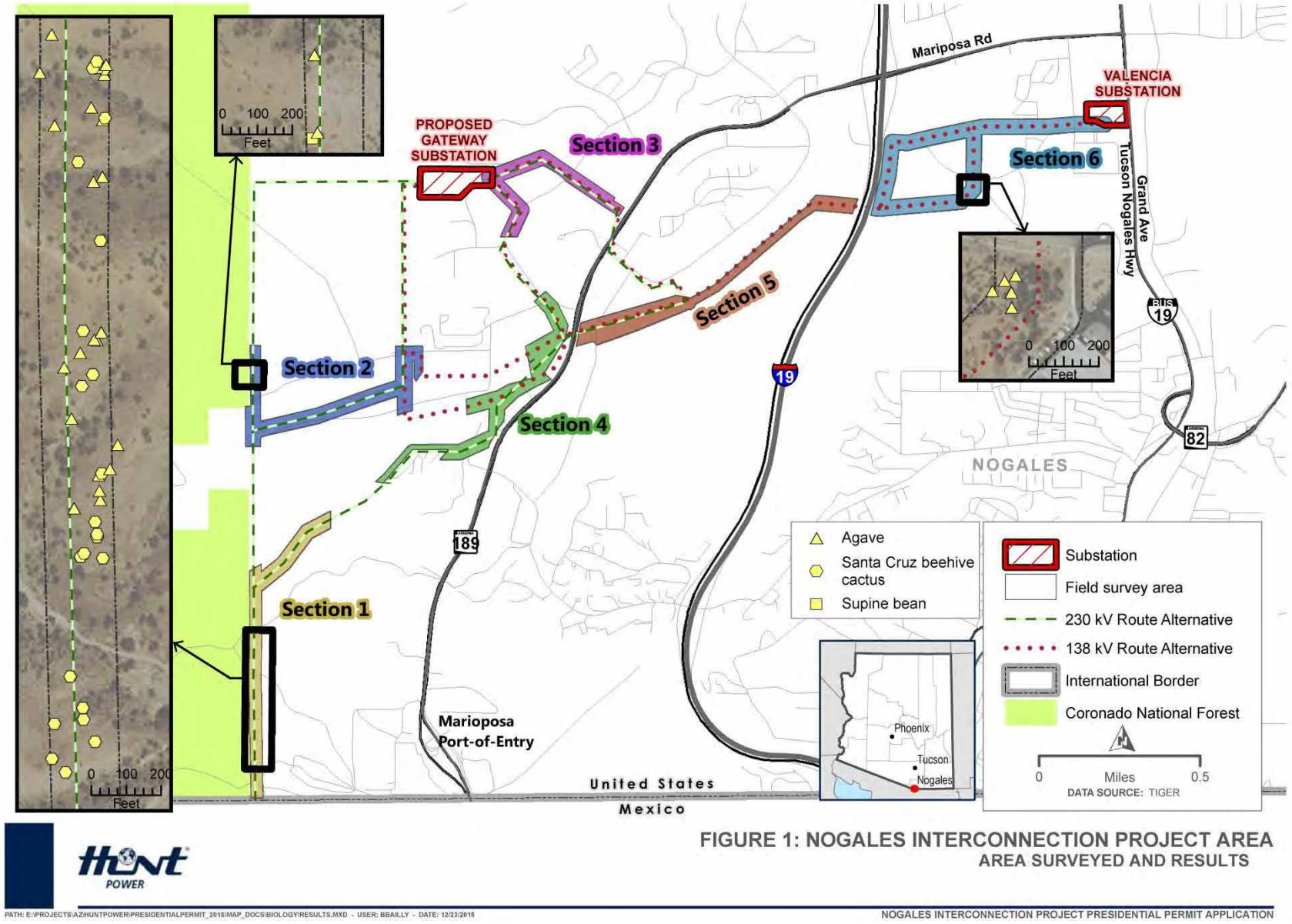
Figure 1. Area surveyed and results



Department of Energy

Washington, DC 20585

May 15, 2017

Mr. Scott Richardson
Supervisory Fish & Wildlife Biologist
Tucson Office - Arizona Ecological Services
U.S. Fish and Wildlife Service
201 N Bonita Avenue, Suite 141
Tucson, AZ 85745

Subject: Informal Consultation under Section 7 of the Endangered Species Act, Nogales Interconnection Project Environmental Assessment; Docket No. DOE/EA-2042

Dear Mr. Richardson:

I am writing in regard to DOE's Section 7 Consultation with the U.S. Fish and Wildlife Service (USFWS) for the Nogales Interconnection Project. DOE submitted a letter to your office on September 23, 2016. At this time, DOE requested USFWS input regarding a species list for consultation. As previously described in this letter, a preliminary biological survey was completed in November and December 2015 by Nogales Transmission, L.L.C. (the Applicant) and submitted to DOE as part of their Presidential permit application.

DOE received a response from you via email on November 7, 2016. In this email, you indicated that you agreed that the Pima pineapple cactus (PPC) (*Coryphantha scheeri var. robustispina*) and the lesser long-nosed bat (*Leptonycteris curasoae yerbabuenae*) are the most likely listed species to be impacted.

We subsequently had a phone conversation on January 5, 2017 during which we confirmed consultation for the PPC and the lesser long-nosed bat. We discussed that the zig-zag approach that the Applicant's consultant performed for the preliminary biological survey submitted as part of their Presidential permit application is not sufficient. A pedestrian survey of all areas that would involve ground disturbance would need to be completed for PPC and agave (a forage resource for the lesser long-nosed bat). The PPC 3-Tier survey protocol (available on USFWS' website) should be used, and the survey must be completed by a PPC-certified biologist.

I am following up on the most recent March 7, 2017 phone conversation between DOE, USFWS, SWCA Environmental Consultants (DOE's environmental contractor), and representatives from the Applicant. During this call, we discussed that the Applicant was working through right-of-entry for biological surveys with the private and public landowners. They did not expect to receive right-of-entry from all affected landowners. The Applicant recently selected their preferred alternative, which will be presented as Alternative 3 in the Draft Environmental Assessment; DOE will be consulting with USFWS on Alternative 3. We also discussed potential conservation measures, which may include the Applicant (1) purchasing credits from an existing PPC bank if PPCs cannot be avoided and (2) preserving in place or transplanting all agaves so that there is no net loss of forage resources for the lesser long-nosed bat. I've outlined the agreed-upon consultation approach below.

Consultation and Survey Approach for Alternative 3, the Applicant's preferred alternative:

- The Applicant will make a good faith effort to obtain right-of-entry from all landowners, including landowners that have not yet allowed access to their parcel for biological survey.
- A biological survey will be completed for PPC and agave (a forage resource for the lesser long-nosed bat) in all areas (including right-of-way, substations, and access roads) that would sustain ground disturbance, where right-of-entry has been obtained.
- The PPC-certified biologist will survey for PPC using the approved USFWS 3-Tier survey protocol. Agave will also be surveyed.
- DOE will provide a Biological Assessment (BA) with an evaluation of the potential effects to the PPC and the lesser long-nosed bat; the BA will support DOE's determination of effect.
- All parcels that are not able to be surveyed due to right-of-entry issues will need to be surveyed by the Applicant prior to ground disturbance. The Applicant will be responsible for coordinating directly with USFWS regarding this survey, the survey results, and any additional required conservation measures.

Request for Concurrence

For purposes of the administrative record for this proposed Project, DOE requests that you review and approve the above list of potentially affected species and the survey approach. In the meantime, if you have any questions, or if I can provide additional information, please contact me directly at any time by phone at 202-586-2942 or by email at Melissa.Pauley@hq.doe.gov. Thank you for your time and review.

Sincerely,

Melissa Pauley

Melissa Pauley
Electricity Policy Analyst
Transmission Permitting & Technical Assistance Division, OE-20
Office of Electricity Delivery and Energy Reliability
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585

cc:
Ms. Jean Calhoun, Assistant Field Supervisor for Southern Arizona
Electronic copy to incomingazcorr@fws.gov for routing purposes

Pauley, Melissa

From: Richardson, Scott <scott_richardson@fws.gov>
Sent: Tuesday, May 30, 2017 3:30 PM
To: Pauley, Melissa
Subject: Proposed Consultation and Survey Approach for the Nogales Interconnection Project

Dear Melissa,

Thank you for your correspondence of May 15, 2017, received in our office on May, 18, 2017 regarding section 7 consultation under the Endangered Species Act (ESA) for the Nogales Interconnection Project proposed by Nogales Transmission, L.L.C. (Applicant). Specifically, you asked us to review the proposed consultation and survey approach for Alternative 3, the Applicant's preferred alternative.

We have reviewed your May 15, 2017 correspondence and the included consultation and survey approach. We are supportive of the approach outlined and approve the list of potentially affected species listed under the ESA and the survey approach for the Pima pineapple cactus, an endangered plant species, and for agaves which are forage plants for the endangered lesser long-nosed bat.

Thank you for the opportunity to review your proposed approach to this section 7 consultation. We look forward to working with you on this project. Please do not hesitate to contact me if you have any questions or need anything additional from us.

Sincerely,
Scott Richardson
U.S. Fish and Wildlife Service
Tucson Suboffice
(520) 670-6150 x 242

Appendix D

MAJOR FEDERAL, STATE, AND LOCAL PERMITS/APPROVALS/CONSULTATIONS

Table D.1. Major Federal, State, and Local Permits/Approvals/Consultations

Issue	Authorization	Regulatory Authority/Agency	Relevant Law/Regulation
Federal			
Electric transmission line crossing of an international border	Presidential permit	DOE	EO 10485, as amended by EO 12038, and the regulations at 10 CFR 205.320 *et seq*. (2000)
	License to construct facilities on USIBWC ROW	USIBWC	47 CFR 90.1337
	Consultation to determine whether proposed facilities would interfere with border patrol operations	CBP	10 CFR 1005.5 10 CFR 1021.342
Cultural Resources	Compliance with Section 106 of the NHPA; comment on undertaking's effect on historic properties	Advisory Council on Historic Preservation	NHPA, Section 106 at 36 CFR 800
Natural Resources	Compliance with ESA Section 7 Consultation: Biological Opinion, concurrence, or incidental take permit	USFWS	ESA, 16 U.S.C. 1531–1534
	Compliance with the Bald and Golden Eagle Protection Act	USFWS	16 U.S.C. 668
	Compliance with the Migratory Bird Treaty Act	USFWS	16 U.S.C. 703–712
Construction and Water Quality	Section 404 Permit for impacts to jurisdictional waters of the U.S.	USACE	Clean Water Act (CWA), Section 404 33 U.S.C. 1251, *et seq*.
Transportation and Safety	Obstruction Evaluation and "No-hazard Declaration" for structures more than 200 feet tall	Federal Aviation Administration	49 U.S.C. 44718 14 CFR 77
	Compliance with Federal Communications Commission Rules and Regulations	Federal Communications Commission	47 CFR 15.25
State			
Utilities	Certificate of Environmental Compatibility for construction of a transmission line greater than 115 kV	ACC	Arizona Revised Statutes (ARS) 40-360 *et seq*.
Cultural Resources	Consultation under Section 106; federal undertaking with the potential to affect historic properties	Arizona SHPO	NHPA, Section 106 at 36 CFR 800
	Potential to disturb human remains	Arizona State Museum	Arizona Antiquities Act ARS 41-844 and ARS 41-865
Natural Resources	Coordination with USFWS and USACE to minimize disturbance to or loss of special status wildlife species habitat	Arizona Game and Fish Department	U.S. Fish and Wildlife Coordination Act; Threatened and endangered species review
Native Plants	Application for Arizona Protected Native Plants and Wood Removal	Arizona Department of Agriculture	Arizona Native Plant Law, ARS Title 3 (Chapter 7)
Construction and Water Quality	Section 402 Arizona Pollutant Discharge Elimination System Permit (assigned to state of Arizona)	Arizona Department of Environmental Quality (ADEQ)	CWA Section 402 at 40 CFR 122.26 ARS 49-255.01 Arizona Administrative Code (AAC) Title 18, Chapter 11
	State Water Quality Certification for construction across water resources	ADEQ	CWA Section 401
	Dust Control Plan	ADEQ	AAC Title 18, Chapter 2, Article 6
	Hazardous Waste Generator Registration	ADEQ	Hazardous Waste Control Act of 1972, Title 18, Chapter 8

Table D.1. Major Federal, State, and Local Permits/Approvals/Consultations (Continued)

Issue	Authorization	Regulatory Authority/Agency	Relevant Law/Regulation
State, cont'd.			
Transportation and Safety	ROW Encroachment Permit	Arizona Department of Transportation (ADOT)	ARS 28-7053 AAC R17-3-501 through 509
	Permit to Cross Federal Aid Highway	ADOT	23 CFR 645.213
Local			
Construction/ Right-of-Way	Coordination may be required to cross or occupy county and\or city road ROWs. Coordination may be required to move over-width or heavy loads on county or city roads. Coordination may be required to construct access roads or driveways from county or city roads. Coordination may be required for earth-moving and grading permits. ROW Permit; Zoning Approval; Conditional Use Permit; Building Permit	Santa Cruz County City of Nogales Development Services, Public Works	County code Local ordinance
	Floodplain Use Permit	Santa Cruz County Floodplain Department	County code
	Dust Abatement Plan	Santa Cruz County Department of Community Development	County code

Note: This list is not exhaustive. It is the responsibility of the Applicant to identify and comply with all applicable federal, state, and local laws and regulations.

Appendix E

DRAFT ENVIRONMENTAL ASSESSMENT DISTRIBUTION LIST

Prefix	First Name	Last Name	Title	Organization	Department	Address1	Address2	City	State	Postal Code
Ms.	Jessica	Acevedo-Gomez	Customer Service/Licensing	Arizona Department of Agriculture	Native Plants - Licensing and Registration Section	1688 West Adams Street		Phoenix	AZ	85007
Ms.	Olivia	Ainza-Kramer	President/CEO	Nogales-Santa Cruz County Chamber of Commerce Visitor & Tourism Center		131 Kino Park		Nogales	AZ	85621
	Marit	Alanen	Fish & Wildlife Biologist	U.S. Fish and Wildlife Service	Tucson Suboffice	201 N Bonita Avenue	Suite 141	Tucson	AZ	85745
Mr.	Mark	Altaha	Tribal Historic Preservation Officer	White Mountain Apache Tribe		P.O. Box 1032		Fort Apache	AZ	85926
Mr.	Alessandro	Amaglio	Regional Environmental Officer	DHS/FEMA Region IX		1111 Broadway	Suite 1200	Oakland	CA	94607
Mr.	Gilbert	Anaya	Environmental Management Division Chief	International Boundary and Water Commission	United States and Mexico	U.S. Section, Building C	4171 North Mesa Street, Suite 100	El Paso	TX	79902
Ms.	Caroline	Antone	Cultural Resource Manager	Ak-Chin Indian Community		42507 W. Peters and Nall Road		Maricopa	AZ	85138
Mr.	Shane	Antone	Cultural Programs Manager	Salt River Pima-Maricopa Indian Community	Cultural and Environmental Services	10005 E. Osborn Road		Scottsdale	AZ	85256
	Paul	Arbo	---	Multi Metals Inc.		1651 W Target Range Rd		Nogales	AZ	85621
Mr.	Trevor	Baggiore	Water Quality Division Director	Arizona Department of Environmental Quality		1110 West Washington Street		Phoenix	AZ	85007
Ms.	Sandy	Bahr	Chapter Director	Sierra Club – Grand Canyon Chapter		514 W. Roosevelt Street		Phoenix	AZ	85003
Mr.	Erik	Bakken	Director, Corporate Environmental Services & Land Use	Tucson Electric Power Company		Post Office Box 711	(Mail Stop HQE602)	Tucson	AZ	85702
	Joe	Barr	---	Mariposa Properties		855 W. Bell Rd.	Suite 100	Nogales	AZ	85621
Mr.	Ed	Beck	Director, Transmission Development	Tucson Electric Power Company		Post Office Box 711	(Mail Stop HQE602)	Tucson	AZ	85702
Ms.	Bitah	Becker	Exec. Director, Div. of Natural Resources	The Navajo Nation		P.O. Box 9000		Window Rock	AZ	86515
Mr.	Russell	Begaye	President	The Navajo Nation		P.O. Box 4950		Window Rock	AZ	86515
Ms.	Lisa	Belenky	Senior Attorney	Center for Biological Diversity		1212 Broadway	Suite 800	Oakland	CA	94612
Mr.	Wayne	Belzer	Environmental Engineer	International Boundary and Water Commission	United States and Mexico	U.S. Section, Building C	4171 North Mesa Street, Suite 100	El Paso	TX	79902
Ms.	Tamara	Billie	Senior Archaeologist, Acting THPO	The Navajo Nation	Historic Preservation Department	P.O. Box 4950		Window Rock	AZ	86515
Ms.	Nancy	Bohman	---			PO Box 1237		Tubac	AZ	85646
Mr.	Rich	Bohman	---			PO Box 1237		Tubac	AZ	85646
Mr.	Bryan	Bowker	Regional Director	Western Regional Office, BIA		2600 North Central Avenue	4th Floor Mailroom	Phoenix	AZ	85004
The Honorable	Mark	Brnovich	Arizona Attorney General	Office of the Arizona Attorney General		1275 West Washington Street		Phoenix	AZ	85007
Mr.	Theodore	Brown	Chief, Policy and Planning Division	U.S. Army Corps of Engineers		441 G Street, NW		Washington	DC	20314
Ms.	Alejandro	Bueno Tamez	Intern	Hunt Power, LP		1900 North Akard Street		Dallas	TX	75201
Mr.	Charley	Bulletts	Cultural Resources Director	Kaibab Band of Paiutes		HC 65, Box 2, Tribal Affairs Building		Fredonia	AZ	86022
Ms.	Deb	Bumpus	Deputy Forest Supervisor	U.S. Forest Service	Coronado National Forest	300 West Congress Street		Tucson	AZ	85701
Ms.	Vivian	Burdette	Chairwoman	Tonto Apache Tribe		Tonto Apache Reservation #30		Payson	AZ	85541
Ms.	Bernadine	Burnette	President	Fort McDowell Yavapai Nation		P.O. Box 17779		Fountain Hills	AZ	85269
Mr.	Thomas	Buschatze	Environment & Water Committee Co-Chairs	Arizona-Mexico Commission		1700 W. Washington Street	Suite 301	Phoenix	AZ	85007
Mr.	James	Bushee	Outside Counsel	Eversheds-Sutherland		600 Congress Avenue	#2000	Austin	TX	78701
Mr.	Misael	Cabrera	Environment & Water Committee Co-Chairs	Arizona-Mexico Commission		1700 W. Washington Street	Suite 301	Phoenix	AZ	85007
Ms.	Jean	Calhoun	Assistant Field Supervisor for Southern Arizona	U.S. Fish and Wildlife Service	Tucson Suboffice - Arizona Ecological Services	201 N Bonita Avenue	Suite 141	Tucson	AZ	85745
Ms.	Kathi	Campana	---							
Mr.	Ron	Campana	---							
Ms.	Carolyn	Campbell	Director	Coalition for Sonoran Desert Protection		300 E University Blvd, #120		Tucson	AZ	85705
Ms.	Laura	Canaca	Project Evaluation Supervisor	Arizona Game and Fish Department	WMHB; Project Evaluation Program	5000 W. Carefree Highway		Phoenix	AZ	85086
Ms.	Gabriela	Canales	Senior Project Development Analyst	Hunt Power, LP		1900 North Akard Street		Dallas	TX	75201
Mr.	Matt	Clark	Conservation Analyst	Tucson Audubon Society		300 E University Blvd, #120		Tucson	AZ	85705
Dr.	Damon	Clarke	Chairman	Hualapai Tribe		P.O. Box 179		Peach Springs	AZ	86434
Mr.	Chris	Coder	Tribal Archaeologist	Yavapai-Apache Nation		2400 W. Datsi Street		Camp Verde	AZ	86322

Prefix	First Name	Last Name	Title	Organization	Department	Address1	Address2	City	State	Postal Code
Mr.	James	Copeland	District Ranger	U.S. Forest Service	Coronado National Forest	300 West Congress Street		Tucson	AZ	85701
Ms.	Sherry	Cordova	Chairwoman	Cocopah Indian Tribe		14515 S. Veterans Drive		Somerton	AZ	85350
The Honorable	Andrea	Dalessandro	District 2	Arizona State Senate		1700 W. Washington	Room 312	Phoenix	AZ	85007
Ms.	Renee	Darling	Senior Environmental and Land Use Planner	Tucson Electric Power Company		Post Office Box 711	(Mail Stop HQE602)	Tucson	AZ	85702
Mr.	Wally	David	Cultural & NAGPRA Representative	Tonto Apache Tribe		Tonto Apache Reservation #30		Payson	AZ	85541
Mr.	Edward	Delgado	Planning & Zoning/Building Director	City of Nogales, Arizona		1450 N. Hohokam Drive		Nogales	AZ	85621
Mr.	Kerwin	Dewberry	Forest Supervisor	U.S. Forest Service	Coronado National Forest	300 West Congress Street		Tucson	AZ	85701
Councilman	Jose	Diaz	Councilman	City Council of Nogales, Arizona		777 N. Grand Avenue		Nogales	AZ	85621
Ms.	Sallie	Diebolt	Chief, Arizona Section	U.S. Army Corps of Engineers	Los Angeles District, Phoenix Office	3636 N. Central Avenue	Suite 900	Phoenix	AZ	85012
Mr.	Frank	Dillon	Assistant Public Works Director	Planning/Zoning/Building	City of Nogales	1450 N. Hohokam Drive		Nogales	AZ	85621
Mr.	Kurt	Dongoske	Director, Tribal Historic Preservation Officer	Pueblo of Zuni		P.O. Box 1149		Zuni	NM	87327
The Honorable	John	Doyle	Mayor	City of Nogales, Arizona		777 N. Grand Avenue		Nogales	AZ	85621
Mr.	Jesse	Drake	Community Development Director & Chief Zoning Inspector	Santa Cruz County Community Development Department		275 Rio Rico Drive		Rio Rico	AZ	85648
The Honorable	Doug	Ducey	Governor	Office of the Arizona Governor		1700 West Washington Street		Phoenix	AZ	85007
Mr.	Kenny	Escalante	President	Fort Yuma-Quechan Tribe		P.O. Box 1899		Yuma	AZ	85366
Ms.	Kristine	FireThunder	Director	Arizona Commission of Indian Affairs		1700 W. Washington Street	Suite 235	Phoenix	AZ	85007
The Honorable	Jeff	Flake	Senator	U.S. Senate		413 Russell Senate Office Building		Washington	DC	20510
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Ms.	Cindy	Folsom	---			PO Box 1983		Tubac	AZ	85646
Ms.	Joyce	Francis	Habitat Branch Chief	Arizona Game and Fish Department; WMHB		5000 W. Carefree Highway		Phoenix	AZ	85086
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The Honorable	Rosanna	Gabaldon	District 2	Arizona State House of Representatives		1700 W. Washington	Room 325	Phoenix	AZ	85007
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	Nohe	Garcia	---	La Loma Grande		PO Box 2080		Nogales	AZ	85628
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Mr.	Rudy	Heredia	---	City of Nogales, Arizona						
The Honorable	Daniel	Hernandez	District 2	Arizona State House of Representatives		1700 W. Washington	Room 115	Phoenix	AZ	85007
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	José Luis	Huerta	---			1700 W La Quinta		Nogales	AZ	85621
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Mr.	David	Jacobs	Compliance Specialist/Archaeologist	Arizona State Historic Preservation Office		1100 W. Washington Street		Phoenix	AZ	85007
Mr.	Ernie	Jones	President	Yavapai-Prescott Indian Tribe		530 E. Merritt Street		Prescott	AZ	86301
Mr.	Cal	Joyner	Regional Forester	U.S. Forest Service	Southwestern Region (3)	333 Broadway SE		Albuquerque	NM	87102
Ms.	Lance	Jungmeyer	President	Fresh Produce Association of the Americas		PO Box 848		Nogales	AZ	85648
Ms.	Bambi	Kraus	President	National Association of Tribal Historic Preservation Officers		P.O. Box 19189		Washington	DC	20036
Ms.	Debby	Kriegel	Landscape Architect	U.S. Forest Service	Coronado National Forest	300 West Congress Street		Tucson	AZ	85701
Mr.	Leigh	Kuwanwisiwma	Director	Hopi Tribe	Hopi Cultural Preservation Office	P.O. Box 123		Kykotsmovi	AZ	86039
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Mr.	Nilo	Larriva	President	Nogales Community Development Corporation		PO Box 421		Nogales	AZ	85621
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Mr.	Barnaby	Lewis	Tribal Historic Preservation Officer	Gila River Indian Community		P.O. Box 97		Sacaton	AZ	85147
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The Honorable	Greg	Lucero	Vice-Mayor, City Council	City of Nogales, Arizona		777 N. Grand Avenue		Nogales	AZ	85621
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Mr.	Shane	Lyman	Nogales Ranger District Fire Management Officer	U.S. Forest Service	Coronado National Forest, Nogales Ranger District	303 Old Tucson Road		Nogales	AZ	85621
Councilman	Jorge	Maldonado	Councilman	City Council of Nogales, Arizona		777 N. Grand Avenue		Nogales	AZ	85621
Mr.	Roland	Maldonado	Chairman	Kaibab Band of Paiutes		HC 65, Box 2, Tribal Affairs Building		Fredonia	AZ	86022
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Mr.	Mike	Massee	---			1148 N Duncan Drive		Nogales	AZ	
	Suzy	Mastick	---			7726 E. Oakwood Cir		Tucson	AZ	85750
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Mr.	Terry	McClung	NEPA Coordinator	Bureau of Indian Affairs	Division of Environmental and Cultural Resources Management	1849 C Street, NW	MS 4637	Washington	DC	20240
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Ms.	Esther	Morales	Director	Villa Mariposa Homeowners Association, Inc.		263-38 W View Point Drive		Nogales	AZ	85621

Prefix	First Name	Last Name	Title	Organization	Department	Address1	Address2	City	State	Postal Code
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Councilman	Robert	Rojas	Councilman	City Council of Nogales, Arizona		777 N. Grand Avenue		Nogales	AZ	85621
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Ms.	Karen	Sogas	Exec. Director	Tucson Audubon Society		300 E University Blvd, #120		Tucson	AZ	85705
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Ms.	Kristin	Terpening	Habitat Specialist	Arizona Game and Fish Department		555 N. Greasewood Road		Tucson	AZ	85745
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Prefix	First Name	Last Name	Title	Organization	Department	Address1	Address2	City	State	Postal Code
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Mr.	Jesus	Valdez	Public Works Director	Santa Cruz County		275 Rio Rico Drive		Rio Rico	AZ	85648
Mr.	Guillermo	Valencia	Chairman	Greater Nogales Santa Cruz County Port Authority		PO Box 4518		Rio Rico	AZ	85648
Mr.	Robert	Valencia	Chairman	Pascua Yaqui Tribe		7474 S. Camino DeOeste		Tucson	AZ	85746
Mr.	Scott	Vandervoet	President	Friends of the Santa Cruz River		PO Box 4275		Tubac	AZ	85646
Councilman	Marcelino	Varona	Councilman	City Council of Nogales, Arizona		777 N. Grand Avenue		Nogales	AZ	85621
Mr.	Raul	Vega	Regional Supervisor	Arizona Game and Fish Department	Region V - Tucson	555 N. Greasewood Road		Tucson	AZ	85745
Mr.	Aleja	Velasquez	Operations Manager	Arizona Department of Agriculture	Tucson Operational Unit	500 W. Congress		Tucson	AZ	85701
Mr.	Matthew	Virant	Manager - Project Development	Hunt Power, LP		1900 North Akard Street		Dallas	TX	75201
Mr.	Timothy	Williams	Chairman	Fort Mojave Indian Tribe		500 Merriman Street		Needles	CA	92363
Mr.	John	Windes	Habitat Evaluation and Lands Program Manager	Arizona Game and Fish Department	Region V - Tucson	555 N. Greasewood Road		Tucson	AZ	85745
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Dr.	Anne	Woosley	Executive Director	Arizona Historical Society		949 E. 2nd Street		Tucson	AZ	85719
Mr.	Martin	Wouch	Environmental, Health, and Safety Advisor	Hunt Consolidated, Inc.		1900 North Akard Street		Dallas	TX	75201
Ms.	Carlene	Yellowhair	President	San Juan Southern Paiute		P.O. Box 2950		Tuba City	AZ	86045
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			Property Manager	Loma Mariposa Apartment Complex		1790 N Mariposa Road		Nogales	AZ	85621
			Loma Mariposa Apt. Property Owner	Loma Mariposa LP		4696 W. Overland Rd.		Boise	ID	83709
			Santa Rita Apt. Property Owner	Nogales Housing Association LTD		951 N. Kitchen Street		Nogales	AZ	85621
			Santa Rita Apt. Management	Nogales Housing Association LTD		4330 N. Civic Center Plaza	Suite 203	Scottsdale	AZ	85251
			Property Manager	Santa Carolina Apartment Complex		1068 W Paul Bond Drive		Nogales	AZ	85621
			Property Manager	Santa Rita Apartment Complex		1100 W Mariposa Ranch Road		Nogales	AZ	85621
			---	Sierra Club	National Headquarters	2010 Webster Street	Suite 1300	Oakland	CA	94612
			Property Manager	Villa Paraiso Apartment Complex		1033 W Mariposa Ranch Road		Nogales	AZ	85621
			Villa Paraiso Apt. Property Owner	Villa Paraiso LP		4696 W. Overland Road	Suite 140	Boise	ID	83705
			Loma Mariposa Apt. Management	Vim Residential Management		1414 N. Broadway Road	Suite 230	Tempe	AZ	85282
			Villa Paraiso Apt. Management	Vim Residential Management		1414 N. Broadway Road	Suite 230	Tempe	AZ	85282
			Santa Carolina Apt. Property Owner and Manager	Westlake Housing, LP		515 S. Capital of Texas Highway	Suite 250	Austin	TX	78759

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Appendix F

CONTRACTOR DISCLOSURE STATEMENT

NEPA DISCLOSURE STATEMENT FOR PREPARATION OF THE NOGALES INTERCONNECTION PROJECT ENVIRONMENTAL ASSESSMENT

The Council of Environmental Quality (CEQ) Regulations at Title 40 of the Code of Federal Regulations (CFR) 1506.5(c), which have been adopted by U.S. Department of Energy (10 CFR 1021), require contractors and subcontractors who will prepare an environmental impact statement to execute a disclosure specifying that they have no financial or other interest in the outcome of the project.

"Financial or other interest in the outcome of the project" is defined as any direct financial benefit such as a promise of future construction or design work in the project, as well as indirect benefits of which the contractor is aware.

In accordance with these requirements, the offeror and any proposed subcontractors hereby certify as follows, to the best of their actual knowledge as of the date set forth below:

(a)__X___ Offeror and any proposed subcontractor have no financial or other interest in the outcome of the project.

(b)_____ Offeror and any proposed subcontractor have the following financial or other interest in the outcome of the project and hereby agree to divest themselves of such interest prior to the award of the contract, or agree to the attached plan to mitigate, neutralize, or avoid any such conflict of interest.

Financial or Other Interests

1.
2.
3.

Certified by:

Cara Bellavia
Office Director, Tucson and Phoenix
SWCA, Inc.
07/11/2016

Exhibit B-2 – Environmental Planning Process for Nogales Tap to Kantor Upgrade

I. ENVIRONMENTAL STUDIES

The environmental studies for the Nogales Tap to Kantor Upgrade Project were completed in 2017 following identification of the need for the project in the UNSE Feasibility Study for the Nogales Interconnection Project. The environmental studies included a Biological Evaluation (Exhibit C-2), a Class I Cultural Resources Assessment (Exhibit E-2(b)) and Class III Cultural Resources Survey (Exhibit E-2(c)), a Pima Pineapple Cactus Presence/Absence Survey (Exhibit B-2(a)), and a Preliminary Jurisdictional Delineation of Waters of the U.S. (Exhibit B-2(b)).

UNSE could not obtain right-of-entry from the Arizona State Land Department to complete field studies of Alternative Routes 1 and 2; therefore, only the existing rights-of-way (along Alternative Route 3) were surveyed in the Class III Cultural Resources Survey, Preliminary Jurisdictional Delineation, and Pima Pineapple Cactus survey. In the event Alternative Route 1 or Alternative Route 2, or some variation thereof is selected, UNSE will conduct environmental studies prior to construction of the project.

A. Biological Resources

UNSE conducted a desktop biological evaluation (Exhibit C-2(a)) in May 2017. This evaluation determined that the project could affect the Pima pineapple cactus or potential forage habitat for the lesser long-nosed bat.

In June 2017, UNSE conducted a Pima pineapple cactus survey of the Alternative 3 right-of-way following the guidelines set forth in the USFWS document entitled *Pima Pineapple Cactus Three Tier Survey Methods* (Roller 1996). The Pima pineapple cactus survey located 13 viable cacti, of which 5 had pups. Given the limited number of cacti in the project area, these plants will be avoided to the extent practical. If avoidance is not possible, mitigation may be required depending on the land jurisdiction and location.

Mature saguaros, those generally over 8 feet in height, and agave are present within the project area and are a potential forage source for the lesser long-nosed bat. A complete survey for these plants will be conducted within the project area prior to any ground disturbing activities. These plants will be avoided to the extent practical. If avoidance is not possible, it may be necessary to consult with the USFWS to identify

mitigation designed to reduce impacts, such as transplanting healthy individuals. However, the listing of this species is currently under review and if it is delisted prior to project construction, no mitigation will be necessary.

B. Cultural Resources

After completing Class I cultural resources assessment for the Nogales Tap to Kantor Upgrade Project (Exhibit E-2(b)), UNSE completed a Class III cultural resources survey in June and July 2017 of the Alternative 3 right-of-way (Exhibit E-2(c)). The survey resulted in the identification of one new archaeological site and 15 isolates. Six previously recorded sites were relocated and updated. The surveyor recommended a finding of no historic properties affected for the cultural resources and sites documented in the project area (Table B-2). Accordingly, UNSE determined that no further archaeological investigations are recommended within the project area. These recommendations need to be approved by Arizona State Land Department ("ASLD") and the Arizona State Historic Preservation Office ("ASHPO").

Table B-2 - Site Management Recommendations

Site Number/Type	Location	ARHP/NRHP Eligibility Recommendation	Recommended Treatment	Effect
AZ DD:8:261(ASM) newly recorded	State land	Ineligible	No further investigation	None
AZ EE:1:161(ASM) previously recorded	Private land	Ineligible	No further investigation	None
AZ EE:1:167(ASM) previously recorded	State land	Ineligible	No further investigation	None
AZ EE:1:168(ASM) previously recorded	State land	Ineligible	No further investigation	None
AZ DD:1:138(ASM) previously recorded	State land	Ineligible	No further investigation	None
AZ DD:8:193(ASM) previously recorded	State and private land	Ineligible individually	No further investigation	None
AZ DD:8:259(ASM) previously recorded	State land	Ineligible	No further investigation	None

C. Preliminary Jurisdictional Delineation of Waters of the U.S. ("WOTUS")

UNSE conducted a desktop review of high-resolution aerial images from Pima Association of Governments, the National Aerial Imagery Program ("NAIP") and Google Earth, and reviewed regional topographic maps, and then conducted a field reconnaissance to identify and map the Ordinary High Water Mark ("OHWM") of potentially jurisdictional WOTUS within the Alternative 3 (existing) project area.

Approximately 200 ephemeral drainages that would be considered potential jurisdictional WOTUS by the U.S. Army Corps of Engineers ("USACE") were identified within the project area. Figures 1 and 2 of Exhibit B-2(b) show the location of major drainages in the project area that would be considered WOTUS.

Impacts to these drainages from project related activities (i.e., road maintenance and construction, pad grading, and temporary or permanent discharge of fill material) would require a permit from the USACE. As indicated in Exhibit B-2(b), there is less than 0.5 acres of potential WOTUS associated with each of the largest drainages that occur within the project area. Most of these drainages occupy less than 0.1-acre within the ROW.

Based on UNSE's experience with similar transmission line projects in the area, impacts to potential WOTUS would be relatively minor. The project would qualify for coverage under Nationwide Permit Number 12 ("NWP 12"), which is a programmatic permit that is available for construction, maintenance, repair, and removal of utility lines and associated facilities in WOTUS, provided the activity does not result in the loss of greater than ½-acre of potential WOTUS for each single and complete project with independent utility (i.e., each crossing of a wash). Since each wash crossing within the ROW is less than ½-acre, the project would qualify for coverage under NWP 12.

Exhibit B-2(a) – Pima Pineapple Cactus Survey for the Nogales Tap to Kantor Upgrade Project

TECHNICAL MEMORANDUM

Prepared for: UniSource Energy Services

Prepared by: Bowers Environmental Consulting, LLC

Date: July 12, 2017

Re: Pima Pineapple Cactus Survey For The Nogales Tap To Kantor Substation 138K Transmission Line Right-Of-Way, Pima And Santa Cruz Counties, Arizona

1.0 INTRODCTION

UniSource Energy Services (UNES) retained Bowers Environmental Consulting, LLC (BEC) to survey an existing 27.5-mile linear power line right-of-way (ROW) for endangered Pima pineapple cactus (*Coryphantha scheeri var. robustispina*). The ROW is located on 272 acres of state trust land, and private land, in Pima and Santa Cruz Counties, Arizona (Figure 1, Attachment 1). Approximately 198 acres of the project area occurs within three UNES ROWs (14-97502, 14-1100981, and 14-117730) that were acquired from the Arizona State Land Department (ASLD) for the existing 138kV transmission line. The project area begins in Pima County approximately 300 feet south of the Nogales Tap substation along Wilmont Road, and heads south for 9.7 miles before turning southwest for 18 miles, ending at the Kantor Substation in Santa Cruz County.

The purpose of this survey is to locate any Pima pineapple cactus (PPC) that occur within the project area, so that potential impacts to this species can be avoided when the power line is maintained, upgraded, or decommissioned.

2.0 STATUS, RANGE, AND HABITAT REQUIREMENTS

PPC is listed as and endangered species by U.S. Fish and Wildlife Service (USFWS) under the Endangered Species Act (58 FR 49875, 09-23-93). There is currently no designated or proposed critical habitat for the species.

The reported elevation range for PPC is from 2,300 to 5,000 feet above mean sea level AGFD 2001). Its range includes northern Sonora, Mexico and Pima and Santa Cruz counties in southern Arizona (Benson 1982; Phillips et al. 1981). The known range of PPC in Arizona is from the eastern base of the Baboquivari Mountains to the western base of the Santa Rita Mountains and Empire Mountains, and from the Mexican border north to the southern portions of Tucson (AGFD 2001, Ecosphere Environmental Services, Inc. 1992). Two populations have been documented in northern Sonora, Mexico (USFWS 1998). PPC do not occur in mountainous areas and has not been found in riparian areas such as the Santa Cruz River floodplain or the Sonoita Creek drainage in Arizona (58 FR 49875).

PPC are generally found on alluvial surfaces and ridges in Sonoran desertscrub and semidesert grassland (Mills 1991). In ridge-valley or hilly geologic formations, the species has been found mainly on relatively level crests and plains, but occasionally on slopes or in drainages contiguous with level areas occupied by PPC. Substrates in which PPC occur have been described as rocky to sandy or silty soils in alluvial valleys or on shallow-slopes (less than 10-percent grade), and White House sandy loam series (Mills 1991, Roller 1996). PPC is not known to occur in very sandy or very rocky soils, in deeper soils along drainages, or in soils with high clay content (Mills 1991). Although a less than 10-percent grade has been cited as the general limit for occurrence, Mills (1991) reported some plants on south-facing hillsides (mid to upper slope) with slope grades up to 15 percent. Mills (1991) reported that they found no plants on north-facing slopes, despite intensive surveys. However, single PPC have been found on small terraces on both northern and southern slopes with approximately 25-percent grade (R. Bowers, personal observation).

3.0 SURVEY METHODS

The PPC survey followed guidelines established by the USFWS (Roller 1996). BEC biologists with PPC survey experience walked parallel transects spaced approximately 15 feet apart to attain 100-percent coverage of the entire project area. The survey was conducted over multiple field visits from June 6-18, 2017. A shape file of the property boundary was uploaded into hand-held computer tablets, and GPS units that were used to guide the survey. Except for sandy drainage bottoms, the entire project area was surveyed for PPC.

The GPS coordinates for all PPC found were entered into a GPS unit and recorded on datasheets. The number of live and dead stems was counted, distinguishing the primary and secondary stems (pups) and each PPC was photographed.

4.0 PROJECT AREA DESCRIPTION

The project area consists of a 50-to-100-foot-wide by 27.7-mile-long ROW that stretches from an area southeast of Tucson to an area east of Amado along the western bajada of the Santa Rita Mountains in Pima and Santa Cruz Counties, Arizona. Portions of the project area cross residential areas that are bisected by gates and fences, but surface disturbance is generally limited to existing power line support poles and associated access roads, other unpaved roads that cross through, and cattle grazing. A large portion of the project area is located within the Santa Rita Experimental Range that has been used for long-term research projects to study effects of grazing, and vegetation, climate, and watershed research.

Geo-coordinates for the northern end of the project area are Latitude 32.051972, Longitude -110.858636, and the southern end is located at Latitude 31.697503, Longitude -111.035388. The project area spans six United States Geographic Service (USGS) topographic maps including the Amado, Mt. Hopkins, Green Valley, Sahuarita, Corona de Tucson, and Tucson, SE, Arizona 7.5 Minute Quadrangles. Table 1 provides the legal description for each of the existing ASLD ROW segments included in this survey.

Table 1. Legal Description of the Nogales Tap to Kantor Substation 138kV Transmission Line ROW

Township	Range	Section
16 South	15 East	Portions of 7, 18, 19, 30, 31
17 South	15 East	Portions of 6, 7, 18, 19, 30, 31
17 South	14 East	Portion of 36
18 South	14 East	Portions of 1, 2, 10, 11, 15, 21, 22, 28, 29, and 32
19 South	14 East	Portion of 6 and 7
19 South	13 East	Portion of 12, 13, 23, 24, 26, 27, 33, and 34
20 South	13 East	Portions of 4, 8, and 9

4.1 Topography

The project area occurs within the Basin and Range physiographic province of Arizona. Regional topography is characterized by alternating northwest-trending mountain ranges that surround flat alluvial-filled basins, most of which were formed by block faulting during the last part of the Cenozoic Era, five to 15 million years ago. The project area occurs along the eastern edge of the Upper and Lower Santa Cruz River Valleys formed by the western slope of the Santa Rita

Mountain Range. Prominent peaks within the Santa Rita Mountains include Mount Wrightson, Mount Hopkins, and Elephant Head Butte. The north end of the project area is covered in vast creosote flats, and as the project area cuts south across the Santa Rita Experimental Range, the landform transitions into a more varied topography of moderate hills and incised drainages. Near the southern of the project area the topographic relief becomes much steeper with high sloping ridges and deep valleys. Surface elevations range from 2,836 feet above mean sea level (amsl) in the northern portion of the project area to 3,250 feet amsl at the southern

4.2 Geology and Soils

The surface geology consists primarily of alluvium composed of gravels and sands deposited from the adjacent mountain peaks (Figure 2, Attachment 1). The northern and southern ends of the project area are comprised of Pleistocene-age surface deposits (Qo). These deposits consist of coarse relict alluvial fan deposits that are generally topographically high, and significantly eroded. This formation is moderately to strongly consolidated, and commonly contains coarser grained sediment than younger deposits in the same area (0.75-3 Ma). The landform associated with these deposits is characterized as rounded ridges or flat, isolated surfaces that are moderately to deeply incised by ephemeral streams. The middle portion of the project is comprised of unconsolidated to strongly consolidated alluvial and eolian deposits (what). This unit includes coarse, poorly sorted alluvial fan and terrace deposits on middle and upper piedmonts and along large drainages; sand, silt and clay on alluvial plains and playas; and wind-blown sand deposits (0-2 Ma).

Soils consist of Sahuarita-Mohave-Cave (Soil Unit s308) components, except for a small intrusion of White House-Hathaway-Bernardo (Unit s325) soil found in the southern portion of the project area. Sahuarita series components consist of very deep, well-drained soils formed in alluvium from limestone, schist, phylite and granitic rock. Sahuarita soils found on fan terraces and basin floors have steep slopes of 0-8 percent. The Mohave series component that is similar to the Sahuarita series is very deep, well-drained soil formed in alluvium from limestone, shist, phyllite, and granitic rock. These soils are on fan terraces and basin floors have slopes of 0 to 8 percent. They are light yellowish brown, very gravelly fine sandy loam soils. Cave series soils are very shallow and shallow hardpan, well-drained soils formed in mixed alluvium. Cave soils are on fan remnants, fan piedmonts and stream terraces and have slopes of 0 to 35 percent. White House-Hathaway-Bernardo series soils are very deep, well-drained gravely soils found on fan alluvium from mixed sources such as igneous and sedimentary rock. These soils are found on slopes from 0-60 percent.

4.3 Vegetation

The project area overlaps two biotic communities (Figure 3, Attachment 1). The northern portion of the project area (7 miles) occurs within the Arizona Upland Subdivision, Sonoran Desertscrub biotic community (Brown 1994). Vegetation identified during the field survey is characteristic of this biotic community. Common plants include velvet mesquite (*Prosopis velutina*), and palo verde (*Cercidium microphyllum*) trees, creosotebush (*Larrea tridentata*), triangle-leaf bursage (*Ambrosia deltoidea*), catclaw (*Acacia greggii*), ephedra (*Ephedra trifurca*), octotillo (*Fouquieria splendens*) and saguaro (*Carnegiea gigantea*), prickly pear cactus (*Opuntia engelmannii*), hedgehog cactus (*Echinocereus sp.*), chain-fruit and cane cholla (*Opuntia fulgida* and *O. spinosior*), and barrel cactus (*Ferocactus wislizeni*). The southern 20.8-mile portion of the project area occurs within the Semidesert Grassland biotic community (Brown 1994). Vegetation in this part of the project area is dominated by native grasses, including aristida (*Aristida* sp.), Muhlenbergia (*Muhlenbergia* sp.), Panicum (*Panicum* sp.), and bromus (*Bromus* sp.). The non-native Lehmann's lovegrass (*Eragrostis lehmanniana*) was abundant, and buffel grass (*Pennisetum ciliare*) was encountered along access roads and washes. The presence of fairly high densities of mesquite trees, shrubs, and cactus species in the grassland areas is consistent with research on the experimental range that indicates a gradual conversion of the area from grassland to a mesquite-cactus scrub community.

4.0 PIMA PINEAPPLE CACTUS SURVEY RESULTS

The entire 27.5 miles (272 acres) of the project area was surveyed for PPC. Seventeen 17 PPC were found within the project area (Figure 4, Attachment 1). All of the PPC occur on state trust land within the three UNES ROWs. Four of the PPC are dead and the remaining plants range from fair to excellent condition. Geo-coordinates and the data collected for all PPC found during the survey are provided in Table 2.

Table 2. Locations and Notes for Pima Pineapple Cactus Found on the Project Area

PPC ID	Coordinates		Notes
	Latitude	Longitude	
1	32.049957	-110.858474	Live; 6-inches tall, 1 stem, 3 buds; Excellent Condition
2	32.039444	-110.858360	Live; 2-inches tall; 1 stem; good condition
3	32.023962	-110.858621	Live; 4-inches tall; 1 stem; excellent condition
4	32.028591	-110.858609	Dead; 2-inches tall, 1 stem
5	32.028168	-110.858446	Dead; 2.5-inches tall, 1 stem
6	32.027899	-110.858380	Live; 4-inches tall, 1 stem; excellent condition
7	31.997644	-110.858395	Live; 5-inches high, 4-inches wide, 1 stem; excellent condition
8	31.996114	-110.858325	Live; 2-inches tall, good condition
9	31.909673	-110.861700	Dead; 2-inches tall, single stem
10	31.905652	-110.865016	Live; 2.5-inches tall, 2 heads; good condition
11	31.899369	-110.870505	Live; 4-inches tall, 2 live and 1 dead stem; 5 pups, good condition
12	31.864733	-110.898471	Dead; 3-inches tall, 1 stem
13	31.859612	-110.903938	Live; 5-inches tall, 1 main stem, 5 pups, good condition
14	31.849531	-110.910865	Live; 3-inches tall, 1 stem, 1 pub, excellent condition
15	31.830153	-110.926619	Live; 6-inches tall, 1 stem, 2 pups, excellent condition
16	31.823922	-110.932179	Live; 5-inches tall, 6 stems, poor condition
17	31.728223	-111.010081	Live; 1 main stem that is dead, 4 pups that are in excellent condition

8.0 REFERENCES

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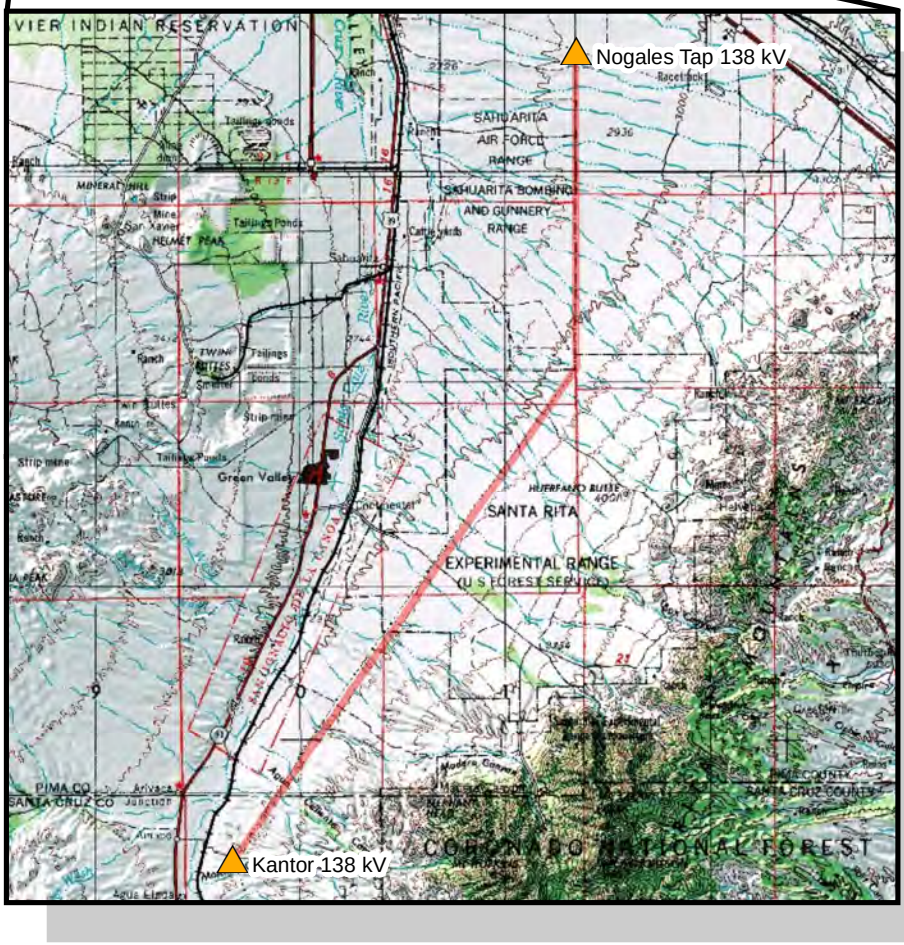
ATTACHMENT 1

FIGURES

1 inch = 80 miles



Legend

- Substation
- Survey Boundary

N W E S

6 3 0 6

Miles

Tucson Electric Power

This map is for planning purposes only. TEP and UNS Energy make no warranty of its accuracy.

Sources: TEP, UNS, ESRI, and USGS
Coordinate System: NAD 1983 HARN UTM Zone 12N
Projection: Transverse Mercator
Datum: D North America 1983 HARN
Basemap: USGS Topo and USA Topo Maps

1 inch = 6 miles

Figure 1: Vicinity Map

Nogales Tap to Kantor PPC Survey

Created on 20 June 2017
Revised on 29 June 2017

Legend

- Pima Pineapple Cactus
- Substation
- Survey Boundary
- Township-Range
- County Line

Nogales Tap 138 kV
Kantor 138 kV
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17

16S-14E 16S-15E 17S-13E 17S-14E 17S-15E 18S-13E 18S-14E 18S-15E 19S-13E 19S-14E 19S-15E

W Helmet Peak Rd W Sahuarita Rd E Sahuarita Rd S Rancho Sahuarita Blvd S La Canada Dr N La Canada Dr N Abrego Dr S Old Nogales Hwy W Duval Mine Rd W Continental Rd E Continental Rd S Camino del Sol S Mission Rd I-19 I-19-BL I-19-BL N

Pima Santa Cruz

2 1 0 2
Miles

TEP Tucson Electric Power

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Sources: TEP, UNS, ESRI, and USGS
Coordinate System: NAD 1983 HARN UTM Zone 12N
Projection: Transverse Mercator
Datum: D North America 1983 HARN
Basemap: World Imagery

1 inch = 2 miles

Figure 2: Aerial PPC Overview Map

Nogales Tap to Kantor PPC Survey

Created on 20 June 2017
Revised on 28 June 2017

Legend

- Pima Pineapple Cactus
- Substation
- Survey Boundary
- County Line
- Township-Range

Jsv
Jv
KJs
Kv
Pz
Q
Qo
Qr
TKg
Tsm
Tsy
Tv
Yg

Jsv JURASSIC SEDIMENTARY AND VOLCANIC ROCKS (150-170 Ma). Sandstone and conglomerate derived from volcanic rocks with associated intermediate-composition lava flows, breccias, and tuffs. In southern Arizona this unit includes rocks of the Artesa sequence, Pantano Formation, Mulberry Wash volcanics, Rudolfo Red Beds, Recreation Red Beds, and Gardner Canyon Formation. In western Arizona it includes the Harquar Formation, rocks of Shungadhon, and related(?) unnamed units in the Kofa and Middle Mountains. This unit is characterized by maroon, brown, and purplish-gray volcanic-lithic sandstone and siltstone, with subordinate to abundant conglomerate, quartz-rich sandstone and sparse limestone.

Jv JURASSIC VOLCANIC ROCKS (160-200 Ma). Massive quartz-feldspar porphyry, generally interpreted as thick, welded rhyolitic tuffs, with locally abundant lava, and sandstone and conglomerate derived from volcanic rocks. Rare eolian quartzite units are interbedded in southern Arizona. Includes Alt Mobina Formation, Mount Wrightson Formation, part of the Canelo Hills Volcanics, Cobre Ridge tuff, Black Rock volcanics, Planet Volcanics, and equivalent rocks.

KJs CRETACEOUS TO UPPER JURASSIC SEDIMENTARY ROCKS WITH MINOR VOLCANIC ROCKS (80-160 Ma). Sandstone and conglomerate, rarely forms prominent outcrops; massive conglomeratic is typical near base of unit and locally in upper part. These deposits are nonmarine except in southeastern Arizona, where prominent gray marine limestone (Mural Limestone) forms the middle of the Bisbee Group. Sandstones are typically medium-bedded, drab-brown, lithic-feldspathic arenites. Includes Bisbee Group (largely Early Cretaceous) and related rocks, Temporal, Bathtub, and Sand Wells formations, rocks of Gu Achi, McCoy Mountains Formation, and Upper Cretaceous Fort Crittenden Formation and equivalent rocks.

Kv EARLY TERTIARY TO LATE CRETACEOUS VOLCANIC ROCKS (50-82 Ma). Rhyolite to andesite and closely associated sedimentary and near-surface intrusive rocks; commonly dark gray to dark greenish gray or greenish brown. In the ranges west of Tucson, this unit includes thick welded ash-flow tuffs. Volcanic rocks of this unit are inferred to be derived from veins and volcanoes above magma chambers that solidified to form the granitic rocks of map unit TKg. These rocks are restricted to southeastern Arizona except for a small outcrop near Baydad.

Pz PALEOZOIC SEDIMENTARY ROCKS (248-544 Ma). Undivided Paleozoic limestone, dolostone, quartzite, shale, and related sedimentary rocks.

Q QUATERNARY SURFICIAL DEPOSITS, UNDIVIDED (0-2 Ma). Unconsolidated to strongly consolidated alluvial and eolian deposits. This unit includes: coarse, poorly sorted alluvial-fan and terrace deposits on middle and upper piedmonts and along large drainages; sand, silt and clay on alluvial plains and playas; and wind-blown sand deposits.

Qo EARLY PLEISTOCENE TO LATEST PLIOCENE SURFICIAL DEPOSITS (0.75-3 Ma). Coarse relict alluvial-fan deposits that form rounded ridges or flat, isolated surfaces that are moderately to deeply incised by streams. These deposits are generally topographically high and have undergone substantial erosion. Deposits are moderately to strongly consolidated, and commonly contain coarser grained sediment than younger deposits in the same area.

Qr HOLOCENE RIVER ALLUVIUM (0-10 ka). Unconsolidated to weakly consolidated sand and gravel in river channels and sand, silt, and clay on floodplains. Also includes young terrace deposits fringing floodplains.

TKg EARLY TERTIARY TO LATE CRETACEOUS GRANITIC ROCKS (50-82 Ma). Porphyritic to equigranular granite to diorite emplaced during the Laramide orogeny. Larger plutons are characteristically medium-grained, biotite ± hornblende granodiorite to granite. Smaller, shallow-level intrusions are typically porphyritic. Most of the large copper deposits in Arizona are associated with porphyritic granitic rocks of this unit, and are thus named "porphyry copper deposits"

Tsm MIDDLE MIOCENE TO OLIGOCENE SEDIMENTARY ROCKS (11-32 Ma). Conglomeratic, sandstone, mudstone, limestone, and rock-avalanche breccia (sheet-like deposits of crushed rock) deposited and tilted during widespread normal faulting and basin development. Sediments, mostly conglomeratic and sandstone, are commonly medium to dark brown, reddish brown, or brownish gray; younger strata are generally lighter colors. Most deposits are 20 to 30 Ma in southeastern Arizona and 15 to 25 Ma in central and western Arizona.

Tsy PLIOCENE TO MIDDLE MIOCENE DEPOSITS (2-16 Ma). Moderately to strongly consolidated conglomeratic and sandstone deposited in basins during and after late Tertiary faulting. Includes lesser amounts of mudstone, siltstone, limestone, and gypsum. These deposits are generally light gray or tan. They commonly form high rounded hills and ridges in modern basins, and locally form prominent bluffs. Deposits of this unit are exposed widely in the dissected basins of southeastern and central Arizona.

Tv MIDDLE MIOCENE TO OLIGOCENE VOLCANIC ROCKS (11-38 Ma). Lava, tuff, fine-grained intrusive rock, and diverse pyroclastic rocks. These compositionally variable volcanic rocks include basalt, andesite, dacite, and rhyolite. Thick felsic volcanic sequences form prominent cliffs and range fronts in the Black (Mohave County), Superstition, Kofa, Eagletail, Galiuro, and Chiricahua Mountains. This unit includes regionally extensive ash-flow tuffs, such as the Peach Springs tuff of northwestern Arizona and the Apache Leap tuff east of Phoenix. Most volcanic rocks are 20-30 Ma in southeastern Arizona and 15 to 25 Ma in central and western Arizona, but this unit includes some late Eocene rocks near the New Mexico border in east-central Arizona.

Yg MIDDLE PROTEROZOIC GRANITIC ROCKS (1400-1450 Ma). Mostly porphyritic biotite granite with large microcline phenocrysts, with local fine-grained border phases and aplite. Associated pegmatite and quartz veins are rare. This unit forms large plutons, including the Oracle Granite, Ruin Granite, granite in the Pinnacle Peak - Carefree area northeast of Phoenix, and several bodies west of Prescott.

Nogales Tap 138 kV
Kantor 138 kV
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17

16S-15E
17S-13E
17S-15E
18S-13E
18S-14E
18S-15E
19S-13E
19S-14E
19S-15E

W Helmet Peak Rd
E Sahuarita Rd
W Sahuarita Rd
S La Canada Dr
I-10 BL N
I-10
S Old Nogales Hwy
S Mission Rd
W Duval Mine Rd
N La Canada Dr
N Abrego Dr
W Continental Rd
E Continental Rd
S Camino del Sol
Pima
Santa Cruz

2 1 0 2
Miles

Tucson Electric Power

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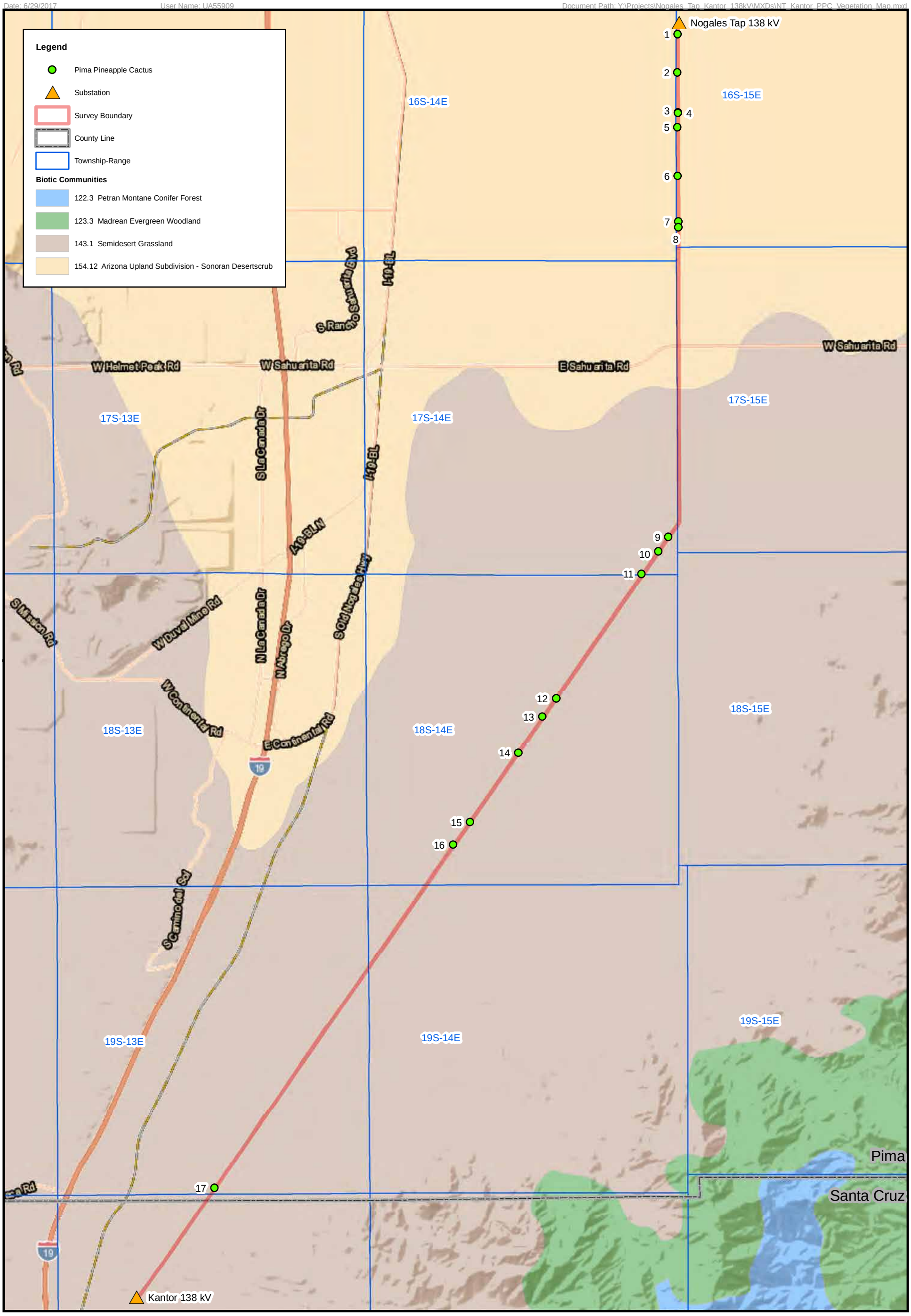
Sources: TEP, UNS, ESRI, AZGS, and USGS
Coordinate System: NAD 1983 HARN UTM Zone 12N
Projection: Transverse Mercator
Datum: D North America 1983 HARN
Basemap: World Terrain Base and Richard, S.M. et al, AZGS, 2000
1 inch = 2 miles

Figure 2: Geological Map

Nogales Tap to Kantor PPC Survey

Created on 20 June 2017
Revised on 29 June 2017



2 1 0 2

Miles

Tucson Electric Power

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Coordinate System: NAD 1983 HARN UTM Zone 12N
Projection: Transverse Mercator
Datum: D North America 1983 HARN
Basemap: World Terrain Base and
Brown, D.E. and Lowe, C.H., 1979
1 inch = 2 miles

Figure 3: Vegetation Map

Nogales Tap to Kantor
PPC Survey

Created on 29 June 2017
Revised on 29 June 2017

Legend

- Pima Pineapple Cactus
- Substation
- Survey Boundary
- Township-Range
- County Line

Nogales Tap 138 kV
Kantor 138 kV
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17

16S-14E 16S-15E 17S-13E 17S-14E 17S-15E 18S-13E 18S-14E 18S-15E 19S-13E 19S-14E 19S-15E

W Helmet Peak Rd W Sahuarita Rd E Sahuarita Rd S Rancho Sahuarita Blvd S La Canada Dr N La Canada Dr N Abrego Dr S Old Nogales Hwy W Duval Mine Rd W Continental Rd E Continental Rd S Camino del Sol S Mission Rd I-19 I-19-BL I-19-BL N

Pima Santa Cruz

2 1 0 2
Miles

Tucson Electric Power

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Coordinate System: NAD 1983 HARN UTM Zone 12N
Projection: Transverse Mercator
Datum: D North America 1983 HARN
Basemap: World Imagery

1 inch = 2 miles

Figure 4: Aerial PPC Overview Map

Nogales Tap to Kantor PPC Survey

Created on 20 June 2017
Revised on 28 June 2017

ATTACHMENT 2

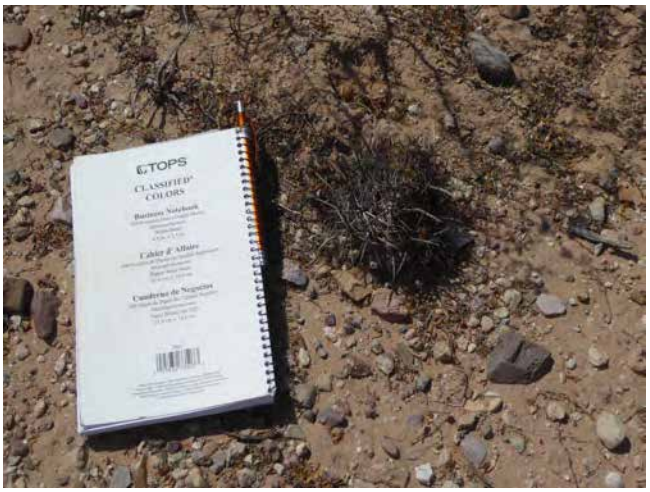
PPC PHOTOGRAPHS

PHOTOGRAPH LOG OF PIMA PINEAPPLE CACTUS

PPC 1.

PPC 2.

PPC 3.



PPC 4.

PPC 5.

PPC 6.

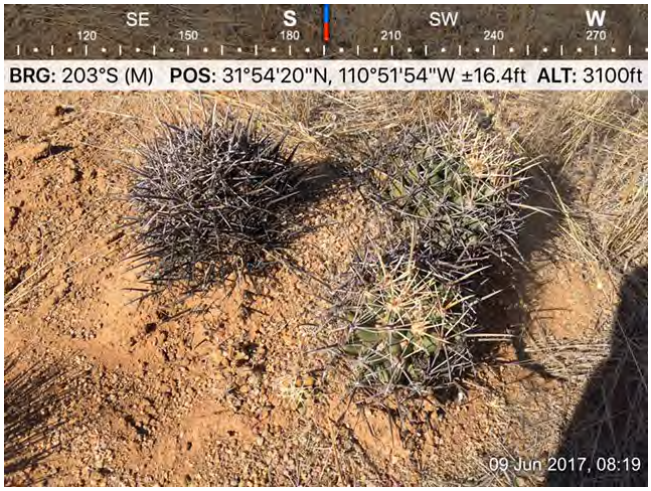
PHOTOGRAPH LOG OF PIMA PINEAPPLE CACTUS

PPC 7.

PPC 8.

PPC 9.

PPC 10.



PPC 11.

PPC 12.

PHOTOGRAPH LOG OF PIMA PINEAPPLE CACTUS

PPC 13.


PPC 14


PPC 15.

PPC 16.

PPC 17. robin

Exhibit B-2(b) – Clean Water Act Section 404 Preliminary Jurisdictional Delineation and Clean Water Act Compliance Permit Coverage for Nogales Tap to Kantor Upgrade Project

BOWERS
Environmental Consulting

Environmental Planning ▪ Natural Resource Management ▪ Biology ▪ Regulatory Compliance ▪ Sustainability

NOGALES TAP TO KANTOR 138KV TRANSMISSION LINE

CLEAN WATER ACT SECTION 404
PRELIMINARY JURISDICTIONAL DELINEATION
AND CLEAN WATER ACT COMPLIANCE PERMIT COMPLIANCE

Date: July 12, 2017

Prepared for: UniSource Energy Services

Prepared by: Bowers Environmental Consulting, LLC

INTRODUCTION

UniSource Energy Services (UNES) retained Bowers Environmental Consulting, LLC (BEC) to conduct a Preliminary Jurisdictional Delineation (PJD) on an existing 27.5-mile power line right-of-way (ROW), and to evaluate Clean Water Act Section 404 permit compliance requirements for the proposed Nogales Tap to Kantor 138kV transmission line upgrade project. The ROW is located on 272 acres of state trust land, and private land, in Pima and Santa Cruz Counties, Arizona (Figure 1). Approximately 198 acres of the project area occurs within three UNES ROWs (14-97502, 14-1100981, and 14-117730) that were acquired from the Arizona State Land Department (ASLD) for the existing 138kV transmission line. The project area begins in Pima County approximately 300 feet south of the Nogales Tap substation along Wilmont Road, and heads south for 9.7 miles before turning southwest for 18 miles, ending at the Kantor Substation in Santa Cruz County.

The purpose of the PJD is to map the location of the ordinary high water mark (OHWM), and provide technical information to the U.S. Army Corps of Engineers (USACE) in support of an official jurisdictional determination on the presence of potential waters of the United States (WOTUS) within the project area. The PJD was completed in accordance with Regulatory Guidance Letter 16-01.

Due to the extensive distribution of ephemeral washes located on the project area, this memorandum provides only a preliminary summary of findings regarding potential jurisdictional waters of the United States on the project area, and outlines potential Section 404 permitting

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requirements based on the proposed project activities. The PJD that includes all of the potential WOTUS is available as a GIS shape file.

METHODS

BEC conducted a desktop review of high-resolution aerial images from Pima Association of Governments, the National Aerial Imagery Program (NAIP) and Google Earth, and reviewed regional topographic map, and then conducted a field reconnaissance to identify and map the Ordinary High Water Mark (OHWM) of potentially jurisdictional WOTUS within the project area. Each step in the delineation process is outlined below.

Review of Aerial Photograph and Maps – Aerial imagery of the project area and United States Geological Survey (USGS) Amado, Mt. Hopkins, Green Valley, Sahuarita, Corona de Tucson, and Tucson, SE, Arizona 7.5' Quadrangle topographic maps were reviewed. The project area consists of a 27.5-mile-long by 50 to 100-foot wide ROW that stretches from an area southeast of Tucson to an area east of Amado along the western bajada of the Santa Rita Mountains in Pima and Santa Cruz Counties, Arizona. Portions of the project area cross residential areas that are bisected by gates and fences, but surface disturbance is generally limited to existing power line support poles and associated access roads, other unpaved roads that cross through, and cattle grazing. A large portion of the project area is located within the Santa Rita Experimental Range that has been used for long-term research projects to study effects of grazing, and vegetation, climate, and watershed research.

The project area occurs along the eastern edge of the Upper and Lower Santa Cruz River Valleys formed by the western slope of the Santa Rita Mountain Range. Prominent peaks within the Santa Rita Mountains include Mount Wrightson, Mount Hopkins, and Elephant Head Butte. The north end of the project area is covered in vast creosote flats, and as the project area cuts south across the Santa Rita Experimental Range, the landform transitions into a more varied topography of moderate hills and incised drainages. Near the southern of the project area the topographic relief becomes much steeper with high sloping ridges and deep valleys. Surface elevations range from 2,836 feet above mean sea level (amsl) in the northern portion of the project area to 3,250 feet amsl at the southern end. Numerous ephemeral washes that originate on the west-facing bajadas cross the project area flowing from east to west towards the Santa Cruz River.

PJD Field Reconnaissance - Rion Bowers conducted the field reconnaissance of the project area between June 7 and 18, 2017. The purpose of the reconnaissance is to verify observations from the aerial photograph review and map the location of OHWM indicators within the project area. He looked for evidence of OHWM indicators, such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate characteristics as defined at 33 CFR 328.3(e), and other physical characteristics that the USACE may consider in determining the OHWM.

During the field reconnaissance the width of the OHWM, and associated indicators, of each potential jurisdictional drainage was recorded on datasheets. Representative photographs were also recorded to show the characteristic of both potential jurisdictional and non-jurisdictional drainages that occur on the project area.

CWA Section 404 Permit Compliance – Impacts to potential WOTUS from proposed project activities (i.e., road maintenance and construction, grading, placement of permanent or temporary fill) would be regulated the under Section 404 of the Clean Water Act (CWA) by the U.S. Army Corps of Engineers. BEC reviewed the available Section 404 Nationwide Permits for Arizona to determine potential Impacts to these drainages would require a permit from the USACE.

RESULTS

Potential Jurisdictional Waters of the U.S. – Approximately 200 ephemeral drainages that would be considered potential jurisdictional WOTUS by the USACE were identified within the project area. Figures 2 and 3 show the location of major drainages in the project area that would be considered WOTUS. Summary data for thirteen of the major drainages depicted on Figures 2 and 3 is provided in Table 1. The complete map of potential jurisdictional washes is available as a GIS shape file, which will be used for project planning, and to document compliance under the Section 404 permit program.

Table 1. Summary of Potential WOTUS in the Project Area

Drainage	Length (Feet)*	Avg. Width (Feet)	Potential JD Waters (Acres)
A	50	15	0.02
B	50	4	0.004
C	50	8	0.01
D	50	5	0.01
E	100	15	0.03
F	100	20	0.05
G	100	15	0.03
H	100	40	0.91
I	100	15	0.03
J	100	20	0.05
K	50	10	0.01
L	50	15	0.02
M	50	20	0.02

* Based on the width of the ROW that varies from 50 to 100 ft. wide.

Clean Water Act Section 404 Permit Compliance - Based on review of aerial photographs and the field reconnaissance, there are numerous ephemeral drainages on the project area that exhibit indicators of an ordinary high water mark (OHWM), and other physical characteristics, that the USACE would consider potential jurisdictional WOTUS. Impacts to these drainages from project related activities (i.e., road maintenance and construction, pad grading, and temporary or permanent discharge of fill material) would require a permit from the USACE. As indicated in Table 1, there is less than 0.5 acres of potential WOTUS associated with each of the largest drainages

that occur within the project area. Most of these drainages occupy less than 0.1-acre within the 50 or 100-foot ROW.

UNES would incorporate the preliminary jurisdictional delineation mapping into project planning, and would avoid and minimize impacts to potential WOTUS to the maximum extent practicable. Avoidance measures would include: 1) no grading of existing, or new access roads, within the OHWM of potential jurisdictional drainages; 2) using grading techniques that avoid the discharge of fill into potential WOTUS; 3) constructing any new facilities, such as tower foundation and access roads, in upland areas. Unavoidable impacts to potential jurisdictional WOTUS would be minimized through: 1) implementation of construction techniques that would disturb the minimum amount of potential WOTUS and adjacent vegetation to meet the project objective; 2) by using temporary fill where necessary; and 3) restoring the drainages to pre-construction surface elevations once construction is complete.

Based on experience with similar transmission line projects in the area completed by UNES, impacts to potential WOTUS would be relatively minor. The project would qualify for coverage under one of the fifty-two Nationwide Section 404 permits that are available from the USACE Los Angeles District Regulatory program. Specifically, Nationwide Permit Number 12 (NWP 12) is a programmatic permit that is available for construction, maintenance, repair, and removal of utility lines and associated facilities in WOTUS, provided the activity does not result in the loss of greater than ½-acre of potential WOTUS for each single and complete project with independent utility (i.e., each crossing of a wash). Since each wash crossing within the ROW is less than ½-acre, the project would qualify for coverage under NWP 12.

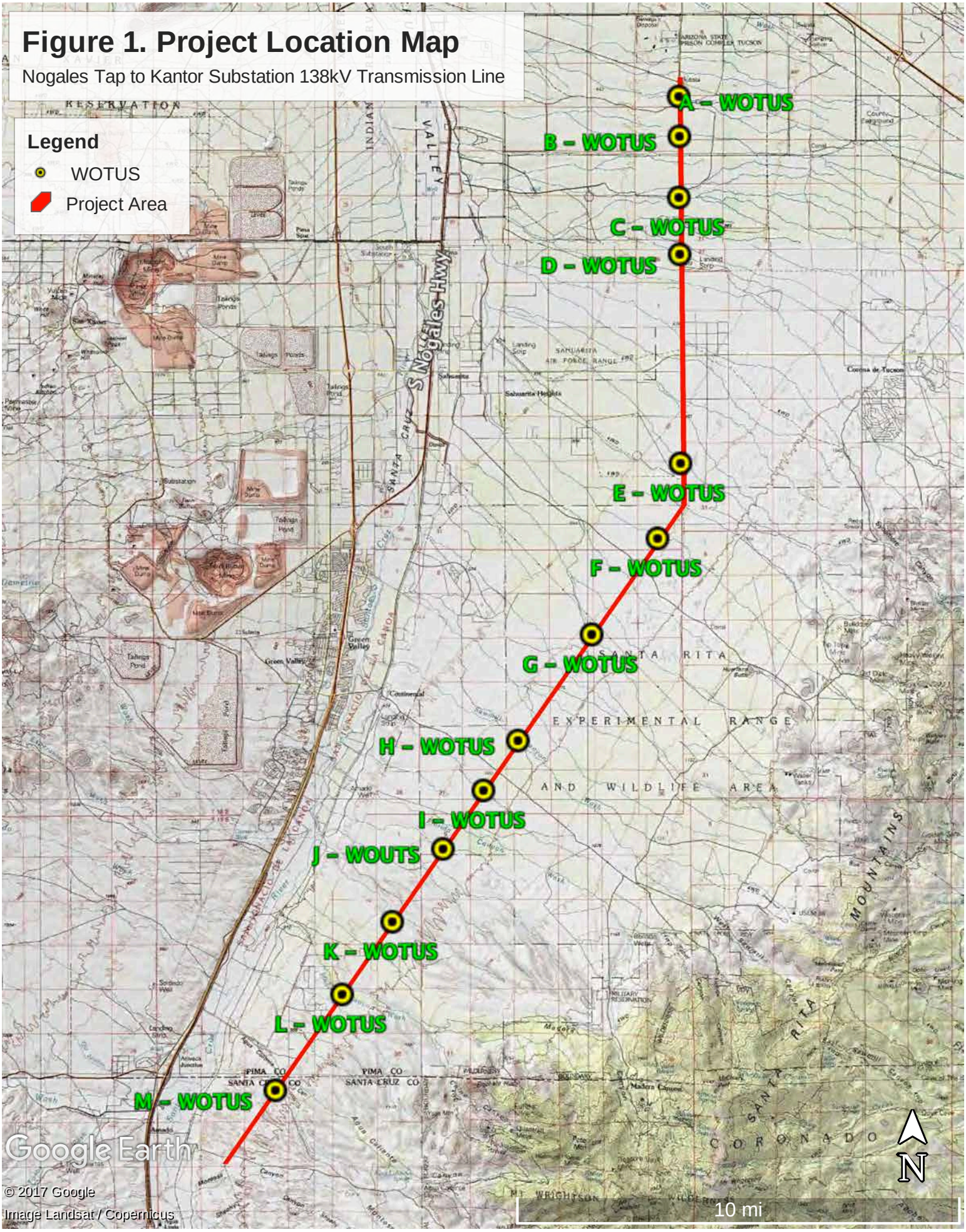
Nationwide Permit Notification Requirements - If impacts to each potential jurisdictional drainage are less than 0.1 acre, and the project meets all the regional and general terms and conditions of NWP 12, the project would be in compliance with the Nationwide Permit program, and notification of the USACE would not be required. However, UNES would be required to prepare a Pre-construction Notification for submittal to the USACE, if any of the following criteria are met: (1) the project activity involves mechanized land clearing in a forested wetland for the utility line right-of-way; (2) a section 10 permit is required; (3) the utility line in waters of the United States, excluding overhead lines, exceeds 500 feet; (4) the utility line is placed within a jurisdictional area (i.e., water of the United States), and it runs parallel to or along a stream bed that is within that jurisdictional area; (5) discharges that result in the loss of greater than 1/10-acre of waters of the United States; (6) permanent access roads are constructed above grade in waters of the United States for a distance of more than 500 feet; or (7) permanent access roads are constructed in waters of the United States with impervious materials.

ATTACHMENT 1

FIGURES

Figure 1. Project Location Map

Nogales Tap to Kantor Substation 138kV Transmission Line



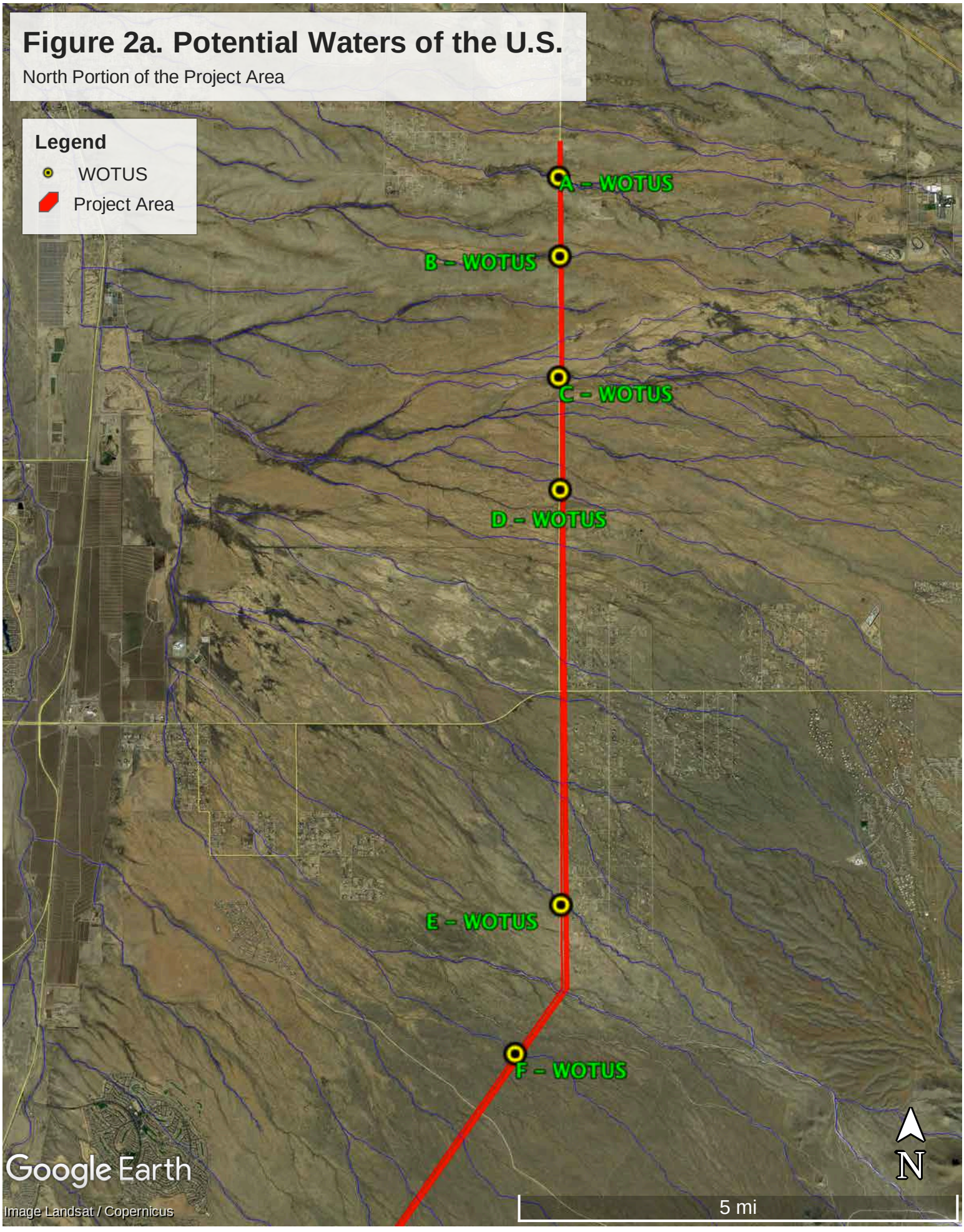


Figure 2a. Potential Waters of the U.S.
North Portion of the Project Area
Legend
WOTUS
Project Area
A – WOTUS
B – WOTUS
C – WOTUS
D – WOTUS
E – WOTUS
F – WOTUS
N
5 mi
Google Earth
Image Landsat / Copernicus

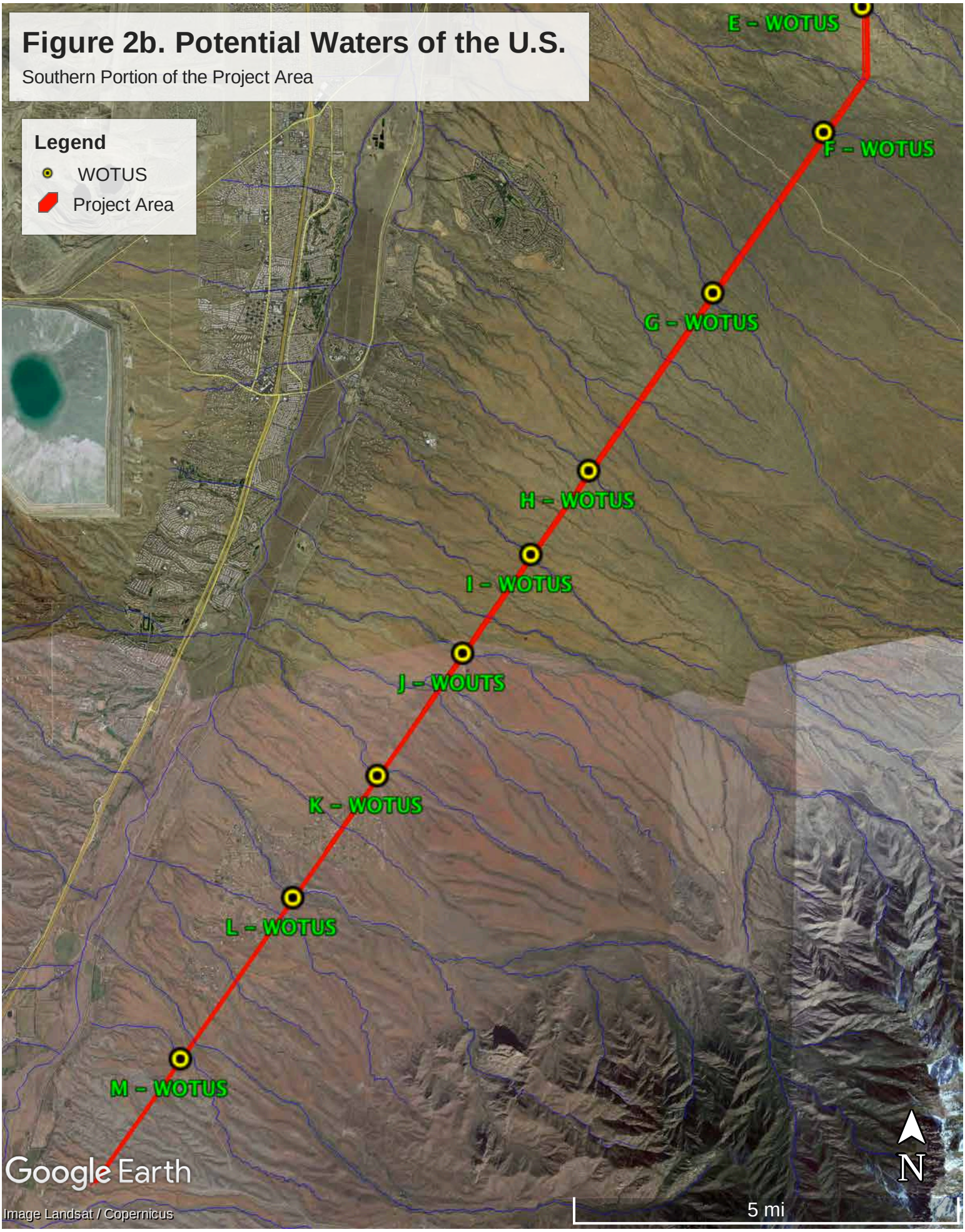


Figure 2b. Potential Waters of the U.S.
Southern Portion of the Project Area
Legend
WOTUS
Project Area
E – WOTUS
F – WOTUS
G – WOTUS
H – WOTUS
I – WOTUS
J – WOUTS
K – WOTUS
L – WOTUS
M – WOTUS
Google Earth
Image Landsat / Copernicus
5 mi
N

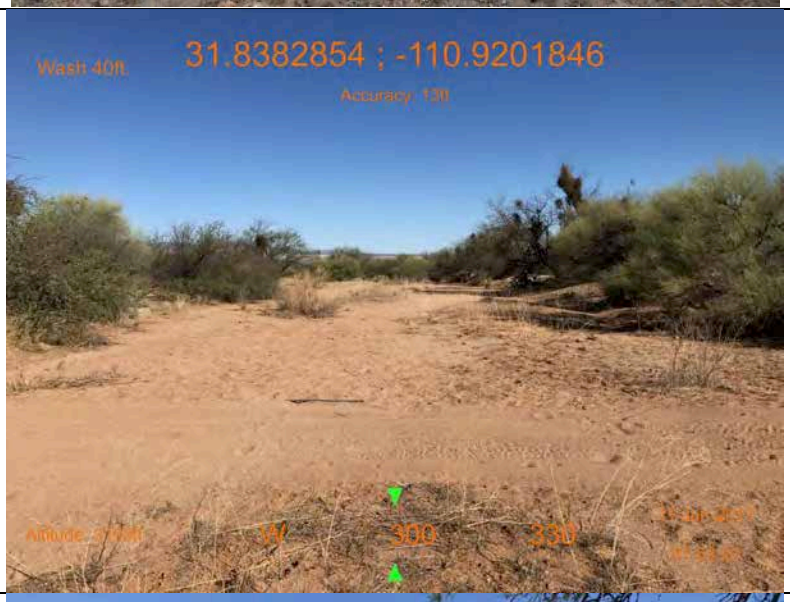
ATTACHMENT 2

REPRESENTATIVE PHOTOGRAPHS

Representative Photographs
Nogales Tap to Kantor 138kV Transmission Line Project

A - WOTUS Direction: East Comments: Width 15 feet. Potential Jurisdictional waters of the U.S.	
B - WOTUS Direction: East Comments: Width10 feet. Potential jurisdictional waters of the U.S.	
C - WOTUS Direction: West Comments: Width 8 feet. Potential jurisdictional waters of the U.S.	

D - WOTUS Direction: East Comments: Width 5 feet. Potential jurisdictional waters of the U.S.	
E - WOTUS Direction: West Comments: Width 15 feet. Potential jurisdictional waters of the U.S.	
F - WOTUS Direction: West Comments: Width 20 feet. Potential jurisdictional waters of the U.S.	

G - WOTUS Direction: East Comments: Width 15 feet. Potential jurisdictional waters of the U.S.	
H - WOTUS Direction: West Comments: Width 40 feet. Potential jurisdictional waters of the U.S.	
I - WOTUS Direction: East Comments: Width 25 feet. Potential jurisdictional waters of the U.S.	

J -WOTUS Direction: East Comments: Width 20 feet. Potential jurisdictional waters of the U.S.	
K - WOTUS Direction: West Comments: Width 10 feet. Potential jurisdictional waters of the U.S.	
L – WOTUS Direction: West Comments: Width 15 feet. Potential jurisdictional waters of the U.S.