BEFORE THE NEW MEXICO PUBLIC REGULATION COMMISSION

IN THE MATTER OF THE AMENDED JOINT APPLICATION OF THE CORONA WIND COMPANIES FOR LOCATION APPROVAL OF THE EXPANSION OF THE CORONA WIND PROJECTS RECONFIGURATION OF THE PROPOSED CORONA GEN-TIE SYSTEM, EXTENSION OF THE CORONA GEN-TIE SYSTEM AND REQUEST FOR RIGHT OF WAY DETERMINATION IN LINCOLN, TORRANCE, AND GUADALUPE COUNTIES PURSUANT TO THE PUBLIC UTILITY ACT, NMSA 1978, § 62-9-3	)	**Case No. 20-00008-UT**
ANCHO WIND LLC, COWBOY MESA LLC, DURAN MESA LLC, RED CLOUD WIND LLC, TECOLOTE WIND LLC, AND VIENTO LOCO, LLC,	)	
Joint Applicants.	)	

EXHIBIT ACC-1

BURNS McDONNELL

Corona Wind Projects Environmental Report Supplement

Pattern

Pattern Energy Group 2 LP

Corona Wind Projects
Project No. 101335

12/18/2019

Corona Wind Projects
Environmental Report Supplement

prepared for

Pattern Energy Group 2 LP
Corona Wind Projects
New Mexico

Project No. 101335

12/18/2019

prepared by

Burns & McDonnell Engineering Company, Inc.
Centennial, Colorado

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LIST OF ABBREVIATIONS

Abbreviation	Term/Phrase/Name
AC	alternating current
ACSR	aluminum conductor steel reinforced
ACSS	aluminum conductor steel supported
APLIC	Avian Power Line Interaction Committee
BCI	Bat Conservation International
BGEPA	Bald and Golden Eagle Protection Act
BISON-M	Biota Information System
BLM	Bureau of Land Management
BMPs	Best Management Practices
Burns & McDonnell	Burns & McDonnell Engineering Company, Inc.
CO	Carbon monoxide
Commission	New Mexico Public Regulation Commission
dBA	A-weighted decibels
DNH	Determination of No Hazard
ECOS	Environmental Conservation Online Service
EPA	U.S. Environmental Protection Agency
ER	Environmental Report
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FCC	Federal Communications Commission
FEMA	Federal Emergency Management Agency

Abbreviation	Term/Phrase/Name
FHWA	Federal Highway Administration
ft	feet
GAP	USGS Gap Analysis Program
GLO	General Land Office
GRT	Gross Receipts Tax
I	interstate
IBA	Important Bird Areas
IPaC	Information for Planning and Consultation
IRBs	Industrial Revenue Bonds
kcmil	Thousand Circular Mil
kV	kilovolt
LM	land mobile
m	meters
MBTA	Migratory Bird Treaty Act
MW	megawatt
NESC	National Electrical Safety Code
NHD	National Hydrography Dataset
NLCD	National Land Cover Database
NM CHAT	New Mexico Crucial Habitat Assessment Tool
NMCRIS	New Mexico Cultural Resource Information System
NMDGF	New Mexico Department of Game and Fish
NMDOT	New Mexico Department of Transportation

Abbreviation	Term/Phrase/Name
NMED-SWQB	New Mexico Environment Department Surface Water Quality Bureau
NMSA	New Mexico Statutes Annotated
NO_x	nitrogen oxide
NPS	National Park Service
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
NWP	Nationwide Permit
O&M	operations and maintenance
OHWM	ordinary high-water mark
OPGW	optic ground wire
PILOTs	provide payments in-lieu of taxes
PLJV	Playa Lakes Joint Venture
PM	particulate matter
PPAs	Power Purchase Agreements
RETA	Renewable Energy Transmission Authority
ROW	right-of-way
SGP CHAT	Southern Great Plains Crucial Habitat Assessment Tool
SLO	State Land Office
SPCC	Spill Prevention, Containment, and Countermeasures Plan
SPS	Special Protection System
SSURGO	USDA Soil Survey Geographic
Staff	Commission Staff

Abbreviation	Term/Phrase/Name
SO_2	sulfur dioxide
SWPPP	Stormwater Pollution Prevention Plan
USDA	U.S. Department of Agriculture
UDP	Unanticipated Discovery Protocol
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VOCs	volatile organic compounds

1.0 SUMMARY

This report responds to the requirement of the New Mexico Public Regulation Commission (Commission) for a report, in the form provided in 40 C.F.R. Section 1502.10, for location of transmission lines of 230 kilovolt (kV) or greater associated with a large-capacity power plants capable of 300 megawatts (MW) or more of generation that do not require an Environmental Assessment or Environmental Impact Statement pursuant to the National Environmental Policy Act. The New Mexico location control statute, New Mexico Statutes Annotated (NMSA) 1978, Section 62-9-3F, provides that the Commission shall approve the location of the transmission line unless the Commission finds that the location will unduly impair important environmental values.

1.1 Background

1.1.1 2018 Approved Project

On October 3, 2018, the Commission approved the Application (Case No. 18-00065-UT) for Location Site Approval of the Corona Wind Projects, Corona Gen-Tie System, and Request for Right of Way Determination (2018 Approved Projects) submitted by Ancho Wind LLC, Cowboy Mesa LLC, Duran Mesa LLC, Red Cloud Mesa LLC, Tecolote Wind LLC, and Viento Loco LLC (Corona Wind Companies or Joint Applicants)[1], per the New Mexico location statute, NMSA 1978, Section 62-9-3, 62-9-3.2, and Commission Rule 17.9.592 NMAC. The 2018 Approved Projects consisted of wind generation facilities with capacity of up to 2,200 MW (Corona Wind Projects) as well as a transmission line and related substation facilities in Lincoln, Torrance, and Guadalupe Counties, New Mexico (Corona Gen-Tie System). The Corona Gen-Tie System is anticipated to consist of 345-kV alternating current (AC) lines and the associated right-of-way (ROW). As previously approved, the Corona Gen-Tie System would interconnect with several specific generation projects comprising the Corona Wind Projects. The Corona Gen-Tie System would consist of approximately 80 miles of transmission line located within a 1-mile study corridor (Corona Gen-Tie System Study Corridor) within the approximately 300,000-acre Corona Wind Projects (Corona Wind Project Area). As described in the 2018 approval, the Corona Wind Projects would interconnect to the SunZia Southwest Transmission Project (SunZia Transmission Project) via the Corona Gen-Tie System. The SunZia Transmission Project consists of an approximately 515-mile-long transmission corridor with possible configurations of two 500-kV AC or DC lines. In either case, the first

[1] The Corona Wind Companies were updated to include Gallinas Mountain Wind LLC as part of the Corona Wind Companies quarterly check on January 15, 2019.

phase of the SunZia Transmission Project will be a 500-kV AC or DC transmission line that would be utilized by the Corona Wind Projects.

Subsequent to the October 3, 2018 approval of the location of the Corona Wind Projects, and the location and ROW width of the Corona Gen-Tie System, Pattern Energy Group 2 LP (Pattern Development) acquired the Mesa Canyons Wind Project, a wind generation facility of up to 1,000 MW previously approved by the Commission for generation location control. At this time, Pattern Development also acquired Western Spirit Transmission LLC, which is co-developing Western Spirit with the New Mexico Renewable Energy Transmission Authority (RETA). Western Spirit is an approximately 165-mile 345-kV transmission project owned by RETA that terminates at its eastern switching station in Santa Fe County, New Mexico approximately 50 miles north of the previously approved Corona Gen-Tie System and will begin construction in the second quarter of 2020. Subsequently, the Clines Corners Wind Project received location control approval for a wind generation facility and an associated high-voltage transmission line located within a 1-mile corridor that would interconnect to the Western Spirit eastern switching station.

The Corona Gen-Tie System will require a ROW width of approximately 180 feet (ft) across primarily private land for which the Corona Wind Companies have obtained, or will obtain, agreements with the underlying landowners prior to commencement of construction.

1.1.2 Update to 2018 Approved Projects

This update to the 2018 Approved Projects involves a proposal by the Corona Wind Companies to update the location of the Corona Wind Projects and the Corona Gen-Tie System. This update consists of 1) an addition of certain property in Lincoln County, New Mexico (Corona Wind Update) to the Corona Wind Projects; 2) an additional transmission line (Extended Corona Gen-Tie System) that would extend the Corona Gen-Tie System north, providing interconnection to the new Western Spirit Transmission Project Switching Station in Torrance County, and 3) a reconfiguration of the previously approved Corona Gen-Tie System within the Corona Wind Project Area (Reconfigured Corona Gen-Tie System).

The Corona Wind Update would add 11,736 acres to the Corona Wind Project Area (Updated Corona Wind Project Area). The Extended Corona Gen-Tie System is approximately 30 miles long and includes approximately 9 miles of land within the Corona Wind Project Area, 9 miles within the El Cabo Wind Project Area[2] with approximately 20 miles of length located on property not previously analyzed. The Extended Corona Gen-Tie System would be located within a 1-mile corridor (Extended Corona Gen-Tie System Corridor). The Reconfigured Corona Gen-Tie System consists of 2 segments, Option A or Option

[2] Separately approved for location control approval by the Commission.

B, each totaling approximately 64 miles of the Corona Gen-Tie System, with 44 miles located within the previously approved Corona Gen-Tie System Corridor and 19 miles located within a 1-mile corridor (Reconfigured Corona Gen-Tie System Corridor) outside of the previously approved Corona Gen-Tie System. Figure 1-1 below provides an overview of the update (Updated Corona Wind Projects) to the 2018 Approved Projects. The Reconfigured Corona Gen-Tie System is located entirely within the previously approved Corona Wind Project Area. Together, the Extended Corona Gen-Tie System and the Reconfigured Corona Gen-Tie System comprise the Updated Corona Gen-Tie System. The Updated Corona Gen-Tie System would be located within a 1-mile corridor comprised of the Extended Corona Gen-Tie System Corridor, the Reconfigured Corona Gen-Tie System Corridor, and remaining portions of the Corona Gen Tie-System Corridor (collectively, the Updated Corona Gen-Tie System Corridor). The Updated Corona Wind Project Area includes both the wind generation area of the Corona Wind Update as well as the Updated Corona Gen-Tie System Corridor.

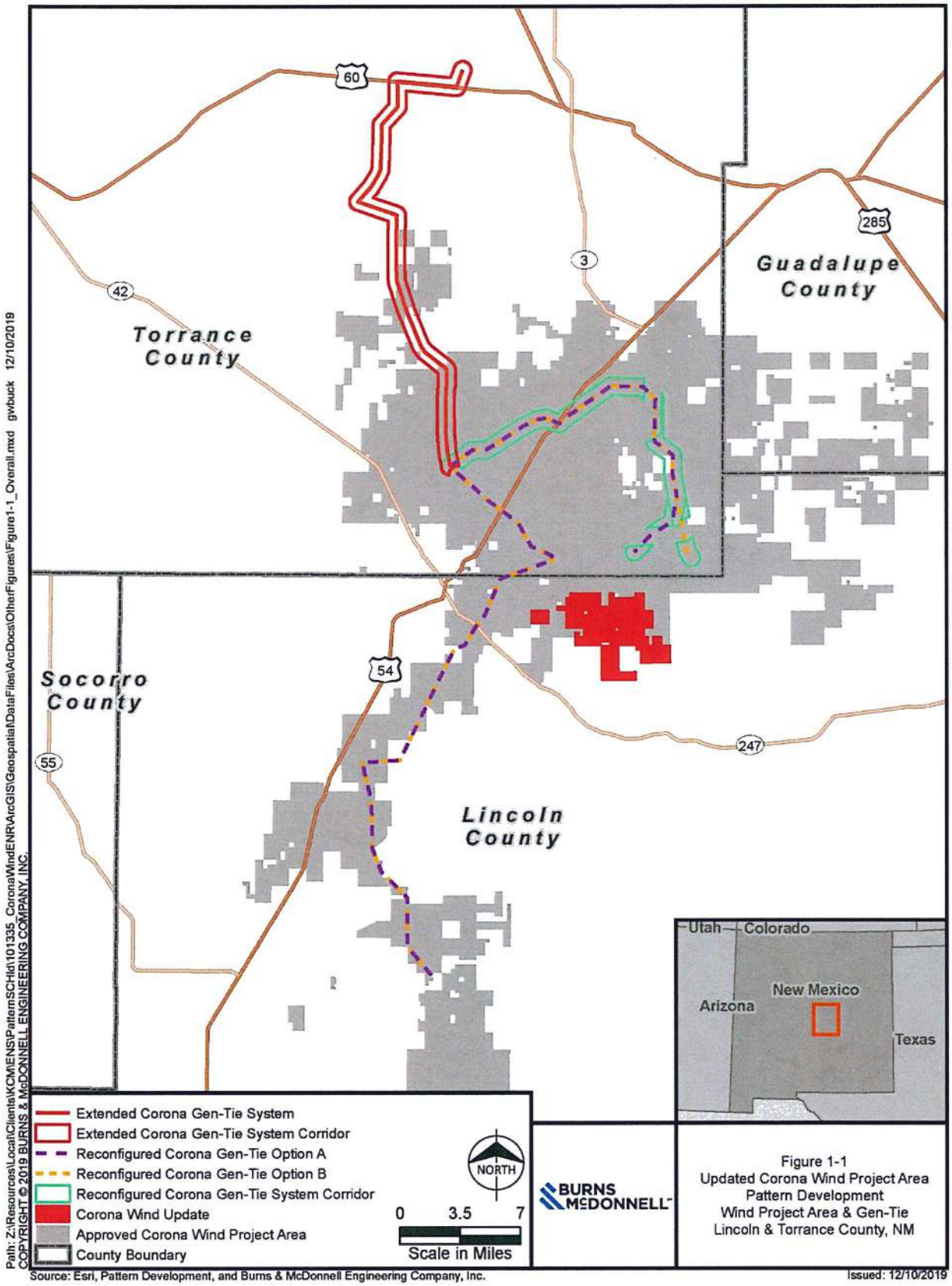
The Updated Corona Gen-Tie System will interconnect the Updated Corona Wind Projects to the Western Spirit eastern switching station. The Updated Corona Gen-Tie System consists of approximately 54 miles (Option A or Option B) of transmission line falling partially within the 2018 Approved Projects' approximate 300,000-acre Corona Wind Project Area. The Updated Corona Gen-Tie System would extend northwest from the Updated Corona Wind Project Area's northwest boundary within Torrance County.

Consistent with the Commission's previous ROW width approval, the Updated Corona Gen-Tie System requires a ROW width of approximately 180 ft across primarily private land for which the Corona Wind Companies have obtained, or will obtain, agreements with the underlying landowners prior to commencement of construction. The Corona Wind Companies are requesting a ROW width determination pursuant to NMSA 1978, §62-9-3.2 to the extent such approval may be required by law.

This Environmental Report (ER) provides a review of the existing environment within the Corona Wind Update (within the Updated Corona Wind Project Area) and analyzes the potential impact of the Extended Corona Gen-Tie System and Reconfigured Corona Gen-Tie System outside previously approved areas within the Updated Corona Gen-Tie System. The affected environment (existing condition) for the environmental values provided in NMSA 1978 Section 62-9-3.M, Commission Rule 17.9.592 NMAC, and additional resource areas identified to be of interest by Commission Staff (Staff) are evaluated in this ER. The resources addressed in this ER include: air resources; water resources; biological resources; land use (including recreation and schools); visual and scenic; cultural, historic, and archeological resources; religious resources; geology and paleontology; soils; minerals and mining;

socioeconomic; roads; noise; communication signals; military activities and aviation; geographic resources; radioactive waste and radiation hazard; hazardous materials; and safety.

The discussion for each resource includes data sources used, current regional conditions, and conditions within the Updated Corona Gen-Tie System Corridor, three step-up substations, and one adjacent switchyard. The environmental consequences (potential impacts) for the resources identified above were addressed to determine whether the proposed transmission line, step-up substation(s) and switchyard (Updated Transmission Line Facilities) would, "unduly impair important environmental values," as provided in NMSA 1978, Section 62-9-3.F. Impact evaluations for each resource are discussed in the context of the Updated Corona Gen-Tie System Corridor alongside Best Management Practices (BMPs) that can help manage impacts.


60
285
3
42
Guadalupe County
Torrance County
54
Socorro County
55
247
Lincoln County
Utah
Colorado
New Mexico
Arizona
Texas
Extended Corona Gen-Tie System
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Reconfigured Corona Gen-Tie System Corridor
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Approved Corona Wind Project Area
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NORTH
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BURNS McDONNELL
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Updated Corona Wind Project Area
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Wind Project Area & Gen-Tie
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2.0 INTRODUCTION AND PURPOSE AND NEED

The Corona Wind Companies are proposing to locate the Updated Corona Gen-Tie System in Lincoln and Torrance County, New Mexico. Approximately 54 miles of transmission line (Option A or Option B) and related substation facilities with possible configurations of 345-kV AC lines (Exhibit 1) additional gen-tie system is being proposed in Torrance County, New Mexico. Although information about the Updated Corona Wind Project Area as a whole is discussed herein to provide overall project context, the New Mexico statutes only require evaluation of the Updated Corona Gen-Tie System.

2.1 Purpose and Need

The purpose and need of the Updated Corona Gen-Tie System is to connect the first phase of the Updated Corona Wind Projects to the Western Spirit Transmission Project. Western Spirit is a RETA project that would allow renewable energy from the Corona Wind Projects to interconnect to the electrical grid. Additionally, Pattern Development applied for and has been granted 800 MW of transmission service on the Western Spirit line once it is completed. Subsequent phases of the Updated Corona Wind Projects will also have the ability to interconnect to the SunZia Transmission Project via the Updated Corona Gen-Tie System.

2.2 Decisions to be Made

The New Mexico location statute, NMSA 1978, Section 62-9-3.F provides the Commission shall approve the location of the transmission line unless the Commission finds that the location will unduly impair important environmental values. This ER addresses the important environmental values the Commission has identified in its location rule 17.9.592 NMAC, as well as other issues identified by Staff.

3.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION

3.1 Alternatives Considered

The Corona Wind Companies are proposing to construct an overhead 345-kV transmission line to connect the Updated Corona Wind Projects to the Western Spirit Transmission Project, to be located within the Updated Corona Gen-Tie System Corridor. The final transmission line route will be determined with respect to several factors, such as, the final turbine layout, siting of the step-up substations and switchyards based on the final turbine layout, interconnection requirements, landowner coordination, geographic features, and micro-siting of poles. Measures would be undertaken to reduce impacts to important environmental resources to the extent practicable.

3.2 Proposed Project (Proponent Preferred)

The proposed action is to construct, operate, and maintain a new 345-kV transmission line located within the Updated Corona Gen-Tie System Corridor. It is anticipated that there will be approximately 54 miles of 345-kV transmission line (Option A or B) along with the related substation facilities that would transport electricity generated at the Corona Wind Projects to the Western Spirit Transmission Project. The proposed action also includes construction, operation, and maintenance of the required step-up substations within the Updated Corona Gen-Tie System Corridor. These step-up substations would convert lower voltage (34.5-kV) electricity generated at the Corona Wind Projects and increase it to higher voltage electricity (345-kV) for interconnection to the transmission line. A switchyard would also be constructed within the Updated Corona Gen-Tie System Corridor to connect individual projects together for interconnection into the Western Spirit Transmission Project at a single point.

3.2.1 Transmission Line

Electricity generated by the wind turbines would be gathered via buried electrical collection system lines that will be charged at 34.5-kV. The collection system circuits would be gathered at one of the Corona Wind Projects' step-up substations where the voltage would be increased from 34.5-kV to 345-kV via large power transformers. The Corona Wind Projects' step-up substations would be connected to each other via a 345-kV transmission line that could connect to not only the SunZia Transmission Project but also the Western Spirit Transmission Project. The decision on the number of 34.5 to 345-kV step-up substations would be made prior to construction and would be determined by design efficiencies that reduce total electrical infrastructure needed and minimize electrical losses. The transmission line(s) would consist of an overhead line operated at 345-kV. The length of the transmission line would depend on final design. The transmission line would require a ROW width of about 180 ft.

3.2.1.1 Structures

The proposed transmission structure types for the 345-kV transmission line would be wood or steel monopole, two-pole H-frame, and/or three-pole angle structures. Most structures would be self-supporting; however, in some areas, structures would be guyed to provide additional structural support. In areas that require long spans between structures, such as riparian or stream crossings, a taller, larger structure would typically be used. In areas where the line turns, the transmission line could be supported by three-pole angle transmission structures or a structure with guy wires. Typical transmission structure heights for the tangent (structures that hold the line up, but bear little tension), dead-end (structure that bears tension), and angle transmission structures (structure that supports change in line direction and bears tension) would be approximately 80 to 130 ft above the existing ground, depending on terrain and span length.

Structures spans would typically be 600 to 900 ft in length. In most cases, transmission structures would be directly embedded into the ground. Additional foundation support, such as drilled pier concrete foundations may be used in special design cases depending on geotechnical conditions. The diameter of the transmission structure poles would be approximately 3 to 5 ft, depending on framing configuration and the angle to adjacent transmission structures.

3.2.1.2 Conductors and Associated Hardware

The 345-kV transmission line would consist of three phases with each phase consisting of bundled conductors composed of two 954-Thousand Circular Mil (kcmil) aluminum conductor steel supported (ACSS) cables or conductors of comparable capacity. An ACSS consists of 7 steel wires surrounded by 54 aluminum strands. Each conductor is approximately 1.2 inches in diameter. Minimum conductor height above the ground for the 345-kV transmission line would be 30.3 ft, at 167 degrees Fahrenheit based on National Electrical Safety Code (NESC) standards and Special Protection System (SPS) standards. At road crossings, minimum clearance would typically increase to approximately 37.3 ft above ground. Similar sized aluminum conductor steel reinforced (ACSR) cables or conductors also could be used.

3.2.1.3 Fiber Optics

Fiber optic ground wire (OPGW) cable for substation-to-substation control would be installed on top of each transmission structure in the shield wire. The outer strands would consist of aluminum wire and the entire OPGW would be approximately 0.55 inch in diameter.

3.2.2 Step-Up Substation and Adjacent Switchyard

More than one new step-up substation would be constructed within the Updated Corona Gen-Tie System Corridor. The step-up substation(s) would consist of transformers; circuit breakers; switching devices; auxiliary equipment; control enclosure containing equipment for proper control; protection, monitoring; and communications; and associated equipment and facilities. The final location(s) would be determined upon the micrositing and geotechnical examinations of proposed wind turbine locations. The principal function of the substation is to increase the voltage from the collector system (34.5-kV) to the voltage of the Updated Corona Gen-Tie System transmission line (345-kV). The Updated Corona Gen-Tie System would allow for the delivery of the electricity of the proposed Updated Corona Wind Projects to either the Sunzia Transmission Project (where the voltage would then be increased to 500-kV) or the Western Spirit Transmission Project (345-kV). The step-up substation(s) would be located within a fenced area. The fence would be designed in accordance with industry standards to provide safety and security.

A switchyard and 345- to 500-kV step-up substation would be located adjacent to the Western Spirit Transmission Project. The switchyard and step-up substation would connect the electricity to the existing transmission system.

3.2.3 Right-of-Way Acquisition

ROW width for the transmission line would be 180 ft (90 ft each side of the transmission line). A 180-foot wide ROW would accommodate the anticipated structure types, span lengths, and heights for the transmission line; would comply with electrical safety codes; would provide adequate logistical space for construction, operations, and maintenance of the line; and would provide sufficient flexibility for siting structures in the ROW. Final design will determine the structure locations and characteristics. Easements for the transmission line ROW, temporary work areas, and temporary access roads would be required for the transmission line and substations. Some public road upgrades may be necessary and will be negotiated through the Torrance County Roads Maintenance Departments and private landowners. The Updated Corona Gen-Tie System on private lands would be obtained as private easements or ROWs.

3.2.4 Access Roads

The Updated Corona Gen-Tie System would use existing roads and overland travel wherever feasible for access in order to reduce new disturbance. Some new permanent or temporary access/short spur roads may be required to access structure locations within the ROW. New access roads within the existing ROW would retain access for maintenance. Portions of existing access roads located outside of the proposed ROW may require improvements as well as new access roads (temporary or permanent). To reduce ground disturbance and/or reduce visual contrast with the landscape, the alignment of any new

temporary access roads or cross-country routes would follow landform contours in designated areas where practicable, provided that such alignment does not impact other resource values additionally. All temporary access roads would be revegetated with native or similar grasses and forbs following construction. Where ground disturbance is substantial, surface preparation and reseeding would occur. The method of restoration would normally consist of loosening the soil surface, reseeding, installing cross drains for erosion control, placing water bars in the former access road, and filling temporary ditches and swales. Impacts and protection measures for disturbance resulting from the Updated Corona Gen-Tie System to soils, water resources, flora and fauna, and visual resources are discussed in Sections 5.5, 5.7, 5.8, and 5.11 of Chapter 5.0.

All new access that is not required for maintenance would be closed with concurrence of the landowner. Gates, where present or if installed, would be closed and/or locked, depending on the agreement with each landowner. Access roads on private property may be maintained with mutual consent of the landowner. A discussion of impacts and protection measures related to land use along the Updated Corona Gen-Tie System is included in Section 5.12 of Chapter 5.0.

3.2.5 Laydown / Material Staging Areas

Temporary laydown material staging areas would be required to store materials and equipment and to assemble structures for the duration of construction of the Updated Corona Gen-Tie System. The staging areas would be up to 20 acres in size and located at level areas in close proximity to existing roads within the area. The laydown staging areas would be used to store material and equipment prior to delivery to the structure sites, park vehicles, and, possibly, station a portable construction trailer. The staging areas would be surveyed for potential environmental impacts, and if any are found, the staging areas would be relocated or shifted to avoid such sensitive areas. The staging areas would be revegetated and reclaimed after completion of the Updated Corona Gen-Tie System. Impacts and protection measures related to micrositing staging areas and impacts due to disturbance are discussed below in Section 5.8 of Chapter 5.0.

3.2.6 Construction Activities

The proposed Updated Corona Gen-Tie System will use standard construction and operation procedures used for other transmission projects in the western United States. Construction of the Updated Corona Gen-Tie System is expected to take approximately 12-18 months, depending on the results of interconnection studies and final design. The Updated Corona Gen-Tie System's construction schedule projects activity commencing early 2020 and concluding by the end of 2021. The Corona Wind Projects and Updated Corona Gen-Tie System will be in full operation by the end of 2021.

3.2.6.1 Sequence of Activities

The construction of the Updated Corona Gen-Tie System is expected to follow the sequence of: (1) new structure locations surveyed and staked; (2) laydown/materials yard and work areas cleared, as needed; (3) access roads improved or built where necessary; (4) materials distributed along centerline; (5) structure holes dug and poles framed and erected; (6) conductors installed; and (7) site cleaned-up and reclaimed. The timing of construction activities may occur at different locations throughout the construction process. This may require several crews operating simultaneously at different locations.

Temporary laydown/material staging areas would be located on existing disturbed areas or other areas on private lands along the line route with negotiated access rights from private landowners. The yards would serve as field offices, reporting locations for workers, parking space for vehicles and equipment, or sites for temporary marshalling of construction materials.

3.2.6.2 Surveying

Construction survey work for the proposed Updated Corona Gen-Tie System consists of ascertaining soil and geotechnical conditions for foundations, determining specific pole locations, and delineation of ROW and work area boundaries, and, in some areas, roads to access work areas.

3.2.6.3 Access Road Construction

The Updated Corona Gen-Tie System would be located in close proximity to many public roads in order to facilitate access the ROW, to the extent practicable. The construction of temporary construction access roads or overland travel may be required to allow access of construction equipment in the transmission line corridor. This may involve clearing vegetation and crushing vegetation for overland travel. In construction areas where re-contouring is not required, disturbance would be limited to overland driving, where feasible, to minimize changes in the original contours. Large rocks and vegetation may be moved within these areas to allow vehicle access. Impacts and protection measures resulting from access road construction to soils, flora and fauna, and visual resources are discussed in Sections 5.5, 5.8, and 5.11 of Chapter 5.0

Equipment to construct the access roads would include hand tools, bulldozers, and graders. Specific BMPs would be implemented to reduce construction impacts. For example, roads would be built at right angles to streams to the extent practicable, to limit the impact of stream crossings; existing public roads would be utilized to the extent possible; appropriately sized culverts would be installed where needed; and road construction would include dust-control measures during construction, as required. Standard design techniques, such as installing water bars and dips to control erosion, would be included in areas

with slopes. In addition, measures would be taken to reduce impacts such as rutting and soil compaction in specific locations and during certain periods of the year. Discussion of impacts and protection measures for water resources resulting from construction of the Updated Corona Gen-Tie System is included in Section 5.7 of Chapter 5.0.

3.2.6.4 Structure Holes

Excavations for structure holes would be generally made with truck-mounted power auger equipment or a standard sized backhoe or large excavator. Where the soil and geotechnical conditions permit, a truck-mounted power auger would be used. The foundation excavation and installation require equipment access to the foundation sites. Structure hole excavation and installation require access to the site by a power auger or drill, a crane, and material trucks.

Structure holes left temporarily open or unguarded during construction would be covered and/or fenced where practical to protect the public, livestock, and wildlife. Soil removed from foundation holes would be stockpiled on the work area and replaced or disposed, in consultation with landowners.

3.2.6.5 Structure Framing and Assembly

Pole sections, pole framing, and associated hardware would be shipped to each laydown/materials yard site by truck. Structures may be assembled offsite and transported to the appropriate pole locations by truck or helicopter. Insulator strings and stringing sheaves are installed at each ground wire and conductor position while the pole is on the ground. Stringing sheaves (pulleys) are used to guide the conductor during the stringing process for attachment onto the insulator strings. The assembled pole would then be hoisted into place by a crane. Helicopter assisted construction may be utilized for portions of the line.

3.2.6.6 Conductor Installation

Once structures are in place, a pilot line would be pulled (strung) from structure to structure and threaded through the stringing sheaves on each insulator. A larger diameter, stronger line would then be attached to the pilot line and strung. This is called the pulling line. This process is repeated until the ground wire and conductor is pulled through all insulator sheaves.

Conductor would be strung using powered pulling equipment at one end and powered braking or tensioning equipment at the other end. For public protection during wire installation, guard structures would be erected over roadways, transmission and distribution lines, structures, and other obstacles. Guard structures would consist of H-frame poles temporarily placed on either side of an obstacle. These structures prevent ground wire, conductor, or equipment from falling on an obstacle. Equipment for erecting guard structures includes augers, line trucks, pole trailers, and cranes. Guard structures may not

be required for small roads where other safety measures such as barriers, flagmen, or other traffic control devices would be used. Impacts and protection measures pertaining to safety are included in Section 5.17 of Chapter 5.0.

Conductor splicing would be required at the end of a conductor spool or if a conductor is damaged during stringing. The work would occur on work areas for the poles or pulling tensioning sites.

3.2.6.7 Helicopter Use

Access is required to each transmission structure site for construction activities, and helicopters may be used to support construction activities on unique areas that limit vehicle access. Gen-Tie construction activities potentially facilitated by helicopters may include:

- Transport of equipment and materials to transmission structure sites.
- Transmission structure placement.
- Hardware installation.
- Wire and conductor stringing operations.

All helicopter operations would be coordinated with and approved by the Federal Aviation Administration (FAA).

3.2.6.8 Step-up Substations and Switchyard

Following survey and staking of the substation and switchyard site, erosion control measures would be installed, as necessary. Site access would be prepared, including installation of culverts in drainages, if needed, to install a gravel driveway. The substation and switchyard site would be graded and fenced. Concrete pads and footing for equipment would be installed. Aggregate would be spread throughout the fenced area. Equipment would be delivered to the site and generally stored inside the fenced area, although some materials may need to be stored on the property outside the fence due to size or safety considerations. Equipment such as circuit breakers, bus work, capacitors, and dead-ends would be assembled and installed. Transformers would be delivered to the site and installed. Substation control house and supervisory control and data acquisition equipment would be installed. Upon completion of construction activities, disturbed areas outside the fence would be restored and erosion control measures removed.

3.2.6.9 Construction Waste Disposal

Construction sites, laydown and material storage yards, and access roads would be kept in an orderly condition throughout the construction period. Refuse and trash would be removed from the sites and

disposed of in an approved manner, including recycling options. Oils and fuels would be hauled to an approved site for disposal. No open burning of construction trash would occur at any time.

3.2.6.10 Site Reclamation

Work sites would be reclaimed using excess materials, native or similar vegetation, and topsoil stockpiled for that purpose. The contractor would dispose of excess soil materials, rock, and other objectionable materials that cannot be used in reclamation work.

Disturbed areas, with the exception of access roads, would be reclaimed, to the extent possible, to their original contour and reseeded where appropriate. Ripping and other surface scarification on construction roads or other areas would be done as necessary. Depending on the amount of soil compaction and vegetation destruction, ripping may not be required for reclamation. This would be determined on a case-by-case basis. Discussion of impacts and protection measures for disturbance resulting from the Updated Corona Gen-Tie System to soils and flora and fauna are discussed in Sections 5.5 and 5.8 in Chapter 5.0.

3.2.6.11 Protection of Private Property and Environmental Resources

Existing improvements would be repaired or replaced if they are damaged by construction activities. All existing roads would be left in a condition generally equal to or better than their condition prior to the construction of the transmission line. Fences and gates would be installed or repaired and replaced (if they are damaged by construction activities) to their original conditions as required by the landowner.

Temporary gates would be installed only with the permission of the landowner and would be restored to original condition following construction unless otherwise agreed with the landowner. Gates would be closed and locked, depending on the agreement with the private landowners.

Prior to construction, all supervisory construction personnel would be instructed on the protection of ecological and cultural resources. To assist in this effort, the construction contract would address: (a) federal, state, and local laws regarding wetlands, vegetation, wildlife, and cultural resources; (b) the importance of these resources and the purpose and necessity of protecting them; and (c) methods for protecting sensitive resources.

All waste products, including food garbage, from construction sites would be deposited in a covered waste receptacle, or removed daily. Garbage would be hauled to a suitable and appropriately permitted disposal facility.

To reduce the number of sensitive features disturbed in designated areas, transmission poles would be sited during the engineering design process so as to avoid sensitive features such as, but not limited to, riparian areas and watercourses and/or to allow conductors to clearly span the features, within limits of standard pole design. A discussion of impacts and protection measures for the environmental resources present in the Updated Corona Gen-Tie System are included in Chapter 5.0.

3.2.7 Operation and Maintenance

Operation and maintenance (O&M) of the Corona Wind Projects is anticipated to include the following.

3.2.7.1 Operation

After the constructed Updated Corona Gen-Tie System has been energized, land uses compatible with safety regulations and activities associated with O&M would be permitted within and adjacent to the ROW. Existing land uses such as agriculture and grazing are generally permitted within the ROW. Incompatible land uses include construction of permanent dwellings and any use requiring changes in surface elevation that would affect NESC electrical clearances of existing or planned facilities.

Safety is a primary concern in the planning and design of the Updated Corona Gen-Tie System. An AC transmission line would be protected with power circuit breakers and related line relay protection equipment. If a conductor failure occurs, power would be automatically removed from the line. Lightning protection would be provided by overhead static and grounding wires along the length of the line. All fences, metal gates, pipelines, etc., that cross or are within the Updated Corona Gen-Tie System ROW would be grounded to prevent electrical shock and to meet NESC requirements. A discussion on impacts and protection measures regarding safety are included in Section 5.17 of Chapter 5.0.

3.2.7.2 Maintenance

Maintenance of the transmission line would be performed as needed. When access is required for non-emergency maintenance and repairs, the same precautions taken during construction activities would be implemented to the extent practicable. Landowners would be contacted when access to their lands is required for maintenance activities on transmission lines.

Emergency maintenance would involve prompt movement of crews to repair or replace any damage. Crews would be instructed to protect vegetation, wildlife, and other environmental resources to the extent possible. Reclamation procedures following completion of repair work would be similar to those prescribed for normal construction.

3.2.7.3 Traffic Safety

Minimal additional vehicular traffic would occur on public roads in the area as a result of transmission line construction and O&M of the transmission line. Because of the low number of vehicles accessing the transmission line, minimal impacts are anticipated. The transmission line would cross U.S. Highways 54 and 60 in Torrance County. County road use and crossings in Torrance County would also be required and would be coordinated with the New Mexico Department of Transportation (NMDOT) and the Torrance County Roads Maintenance Department. Final engineering design would determine specific road crossing requirements (see additional discussion in Section 5.20).

3.2.8 Decommissioning

Decommissioning of the Corona Wind Projects will involve removal of all wind facilities. Pattern Development will take appropriate measures to restore the development area to its pre-existing conditions. Pattern Development's removal and restoration efforts will generally involve:

- **Wind turbines (including towers and pad-mount transformers):** Wind turbines will be cleared, cleaned and removed from the Corona Wind Projects site. Any liquids, greases, etc. contained therein will also be removed safely from the site in accordance with then-existing laws and regulations.

- **Tower foundations and pad mount transformer foundations:** All foundations installed in the ground, the foundations will be cleared, cleaned and removed from the ground to at least four ft below the grade. Holes or cavities created in the ground, as a result of such removal, will be filled with topsoil of the same or similar type found at the site.

- **Overhead power and/or communication lines:** Overhead power and/or communication lines owned by Pattern Development and no longer in use will be cleaned and removed from the Corona Wind Projects site.

- **Substations:** Substations will be cleared, cleaned and removed from the Corona Wind Projects site and any liquids, greases, etc. contained in the substations will be removed safely from the site in accordance with then-existing laws and regulations.

- **Buried cables (power and/or communication):** All buried cables (power, fiber-optic, communication, etc.) installed in the ground will be cleared, cleaned at least three ft below the grade of the land affected. Pattern Development will ensure that any holes or cavities created in

the ground as a result of such removal are filled with topsoil of the same or similar type found at the Corona Wind Projects site.

- **O&M building**: Will be cleared, cleaned and removed from the Corona Wind Projects site. Pattern Development may request that the O&M building be assigned to a new owner.

- **Restoration of property:** To the extent reasonably practicable, the Corona Wind Projects site will be returned to pre-existing conditions. Pattern Development will ensure that any holes or cavities created in the ground are filled with topsoil of the same or similar type found at the Corona Wind Projects site and to the extent reasonably practicable, the surface is returned to the same condition as before the holes or cavities were dug.

4.0 AFFECTED ENVIRONMENT

4.1 Introduction

The affected environment is described below for the environmental values provided in NMSA 1978 Section 62-9-3.M, Commission Rule 17.9.592 NMAC, and additional resource areas identified to be of interest by Staff. These are: air resources; noise, geology and mineral resources; soil resources; paleontological resources; water resources; flora and fauna; cultural and historic archaeological resources; religious and cemetery sites; socioeconomics and environmental justice; communication signals; radioactive waste and radiation hazards; hazardous materials; safety; geographic resources; military activities and aviation; and roads. The discussion for each resource includes data sources used, current regional conditions, and conditions within the Extended Corona Gen-Tie System Corridor and the Reconfigured Corona Gen-Tie System Corridor as well as the Corona Wind Update. The Corona Wind Update is shown in Exhibit 2 alongside the Updated Corona Gen-Tie System Corridor. Final siting of transmission facilities will depend upon the results of SPP interconnection studies and other factors such as landowner preferences.

This section of the ER describes the existing conditions of certain relevant resources. The primary focus is on the resources potentially affected by an electric transmission line that will enable certain wind generation systems to connect to electric markets. This area of potentially affected resources is defined as the parcels of land within the 180-foot ROW of the transmission line and associated facilities, including areas of interconnection (substations) and access roads for maintenance or operation of the line, 1-mile buffer, and is called the Updated Corona Gen-Tie System Corridor. This area is shown in Exhibit 2. In an effort to provide additional context, this section also presents the existing conditions of resources that could potentially be affected by the wind generation systems.[3] This area of consideration is called the Corona Wind Update and is also shown in Exhibit 2.

4.2 Air Resources

4.2.1 Data Sources

The following data sources were reviewed to assess the existing air quality conditions of Torrance and Lincoln Counties; the Updated Corona Gen-Tie System Corridor; and the Corona Wind Update.

3 Note that, to the extent that resource avoidance (e.g., cultural, wetland resources) drives micro-siting outside of the transmission corridor, such changes would still remain within the Corona Wind Project Area.

- New Mexico Environmental Department. Air Quality Bureau, *Air Monitoring Network.* Accessed September 2019 from: https://www.env.nm.gov/air-quality/air-monitoring-network-2/.
- U.S. Environmental Protection Agency (EPA) in New Mexico. Accessed September 2019 from: https://www.epa.gov/nm.

4.2.2 Current Conditions and Trends, Regional Overview – Updated Corona Gen-Tie System Corridor

Air quality in Torrance County in which the Updated Corona Gen-Tie System Corridor is located is generally considered very good. For all criteria pollutants, the county is in attainment. New Mexico Environmental Department (NMED), Air Quality Bureau reports in Torrance County are in attainment of all national and state ambient air quality standards. The attainment status for Torrance County is reflective of low population density and land use dominated by agriculture. Torrance County is below national and New Mexico state averages reported to EPA (EPA, 2019a) for air quality index scores, levels of ozone, and levels of particulate matter (PM), all of which are indicative of good regional air quality above the national and state averages.

4.2.3 Current Conditions and Trends, Regional Overview – Corona Wind Update

No unique air quality conditions are known to occur in Lincoln County where the Corona Wind Update is located. Air quality conditions within the Corona Wind Update (Lincoln County) would be similar to what is described above for Torrance County based on low population density and land use in the areas.

4.3 Noise

4.3.1 Data Sources

The following data sources were reviewed to assess the existing noise conditions of Lincoln and Torrance Counties; the Updated Corona Gen-Tie System Corridor; and the Corona Wind Update.

- U.S. Census Bureau, *Quick Facts*. Accessed September 2019 from: https://www.census.gov/quickfacts/fact/table/US/PST045217.
- Lincoln County Comprehensive Plan. (August 2007). Sites Southwest LLC.
- Comprehensive Land Use Plan for Torrance County, New Mexico. (July 29, 2003).

4.3.2 Current Conditions and Trends, Regional Overview – Updated Corona Gen-Tie System Corridor

Lincoln and Torrance Counties are rural counties located in central New Mexico with population density below the state and national averages. The counties generally have relatively low ambient noise levels due to the rural setting. Noise in the Updated Corona Gen-Tie System Corridor typically ranges from very quiet with natural sounds and wind dominating to noisy in localized areas near towns, at highway crossings, and in agricultural areas during cultivation activities. Additional noise is also created by aircraft within the airspace.

4.3.3 Current Conditions and Trends, Regional Overview – Corona Wind Update

No unique noise is known to occur within the Corona Wind Update. Lincoln County is a rural county of central New Mexico with low population density and ambient noise. Noise within the Corona Wind Update would be similar to what is described above for the Updated Corona Gen-Tie System Corridor, based on low population density and land uses present in the area.

4.4 Geology and Mineral Resources

4.4.1 Data Sources

The following data sources were reviewed to assess geological and mineral resources of Lincoln, and Torrance Counties; the Updated Corona Gen-Tie System Corridor; and the Corona Wind Update.

- Broadhead, R.F. 1997. *Subsurface geology and oil and gas potential of the Estancia Basin, New Mexico*. New Mexico Bureau of Geology and Mineral Resources Bulletin 157, 54p. Socorro, New Mexico.
- *Preliminary Geotechnical Engineering Report Sunzia Wind Project*, New Mexico. (Barr Engineering Company. October 2017).
- *The Drillings*. 2019. Lincoln and Torrance Counties, New Mexico. Accessed September 2019 from https://thedrillings.com/usa/new-mexico/.

4.4.2 Current Conditions and Trends, Regional Overview – Updated Corona Gen-Tie System Corridor

The Corona Wind Projects are located on the west side of the Great Plains physiographic province. The signature geologic deposit of the Great Plains is the Ogallala Formation, and it has been largely eroded away in the area by the Pecos River. The resulting landscape is largely a piedmont – thin to non-existent

soil over a gently sloping bedrock surface. In places there are remnants of the Ogallala and younger river sediments. The bedrock itself is mostly Permian aged sedimentary rock that had been deposited in the ocean on a continental shelf. In the western and southern margins of the Corona Wind Project Area there are some highlands with cores of igneous intrusive rocks.

In general, a 2017 field investigation conducted by Barr Engineering Company encountered a thin layer of soil overlying the bedrock surface. In places there are remnants of the Ogallala Formation (contains varying proportions of sand, gravel, silt, clay, and caliche) and younger river sediments. The bedrock generally consists of sedimentary rock (sandstone, limestone, siltstone, and dolomite), however isolated areas of igneous bedrock (rhyolite) were encountered in the southern portion of the Corona Wind Project Area. In most cases a weathered bedrock unit was observed immediately below the cover soil, which was underlain by more competent rock (Exhibit 3). Karst features, including open voids, were encountered at one geotechnical boring location and documented with a borehole camera.

There are no identified hydrocarbon extraction activities within Option A and one gas well within the 1-mile corridor of Option B that is plugged along the Updated Corona Gen-Tie System. There are no mining activities within the Updated Corona Gen-Tie System Corridor. In Torrance County there are 2,469 exploration leases (The Drillings, 2019). Some of the exploration wells have located very deep oil and gas deposits in the Estancia Basin in the northern portion the Corona Wind Project Area (Broadhead, 1997); however, these deposits have yet to be exploited.

4.4.3 Current Conditions and Trends, Regional Overview – Corona Wind Update

Geological conditions for the Corona Wind Update are the same as previously described for the Updated Corona Gen-Tie System Corridor. In addition, closed topographic depressions or surficial karst features were observed near a number of locations across the Corona Wind Project Area, specifically in the northern and northeastern extents.

There are currently 3,192 oil/natural gas leases in Lincoln County on BLM administered lands (The Drillings, 2019). Most of these leases are to support exploration drilling projects for hydrocarbons; however, there are no major oil and natural gas basins in the county. There are currently no major exploration activities or oil wells within the Corona Wind Update (Exhibit 4).

Mining has always been important to the economies of these two counties, but due to many of the mineral deposits being limited or the extraction process too expensive, all mines within the Corona Wind Update have been shut down. Lincoln County has had 8,829 registered mines extracting iron, gold, silver, copper

and fluorine but only 188 of the mines are currently active (The Drillings, 2019). Torrance County has had 2,711 registered mines extracting iron, potassium, uranium, barium and silver and only 53 mines are currently active (The Drillings, 2019). It is to be noted that the areas around the abandoned mines may contain contaminated soils originating from extraction and processing activities (Exhibit 5).

4.5 Soil Resources

4.5.1 Data Sources

The following data source was reviewed to assess the existing soil resources of Lincoln and Torrance Counties; the Updated Corona Gen-Tie System Corridor; and the Corona Wind Update.

- U.S. Department of Agriculture (USDA) Soil Survey Geographic (SSURGO) Database for New Mexico (2019). Accessed September 2019 from: http://apps.cei.psu.edu/soiltool/.

4.5.2 Current Conditions and Trends, Regional Overview – Updated Corona Gen-Tie System Corridor

The soils at the site have low to moderate shrink-swell potential based on visual classification during logging and laboratory test results. The following Table **Error! Reference source not found.** summarizes the existing soil resources located within the Updated Corona Gen-Tie System Corridor for Option A and Option B. For a visual representation of the soil locations within the Updated Corona Gen-Tie System Corridor, refer to Exhibit 6. As the Updated Corona Gen-Tie System Corridor does not extend into Guadalupe or Lincoln Counties, the existing soil resources within these regions are not shown in the table below.

Table 4-1: Torrance County Soil Coverage Types

Soil Type	Acres (Option A)	Acres (Option B)
Chilton-La Fonda complex, 1 to 9 percent slopes	626	626
Clovis loam, 0 to 5 percent slopes	974	974
Clovis soils, 0 to 5 percent slopes, eroded	97	97
Clovis-Dean loams, 0 to 5 percent slopes	335	335
Dean loam, 1 to 9 percent slopes	3,002	3,002
Gravel pit	3	3
Harvey loam, 1 to 9 percent slopes	262	262
Harvey-Dean loams, 1 to 9 percent slopes	2.397	2,397
Ildefonso fine sandy loam, 0 to 5 percent slopes	1	1

Soil Type	Acres (Option A)	Acres (Option B)
Karde-Willard loams, saline	28	28
Kech gravelly loam, 1 to 9 percent slopes	254	254
Kim-Otero-Pastura complex	474	474
Kim-Pastura-Tapia loams	4,243	4,318
La Fonda loam, 1 to 9 percent slopes	1,333	1,333
La Fonda-Rock outcrop complex	2,314	2,314
Laporte-Rock outcrop complex	2331	233
Manzano loam, 0 to 1 percent slopes	195	195
Manzano loam, saline substratum, 0 to 1 percent slopes	86	86
Otero and Palma soils	524	570
Pastura loam, 1 to 9 percent slopes	691	647
Pastura loam, 9 to 25 percent slopes	33	33
Pedrick loamy fine sand	333	333
Penistaja fine sandy loam, 1 to 6 percent slopes	1,180	1,180
Penistaja-Dean fine sandy loams, 1 to 5 percent slopes	224	224
Pinon channery loam, 3 to 20 percent slopes	204	216
Playas	6	6
Prewitt and Manzano soils	414	414
Rance-Gypsum land complex	234	234
Rock land	488	488
Rock outcrop-Pinon-La Fonda complex	199	199
Steep rock land	267	267
Tapia and Dean soils, eroded	298	298
Tapia loam, 0 to 5 percent slopes	3,359	3,359
Tapia-Dean loams, 0 to 5 percent slopes	5,175	5,107
Willard loam, strongly saline	1,455	1,455

Source: SSURGO Database for New Mexico, 2019

4.5.3 Current Conditions and Trends, Regional Overview – Supplemental Corona Wind Update

Table 4-2 summarizes the existing soil resources located within the Corona Wind Update in Lincoln County. For a visual representation of the soil locations within the Corona Wind Update, refer to Exhibit 6.

Table 4-2: Lincoln County Soil Coverage Types

Soil Type	Acres
Penistaja-Travessilla association, gently sloping	5,662
Plack-Dioxice association, gently sloping	139
Plack-Penistaja association, gently sloping	1,835
Rock outcrop-Stroupe-Deama association, extremely steep	2,251
Sampson loam, 0 to 5 percent slopes	53
Tortugas-Asparas-Rock outcrop association, moderately sloping	72
Tortugas-Rock outcrop association, moderately sloping	1,725

Source: SSURGO Database for New Mexico, 2019

4.6 Paleontological Resources

4.6.1 Data Sources

The following data sources were reviewed to assess paleontological resources of Lincoln and Torrance Counties; the Updated Corona Gen-Tie System Corridor; and the Corona Wind Update.

- Anderson, O.J., Jones, G.E., and Green, G.N. 1997. *Geological map of New Mexico: U.S. Geological Survey (USGS) Open-file Report 97-52*. Accessed September 2019 from: http://pubs.er.usgs.gov/publications/ofr9752.
- Paleobio database. Accessed September 2019 from: https://paleobiodb.org/#/.

4.6.2 Current Conditions and Trends, Regional Overview – Updated Corona Gen-Tie System Corridor

No formal paleontological work has been completed in the Updated Corona Gen-Tie System Corridor. The geology in the area consists of Permian deposits of the Yeso Formation, the Tertiary Ogallala Formation, and several deposits of the Quaternary Period including piedmont alluvium, aeolian deposits, and lacustrine/playa lake deposits, all unconsolidated. The Yeso formation was deposited during the Permian Period (298.9 – 252.17 my). Since that period, the original deposits of sandstone and limestone have metamorphosed into dolomite and other types of rocks that are called *textually mature*; fossils have not survived that metamorphosis. The only fossils that are recovered from the Permian are either in very fine silts or in now-coal formations; neither of which are found in this area of New Mexico. The Ogallala Formation consists of alluvial and aeolian deposits, and petrocalcic soils. This formation has been known to contain scattered megafaunal fossils. The alluvial deposits consist of sand and gravels that were deposited during the Lower Pleistocene into the Holocene. These deposits have been known to contain

megafaunal finds, but they are rare. Any discoveries which may occur during construction would be managed through an Unanticipated Discovery Protocol (UDP).

4.6.3 Current Conditions and Trends, Regional Overview – Supplemental Corona Wind Update

The potential for paleontological resources in the Corona Wind Update is similar to that of the Updated Corona Gen-Tie System Corridor; however, the south-central area of Corona Wind Projects crosses the Mancos Shale and Chinle Formation exposures in Lincoln County. The Mancos Shale is known to contain marine invertebrate and shark fossils, while the Chinle Formation in other areas of New Mexico is known to contain dinosaur fossils; local deposits in the Chinle Formation are known to contain large amounts of silicified wood (Lucas, 1993).

4.7 Water Resources

4.7.1 Data Sources

The following data sources were reviewed to assess the existing water resources of Lincoln and Torrance Counties; the Updated Corona Gen-Tie System Corridor; and the Corona Wind Update.

- 2011 National Land Cover Database (NLCD). Homer, C.G., Dewitz, J.A., Yang, L., Jin, S., Danielson, P., Xian, G., Coulston, J., Herold, N.D., Wickham, J.D., and Megown, K., 2015, *Completion of the 2011 National Land Cover Database for the conterminous United States-Representing a decade of land cover change information. Photogrammetric Engineering and Remote Sensing*, v. 81, no. 5, p. 345-354
- Anderson, O.J., Jones, G.E., and Green, G.N. 1997. *Geological map of New Mexico: USGS Open-file Report 97-52*. Accessed September 2019 from: http://pubs.er.usgs.gov/publications/ofr9752.
- EPA in New Mexico. Accessed September 2019 from: https://www.epa.gov/nm.
- EPA. Ecoregions. Accessed September 2019 from: https://www.epa.gov/eco-research/ecoregions.
- Playa Lakes Joint Venture (PLJV). 2019. Maps of Probable Playas, Roosevelt, New Mexico. Accessed September 2019 from: http://pljv.org/for-habitat-partners/maps-and-data/interactive-playa-map/.
- Federal Emergency Management Agency (FEMA) *Flood Map Service Center*. Accessed September 2019 from: https://msc.fema.gov/portal/search.

- U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) Data Mapper (USFWS, 2019a). Accessed September 2019 from: https://www.fws.gov/wetlands/data/mapper.html.
- USGS National Hydrography Dataset (NHD) (USGS, 2019b). Accessed September 2019 from: https://nhd.usgs.gov/tools.html.

4.7.2 Current Conditions and Trends, Regional Overview – Updated Corona Gen-Tie System Corridor

The Updated Corona Gen-Tie System Corridor occurs mostly within the Southwestern Tablelands Level III Ecoregion (EPA, 2019b) and more specifically within Central New Mexico Plains, Pinyon-Juniper Woodlands and Savannahs, and Pluvial Lake Basins ecoregions containing short-grass prairie and pinyon-juniper woodland plant communities. Common vegetation of the Southwestern Tablelands includes grama grasses (*Bouteloua gracilis*), buffalo grass (*B. dactyloides*), piñon pine (*Pinus spp*), junipers (*Juniperus spp*), and scrub oak (*Quercus gambelii*).

A review of the 2011 NLCD (NLCD, 2011; Homer et al., 2015) identified two major cover types in the Updated Corona Gen-Tie System Corridor (Option A): Grassland/Herbaceous 66 percent and Shrub/Scrub 33 percent, and 65 percent and 34 percent respectively for Option B of the Updated Corona Gen-Tie System Corridor. Table 4-3 below summarizes the NLCD cover types in the Updated Corona Gen-Tie System Corridor for Options A and B.

The Updated Corona Gen-Tie System Corridor is situated in various watersheds throughout the area of development (Exhibit 7). Specifically, development would occur within the Camaleon Draw (HUC 1306000302), Town of Cedarvale (HUC 1305000202), City of Encino (HUC 1305000201), Pueblo Blanca Canyon (HUC 1305000107), Cola de Gallo Arroyo (HUC 1306000602). Surface water features in the vicinity of the Updated Corona Gen-Tie System Corridor include intermittent drainages and stream channels, and ponds.

Table 4-3: National Land Cover Database Type Updated Corona Gen-Tie System Corridor Acreage

Land Cover	Acres (Option A)	Acres (Option B)	Percent
Barren Land	<1	<1	<1%
Developed, High Intensity	<1	<1	<1%
Developed, Low Intensity	5	5	<1%
Developed, Medium Intensity	<1	<1	<1%

Land Cover	Acres (Option A)	Acres (Option B)	Percent
Developed, Open Space	218	218	1%
Emergent Herbaceous Wetlands	4	4	<1%
Evergreen Forest	45	45	<1%
Grasslands/Herbaceous	21,200	20,773	66% (65% Option B)
Shrub/Scrub	10,442	10,892	33% (34% Option B)
Open Water	2	2	<1%
Total	**31,918[a]**	**31,942[a]**	**100%[a]**

Source: 2011NLCD, 2017
(a) Acreages and percentages are rounded up to the next whole number.

Wetlands, floodplains, and streams were inventoried for the Updated Corona Gen-Tie System Corridor. The NWI data documented 188 acres of wetlands within Option A and 184 acres of wetlands for Option B within the Updated Corona Gen-Tie System Corridor (see **Error! Reference source not found.**). The NWI identified wetlands included three wetland types: freshwater emergent wetland, freshwater pond, and riverine for both Option A and B (Exhibit 8). According to the NWI data, Option A of the Updated Corona Gen-Tie System Corridor has approximately 59-miles of mostly unnamed intermittent stream features and Option B has 58 miles of unnamed intermittent stream features (data from NHD). There are no ephemeral or perennial streams, and approximately 1 mile of artificial paths and connectors present in Options A and B. Of the NWI identified wetland areas, there are more than 37 wetlands that appear to be potentially jurisdictional.

Table 4-4: Updated Corona Gen-Tie System Corridor Wetland Table Based on the U.S. Fish and Wildlife Service National Wetland Inventory Data

Wetland Type	Sum of Acres (Option A)	Sum of Acres (Option B)	Percentage
Freshwater Emergent Wetland	36	36	19%
Freshwater Pond	9	8	<1%
Riverine	143	140	76%
Total	**188[a]**	**184[a]**	**100%[a]**

Source: USFWS, 2019
(a) Acreages and percentages are rounded up to the next whole number.

The Updated Corona Gen-Tie System Corridor is part of the Southeastern Plains which slope gradually eastward and southeastward. This part of these eastern plains lies within the Pecos River and flows

southward through the Southeastern Plains into Texas, and then southeastward to join the Rio Grande. Summer rains fall almost entirely during brief, but frequently intense thunderstorms. July and August are the rainiest months over most of the State, with 30 to 40 percent of the year's total moisture falling at that time. During the warmest six months of the year, May through October, total precipitation averages 80 percent of the annual total.

General floods are seldom widespread in New Mexico. Heavy summer thunderstorms may bring several inches of rain to small areas in a short time. Because of the rough terrain and sparse vegetation in many areas, runoffs from these storms frequently cause local flash floods. Normally dry arroyos may overflow their banks for several hours, halting traffic where water crosses highways; damaging bridges, culverts, and roadways; and if in an urban area, possible causing considerable property damage. Snowmelt during April to June, especially in combination with a warm rain, and heavy general rains during August to October may occasionally cause flooding of the larger rivers.

Playa lakes are shallow, clay-lined ephemeral rainwater basins occurring throughout the Great Plains ecoregion. There are estimated to be over 4,000 playa lakes in eastern New Mexico, none of which occur within the Updated Corona Gen-Tie System Corridor or Corona Wind Update (PLJV, 2019). Approximately 229 acres of known FEMA mapped floodplain fall within the Updated Corona Gen-Tie System Corridor (Option A and Option B). Approximately 19,737 acres (Option A) and 19,758 acres (Option B) of the Updated Corona Gen-Tie System Corridor are unmapped FEMA areas (FEMA, 2019) (Exhibit 9).

4.7.3 Current Conditions and Trends, Regional Overview – Supplemental Corona Wind Update

The Corona Wind Update includes the water resource features generally similar to those described above for the Updated Corona Gen-Tie System Corridor. The Corona Wind Update is situated in various watersheds throughout the area of development (Exhibit 7). Specifically, development would occur within the Headwaters Gallo Arroyo watershed (HUC 1306000603), and Cola de Gallo Arroyo watershed (HUC 1306000602), which are tributaries of the Pecos River (EPA, 2019). The Corona Wind Update has approximately 54 acres of NWI wetlands, approximately 22 miles of mostly unnamed intermittent streams, less than 0.5 mile of artificial paths, and approximately 11,736 acres of mapped floodplain FEMA. Table 4-5 below indicates the various wetland types within the Corona Wind Update.

Table 4-5: Corona Wind Update Wetland Table Based on the U.S. Fish and Wildlife Service National Wetland Inventory Data

Wetland Type	Sum of Acres	Percentage
Freshwater Emergent Wetland	<1	<1%
Freshwater Pond	2.26	<1%
Riverine	52	96%
Total	**54**[a]	**100%**[a]

Source: USFWS, 2019
(a) Acreages and percentages are rounded up to the next whole number.

A review of the 2011 NLCD (NLCD, 2011; Homer et al., 2015) identified three major cover types in the Corona Wind Update: Shrub/Scrub 94 percent, Grassland/Herbaceous 2 percent and Evergreen Forest 4 percent. Table 4-3 below summarizes the NLCD cover types in the Corona Wind Update.

Table 4-6: National Land Cover Data Summary for the Corona Wind Update

Land Cover	Acres	Percent
Evergreen Forest	483	4%
Grasslands/Herbaceous	231	2%
Shrub/Scrub	11,020	94%
Total	**11,734**[a]	**100%**[a]

Source: 2011 NLCD, 2017
(a) Figures and percentages are rounded up to the next whole number.

4.8 Flora and Fauna

4.8.1 Data Sources

The following data sources (based on the 2017 WEST reports) were reviewed to assess the existing biological resources of Lincoln and Torrance Counties; the Updated Corona Gen-Tie System Corridor; and the Corona Wind Update.

- 2011 NLCD Data Downloads. Accessed September 2019 from: https://www.mrlc.gov/nlcd2011.php.
- *Critical Issues Analysis for the Proposed Ancho Wind Project* (Report, WEST, Inc., March 2017a).
- *Critical Issues Analysis for the Proposed Cowboy Mesa Wind Project* (Report, WEST, Inc., March 2017b).
- *Critical Issues Analysis for the Proposed Viento Loco Wind Project* (Report, WEST, Inc., March 2017c).

- eBird, an online database of bird distribution and abundance. Accessed September 2019 from: https://ebird.org/.
- New Mexico Crucial Habitat Assessment Tool (NM CHAT). Accessed September 2019 from: http://nmchat.org/data.html.
- NMDGF Biota Information System (BISON-M). Accessed September 2019 from: http://www.wildlife.state.nm.us/conservation/wildlife-species-information/threatened-andendangered-species/.
- PLJV Maps of Probable Playas Accessed September 2019 from: https://pljv.org/for-habitat-partners/maps-and-data/maps-of-probable-playas/.
- *Raptor Nest Survey, Pattern Wind Energy Project* (Report, WEST, Inc., August 2017d).
- *Site Characterization Study, Pattern Wind Energy Project* (Report, WEST, Inc., August 2017e).
- Southern Great Plains Crucial Habitat Assessment Tool (SGP CHAT). Accessed September 2019 from: https://kars.ku.edu/geodata/maps/sgpchat/.
- The National Audubon Society (Audubon) Important Bird Areas (IBA) Accessed September 2019 from: http://www.audubon.org/important-bird-areas.
- USFWS Environmental Conservation Online System Species Profiles (USFWS, 2019b). Accessed September 2019 from: https://www.fws.gov/southeast/conservation-tools/environmental-conservation-online-system/.
- USFWS Information forPlanning and Consultation (IPaC) (USFWS, 2019c). Accessed September 2019 from: https://ecos.fws.gov/ipac/.
- USGS Gap Analysis Program (GAP) Protected Areas of the U.S. database (USGS, 2019a). Accessed September 2019 from: https://gapanalysis.usgs.gov/padus/.
- USGS NHD. (USGS, 2019b) Accessed September 2019 from: https://nhd.usgs.gov/tools.html.
- *Waters of the U.S. and Biological Resources Assessment for 10 Proposed Wind Turbine Locations and Access Roads at the Ancho Wind Project*, Lincoln County, New Mexico (Report, Blanton & Associates, Inc., 2017a).
- *Waters of the U.S. and Biological Resources Assessment for 11 Proposed Wind Turbine Locations and Access Roads at the Viento Loco Wind Project*, Torrance County, New Mexico (Report, Blanton & Associates, Inc., 2017b).
- *Waters of the U.S. and Biological Resources Assessment for 15 Proposed Wind Turbine Locations and Access Roads at the Duran Mesa Wind Project*, Torrance County, New Mexico (Report, Blanton & Associates, Inc., 2017c).

- *Waters of the U.S. and Biological Resources Assessment for 16 Proposed Wind Turbine Locations and Access Roads at the Tecolote Wind Project*, Torrance County, New Mexico (Report, Blanton & Associates, Inc., 2017d).
- *Waters of the U.S. and Biological Resources Assessment for 21 Proposed Wind Turbine Locations and Access Roads at the Red Cloud Wind Project*, Torrance County, New Mexico (Report, Blanton & Associates, Inc., 2017e).
- Western Bat Working Group. Accessed September 2019 from: wbwg.org/matrices/species-matrix/.
- Bat Conservation International (BCI). Accessed September 2019 from: http://www.batcon.org/our-work/regions/usa-canada/wind2.
- USFWS NWI Data Mapper. Accessed September 2019 from: https://www.fws.gov/wetlands/data/mapper.html.

4.8.2 Current Conditions and Trends, Regional Overview – Updated Corona Gen-Tie System Corridor

The NM CHAT is a habitat classification system for crucial habitat using a relative, six-level prioritization scheme, where 1 represents areas most crucial and 6 represents areas least crucial. The NM CHAT identified none of the overall area of development (Updated Corona Gen-Tie System Corridor) as Rank 1 for Wildlife Corridors for the cougar (*Puma concolor*), which are defined as areas that link core habitats for sustaining populations across landscapes (NM CHAT, 2019). These crucial habitat areas are located to the west and northwest of the Updated Corona Gen-Tie System Corridor; no crucial cougar wildlife corridors fall within the Updated Corona Gen-Tie System Corridor. Approximately 95 percent of the overall area was either Rank 3 or Rank 4, which is defined as areas that may provide high-priority wildlife corridors, mid-level priority wetland/riparian habitat, or mid-level habitat for species of concern.

The likelihood of a special-status animal or plant species that may occur was determined by considering the species' range, habitat suitability, species' mobility, population size, and records of occurrence within or adjacent to the Updated Corona Gen-Tie System Corridor. Based on these factors, the likelihood of occurrence was defined for each special-status species using the following categories:

- **None** – outside the species known range, no suitable habitat within the Updated Corona Gen-Tie System Corridor, restricted mobility and small population size;
- **Not likely** – outside the species known range and suitable habitat appears absent within the Updated Corona Gen-Tie System Corridor; however, due to the species mobility and population

size, species may occur within the Updated Corona Gen-Tie System Corridor during migration or other times of the year;

- **Possible** – is located within the range of the species but contains marginal suitable habitat; species highly mobile and may occur year-round;
- **Likely** – is located within the range of the species and contains suitable habitat; records of species occurrence in the surrounding area but no records from the Updated Corona Gen-Tie System Corridor; and
- **Occurs** – records of species occurrence within the Updated Corona Gen-Tie System Corridor based on USFWS/WDFW data or other survey data.

Brief species accounts are written for special-status and other protected species whose likelihood of occurrence was either possible, likely, or occurs.

4.8.2.1 Federally Listed Species

One animal species that is federally listed under the Endangered Species Act (ESA) may potentially occur in the Updated Corona Gen-Tie System Corridor (USFWS, 2019b). The Mexican spotted owl (*Strix occidentalis lucida*) is listed as federally threatened (Table 4-7). The other listed species, yellow-billed cuckoo (*Coccyzus americanus*) is considered unlikely to be impacted due to their specific habitat not occurring within the updated transmission line area.

Table 4-7: Federally Listed Species in the Updated Corona Gen-Tie System Corridor

Common Name	Scientific Name	Federal Status[a]	Likelihood of Occurrence
Birds			
Mexican spotted owl	*Strix occidentalis lucida*	T	**Possible.** Project is located with the elevational and ecological range for the owl. Designated critical habitat for the owl is approximately 40 miles west of the Project. Evergreen forest within the Project may provide suitable nesting or wintering habitat.
yellow-billed cuckoo (western population)	*Coccyzus americanus*	T	**Not likely.** Project is not likely to include riparian, wetlands, riverine, lacustrine, or otherwise suitable habitat. There is at least some potential for the species to migrate through the area.

Source: USFWS, 2019b
(a) T=Threatened

4.8.2.2 State-listed Species

State-listed endangered or threatened wildlife species are identified for Torrance County in which the Updated Corona Gen-Tie System Corridor is located (NMDGF, 2019), as shown in Table 4-8. These species include four birds: southwestern willow flycatcher, bald eagle (*Haliaeetus leucocephallus*), Baird's sparrow (*Ammodramus bairdii*), and peregrine falcon (*Falco peregrinus* and Arctic subspecies *F. p. tundrius*).

Table 4-8: State Listed Wildlife Species

Common Name	Scientific Name	State Status[a]	Likelihood of Occurrence
Birds			
bald eagle	*Haliaeetus leucocephallus*	T	**Likely.** Species likely to occur within the Project as occasional winter visitor.
peregrine falcon	*Falco peregrinus*	T	**Likely.** Peregrine likely to occur in Project as occasional year-round resident and migrant.
Baird's sparrow	*Ammodramus bairdii*	T	**Possible.** Species may occur in the Project during migration; Project is outside species' breeding range.
southwestern willow flycatcher	*Empidonax traillii extimus*	E	**Not Likely.** Project does not appear to contain suitable riparian breeding habitat; some potential for species to migrate through Project.

Source: NMDGF, 2019
(a) E=Endangered, T=Threatened

4.8.2.3 Bats

Potentially 31 bat species in New Mexico have ranges in the vicinity of and overlapping the Updated Corona Gen-Tie System Corridor and Corona Wind Update (Western Bat Working Group, 2017). BCI states that at least 24 species of bats have been reported as killed by wind turbines, however, they do not provide a species-specific list (2019). BCI does specifically identify the hoary bat (*Lasiurus cinereus*), eastern red bat (*Lasiurus borealis*), and silver bat (*Lasiurus noctivagans*), and all migratory tree dwelling bats as accounting for nearly 78 percent of fatalities north of Mexico. None of those species are federally protected.

Potential roosting habitat within the Updated Corona Gen-Tie System Corridor and Corona Wind Update is found primarily in the form of trees and man-made structures; however, these habitats are limited in the Updated Corona Gen-Tie System Corridor and Corona Wind Update. No known bat colonies were identified as occurring in the Updated Corona Gen-Tie System Corridor and Corona Wind Update.

Bats generally forage over water and other open spaces, such as agricultural fields, grasslands, streams, and wetlands/ponds. Insects often concentrate over wet areas associated with wetlands and streams, which may in turn concentrate foraging bats. Within the Updated Corona Gen-Tie System Corridor and Corona Wind Update, bat use is likely to be greater in areas around ponds and other water sources within the Updated Corona Gen-Tie System Corridor and Corona Wind Update when these areas have some available water, as bats would likely concentrate around these features to forage and drink. Although bats may also forage throughout the drier grasslands and shrublands within the Updated Corona Gen-Tie System Corridor and Corona Wind Update, they are likely to do so at much lower densities.

4.8.2.4 Birds

Passerines, raptors, waterfowl, and waterbirds likely migrate through the Updated Corona Gen-Tie System Corridor. Grassland and cropland provide stopover habitat during migration or during post breeding dispersal and may attract a broad suite of birds. Waterfowl and waterbirds (including shorebirds) would primarily be attracted to the small emergent wetlands and open water as stopover habitat during migration, these resources comprise less than 1 percent of the Updated Corona Gen-Tie System Corridor.

The Baird's sparrow is a state-threatened grassland bird species that breeds in the tall grasses of the northern Great Plains and winters in northern Mexico and the southern-most areas of Arizona and New Mexico. While the Updated Corona Gen-Tie System Corridor is outside of the breeding range of the species, it does fall within the migratory pathway of Baird's sparrow and there is at least some potential for the species to occur within the Updated Corona Gen-Tie System Corridor area during migration.

4.8.2.4.1 Bald Eagle

Bald eagles are state listed as threatened and protected under the Bald and Golden Eagle Protection Act (BGEPA). Bald eagles are known to occur in New Mexico year-round, with larger densities during both spring and fall migration, and during the winter (eBird, 2019). Bald eagles are uncommon breeders in New Mexico, with no more than nine known breeding sites documented in New Mexico since the 1980s (NMDGF, 2012). In New Mexico, bald eagle nests are placed in large cottonwoods or ponderosa pines, typically in the vicinity of water and often also in close proximity to concentrations of small mammals such as prairie dogs (NMDGF, 2012), none of which exist in the Updated Corona Gen-Tie System Corridor. The nearest bald eagle observation was over 50-miles northwest of the Corona Wind Projects in October 2018 (eBird, 2019). Bald eagles are also regularly seen along the Rio Grande River, which is approximately 60 miles east of the area where the Corona Wind Projects will be developed (eBird 2019; WEST, 2017b). Additionally, no prairie dog towns or other areas that might provide foraging opportunities occur in the immediate vicinity of the Corona Wind Projects (WEST, 2017b). Potential bald

eagle occurrence within the Corona Wind Update and Updated Corona Gen-Tie System Corridor would be infrequent, due to the lack of large trees for perching and lack of optimal foraging habitat. However, bald eagles may occur occasionally as migrants or transient wintering birds, and grasslands and ponds in the Updated Corona Gen-Tie System Corridor and Corona Wind Update may attract foraging bald eagles.

4.8.2.4.2 Raptors

Based on raptor distribution maps, 15 species of diurnal raptors, 9 owl species, and 1 vulture species may occur within or near the Updated Corona Gen-Tie System Corridor and Corona Wind Update. The Updated Corona Gen-Tie System Corridor contains limited breeding habitat for most raptors because it lacks much mature forested area, which is preferred breeding habitat for many tree-nesting raptor species. Tree-nesting species would resort to nesting in man-made structures in open herbaceous areas that encompass the Updated Corona Gen-Tie System Corridor. Additionally, there are few topographic features such as ridges and large bodies of water present that would attract migrating raptors. The Updated Corona Gen-Tie System Corridor contains foraging habitat for many grassland- and wetland-associated species. Raptors could use open fields and small bodies of water where prey are present for hunting in the Updated Corona Gen-Tie System Corridor.

Two state-listed threatened species, the bald eagle and peregrine falcon, have potential to occur in the Updated Corona Gen-Tie System Corridor. As discussed in Section 4.8.4.2.1 above, bald eagle habitat is lacking, but bald eagles may occur occasionally as migrants or transient wintering birds. The peregrine falcon is one of the largest falcons in North America. Peregrine falcons are associated with habitats from sea level to 13,000 ft (4,000 meters [m]), including plains, grasslands, shrublands, forests, and deserts (WEST, 2017a). Peregrine falcons show little preference for specific ecological communities, but their hunting behavior makes them most adapted to open or partially wooded habitats (WEST, 2017a). In New Mexico, the species may nest in cliffs and hunt in a variety of woodland, grassland, and shrub/scrub habitats. The Clines Corners Gen-Tie System Corridor and Wind Farm, north of the Corona Wind Projects, appears to contain suitable foraging habitat and cliffs within the surrounding area provide potential nesting habitat. There is potential for peregrine falcons to occur within the Clines Corners Gen-Tie System Corridor and Wind Farm any time of year.

4.8.3 Current Conditions and Trends, Regional Overview – Corona Wind Update

The NM CHAT is a habitat classification system for crucial habitat using a relative, six-level prioritization scheme, where 1 represents areas most crucial and 6 represents areas least crucial. The NM CHAT identified one of the overall areas of development (Corona Wind Update) as Rank 1 for Wildlife

Corridors for the cougar, which are defined as areas that link core habitats for sustaining populations across landscapes (NM CHAT, 2019). These crucial habitat areas are located to the west and southwest of the Corona Wind Update; no crucial cougar wildlife corridors fall within the Corona Wind Update. Approximately 92 percent of the overall area was either Rank 3 or Rank 4, which is defined as areas that may provide high-priority wildlife corridors, mid-level priority wetland/riparian habitat, or mid-level habitat for species of concern.

4.8.3.1 Federally Listed Species

The Corona Wind Update includes six animals and one plant species that are either federally listed or candidate species (four birds, two mammals, and one plant) from those noted in this section. The Corona Wind Update includes the yellow-billed cuckoo, Mexican spotted owl, southwestern willow flycatcher (*Empidonax traillii extimus*), northern aplomado falcon (*Falco femoralis septentrionalis*), New Mexico meadow jumping mouse (*Zapus hudsonius luteus*), Peñasco least chipmunk (*Tamias minimus atristriatus*), and Kuenzler hedgehog cactus (*Echinocereus fendleri var. kuenzleri*) based on the IPaC report (USFWS, 2019c). There is a possibility for the Mexican spotted owl, northern aplomado falcon and Kuenzler hedgehog cactus to occur within the Corona Wind Update; the yellow-billed cuckoo, southwestern willow flycatcher, New Mexico meadow jumping mouse, and Peñasco least chipmunk are considered unlikely to be present due to the lack of suitable habitat (Table 4-9).

Table 4-9: Federally Listed Species in the Corona Wind Update

Common Name	Scientific Name	Federal Status*	Likelihood of Occurrence
Birds			
yellow-billed cuckoo (western population)	*Coccyzus americanus*	T	**Not likely.** Project is not likely to include riparian, wetlands, riverine, lacustrine, or otherwise suitable habitat. There is at least some potential for the species to migrate through the area.
Mexican spotted owl	*Strix occidentalis lucida*	T	**Possible.** Project is located with the elevational and ecological range for the owl. Designated critical habitat for the owl is approximately 30 miles from the southern end of the Project. Evergreen forest within the Project may provide suitable nesting or wintering habitat.
southwestern willow flycatcher	*Empidonax traillii extimus*	E	**Not likely.** Project is not likely to include dense riparian, riverine, lacustrine, or otherwise suitable habitat; however, this species may migrate through the region.
northern aplomado falcon	*Falco femoralis septentrionalis*	EXPN	**Possible.** This species forages in open terrain with scattered shrubs, which is likely present in portions of the Project area.
Mammals			
New Mexico meadow	*Zapus hudsonius luteus*	E	**Not likely.** Project is not likely to include dense riparian, riverine, lacustrine, or otherwise suitable habitat.

Common Name	Scientific Name	Federal Status*	Likelihood of Occurrence
jumping mouse			
Peñasco least chipmunk	*Tamias minimus atristriatus*	C	**Not likely.** The Project is not located within the known range of the subspecies.
Plants			
Kuenzler hedgehog cactus	*Echinocereus fendleri var. kuenzleri*	E	**Possible.** Updated Corona Gen-Tie System Corridor is likely to include suitable habitat.

Source: USFWS, 2019b
(a) E=Endangered, T=Threatened, C=Candidate

4.8.3.2 State-listed Species

State-listed endangered or threatened wildlife species in Lincoln County in which the Corona Wind Update is located (NMDGF, 2019) are shown in Table 4-10. These species include eight birds: broad-billed hummingbird (*Cynanthus latirostris*), brown pelican (*Pelecanus occidentalis*), southwestern willow flycatcher, bald eagle, Baird's sparrow, peregrine falcon, common black hawk (*Buteogallus anthracinus*), and gray vireo (*Vireo vicinior*). Two mammals are listed: Oscura Mountains Colorado chipmunk (*Tamis quadrivittatus oscutaensis*) and Peñasco least chipmunk (*Tamias minimus atristriatus*). One fish species is listed: White Sands pupfish (*Cyprinodon tularosa*).

Table 4-10: State Listed Wildlife Species in the Corona Wind Update

Common Name	Scientific Name	State Status[a]	Likelihood of Occurrence
Birds			
brown pelican	*Pelecanus occidentalis*	E	**Not Likely**. Species primarily inhabits marine areas and is a rare visitor to New Mexico. Project does not contain large water bodies or major rivers that may attract the species.
common black hawk	*Buteogallus anthracinus*	T	**Not Likely.** Project is not likely to contain suitable riparian woodland habitat.
bald eagle	*Haliaeetus leucocephallus*	T	**Likely.** Species likely to occur within the Project as occasional winter visitor.
peregrine falcon	*Falco peregrinus*	T	**Likely.** Peregrine likely to occur in Project as occasional year-round resident and migrant.
broad-billed hummingbird	*Cynanthus latirostris*	T	**Not Likely.** Project does not appear to contain suitable riparian woodland habitat; only a single observation known from Lincoln County.
gray vireo	*Vireo vicinior*	T	**Possible.** Species may occur in the Project as summer resident or migrant.

Common Name	Scientific Name	State Status[a]	Likelihood of Occurrence
Baird's sparrow	*Ammodramus bairdii*	T	**Possible.** Species may occur in the Project during migration; Project is outside species' breeding range.
southwestern willow flycatcher	*Empidonax traillii extimus*	E	**Not Likely.** Project does not appear to contain suitable riparian breeding habitat; some potential for species to migrate through Project.
Mammals			
Oscura Mountains Colorado chipmunk	*Tamis quadrivittatus oscutaensis*	T	**Not Likely.** Project is outside of known range for this species (Oscura Mountains)
Peñasco least chipmunk	*Tamias minimus atristriatus*	E	**Not Likely.** Project is outside the known range of this species (Sacramento Mountains)
Fish			
White Sands pupfish	*Cyprinodon tularosa*	T	**Not Likely.** Project is outside of species' known range.

Source: NMDGF, 2019
(a) E=Endangered, T=Threatened

4.8.3.3 Bats

As indicated in Section 4.8.2.3 above, potentially 31 bat species in New Mexico have ranges in the vicinity of and overlapping the Updated Corona Gen-Tie System Corridor and Corona Wind Update (Western Bat Working Group, 2017). BCI states that at least 24 species of bats have been reported as killed by wind turbines, however, they do not provide a species-specific list (2019). BCI does specifically identify the hoary bat, eastern red bat, and silver bat, and all migratory tree dwelling bats as accounting for nearly 78 percent of fatalities north of Mexico. None of those species are federally protected.

4.8.3.4 Birds

Similar to the Updated Corona Gen-Tie System Corridor, passerines, raptors, waterfowl, and waterbirds likely migrate through the Corona Wind Update. When full, the complex of small ponds throughout the Corona Wind Update may attract migrating waterfowl, waterbirds, and raptors (PLJV, 2019). Harvested crops are rare in the Corona Wind Update. Breeding Bird Survey routes near the Corona Wind Projects are shown on Exhibit 10.

4.8.3.4.1 Bald Eagle

Similar to the Updated Corona Gen-Tie System Corridor, documented bald eagle nests are typically in areas with major rivers supporting high fish populations and with mature trees (NMDGF, 2012), none of

which exist in the Corona Wind Update. The nearest bald eagle observation was over 50-miles northwest of the Corona Wind Projects in October 2018 (eBird, 2019). Potential bald eagle occurrence within the Corona Wind Update and Updated Corona Gen-Tie System Corridor would be infrequent, due to the lack of large trees for perching and lack of optimal foraging habitat. However, bald eagles may occur occasionally as migrants or transient wintering birds, and grasslands and ponds in the Corona Wind Update and Updated Corona Gen-Tie System Corridor may attract foraging bald eagles.

4.8.3.4.2 Raptors

Based on raptor distribution maps, 15 species of diurnal raptors, 9 owl species, and 1 vulture species may occur within or near the Corona Wind Update and Updated Corona Gen-Tie System Corridor. Of these 25 species, 17 have the potential to breed in the Corona Wind Project Area, based on potential breeding habitat and reports of their presence in the area during the breeding season (eBird, 2019). Two state-listed raptor species potentially occur in or near the Corona Wind Update: the bald eagle and peregrine falcon (NMDGF, 2012). All raptor species are protected under the Migratory Bird Treaty Act (MBTA) (1918), and both bald and golden eagles are protected under the BGEPA (1940).

The Corona Wind Update contains limited breeding habitat for most raptors. The Corona Wind Update lacks much mature forested area, which is preferred breeding habitat for many tree-nesting raptor species. Breeding by tree-nesting species in the open herbaceous areas typically would be limited to manmade structures, such as power poles, livestock windmills, barns, and other infrastructure, or isolated trees associated with these structures. The Corona Wind Update and Updated Corona Gen-Tie System Corridor contain foraging habitat for many grassland- and wetland-associated species. While no large reservoirs or lakes occur in the Corona Wind Update, there are many small ponds that, when full, potentially attract concentrations of waterfowl, shorebirds, waterbirds, and raptors utilizing open fields for hunting (e.g., American kestrel [*Falco sparverius*], rough-legged hawk [*Buteo lagopus*], red-tailed hawk [*Buteo jamaicensis*], and northern harrier [*Circus hudsonius*]) (WEST, 2017a). The Corona Wind Update does include a small percentage of forest habitat which could support numbers of *Accipiters* (e.g., Cooper's hawk [*Accipiter cooperii*], sharpshinned hawk [*Accipiter striatus*], buteos (e.g., red-tailed hawk, rough-legged hawk), or owls (e.g., long-eared owl [*Asio otus*], great horned owl [*Bubo virginianus*]). Few topographic features (e.g., prominent ridges, large bodies of water) occur in the Corona Wind Update that would regularly attract high concentrations of migrating raptors.

4.9 Cultural Historic and Archaeological Resources

4.9.1 Prehistoric Cultural

4.9.1.1 Data Sources

The following data sources were reviewed to assess the prehistoric cultural, historic, and archeological resources of Lincoln and Torrance Counties; the Corona Wind Update; and the Updated Corona Gen-Tie System Corridor.

- New Mexico Cultural Resource Information System ([NMCRIS], 2019). Accessed September 2019 from: https://nmcris.dca.state.nm.us.
- Bureau of Land Management (BLM) General Land Office (GLO) plats (BLM, 2019). Accessed September 2019 from: https://glorecords.blm.gov/.
- Anderson, O.J., Jones, G.E., and Green, G.N. (1997). *Geological map of New Mexico: USGS Open-file Report 97-52*. Accessed September 2019 from: http://pubs.er.usgs.gov/publications/ofr9752.

4.9.1.2 Current Conditions and Trends, Regional Overview - Updated Corona Gen-Tie System Corridor

In general, little archaeological work has been conducted within the Updated Corona Gen-Tie System Corridor; a total of two sites have been previously recorded. Most of the previous survey projects have been conducted for small hydrocarbon well pad areas with associated access roads and larger linear projects such as roads, pipelines, and transmission lines. The linear survey areas account for the recording of the sites that have been recorded within the Updated Corona Gen-Tie System Corridor.

There have been 8 prehistoric sites located within the Updated Corona Gen-Tie System Corridor. Only one site has been recorded along the Updated Corona Gen-Tie System. The prehistoric site is a small lithic scatter, and the eligibility to the National Register of Historic Places (NRHP) is not specified. The soil and geology studies of the Updated Corona Gen-Tie System Corridor indicate that undocumented cultural materials, both prehistoric and historic, may be located within the area, particularly around the major drainages and their tributaries.

4.9.1.3 Current Conditions and Trends, Regional Overview - Corona Wind Update

In general, little archaeological work has been conducted within the Corona Wind Update; a total of 82 prehistoric sites have been previously recorded. Most of the previous survey projects have been conducted for small hydrocarbon well pad areas with associated access roads and larger linear projects such as roads, pipelines, and transmission lines. The largest projects have been a series of block surveys in Lincoln County for vegetation clearance to increase livestock grazing areas. These block survey areas account for approximately half of the sites that have been recorded within the Corona Wind Update.

Most prehistoric sites that have been recorded are associated with Jornada-Mogollon culture or with the Southern Archaic culture. The soil and geology studies of the Corona Wind Update indicates that undocumented cultural materials may be located within the Corona Wind Update, particularly around the major drainages and their tributaries.

4.9.2 Historic Cultural Resources

4.9.2.1 Data Sources

- NMCRIS. (2019). Accessed September 2019 from: https://nmcris.dca.state.nm.us.
- BLM GLO plats (BLM, 2019). Accessed September 2019 from: https://glorecords.blm.gov/.
- Anderson, O.J., Jones, G.E., and Green, G.N. (1997). *Geological map of New Mexico: USGS Open-file Report 97-52*. Accessed September 2019 from: http://pubs.er.usgs.gov/publications/ofr9752.

4.9.2.2 Current Conditions and Trends, Regional Overview – Updated Corona Gen-Tie System Corridor

In general, little archaeological work has been conducted within the Updated Corona Gen-Tie System Corridor. A total of 10 historic sites have been recorded within the Updated Corona Gen-Tie System Corridor, of those 10 sites, only two are located within the direct corridor of the Updated Corona Gen-Tie System. Most of the previous survey projects have been conducted for small hydrocarbon well pad areas with associated access roads and larger linear projects such as roads, pipelines, and transmission lines. The linear survey areas account for the recording of the sites that have been recorded within the Updated Corona Gen-Tie System Corridor.

Of the two historic sites that have been recorded along the Updated Corona Gen-Tie System Corridor, one site is the Atchison-Topeka Railroad Right of Way and has been recommended as being eligible for

listing on the NRHP, the second is the remains of a foundation and associated trash scatter and has been recommended not to be eligible. The soil and geology studies of the Updated Corona Gen-Tie System Corridor indicate that undocumented cultural materials, both prehistoric and historic, may be located within the area, particularly around the major drainages and their tributaries.

4.9.2.3 Current Conditions and Trends, Regional Overview – Corona Wind Update

There have been 24 historic sites which have been recorded throughout the Corona Wind Update, these primarily consist of isolated historic trash dumps or ruins of structures associated with ranching activities. No area historic research activities have been conducted within the Corona Wind Update, and as such, none of the structures have been researched for their contributions of the historical development of the local area. The USGS maps of the area have several structures marked as "ruins" that probably are additional abandoned structures associated with ranching activities which have not been formally recorded.

Data obtained from the available GLO plats for the area indicates that the Corona Wind Update were surveyed by the USGS between 1882 and 1922. The majority of objects identified from the plats are unnamed trails and roads. Neither the GLO plats or the USGS maps identified any abandoned historic-aged towns (ghost towns) or ranches.

4.10 Religious and Cemetery Sites

4.10.1 Data Sources

The following data sources were reviewed to assess the existing religious and cemetery sites in Lincoln and Torrance Counties; the Updated Corona Gen-Tie System Corridor; and the Corona Wind Update.

- Cemeteries of Torrance County. Accessed September 2019 from: http://www.americancemeteries.org/new-mexico/torrance-county.
- Churches of Torrance County. Accessed September 2019 from: https://newmexico.hometownlocator.com/features/cultural,class,church,scfips,35057.cfm.
- NMCRIS. Accessed September 2019 from https://nmcris.dca.state.nm.us/NMCRISt/Security/SignIn.aspx.
- Cemeteries of Lincoln County. Accessed September 2019 from: http://www.americancemeteries.org/new-mexico/Lincoln-county.

- Churches of Lincoln County. Accessed September 2019 from: https://newmexico.hometownlocator.com/features/cultural,class,church,scfips,35027.cfm.
- NMCRIS. Accessed September 2019 from: https://nmcris.dca.state.nm.us/NMCRISt/Security/SignIn.aspx.

4.10.2 Current Conditions and Trends, Regional Overview – Updated Corona Gen-Tie System Corridor

No churches are located near the Updated Corona Gen-Tie System Corridor. Four cemeteries are known to be within the Updated Corona Gen-Tie System Corridor. Two of the cemeteries are located to the south and southeast of Duran, and the other two are located at Piños Wells. Unidentified formal and informal cemeteries associated with active and abandoned ranches could be within the footprint of the proposed Updated Corona Gen-Tie System Corridor. Churches and cemeteries within portions of the Updated Corona Gen-Tie System Corridor within the Corona Wind Update are identified below in Section 4.10.3.

4.10.3 Current Conditions and Trends, Regional Overview –Corona Wind Update

The Corona Wind Update contains a small number of abandoned and active ranches. Most of the churches that serve the area are either in Carrizozo or Vaughn, New Mexico. However, within the vicinity of the Corona Wind Update, there are no known churches.

One formal cemetery is identified within the vicinity of the Corona Wind Update, the Corona Cemetery is located approximately 0.5 mile to the southeast of the town within the footprint of the Corona Wind Update. Additional unidentified formal and informal cemeteries associated with the active and abandoned ranches could be throughout the Corona Wind Update (Exhibit 11).

4.11 Visual and Scenic Resources

4.11.1 Data Sources

The following data sources were reviewed to assess the existing visual and scenic conditions of Lincoln and Torrance Counties; the Updated Corona Gen-Tie System Corridor; and the Corona Wind Update:

- EPA Ecoregions (EPA, 2019b). Accessed September 2019 from: https://www.epa.gov/eco-research/ecoregions-north-america.
- NMDOT. Accessed September 2019 from: https://www.dot.state.nm.us/content/nmdot/en/byways.html.
- Federal Highway Administration (FHWA). Accessed September 2019 from: https://www.fhwa.dot.gov/byways/.

4.11.2 Overview

The combined Updated Corona Gen-Tie System Corridor and Corona Wind Update encompasses approximately 176,021 acres (Option A) and 176,043 acres (Option B) of private, BLM, and state lands within the Southwestern Tablelands and Arizona/New Mexico Mountains Level III Ecoregion (EPA, 2019b), located within Torrance and Lincoln Counties. This combined area is bounded by the northern extent of the Sacramento Mountains to the south, including the Jicarilla, Capitan and Vera Cruz ranges, and the Gallinas Mountains to the west. East and north of the combined area, the landscape transitions to mixed Chihuahuan Desert grassland. Non-private lands in proximity to the combined area include portions of the Mountainair District of the Cibola National Forest, Smokey Bear District of the Lincoln National Forest, State Trust Lands administered by the New Mexico State Land Office (SLO), and BLM lands (Exhibit 12).

According to the EPA Ecoregions (EPA, 2019b): the Arizona/New Mexico Mountains ecoregions:

> *...are distinguished from neighboring mountainous ecoregions by their lower elevations and an associated vegetation indicative of drier, warmer environments, due in part to the region's more southerly location. Forests of spruce, fir, and Douglas-fir, common in the Southern Rockies and the Wasatch and Uinta Mountains, are only found in limited areas at the highest elevations in this region. Chaparral is common at lower elevations in some areas, pinyon-juniper and oak woodlands occur at lower and middle elevations, and the higher elevations are mostly covered with open to dense ponderosa pine forests. These mountains are the northern extent of some Mexican plant and animal species. Surrounded by deserts or grasslands, these mountains in Arizona and New Mexico can be considered biogeographical islands.*

In addition, the U.S. Environmental Protection Agency Ecoregions (2019) put forth the following description for the Southwestern Tablelands:

> *The Southwestern Tablelands flank the High Plains with red hued canyons, mesas, badlands, and dissected river breaks. Unlike most adjacent Great Plains ecological regions, little of the Southwestern Tablelands is in cropland. Much of this region is in sub-humid grassland and semiarid range land. The potential natural vegetation is grama-buffalo grass with some mesquite-buffalo grass in the southeast, juniper-scrub oak-midgrass savanna on escarpment bluffs, and shinnery (midgrass prairie with open low and shrubs) along the Canadian River.*

4.11.3 Current Conditions and Trends, Regional Overview – Updated Corona Gen-Tie System Corridor

Topography within the Updated Corona Gen-Tie System Corridor is variable, including relatively flat grassland, gentle slopes, small ridgelines, canyons, hills, mesas, canyons, and steep slopes. Herbaceous/grassland cover types dominate the landscape, with shrub/scrub and evergreen forest vegetation communities covering smaller areas of the 2018 Approved Projects. Land use within the Updated Corona Gen-Tie System Corridor is primarily open range livestock grazing. Elevation within the

Updated Corona Gen-Tie System Corridor ranges from 6,020 to 6,771 ft (1,835 to 2,064 m) above mean sea level (see Exhibit 13).

Lincoln and Torrance Counties both have low population densities. The population density for Lincoln County is approximately 4.2 inhabitants per square mile, with most of the population in the county's southern portion in the Greater Ruidoso Area. Torrance County is a large and rather sparsely populated county located in central New Mexico, southeast of the City of Albuquerque. Over 95 percent of the population resides in the western half of the county. Several inhabitable residences are within the Updated Corona Gen-Tie System Corridor, and other scattered rural residences and small communities are nearby. Travelers in proximity to the Updated Corona Gen-Tie System Corridor would include local or regional traffic along U.S. Highways 54 and 60, and county roads.

Existing transmission lines (100-kV or above) in the vicinity of the 2018 Approved Projects include: the Willard to Duran 115-kV line, situated along the northwest portion of the 2018 Approved Projects; the Corona to Blackwater 500-kV line, situated east of the area where the 2018 Approved Projects will be developed; and the Pinal Central (Pinal South) to SunZia East 500-kV line, situated along the southwest portion of the 2018 Approved Projects (Exhibit 14).

No designated federal or state scenic routes or byways are in the vicinity of the Updated Corona Gen-Tie System Corridor (NMDOT, 2019; FHWA, 2019) (see Exhibit 15). The nearest scenic route is Historic Route 66, which is more than 20 miles north of the Updated Corona Gen-Tie System Corridor. Salt Missions trail is approximately 28 miles to the west of the route.

Additionally, no national parks or state parks are in the vicinity of the Updated Corona Gen-Tie System Corridor. The closest national park is Salinas Pueblo Missions National Monument, which is approximately 28 miles west of the Updated Corona Gen-Tie System Corridor. The closest state parks are the Santa Rosa Lake State Park, Sumner Lake State Park, and Manzano Mountains State Park, all located more than 40 miles from the Updated Corona Gen-Tie System Corridor. Manzano Mountains State Park is the closest at 40 miles away. No known visually sensitive, cultural resource sites are in the vicinity of the Updated Corona Gen-Tie System Corridor. No known organized tourism activities are in or near the Updated Corona Gen-Tie System Corridor.

4.11.4 Current Conditions and Trends, Regional Overview – Corona Wind Update

The existing visual and scenic resources previously described for the Updated Corona Gen-Tie System Corridor are generally similar for the Corona Wind Update. Travelers in proximity to the Corona Wind

Update, would include local or regional traffic along U.S. Highway 54 and New Mexico State Road 247. The nearest scenic route is the Salt Missions Trail, which is 30 miles west of the Corona Wind Update. The closest national park is Salinas Pueblo Missions National Monument, which is approximately 35 miles west of the Corona Wind Update. The closest state park is the Valley of Fires State Park, approximately 46 miles southwest of the Corona Wind Updated. Additionally, the Santa Rosa Lake State Park, Sumner Lake State Park, and Manzano Mountains State Park are all located more than 50 miles from the Corona Wind Update. The Lincoln Station Airport is located about 15 miles southwest of the Corona Wind Update. The community of Ruidoso contains the largest population within Lincoln County and is located approximately 58 miles south of the Corona Wind Update. The community of Corona is the closest populated area, roughly 7-miles west of the Corona Wind Update. The closest school in vicinity of the Corona Wind Project Area (approximately 7 miles), is the Corona High School and Elementary School (same building).

4.12 Land Use, Including Farm, Range, and Recreational Resources

4.12.1 Data Sources

The following data sources were reviewed to assess the existing land use, including farm, range and recreational resources of Lincoln and Torrance Counties; the Updated Corona Gen-Tie System Corridor; and the Corona Wind Update.

- 2011 NLCD.
- The National Map (USGS, 2019c).
- Lincoln County Comprehensive Plan (August 2007) (Lincoln County, 2017).
- Lincoln Soil and Water Conservation District Land Use Plan (Lincoln County, 2015).
- Torrance County Comprehensive Plan (July 2003) (Mid-Region Council of Governments, 2003).
- Torrance County Zoning Ordinance (revised 2016) (The Board of County Commissioners of Torrance County, 2016).
- East Torrance Soil and Water Conservation District Long Range Plan (2009 - 2019) (East Torrance Soil and Water Conservation District, 2009).
- John C. Tysseling PhD, *The Economic and Fiscal Impact of the Corona Wind Project in New Mexico* (2017).

4.12.2 Current Conditions and Trends, Regional Overview – Updated Corona Gen-Tie System Corridor

4.12.2.1 Torrance County

Torrance County is a large and rather sparsely-populated county located in central New Mexico, southeast of the City of Albuquerque. Over 95 percent of the population resides in the western half of the county. Farming and ranching have been the traditional economic activities of the county, but are diminishing as the population grows in the Estancia Valley. Today, there are growing sectors of non-agricultural commerce and business. Most of the agricultural products that are produced in the area where the Corona Wind Projects will be developed come from Torrance County, but given the rural character of the three counties encompassing the Corona Wind Projects, agricultural businesses still play a large role in all three counties. Much of Torrance County is situated within the, "commuter shed," of the Albuquerque metropolitan region and is therefore growing in scattered residential subdivisions and housing developments.

Various jurisdictions and special territories within the Torrance County boundaries include five incorporated municipalities, significant lands held in state and federal ownership, and a small area within the Isleta Indian Reservation. Also, there are all or portions of four Mexican Land Grants in the county. The principal transportation structure in Torrance County is comprised of roads and highways. The county is traversed by an interstate (I) highway (I-40) and several state and federal highways forming the base road network for the county. Relatively good east-west and north-south corridors are in the county, although they are widely spaced.

The community of Moriarty contains the largest population within Torrance County and is located approximately 24 miles northwest of the Updated Corona Gen-Tie System Corridor. The community of Duran is the closest populated area, roughly 2 miles from the Updated Corona Gen-Tie System and 1.5 miles from the 1-mile corridor of the Updated Corona Gen-Tie System Corridor. Several other small towns are scattered throughout the county. Major state and federal properties in the county include Manzano Mountains State Park, Gallinas National Forest, Cibola National Forest, and scattered BLM parcels (Exhibits 16, 17, 18, and 19). No military bases are located in the county. Large-scale irrigated agriculture has become a major feature in the central portion of the Estancia Valley. Although these agricultural croplands rely solely on groundwater pumping, there is a reluctance to eliminate such land uses. Lastly, the expansive, but semi-arid rangelands throughout the county have attracted a ranching livelihood for a small but dispersed segment of the population.

The Torrance County Comprehensive Plan (July 2003) governs all land use planning in the county and provides the rationale and guidance for specific land use regulations and projects developed by the local government (Mid-Region Council of Governments, 2003). It establishes a basis for regulations and programs necessary to manage current and future land development within the jurisdiction of Torrance County. The Torrance County Comprehensive Plan promotes consistency and continuity in making decisions to carry out the programs, projects, and operations of Torrance County. The county presently administers the comprehensive land use management program supported by regulatory ordinances and enforcement powers. Actual implementation of the Torrance County Comprehensive Plan is subject to the policy directives and actions of the Board of County Commissioners as deemed appropriate.

In accordance with the Torrance County Comprehensive Plan, the Torrance County Zoning Ordinance (revised 2016), establishes comprehensive zoning regulations for the unincorporated areas of Torrance County (The Board of County Commissioners of Torrance County, 2016). It is designed to promote health and the general welfare of the county; secure safety from fire, flood, and other dangers; protect local water resources; facilitate adequate provisions for transportation, solid waste management, water and wastewater systems, schools, parks, and other community requirements; conserve the value of property; and provide for the compatible development of land and other natural resources in the county.

The East Torrance Soil and Water Conservation District Long Range Plan (2009-2019) promotes stewardship of natural resources by providing leadership, education, technical, and financial assistance to the residents of the District (East Torrance Soil and Water Conservation District, 2009).

The Estancia Elementary/Middle/High School serves approximately 890 students and covers grades pre-kindergarten through 12th grade. This school is the closest school to the Updated Corona Gen-Tie System Corridor boundary within Torrance County, located approximately 22 miles away. The closest school, however, is the Corona Elementary/High School (located in Lincoln County) which is located about 10 miles southwest of the Updated Corona Gen-Tie System Corridor boundary.

Torrance County has natural and scenic resources. The "Laguna de Perro," and surrounding salt lakes are historically and culturally valuable to Torrance County.

4.12.3 Current Conditions and Trends, Regional Overview – Corona Wind Update

The existing conditions previously identified for the Updated Corona Gen-Tie System Corridor for land use also apply for the Corona Wind Update. However, the Corona Elementary/High School is located 7 miles north of the Corona Wind Update; the Vaughn Elementary/High School is located approximately 27

miles northeast of the Corona Wind Update; and the Estancia Elementary/Middle/High School is located approximately 50 miles northwest of the Corona Wind Update.

4.13 Socioeconomics

4.13.1 Data Sources

The following data source was reviewed to assess the existing socioeconomic conditions of Lincoln and Torrance Counties; the Updated Corona Gen-Tie System Corridor; and the Corona Wind Update.

- John C. Tysseling PhD, *The Economic and Fiscal Impact of the Corona Wind Project in New Mexico* (2017).

4.13.2 Current Conditions and Trends, Regional Overview – Updated Corona Gen-Tie System Corridor

The area where the Corona Wind Projects will be developed is a largely a rural region of central New Mexico, dominated by high-desert range lands and forested mountain landforms on the western margins of the area. The largely rural area has significant access to major urban economic and cultural centers, with relatively close access to recreation and resort facilities in the Ruidoso and related mountain communities to the south and west, regional trade centers in Roswell and Alamogordo to the south, and the state's largest metropolitan area comprising the Albuquerque and middle Rio Grande suburban communities approximately a 2-hour drive from the Updated Corona Gen-Tie System Corridor. These larger population centers, combined with the traditional ranching communities found within the area where the Corona Wind Projects will be developed, provide wide ranging economic and cultural resources, which will support Project activities.

Lincoln County has the largest population and the largest geographic area. Torrance County, however, has the greatest population density of the two counties. An overview of the area's population demographics is shown in Table 4-11.

Table 4-11: Study Area Counties

County	Population	Geographic Area (Square Miles)	Population Density (people/square mile)
Torrance	15,302	3,346	4.6
Lincoln	16,622	4,832	3.4
Study Area Total	**31,924**	**8,178**	**4 (Avg.)**

Source: Tysseling, 2017

Lincoln County has several large communities — the county seat, Carrizozo (population 938); Capitan (population 1,388); and the county's commercial center, Ruidoso (population 7,770). Torrance County has its primary population centers along the I-40 corridor, with the county seat in Estancia (population 1,584) and Moriarty (population 1,786). Importantly, these 2016 population estimates also demonstrate a population decline, in the area where the Corona Wind Projects will occur, of nearly 6.2 percent per annum since 2010. The area where the 2018 Approved Projects and Updated Corona Wind Projects would be developed, as a whole, comprises 1.74 percent of New Mexico's population.

The area where the 2018 Approved Projects and Updated Corona Wind Projects will be developed has a total non-farm labor force reported in 2016 of 15,592, and employment of 14,494 (approximately 1.66 percent of statewide employment). The unemployment rate in the area where the 2018 Approved Projects and Updated Corona Wind Projects will be developed is 7.0 percent, which is somewhat higher than the unemployment rate in the state (6.2 percent) in 2016.

2016 total wages and salaries for covered employment (non-farm) in the area where the 2018 Approved Projects and Updated Corona Wind Projects would be developed was an estimated average annual compensation of $29,618 per employee. The New Mexico statewide average compensation is $42,599 per year, revealing that reported wages and salaries in the area where the 2018 Approved Projects and Updated Corona Wind Projects would be developed are approximately 70 percent of the state average. Additionally, the estimated per capita income of $20,292 for the area where the 2018 Approved Projects and Updated Corona Wind Projects would be developed compares with $24,012 for the state of New Mexico. The higher proportion of the area where the 2018 Approved Projects and Updated Corona Wind Projects would be developed per capita income (in relationship to New Mexico as a whole, and as compared to the compensation data previously discussed) is likely reflecting the role of investment and retirement income in the somewhat older profile of the population for the area where the 2018 Approved Projects and Updated Corona Wind Projects will occur.

The largely rural, sparsely populated area where the 2018 Approved Projects and Updated Corona Wind Projects will occur has dominant land use which is focused on agricultural business enterprises (particularly ranching), but the dominant economic activities (measured by reported employment and output) are related to retail trade, hospitality, and health care.

Private firms comprise about 83 percent of the business entities in the area where the 2018 Approved Projects and Updated Corona Wind Projects would be developed. However, this data excludes agricultural employment, which is recognized to be a significant component of the rural economy in the

area where the 2018 Approved Projects and Updated Corona Wind Projects would be developed. Due to the population and predominantly rural nature of the counties' land area, most of the establishments in the area where the 2018 Approved Projects and Updated Corona Wind Projects will be developed are quite small, with a limited number of employees.

Excluding the agricultural sectors, the statistics suggest that the area economy, where the 2018 Approved Projects and Updated Corona Wind Projects will occur, is largely driven by retail; accommodations and food services; healthcare and social assistance; and public administration. These four sectors alone comprise around two-thirds of total annual employment by industry for the area where the 2018 Approved Projects and Updated Corona Wind Projects will occur.

Table 4-12 presents an agricultural profile for the area where the 2018 Approved Projects and Updated Corona Wind Projects will be developed; the table does not include forestry data, as this data was not included in the 2007 and 2012 censuses.

Table 4-12: 2012 and 2007 New Mexico Project Area Farm Demographics

2012 and 2007 Farm Demographics					
Number of Farms	2012	2007	Average Farm Size (acres)	2012	2007
	1,323	1,180		3,826	4,195
2012 Market Value of Agricultural Products Sold ($ millions)					
Crops		Livestock and Poultry		Total	
$24.26		$68.84		$93.10	
26.1%		73.9%			
2012 Values of Sales by Commodity Group ($ millions)					
Grains, Dry Beans and Peas	Corn	Other Crops	Cattle and Calves	Other Livestock and Poultry	
$9.99	$9.44	$4.81	$56.47	$12.37	

Source: Tysseling, 2017

The role of agriculture in the area economy, where the 2018 Approved Projects and Updated Corona Wind Projects will be developed, is best reflected in comparing the reported $93.1 million agricultural production to the $972.8 million of reported Taxable Gross Receipts. Agriculture is an important foundation of the area economy, where the 2018 Approved Projects and Updated Corona Wind Projects will be developed, but that the previously identified non-agricultural sectors provide for the dominant employment and income in the regional economy.

The area where the 2018 Approved Projects and Updated Corona Wind Projects will be developed, had over $72.6 million in Gross Receipts Tax (GRT) collections, providing 1.83 percent of the total GRT collections in the state of New Mexico. The economic sector reporting the highest levels of GRT, in the area where the 2018 Approved Projects and Updated Corona Wind Projects will be developed, is the Retail Trade sector, with revenues from the sales in this sector constituting 24 percent of the GRT collections. This is followed by the Construction sector, which boasts 20 percent of the total GRT. Construction is 20 percent of the GRTs, and only 7 percent of the employment, in the area where the 2018 Approved Projects and Updated Corona Wind Projects will be developed, highlights the ready supply of construction firms and workers from the larger population centers surrounding the Updated Corona Gen-Tie System Corridor and Corona Wind Update.

4.13.3 Current Conditions and Trends, Regional Overview – Corona Wind Update

The existing socioeconomics and economy previously described for the Updated Corona Gen-Tie System Corridor are similar for the Corona Wind Update.

4.14 Communication Signals

4.14.1 Data Sources

The following data sources were reviewed to assess the existing communication signals of Lincoln and Torrance Counties; the Updated Corona Gen-Tie System Corridor; and the Corona Wind Update.

- Federal Communications Commission (FCC) info (FCC, 2019); based on publicly available data from the FCC. Accessed on September 2019 from: http://www.fccinfo.com/disclaimerphp.

4.14.2 Current Conditions and Trends, Regional Overview – Updated Corona Gen-Tie System Corridor

Lincoln and Torrance Counties are rural counties in central New Mexico with population densities below the state and national averages. A review of coordinates at the north, south, east, and west points of the Updated Corona Gen-Tie System Corridor, with an expanded search to 35 miles from the edge of the Updated Corona Gen-Tie System Corridor endpoints boundary, indicates that 500 microwave towers, 114 antenna structure registration towers, 434 land mobile (LM) towers, 34 cell towers, 4 paging towers, and 1 AM/FM/TV towers are present (Exhibit 20).

4.14.3 Current Conditions and Trends, Regional Overview – Corona Wind Update

Communication signal conditions within the Corona Wind Update are similar to what is described above for the Updated Corona Gen-Tie System Corridor.

4.15 Radioactive Waste and Radiation Hazards

Electric transmission line and substation infrastructure do not generate or contain radioactive waste or radiation hazards. The Updated Corona Gen-Tie System and Corona Wind Update would not generate radioactive waste or radiation hazards and, therefore, they are not addressed further in this ER.

4.16 Hazardous Materials

Prior to construction, a Phase I Environmental Site Assessment will be performed to identify any hazardous materials, substances, or facilities in the Updated Corona Gen-Tie System Corridor. Chapter 5, Section 5.16 describes potential hazardous materials associated with construction, operation, and maintenance of a transmission line, substation, and switchyard as well as protection measures to reduce impacts from hazardous materials.

4.17 Safety

The Updated Corona Gen-Tie System Corridor does not contain any known safety concerns. Chapter 5, Section 5.17 describes potential safety concerns associated with construction, operation, and maintenance of a transmission line, substation, and switchyard as well as protection measures to reduce safety impacts.

4.18 Geographic Resources

4.18.1 Data Sources

The following data sources were reviewed to assess the existing geographic resources of Lincoln and Torrance Counties; the Updated Corona Gen-Tie System Corridor; and the Corona Wind Update.

- National Park Service (NPS) Physiographic Provinces (NPS, 2019).
- 2011 NLCD (NLCD, 2017).
- The National Map (USGS, 2019c).

4.18.2 Current Conditions and Trends, Regional Overview – Updated Corona Gen-Tie System Corridor

The area where the Corona Wind Projects will be developed is located within the Great Plains physiographic province (NPS, 2019). The Great Plains extend from Texas north to Montana and are

bordered to the west by the Rocky Mountains and to the east by the Central Lowlands. The Great Plains slope downward to the east, with maximum heights in the foothills of the Rockies at 5,500 ft, decreasing to 2,000 ft. The bedrock is horizontal beds of sandstones, shales, limestones, conglomerates, and lignite. Coal, petroleum, and natural gas are all mined extensively throughout the Great Plains. National Parks and Monuments of the Great Plains in New Mexico include Carlsbad Caverns National Park, Fort Union National Monument, and Capulin Volcano National Monument. None of these items are within or near the Updated Corona Gen-Tie System Corridor or the Corona Wind Update.

No national parks or state parks are in the vicinity of the Updated Corona Gen-Tie System Corridor. The closest national park is Salinas Pueblo Missions National Monument, which is approximately 28 miles west of the Updated Corona Gen-Tie System Corridor. The closest state parks are the Santa Rosa Lake State Park, Sumner Lake State Park, and Manzano Mountains State Park, all located more than 40 miles from the Updated Corona Gen-Tie System Corridor.

4.18.3 Current Conditions and Trends, Regional Overview – Corona Wind Update

No additional geographic resources are within the Corona Wind Update; however, 24 historic sites have been recorded throughout the Corona Wind Update, which primarily consist of isolated historic trash dumps or ruins of structures associated with ranching activities.

4.19 Military Activities and Aviation

4.19.1 Data Sources

The following data sources were reviewed to assess the existing military and aviation conditions of Lincoln and Torrance Counties; the Updated Corona Gen-Tie System Corridor; and the Corona Wind Update.

- Digital Aviation LLC. (2019). *VFR Map*. Accessed September 2019 from: http://vfrmap.com/tos.html.
- New Mexico Military Bases Map (Military Bases, 2019). Accessed September 2019 from: https://militarybases.com/new-mexico/.

4.19.2 Current Conditions and Trends, Regional Overview – Updated Corona Gen-Tie System Corridor

No military bases occur within the Updated Corona Gen-Tie System Corridor; three military training routes intersect the Updated Corona Gen-Tie System Corridor (Exhibit 21). Pattern Development would

request Determination of No Hazard (DNH) from the FAA for any transmission line structures over 200 ft (transmission line structures of this height are very unlikely for the Corona Wind Projects).

4.19.3 Current Conditions and Trends, Regional Overview – Corona Wind Update

No military bases occur within the Corona Wind Update. Exhibit 21 identifies military training routes that intersect the Updated Corona Gen-Tie System Corridor and Corona Wind Update, occurring within the northeast portion of development. Pattern Development would request DNH from the FAA for any transmission line structures over 200 ft (transmission line structures of this height are very unlikely for the Corona Wind Projects).

4.20 Roads

4.20.1 Data Sources

The following data sources were reviewed to assess the road conditions of Lincoln and Torrance Counties; the Updated Corona Gen-Tie System Corridor; and the Corona Wind Update.

- NMDOT. (20012). Transportation Maps. Accessed September 2019 from: https://www.dot.state.nm.us/content/nmdot/en/Maps.html#m_par_text.

4.20.2 Current Conditions and Trends, Regional Overview – Updated Corona Gen-Tie System Corridor

Torrance County is a rural county in central New Mexico with a sparse network of U.S. Highways, county, and private roads within the area where the Updated Corona Gen-Tie System will be developed. Pattern Development will work with NMDOT and the Torrance County Road Maintenance Departments to determine current road conditions for construction access prior to the start of any construction. U.S. Highways 60, 54, and several east-west and north-south segments of county roads traverse the Updated Corona Gen-Tie System Corridor.

4.20.3 Current Conditions and Trends, Regional Overview – Corona Wind Update

Lincoln County is a rural county in central New Mexico with a sparse network of U.S. Highway, state, county, and private roads surrounding the area where the Corona Wind Update will be developed. Pattern Development will work with NMDOT and the Lincoln County Road Maintenance Departments to

determine current road conditions for construction access prior to the start of any construction. No state highways or county roads traverse the Corona Wind Update.

5.0 ENVIRONMENTAL EFFECTS

5.1 Introduction

This chapter addresses whether the proposed Updated Corona Gen-Tie System Corridor and Updated Transmission Line Facilities would "unduly impair important environmental values," as provided in NMSA 1978, Section 62-9-3F. Potential consequences, or impacts, on the environment that could result from the location of the proposed Updated Transmission Line Facilities are described, including construction, operation, and maintenance activities. Each of the resource areas provided in NMSA 1978 Section 62-9-3M, Commission Rule 17.9.592.10 NMAC are addressed, as well as additional resource areas identified by Staff. These resources are: air resources; noise; geology and mineral resources; soil resources; paleontological resources; water resources; flora and fauna resources; cultural and historic archaeological resources; religious and cemetery sites; socioeconomics and environmental justice; communication signals; radioactive waste and radiation hazards; hazardous materials; safety; geographic resources; military activities and aviation; and roads. Impact evaluations for each resource are discussed below in the context of the Extended Corona Gen-Tie System Corridor and the Reconfigured Corona Gen-Tie System Corridor within the Updated Corona Gen-Tie System Corridor together with BMPs that can help manage impacts.

Implementation of the proposed Updated Transmission Line Facilities could affect the existing condition of the environment. Effects can occur directly or indirectly within the Updated Corona Gen-Tie System Corridor. Direct effects are those that occur through direct or immediate interaction of the proposed Updated Transmission Line Facilities with environmental components. Indirect effects are those that are somewhat distant from the Updated Transmission Line Facilities in time, space, or both.

Short-term impacts are considered those impacts that occur during construction and are generally anticipated to return to a preconstruction condition, at or within 3 to 5 years following construction. Environmental effects that would be anticipated to remain for the life of the Updated Corona Gen-Tie System (approximately 30 years) were considered long-term impacts. Permanent impacts are those that would be anticipated to remain for the life of the Updated Corona Gen-Tie System and beyond.

For each resource area review below, this report: describes the potential ground disturbance and environmental effects that may occur due to the Updated Transmission Line Facilities; identifies the protection measures the Corona Wind Companies proposes to avoid and minimize impacts; and summarizes the potential for the Updated Transmission Line Facilities to result in undue impairment of important environmental values.

5.2 Air Resources

5.2.1 Impact Assessment Methods

Assessment of impacts to air resources from the Updated Transmission Line Facilities construction, operation, and maintenance within the Updated Corona Gen-Tie System Corridor follows the impact assessment methodology described in Section 5.1 above and is discussed below. Construction, operations, and maintenance impacts are generally short term and temporary in nature for air resources.

5.2.2 Impacts Specific to the Updated Corona Gen-Tie System Corridor

5.2.2.1 Construction

The large equipment used during construction would likely be powered with diesel or gasoline. These combustibles include pollutants such as nitrogen oxides (NO_x), carbon monoxide (CO), volatile organic compounds (VOCs), PM, small amounts of sulfur dioxide (SO_2), and trace amounts of hazardous air pollutants. Construction contractors and their equipment would be required to comply with all emissions standards. If an onsite concrete (a batch plant) is required for transmission line facility construction, the proper state and county location and air quality permitting would be obtained by Pattern Development prior to construction. Therefore, air quality impacts associated with construction of the Updated Transmission Line Facilities would primarily be limited to fugitive dust.

Fugitive dust arises from land clearing, grading, excavation, and vehicle traffic on unpaved roads. The amount of fugitive dust depends on the amount of vehicular traffic, construction activities, moisture content of the soil, and wind speed. During dry periods with high winds, fugitive dust would be much more prevalent than during wet periods with low winds. Dust suppression methods such as watering are planned to be used in construction zones during dry periods to minimize fugitive dust impacts.

As the fugitive dust emissions and emissions from combustion engines would be temporary (limited to the construction period), limited to the construction area, and transient and likely controlled with watering, these sources would not significantly contribute to reduced air quality levels in the Updated Corona Gen-Tie System Corridor.

5.2.2.2 Operations and Maintenance

During operation of the Updated Transmission Line Facilities, the primary emissions are expected to be fugitive dust from worker and maintenance vehicles traveling intermittently on unpaved roads. In addition, there would be emissions from the vehicles themselves. Such emissions are not anticipated to be

substantial, and, therefore, only minimal impacts to air quality are anticipated during the operation of the Updated Transmission Line Facilities.

5.2.3 Protection Measures

Protection measures would be implemented to reduce potential impacts to air quality from construction activities. Emissions are only anticipated to arise from ground disturbing activities, equipment movement, fuel combustion, and a concrete batch plant, if required. These emissions would be temporary and localized. Protection measures to address construction-related impacts to air quality resources would include:

Air-1: Maintaining all fossil fuel-fired construction equipment in accordance with manufacturers' recommendations to minimize construction-related combustion emissions.

Air-2: Controlling combustion emissions through engine manufacturing requirements for both mobile sources and portable equipment such as air compressors.

Air-3: Limiting the idling time of equipment, unless idling must be maintained for proper operation (e.g., drilling, hoisting, and trenching).

Air-4: Limit the speed of vehicles within construction sites and along the utility ROW during construction to reduce the amount of fugitive dust generated.

Air-5: Water trucks will be utilized as necessary to reduce fugitive dust from construction activities.

5.2.4 Conclusion

Considering the limited and transient nature of emissions resulting from construction, operation, and maintenance of the Updated Transmission Line Facilities, as well as the protection measures detailed above, it is not expected that the proposed location of the Updated Transmission Line Facilities would unduly impair air resources.

5.3 Noise

5.3.1 Impact Assessment Methods

Assessment of impacts to noise conditions from the Supplemental Transmission Line Facilities construction, operation and maintenance within the Updated Corona Gen-Tie System Corridor of consideration follows the impact assessment methodology described in Section 5.1 above and is discussed

below. Construction, operations, and maintenance impacts are generally low, short term, and temporary in nature for noise.

5.3.2 Impacts Specific to the Updated Corona Gen-Tie System Corridor

The existing noise levels in the Updated Corona Gen-Tie System Corridor within rural parts of Torrance County is relatively low. The primary existing sources of noise in the Updated Corona Gen-Tie System Corridor are traffic along U.S. highways, local county roads, and some agricultural machinery. Localized noise associated with equipment operation during construction and maintenance activities would increase local noise levels in the Updated Corona Gen-Tie System Corridor. Noise impacts from construction of Updated Transmission Line Facilities would be localized, short term, and temporary, and all applicable state and local noise regulations would be complied with. After construction, operating noise from the Updated Transmission Line Facilities would be greatly reduced and cause negligible impacts.

5.3.3 Protection Measures

Protection measures that would be implemented to reduce any potential negative noise impacts from construction activities include:

Noise-1: Restrict construction activity near residences to normal business hours.

Noise-2: Audible noise due to wind energy facility operations shall not exceed fifty (50) A-weighted decibels (dBA) for any period of time, when measured at any occupied residence, school, hospital, church or public library existing on the date of approval of the wind energy facility.

5.3.4 Conclusion

Based on localized, low, short term impacts, compliance with regulated noise limits during operation, negligible impacts during operation, as well as the protection measures detailed above, it is not expected that the proposed location of the Updated Transmission Line Facilities would unduly impair noise.

5.4 Geology and Mineral Resources

5.4.1 Impact Assessment Methods

Assessment of impacts to geological and paleontological resources from the Updated Transmission Line Facilities construction, operation, and maintenance within the Updated Corona Gen-Tie System Corridor follows the impact assessment methodology described in Section 5.1 above and is discussed below.

5.4.2 Impacts Specific to the Updated Corona Gen-Tie System Corridor

There are no identified operational hydrocarbon facilities or unique geological features located within the Updated Corona Gen-Tie System Corridor, and impacts from the construction, operation, and maintenance of the Updated Transmission Line Facilities are not anticipated. There are no known faults or landslide areas in the Updated Corona Gen-Tie System Corridor, and, therefore, impacts from the construction, operation, and maintenance of the Updated Transmission Line Facilities are not anticipated.

5.4.3 Protection Measures

No protection measures are needed for geology resources. This is due to the lack of unique geological features, faults, or landslide areas in the Updated Corona Gen-Tie System Corridor.

5.4.4 Conclusion

Due to no unique geological features, faults, or landslides; the types of bedrock in the area; and the proposed activities for the Updated Transmission Line Facilities, it is not expected that the proposed location of the Updated Transmission Line Facilities would unduly impair geological sites.

5.5 Soil Resources

5.5.1 Impact Assessment Methods

Assessment of impacts to soil resources from the Updated Transmission Line Facilities from construction, operation, and maintenance within the Updated Corona Gen-Tie System Corridor follows the impact assessment methodology described in Section 5.1 above and is discussed below. Construction, operations, and maintenance impacts are generally low, short term, and temporary in nature for soil resources. A small amount of soil would be lost due to the permanent footprint of the Updated Transmission Line Facilities and is discussed below in Section 5.5.2.3.

5.5.2 Impacts Specific to the Updated Corona Gen-Tie System Corridor

Construction activities affecting soils include permanent and temporary land-disturbance activities such as structure work areas, wire-pulling, tensioning and splicing sites, construction yards, and temporary and permanent roads.

5.5.2.1 Temporary Erosion

Ground disturbance during construction may increase the potential for erosion. For example, removal of protective vegetation may expose soil to potential wind and water erosion. Certain soils within the Updated Corona Gen-Tie System Corridor would be more sensitive to soil erosion impacts. The primary soil erosion factor is water erosion and wind erosion on bare soils.

Potential erosional effects from the Updated Corona Gen-Tie System operations would consist of soil disturbances necessary to maintain the Updated Transmission Line Facilities in working order and conduct necessary repairs. Potential stormwater BMPs, including erosion and sediment control structures, as well as new culverts, might require inspection, maintenance, and/or repair throughout the operational life of the Updated Transmission Line Facilities to reduce soil erosion or sedimentation to surface water. Temporary access, not retained for operations, would be seeded with a native grass mix and allowed to revegetate, thereby minimizing the surface exposed to erosive conditions.

The areas used for construction would be reclaimed as soon as possible, which may include regrading to original land contours, topsoil replacement, and revegetation. Implementation of a Stormwater Pollution Prevention Plan (SWPPP)—a stormwater management program from the EPA under National Pollutant Discharge Elimination System that would protect water and soil resources—and use of appropriate soil mitigation measures and BMPs would reduce the effects of erosion.

5.5.2.2 Accidental Spills

During construction, use of trucks, heavy equipment, and stored supplies could result in accidental discharge of fuel, lubricants, and automotive fluids. Although the potential exists, any spills would be accidental, occasional, and of limited extent and would be considered minor to negligible and temporary in duration. BMPs for construction housekeeping, spill prevention, and cleanup would be used to prevent and remediate accidental spills. Therefore, accidental spills would not result in widespread or long-term effects to soils.

5.5.2.3 Permanent Soil Loss

The area within the footprint of the Updated Transmission Line Facilities would result in minor long-term loss of acreage to other productive soil uses. The total permanent footprint of Updated Transmission Line Facilities would range from approximately 50 to 60 acres inside the Updated Corona Gen-Tie System Corridor, equaling less than one-tenth of 1 percent of the Updated Corona Gen-Tie System Corridor.

5.5.3 Protection Measures

Protection measures that would be implemented to reduce any potential negative soil impacts from construction activities include:

Soil-1: Construction crews will reduce the amount of soil compaction by using equipment with more tires and wider tires to distribute the weight of the vehicle and tilling the severely compacted areas after construction is completed or using ground mats when the ground is wet.

Soil-2: To the extent possible, topsoil will be placed separately from sub-soils/bedrock during excavation and not comingled. Pattern Development will replace soil in reverse order, to help preserve topsoil.

Soil-3: Pattern Development will reduce erosion by applying and maintaining standard erosion and sediment control methods. These may include using certified weed-free straw wattles, bale barriers, and silt fencing, which would be placed at construction boundaries and where soil would be disturbed near a wetland or water body. Specific erosion and sediment control measures and locations will be specified in a SWPPP.

5.5.4 Conclusion

Based on BMPs to minimize and stabilize disturbed soils, BMPs to reduce accidental spills, the small amount of permanent soil loss as well as the protection detailed above, it is not expected that the proposed location of the Updated Transmission Line Facilities would unduly impair soil resources.

5.6 Paleontological Resources

5.6.1 Impact Assessment Methods

Assessment of impacts to paleontological resources from the Updated Transmission Line Facilities construction, operation, and maintenance within the Updated Corona Gen-Tie System Corridor follows the impact assessment methodology described in Section 5.1 above and is discussed below.

5.6.2 Impacts Specific to the Updated Corona Gen-Tie System Corridor

Construction activities that may affect paleontological resources include excavation, heavy equipment usage and movement, drilling, and trenching for utilities. Grading for access roads could also directly impact paleontological resources. The geology in the area consists of Mesoproterozoic plutonic rocks, Permian deposits of the Yeso Formation, the Tertiary Ogallala Formation, and several deposits of the Quaternary Period including piedmont alluvium, aeolian deposits, and lacustrine/playa lake deposits, all unconsolidated, all of which would have a low probability for the presence of paleontological deposits. The greatest possibility of discovery of paleontological resources would be from Ogallala Formation, however these would be rare. However, any grading and excavation during site preparation and construction would have potential to impact paleontological resources that may be present within the boundaries of the Updated Corona Gen-Tie System Corridor. As previously mentioned, any discoveries which may occur during construction would be managed through a UDP.

5.6.3 Protection Measures

Protection measures that would be implemented to reduce any potential negative impacts from construction activities include:

Paleo-1: Follow a UDP, providing protection for unknown sites.

5.6.4 Conclusion

Due to the low probability for the presence of paleontological deposits in the area and the fact that no ground disturbance activities would be completed prior to paleontological survey work being completed, it is not expected that the proposed location of the Updated Transmission Line Facilities would unduly impair paleontological sites.

5.7 Water Resources

5.7.1 Methods and Impact Types

Assessment of impacts to water resources from the Updated Transmission Line Facilities construction, operation, and maintenance within the Updated Corona Gen-Tie System Corridor follows the impact assessment methodology described in Section 5.1 above and is discussed below. Construction, operations, and maintenance impacts are generally low, avoidable, short term, and temporary in nature for water resources.

5.7.2 Impacts Specific to the Updated Corona Gen-Tie System Corridor

5.7.2.1 Surface Water

The potential sources of surface water resource impacts from the Updated Transmission Line Facilities include permanent and temporary soil-disturbance activities from structure work areas, wire-pulling, tensioning and splicing sites, construction yards, and temporary and permanent roads as well as potential accidental spills of hazardous materials from these activities. Short-term impacts from soil disturbances that increase erosion (or water runoff in areas with compacted soils) would potentially result in an increase in suspended sediments within adjacent waterbodies and accidental spills of hazardous materials that could wash into and pollute surface water. Based on the short construction duration, the small ground disturbance area, and minimal amount of surface water present in the Updated Corona Gen-Tie System Corridor, low impacts to surface water are anticipated from the Updated Transmission Line Facilities.

In addition to soil-disturbance activities, impacts to surface waters may include stream crossings by Updated Transmission Line Facilities or access roads. All streams would be spanned by the transmission

line, and individual structures would be located outside the stream bank ordinary high-water mark (OHWM) to avoid potential impacts. Where available, existing road-stream crossings would be utilized for access; however, new stream crossings may be required in certain areas. These activities would be permitted through the applicable agencies. Low impacts to streams would occur from the Updated Transmission Line Facilities based on the low number of streams in the Updated Corona Gen-Tie System Corridor and the ability to avoid stream resources through aerial spanning.

Stormwater BMPs would be used during construction to reduce potential impacts from erosion, sedimentation, and turbidity in surface waters during construction. A SWPPP would be developed and implemented for the Updated Transmission Line Facilities, which would meet the construction stormwater discharge permit requirements of the New Mexico Environment Department Surface Water Quality Bureau (NMED-SWQB). The SWPPP would include a number of measures to control runoff and to reduce erosion and sedimentation at construction sites. In addition, a Spill Prevention, Containment, and Countermeasures Plan (SPCC) would be implemented to prevent pollution of surface waters from accidental spills of hazardous materials.

5.7.2.2 Floodplains

It is reasonable to assume that all watercourses that convey natural flows, whether or not mapped by FEMA as floodplains or flood hazard areas, present some level of flood hazard. Encroachment of a structure into a flood path could result in flooding of or erosion damage to the encroaching structure and diversion of flows. The Updated Transmission Line Facilities would be set back from channel banks to avoid impacts (such as channel alteration and flow modification) and, therefore, impacts to floodplains would be low.

5.7.2.3 Groundwater

It is unlikely the Updated Transmission Line Facilities would affect groundwater to any extent. Any impacts to groundwater would be low impacts for a short duration and consist mainly of temporary sedimentation. Excavations for Updated Transmission Line Facilities may contact shallow groundwater; however, the groundwater contact would be unlikely to adversely impact this resource, unless an accidental spill of fuel or petroleum from construction equipment (which is very unlikely) occurs near an open excavation or is not cleaned up in a timely manner.

No water wells would be drilled for the Updated Transmission Line Facilities. All water used for construction (e.g., dust control or concrete production) would come from existing offsite sources, which would be identified and secured prior to construction.

5.7.2.4 Wetlands

A desktop assessment utilizing existing maps and data to identify potentially jurisdictional waters of the U.S., including wetlands that could potentially be affected by construction, was conducted to address compliance with Sections 404 and 401 of the Clean Water Act and Section 10 of the Rivers and Harbors Act. Based on the desktop assessment using NWI data, there are more than 37 wetlands that appear to be potentially jurisdictional waters of the U.S. Wetland presence based only on NWI data cannot be assumed to be an accurate assessment of potentially occurring jurisdictional wetlands and waterbodies. Wetland identification criteria differ between the USFWS and the USACE. As a result, wetlands shown on an NWI map may not be under the jurisdiction of the USACE, and all USACE jurisdictional wetlands are not always included in NWI data. A wetland delineation would be conducted to identify any wetlands or other water bodies that may be present within the Updated Corona Gen-Tie System prior to construction of the Updated Transmission Line Facilities. This information would be provided to the design team so direct impact to wetlands can be avoided.

No wetlands or water bodies are anticipated to be impacted by construction within the Updated Corona Gen-Tie System Corridor or access roads, as currently designed. All wetlands would be avoided or spanned by the transmission line to avoid direct impacts. Substations and switchyards would not be located in wetlands or playas. Work areas and wire pulling and tensioning sites would be sited to avoid wetlands to the extent practicable. Therefore, a Section 404 permit, Section 10 permit, or Section 401 water quality certification would not likely be required. However, only the U.S. Army Corps of Engineers can make final official jurisdictional determinations. If wetlands cannot be avoided, matting and other temporary protective measures would be used, and proper permits would be obtained. No permanent loss of wetlands or playas would occur from the Updated Transmission Line Facilities based on the following protection measures.

5.7.3 Protection Measures

Protection measures that would be implemented to reduce potential negative water resource impacts from construction activities include:

Water-1: Develop and implement a SWPPP. The SWPPP will include measures such as: silt barrier fences to control runoff, sediment traps and basins, and minimizing exposed soils by using temporary and permanent seeding and mulching.

Water-2: Disturbed areas will be restored to their original condition to the extent practicable. Seed mix and seeding rates will be developed through consultation with the local agency and landowner preference.

Water-3: Equipment will be properly maintained to avoid fluid leaks.

Water-4: Fuels and petroleum will be stored away from excavated areas.

Water 5: Spills will be cleaned up immediately.

Water-6: Matting and other temporary protective measures will be used on wetlands that cannot be avoided.

Water-7: Impacts will be evaluated against the requirement of the U.S. Army Corps of Engineers for a Nationwide Permit (NWP).

Water-8: Establish an appropriate buffer zone around wetlands, as necessary to reduce disturbance.

5.7.4 Conclusion

Based on the limited amount of water resources in the Updated Corona Gen-Tie System Corridor, avoidance of water resources by the Updated Transmission Line Facilities, and the protection measures detailed above, it is not expected that the proposed location of the Updated Transmission Line Facilities would unduly impair water resources.

5.8 Flora and Fauna

5.8.1 Methods and Impact Types

Assessment of impacts to biological resources from the Updated Transmission Line Facilities construction, operation, and maintenance within the Updated Corona Gen-Tie System Corridor follows the impact assessment methodology described in Section 5.1 above and is discussed below. Construction and maintenance impacts would be generally short-term and temporary. Operation impacts would be low for biological resources; a small amount of permanent habitat loss would occur due to the permanent footprint of transmission line structures and substation and switchyard components.

5.8.2 Impacts Specific to the Updated Corona Gen-Tie System Corridor

The Updated Corona Gen-Tie System Corridor is dominated by open grassland grazing. Plant and wildlife species adapted to shortgrass lands are present within the Updated Corona Gen-Tie System Corridor.

Increased noise and equipment movement during construction might temporarily displace wildlife species from the area in which construction is occurring. These impacts are considered low and short-term. Most wildlife movements would be expected to resume to preconstruction levels a short time after construction is completed. Potential long-term impacts include those resulting from habitat modifications and/or fragmentation. Pattern Development would work to minimize potential habitat fragmentation by paralleling the Updated Transmission Line Facilities with existing linear features (e.g., road and existing transmission lines) and avoid paralleling water features (such as streams or wetlands) when feasible. Construction activities might also impact plants and small, immobile, or fossorial (living underground) animal species through direct impact or from the alteration of local habitats. Direct impact on these species might occur due to equipment or vehicular movement on the ROW or due to the compaction of the soil if the species is fossorial. Potential impacts of this type would likely be low and isolated to an individual. Population-level impacts are not likely. Therefore, low impacts to local wildlife populations may occur due to habitat disturbance and localized potential for direct mortality to individuals during construction.

5.8.2.1 Federally and State Listed Species

One animal species that is federally listed under the ESA may potentially occur in Updated Corona Gen-Tie System Corridor (USFWS, 2019b). The Mexican spotted owl is listed as federally threatened. The other listed species (yellow-billed cuckoo) is considered unlikely to be impacted due to their specific habitat not occurring within the updated transmission line area. State-listed endangered or threatened wildlife species are identified for Torrance County in which the Updated Corona Gen-Tie System Corridor is located (NMDGF, 2019), as shown in Table 4-8 above. These species include four birds: southwestern willow flycatcher, bald eagle, Baird's sparrow, and peregrine falcon. The peregrine falcon, a state-threatened species, is likely to occur in the Updated Corona Gen-Tie System Corridor as an occasional year-round resident and migrant. The Clines Corners Gen-Tie System Corridor and Wind Farm appears to contain suitable foraging habitat and cliffs within the surrounding area provide potential nesting habitat. Potential bald eagle occurrence within the Updated Corona Gen-Tie System Corridor would be infrequent, due to the lack of large trees for perching and lack of optimal foraging habitat. However, bald eagles may occur occasionally as migrants or transient wintering birds, and grasslands and ponds in the Updated Corona Gen-Tie System and Corona Wind Update may attract foraging bald eagles.

The Updated Corona Gen-Tie System Corridor is currently dominated by grazed shortgrass prairie. Unaltered native habitats are sparse due to land use practices. If any species or suitable habitat for threatened and endangered species is identified during a field survey, Pattern Development would further coordinate with USFWS and NMDGF to determine avoidance or minimization strategies, if necessary. Impacts to federal and state protected species would be low based on low potential for species occurrence; the limited amount and quality of species habitat present, and short construction duration for the Updated Transmission Line Facilities in the Updated Corona Gen-Tie System Corridor.

5.8.2.2 Raptors, Eagles, and Birds

Raptor, eagle, and migratory bird species are known to use the Updated Corona Gen-Tie System Corridor for breeding, foraging, and migration (WEST, 2017b). If Updated Transmission Line Facilities construction occurs during bird nesting season, potential impacts could occur to migratory bird eggs and/or nestlings. Increases in noise and equipment activity levels during construction could also potentially disturb breeding or other activities of bird species nesting in adjacent areas. Pattern Development proposes to complete all clearing and construction activities to reduce potential impacts and in alignment with the MBTA. Pre-construction MBTA surveys would be completed by Pattern Development and/or construction activities would occur outside of breeding seasons for MBTA protected species. Furthermore, in accordance with the BGEPA, Pattern Development would avoid placing the Updated Transmission Line Facilities near active eagle nests. Construction activities would also be limited to a safe distance around active nests. Nests identified during preconstruction surveys and are determined active would be flagged for an established protection buffer.

The Updated Transmission Line Facilities can present additional hazards to birds due to electrocutions and/or collisions. However, no electrocution risk to perching birds would apply to the 345-kV transmission line, given the phase-to-phase and phase-to-ground clearances (Avian Power Line Interaction Committee [APLIC], 2018). Potential water resources are limited to stock ponds and intermittent drainages that may be inundated during wet seasons. A number of birds may migrate through the area, but few waterbirds or waterfowl potentially at risk of overhead line collisions would occur in the Updated Corona Gen-Tie System Corridor (APLIC, 2018). Collision risks to waterbirds or waterfowl would only apply during wet periods during the spring and fall migration as migrating birds may descend or ascend to access stopover habitats.

Pattern Development would follow Avian Power Line Interaction Committee (APLIC) guidance to implement measures to minimize collision risk with proper siting, and electrocution risk with proper transmission line engineering design. The electrocution risk to birds should not be significant since the

engineering design distance between conductors, conductor to structure, or conductor to ground wire for the proposed transmission line is greater than the wingspan of any bird potentially within the area (i.e., greater than 8 ft). While the conductors are typically thick enough to be seen and avoided by birds in flight, the shield wire (upper most wire) is thinner and can present a risk for avian collision. In areas of greater risk (e.g., near wetlands) for avian collisions, Pattern Development would install bird diverters to minimize collision risk for avian species.

5.8.3 Protection Measures

Protection measures that would be implemented to reduce any potential negative biological resource impacts from construction activities include:

Bio-1: Properly disposing of trash and food debris in secured containers.

Bio-2: Allowing wildlife that has entered the work area to leave the area on their own.

Bio-3: Providing environmental awareness training to all construction personnel working on the Project.

Bio-4: Checking for wildlife under vehicles and equipment that have been stationary for more than 1 hour and each morning prior to moving or operation.

Bio-5: Checking trenches, excavations, and uncapped pipe segments for wildlife.

Bio-6: Complying with posted speed limits.

Bio-7: Conducting tree/vegetation clearing outside the nesting season where feasible, to discourage birds from establishing nests in Project work areas.

Bio-8: Conducting pre-construction nest surveys prior to initiating construction activities, unless vegetation clearing has been completed prior to the nesting season.

Bio-9: Establishing an appropriate buffer zone around occupied raptor nests, as necessary to minimize disturbance.

Bio-10: Design transmission line facilities to APLIC guidance or similar in order to minimize electrocution and collision risk.

Bio-11: Micrositing will be completed during engineering design to avoid sensitive biological resources.

Bio-12: Setbacks from sensitive biological resources will be implemented to protect species habitat and time critical periods (e.g., breeding season).

Bio-13: Install bird diverters near areas with increased risk for avian-collision, to minimize collision risk for avian species.

5.8.4 Conclusion

Based on the amount of disturbed habitat, landscape dominated by grazed grassland, the lack of quality species habitat, and low likelihood for federal and state protected species to occur in the Updated Corona Gen-Tie System Corridor; as well as the protection measures detailed above, it is not expected that the proposed location of the Updated Transmission Line Facilities would unduly impair biological resources.

5.9 Cultural, Historic, and Archaeological Resources

This section is intended to support the Application for Location Approval of Transmission Line under NMAC Title 17 Chapter 9 Part 592. The power generation portion of the project, occurring within the Updated Corona Wind Project Area, would, as a whole, avoid or minimize impacts to environmental resources. Although studies have been conducted on the Updated Corona Wind Project Area, that portion of the project previously described in the Existing Conditions section is not required by NMAC 17.9.592.10 to be analyzed within this report.

The amount of ground that could be disturbed as a result of the Updated Transmission Line Facilities was estimated based on the typical design characteristics of this 345-kV line. Short-term disturbance estimates included structure work areas for the staging and installation of the transmission line structures as well as the conductor pulling and tensioning sites. Long-term disturbance estimates included structure base areas and associated access roads. Qualitative and quantitative variables of resource sensitivity, resource quantity, and estimated ground disturbance were considered in predicting the extent and magnitude of impacts. What constitutes an impact level on a resource varies by resource as well as the assumptions for analysis for each resource. Protection measures were identified and include action that will reduce potential impacts to a resource from the Updated Transmission Line Facilities.

5.9.1 Methods and Impact Types

Assessment of impacts to cultural, historic, and archaeological resources from the Updated Transmission Line Facilities construction, operation, and maintenance within the Updated Corona Gen-Tie System

Corridor follows the impact assessment methodology described in Chapter 5.1 above and is discussed below. Construction, operations, and maintenance impacts are generally low, avoidable, short term, and temporary in nature for cultural, historic, and archaeological resources. Cultural resources surveys would be completed for all areas of anticipated ground disturbance for the Updated Corona Gen-Tie System Corridor prior to any ground disturbance on public as well as private property.

5.9.2 Impacts Specific to the Updated Corona Gen-Tie System Corridor

Two historic archaeological resources are reported with the Updated Corona Gen-Tie System Corridor. One site is associated with the railroad and the second is a small prehistoric lithic scatter. Impacts to known locations of cultural resources would be low because the Updated Transmission Line Facilities are intended to be designed around these areas. Cultural resource field surveys would be completed prior to any construction activity to reduce potential impacts from the Updated Transmission Line Facilities to unlocated sites. Any discoveries which may occur during construction would be managed through an UDP.

5.9.3 Protection Measures

Protection measures that would be implemented to reduce any potential negative cultural, historic, and archaeological impacts from construction activities include:

Cul-1: The Transmission Line Areas will be designed to avoid known sites.

Cul-2: Cultural surveys in known areas of ground disturbance for the final transmission line facilities will be completed ahead of construction. No ground disturbance activities will be completed prior to cultural survey work being completed.

Cul-3: If sites are found at the location of planned infrastructure, micrositing techniques will be used to move around and/or span sites to the greatest extent practicable.

Cul-4: Follow a UDP, providing protection for unknown sites.

5.9.4 Conclusion

Based on the protection measures listed above, the proposed location of the Updated Transmission Line Facilities would not unduly impair cultural, historic, and archaeological resources. Impacts to cultural resources are expected to be *de minimis,* if at all.

5.10 Religious and Cemetery Sites

5.10.1 Methods and Impact Types

Assessment of impacts to religious resources from the Updated Transmission Line Facilities construction, operation, and maintenance within the Updated Corona Gen-Tie System Corridor follows the impact assessment methodology described in Chapter 5.1 above and is discussed below. Construction, operations, and maintenance impacts are generally low, avoidable, short term, and temporary in nature for religious resources.

5.10.2 Impacts Specific to the Updated Corona Gen-Tie System Corridor

Within the Updated Corona Gen-Tie System Corridor, there are no known churches and four cemeteries. No impacts to known locations of religious resources are expected to occur because religious resources may be avoided by the Updated Transmission Line Facilities. Cultural resource field surveys would be completed prior to any construction activity to reduce potential impacts from the Updated Transmission Line Facilities. Siting of the Updated Transmission Line Facilities would follow industry standard siting guidelines.

5.10.3 Protection Measures

Protection measures that would be implemented to reduce any potential negative impacts to religious facilities from construction activities include:

Rel-1: Avoid known sites.

5.10.4 Conclusion

Because there are no known churches within the Updated Corona Gen-Tie System Corridor and given the Project's commitment to the protection measure detailed above, no impacts are anticipated to religious resources. It is not expected that the proposed location of the Updated Transmission Line Facilities would unduly impair religious resources.

5.11 Visual and Scenic Resources

This section is intended to support the Application for Location Approval of Transmission Line under NMAC Title 17 Chapter 9 Part 592. The power generation portion of the project, occurring within the Updated Corona Wind Project Area, would, as a whole, avoid or minimize impacts to environmental resources. Although studies have been conducted on the Updated Corona Wind Project Area, that portion of the project previously described in the Existing Conditions section is not required by NMAC 17.9.592.10 to be analyzed within this report.

Qualitative and quantitative variables of resource sensitivity, resource quantity, and estimated ground disturbance were considered in predicting the extent and magnitude of impacts. What constitutes an impact level on a resource varies by resource as well as the assumptions for analysis for each resource. Protection measures were identified and include action that will reduce potential impacts to a resource from the Updated Transmission Line Facilities.

Based on the compatibility of the Updated Transmission Line Facilities with the current land uses within the Updated Corona Gen-Tie System Corridor; impacts to land uses from location of the Updated Transmission Line Facilities would be largely temporary and limited in area during construction; and the large majority of the Updated Corona Gen-Tie System Corridor would remain in its pre-existing use, as well as the protection measures detailed above, it is not expected that the proposed location of the Updated Transmission Line Facilities would unduly impair land use resources. Based on no direct or indirect impacts to schools and no direct or indirect impacts on State or County recreation lands, local parks, trails, or hunting access lands would occur as a result of the construction, operation, and maintenance of the Updated Transmission Line Facilities, it is not expected that the proposed location of the Updated Transmission Line Facilities would unduly impair school or recreation resources.

5.11.1 Methods and Impact Types

Assessment of impacts to visual and scenic resources from the Updated Transmission Line Facilities construction, operation, and maintenance within the Updated Corona Gen-Tie System Corridor follows the impact assessment methodology described in Chapter 5.1 above and is discussed below. Construction, operation, maintenance of the Updated Transmission Line Facilities would introduce new features into the visual landscape of the Updated Corona Gen-Tie System Corridor. The Updated Transmission Line Facilities were evaluated to determine whether the following types of impacts would occur:

- Proximity of the Updated Transmission Line Facilities to residences and residential areas.
- Changes to the visual landscape with respect to scenic resources, such as scenic byways.
- Changes to the visual landscape within or near recreational areas such as state and national parks.

5.11.2 Impacts Specific to the Updated Corona Gen-Tie System Corridor

New transmission structures, conductors, substation components, and cleared ROW areas would change the visual characteristics in the vicinity and the viewshed of the Updated Transmission Line Facilities. However, the Updated Transmission Line Facilities would not differ from other transmission lines and substations in the vicinity. For residences located near the Updated Transmission Line Facilities and residents traveling area roads in the Updated Corona Gen-Tie System Corridor, a new man-made feature

would be present in the landscape. Residents of homes along the line would be most prone to changes in the visual environment around their homes. Impacts would likely be low based on the low population density. However, the visual sensitivity to the line would be highly dependent on the orientation of the line to the home (in front, behind, alongside), any screening between the home and the line (trees, topography), distance, other visual components (existing lines, radio towers), and the general sensitivity of the occupants to the Updated Transmission Line Facilities.

Visual impacts resulting from the construction and operation of the proposed substations are anticipated to have similar impacts associated with the construction and operation of the proposed Supplemental Transmission Line Facilities. Each new substation would be an added visual element in the existing landscape.

No designated federal or state scenic routes or byways are in the vicinity of the Updated Corona Gen-Tie System Corridor (NMDOT, 2019; FHWA, 2019) (see Exhibit 15). The nearest scenic route is Historic Route 66, which is more than 20 miles north of the Updated Corona Gen-Tie System Corridor. Salt Missions trail is approximately 28 miles to the north end of the route. Therefore, the transmission line is sufficiently far from these routes that it would not be deemed to impact the scenic values of the routes.

Additionally, no national parks or state parks are in the vicinity of the Updated Corona Gen-Tie System Corridor. The closest national park is Salinas Pueblo Missions National Monument, which is approximately 28 miles west of the Updated Corona Gen-Tie System Corridor. The closest state parks are the Santa Rosa Lake State Park, Sumner Lake State Park, and Manzano Mountains State Park, all located more than 40 miles from the Updated Corona Gen-Tie System Corridor. Manzano Mountains State Park is the closest at 40 miles away. No known visually sensitive, cultural resource sites are in the vicinity of the Updated Corona Gen-Tie System Corridor. No known organized tourism activities are in or near the Updated Corona Gen-Tie System Corridor.

5.11.3 Protection Measures

Protection measures that would be implemented to reduce any potential negative visual impacts from construction activities include:

Vis-1: Leave (where possible) plants smaller than 8 ft in height within the 180-foot-wide ROW to help reduce the effect of the ROW of visual and aesthetic resources.

Vis-2: Keep the ROW free of construction debris and other litter during construction to further reduce visual intrusion to the surrounding landscape.

Vis-3: The design of the buildings and related structures shall, to the extent reasonably possible, use materials, colors, textures, screening and landscaping that will blend the facility into the natural setting and existing environment.

Vis-4: No individual tower facility shall be installed at any location that would substantially detract from or block the view of the major portion of a recognized scenic vista, as viewed from any public road ROW or publicly accessible parkland or open space within the County.

Vis-5: As a condition of approval of a special use district for a Wind Energy Facility, within one year of the termination or abandonment of leases, easements or operations of a Wind Energy Facility, the permittee shall cause, at its own expense, the restoration of the land to its pre-facility condition.

5.11.4 Conclusion

Based on low visual impacts due to low population and long distances to sensitive visual areas such as scenic byways and parks, as well as the protection measures detailed above, it is not expected that the proposed location of the Updated Transmission Line Facilities would unduly impair visual resources.

5.12 Land Use, Including Farm, Range, and Recreational Resources

5.12.1 Impact Assessment Methods

Assessment of impacts to land uses from the Updated Transmission Line Facilities construction, operation, and maintenance within the Updated Corona Gen-Tie System Corridor follows the impact assessment methodology described in in Chapter 5.1 above and is discussed below. A land use impact is one that restricts the future use of land or conflicts with an existing use. The Updated Transmission Line Facilities tend to restrict certain activities but may or may not change the land use. Construction, operation, and maintenance of the Updated Transmission Line Facilities would result in both direct and indirect impacts to land use. For schools and recreational resources, impacts are generally low, short term, and temporary in nature. The Updated Transmission Line Facilities were evaluated to determine whether the following types of impacts would occur:

- Temporary and permanent land use changes.
- Restrictions on activities within the ROW.
- Inconsistency with local land use plans and zoning.
- Removal of land from future development.
- Potential use restrictions or conflicts on public lands.

5.12.2 Impacts Specific to the Updated Corona Gen-Tie System Corridor

5.12.2.1 Agricultural Land Use Impacts

The lands crossed by the Updated Transmission Line Facilities are used for agricultural purposes. Long-term land use impacts to grassland, cropland, and pasture primarily would be the result of structure placement, ROW maintenance, and access roads. Current agricultural practices would be maintained for most of the ROW. Areas of cropland within the ROW could continue to be farmed, and grazing could continue within the ROW. The only land that would be unavailable for agriculture would be the area occupied by actual transmission structures. Structures would be approximately 3 to 5 ft in diameter at ground level depending on the type of structure. The permanent footprint of transmission line structures would be removed from production, and structures would present obstacles that would need to be avoided. Pattern Development would work with landowners to reduce impacts to irrigation facilities. However, overall, the Updated Transmission Line Facilities would result in minimal reduction in agricultural production or land available for agricultural activities.

Easements or ROWs have been or would be obtained from landowners along the Updated Transmission Line Facilities for constructing and maintaining the line. The landowner would maintain ownership of the property and continue to pay taxes on the property, but Pattern Development would acquire rights allowing construction, operation, and maintenance of the Updated Transmission Line Facilities in exchange for a monetary payment to the landowner. The agreement between the landowner and Pattern Development would outline any use restrictions applying to the agreement. The agreement would include certain restrictions on the continued use of the property, such as prohibiting permanent structures and establishment of certain types of vegetation within the ROW that could affect access to the line or safe and reliable operation.

During construction and maintenance activities, agricultural lands would be subject to temporary impacts. Depending on the time of year, access for construction would result in damage to crops, compaction and rutting of soil, restrictions on access to the ROW, and restrictions on general agricultural practices in and around the ROW (such as prescribed burning of grassland pasture). Landowners would be compensated for crop and forage loss, and damaged soils would be restored to arable condition. Cattle may need to be re-located or confined away from the ROW areas of pasture during construction. Following completion of construction, disturbance and disruption to agricultural activities would largely cease. Periodic maintenance activities and emergency repairs would result in impacts similar to those for construction. However, these activities would be infrequent over the life of the Project. Landowners would be compensated for any damage, and the ROW would be restored to previous conditions.

In addition to the ROW for the Updated Transmission Line Facilities, approximately four temporary laydown areas for construction material and equipment would be necessary for the duration of construction. These laydown areas each would be up to 20 acres in size each. Where feasible, construction laydown areas are typically located at previously disturbed or developed locations such as vacant lots, existing utility yards, or parking lots to reduce impacts to sensitive resources. If existing yard locations are not available, preferred locations for yards would be undeveloped areas, such as grazing or cropland, that are cleared, flat, have all-weather access, and do not contain streams, wetlands, or other environmentally sensitive resources. Laydown yards would typically consist of flat or gently sloping lands where much of the construction material would be placed on pallets or cribbing. No topsoil would be removed, and minimal, if any, re-grading is expected to take place at these facilities. Laydown areas generally would be returned to a pre-construction condition upon completion of the Updated Transmission Line Facilities.

Three step-up substations and an adjacent switchyard would also be constructed. Construction would take place on up to approximately 20 acres of land per substation/switchyard and would result in the permanent conversion of this area from agricultural land to utility land use.

5.12.2.2 Land Use Plans and Regulations

As part of Torrance County's Goals and Objectives in the Torrance County Comprehensive Land Use Plan, the potential for wind and solar generated power is encouraged in order to improve and expand Torrance County-wide infrastructure to enhance the quality of life and support economic development. The Torrance County Zoning Ordinance encourages the development of businesses that harness wind energy (The Board of County Commissioners of Torrance County, 2016). Special Use Districts for Wind Energy Facilities are to foster the development of the county's wind power resources while preserving traditional land uses.

5.12.2.3 Public Lands

The Updated Transmission Line Facilities may cross state trust lands, depending on the final route. An easement to cross these state lands would be needed from the New Mexico SLO for these portions of the Updated Transmission Line Facilities. If an easement is needed across state trust lands, Pattern Development would coordinate with the SLO to develop an agreement that is consistent with the SLO's development of state trust lands, per its planning requirements. Applications have or will be submitted for all of the Updated Corona Wind Project Area (including the Updated Corona Gen-Tie System Corridor) to SLO.

5.12.2.4 Schools

No direct or indirect impacts to schools would occur as a result of the construction, operation, and maintenance of the Updated Transmission Line Facilities. The Corona Elementary/High School is located about 10 miles southwest of the Updated Corona Gen-Tie System Corridor boundary. Siting of the Updated Transmission Line Facilities would follow industry standard siting guidelines.

5.12.2.5 Recreation

No direct or indirect impacts on state or county recreation lands, local parks, trails, or hunting access lands would occur as a result of the construction, operation, and maintenance of the Updated Transmission Line Facilities. There are no parks and recreational areas in close proximity to the Updated Corona Gen-Tie System Corridor. Existing recreational opportunities would continue as they currently exist with minor, temporary disturbances possible during construction.

5.12.3 Protection Measures

Protection measures that would be implemented to reduce any potential negative land use impacts include:

Land-1: Coordinate with landowners for potential measures, including routing, to reduce Project impacts on uses on specific properties.

Land-2: Coordinate with appropriate state land management agencies to obtain appropriate permits and easements for portions of the transmission line traversing public lands.

Land-3: Plan and conduct construction activities to reduce temporary disturbance, displacement of crops, and interference with agricultural activities.

Land-4: Restore compacted cropland soils as close as possible to pre-construction conditions using tillage.

Land-5: Compensate landowners for any new land rights required for ROW or access road easements.

Rec-1: Plan and conduct construction activities to reduce temporary disturbance, displacement of recreationists, and interference with recreation activities.

5.12.4 Conclusion

Based on the compatibility of the Updated Transmission Line Facilities with the current land uses within the Updated Corona Gen-Tie System Corridor, impacts to land uses from location of the Updated Transmission Line Facilities would be largely temporary and limited in area during construction. The large majority of the Updated Corona Gen-Tie System Corridor would remain in its pre-existing use. With inclusion of the protection measures detailed above, it is not expected that the proposed location of the Updated Transmission Line Facilities would unduly impair land use resources.

Based on no direct or indirect impacts to schools and no direct or indirect impacts on state or county recreation lands, local parks, trails, or hunting access lands as a result of the construction, operation, and maintenance of the transmission line, it is not expected that the proposed location of the Updated Transmission Line Facilities would unduly impair school or recreation resources.

5.13 Socioeconomics

5.13.1 Impact Assessment Methods

Assessment of impacts to socioeconomic resources from the Updated Transmission Line Facilities construction, operation, and maintenance within the Updated Corona Gen-Tie System Corridor follows the impact assessment methodology described in Chapter 5.1 above and is discussed below. Socioeconomic resources include elements of the human environment, such as population characteristics, employment and other economic factors, public services, and housing. Construction and operation of the Updated Corona Gen-Tie System and Corona Wind Update would result in both direct and indirect socioeconomic impacts, most of which are positive impacts. Potential socioeconomic impacts include:

- Generation of economic activity from jobs, earnings, and economic output.
- Temporary increase in demand and spending for local goods, services, and construction materials from construction of the Updated Corona Gen-Tie System and Corona Wind Update.
- Temporary increase in population from the influx of construction workers.
- Temporary increase in demand for temporary lodging facilities from the influx of construction workers.
- Temporary disruptions (such as temporary traffic changes or noise) to nearby residents during construction.

5.13.2 Impacts Specific to the Updated Corona Gen-Tie System Corridor

The economic and fiscal impacts of the Corona Wind Projects would make a significant contribution to the economic base of Torrance County with both short-term development activities, and long-term contributions to the regional economy.

Over 30 years of operations, the overall 2018 Approved Projects would produce an estimated $2.6 billion in direct economic impacts, and taking account of economic multiplier impacts, approximately $3.8 billion in direct, indirect and induced economic benefit to the local economy (Tysseling, 2017). Discounting this stream of benefits at a 5 percent annual rate (appropriate for public benefits analysis), and noting that the undiscounted economic impacts are stated in terms of 2018 dollars (i.e., unadjusted for inflation), the present value of the direct economic benefits from the 2018 Approved Projects are estimated to be nearly $1.4 billion, and the direct, indirect, and induced economic benefits of the 2018 Approved Projects are estimated to produce a present value of $2.0 billion (Tysseling, 2017). This equates to an estimated $1.44 billion, and the direct, indirect, and induced economic benefits of the 2018 Approved Projects are estimated to produce a present value of $2.1 billion scaled at a 3-percent increase to account for the updated wind and transmission areas.

The 2018 Approved Projects align directly with several of the specific goals of the New Mexico State Energy Plan. A significant attribute of the 2018 Approved Projects is the development of the SunZia Transmission Project transmission facilities. Moreover, several other objectives of the State Energy Plan are achieved by the 2018 Approved Projects and related developments, including:

- Supporting regional energy policy, infrastructure, and development pathways and solutions.
- Ensuring that sound science and economics, as well as the availability of energy resources drive state energy policy decisions.
- Focus on economic growth, diversification, and private sector job creation.
- Consider appropriate incentives that would increase market potential and competitiveness with other states in the West.
- Accelerate reduction of freshwater consumption in the energy sector.
- Establish the energy foundation of new and improved infrastructure in electric power transmission.

Development of electric generation facilities comprising the Updated Corona Gen-Tie System and Corona Wind Update to be included in the 2018 Approved Projects, offers New Mexico highly desirable economic development investments. Investments in these wind generation and transmission facilities

stimulate substantial growth in the renewable energy sector and foster an economic development climate that broadens the state's long-standing role as a sustainable participant in the energy marketplace. The Updated Corona Gen-Tie System and Corona Wind Updates' facilities would not displace or capture existing commercial energy market activities. Instead, these investments would create new economic development in its exportation of environmentally preferred New Mexico energy resources.

Once operational, the economic benefits and revenue streams would be a stable foundation of economic activity anticipated for at least the 30-year life of the 2018 Approved Projects and the Updated Corona Wind Projects' financing and would likely continue beyond that time. Additionally, the 2018 Approved Project and Updated Corona Wind Project establish a new economic infrastructure that would likely foster further developments of a similar nature.

The short-term impacts during the development period would flow from the $2.4 billion capital investment for the 2018 Approved Projects and Updated Corona Wind Projects' facilities (Tysseling, 2017). These developments would occur over approximately 350,000 acres across the three counties and would introduce significant new economic activities for decades to come.

The 2018 Approved Projects and Updated Corona Wind Projects are estimated to create 1,186 total full-time equivalent jobs during construction, with an estimated 356 of those jobs sourced from local labor sources (Tysseling, 2017). This equates to an estimated 1,225 total full-time equivalent jobs during construction, with an estimated 370 of those jobs sourced from local labor sources at a 3-percent increase to account for the updated wind and transmission areas. Payroll during the development phase would add approximately $60 million in income to the local labor force for the Project construction alone. The bulk of these short-term impacts would occur in 2020 to 2022.

Pattern Development estimates that of the total capital expenditures during construction of the 2018 Approved Projects and Updated Corona Wind Projects, it is likely that $120 million in contracts would flow to local construction service providers (Tysseling, 2017).

Once construction is completed and operations commence, the 2018 Approved Projects and Updated Corona Wind Projects are expected to employ approximately 94 permanent jobs with a payroll estimated to be approximately $4.5 million and total operating costs of approximately $1.7 million per year (Tysseling, 2017).

The land lease and easement agreements with the private landowners on which the 2018 Approved Projects and Updated Corona Wind Projects would be sited would provide direct new revenues to

landowners within the footprint of development. These landowners are expected to realize approximately $12.5 million of new revenues during the development period, and a minimum of approximately $9.3 to $10.5 million per year during the operations period (Tysseling, 2017).

GRT revenues will increase as a result of the construction projects by an estimated $22.4 million for 2018 Approved Projects' and Updated Corona Wind Projects' development. Fiscal impacts associated with property taxes are muted as a result of the financing through Industrial Revenue Bonds (IRBs), but provision has been made by the developers to provide payments in-lieu of taxes (PILOTs) to several of the municipal and school district beneficiaries of these tax revenues in an amount estimated at approximately $3.6 million per year (Tysseling, 2017).

The direct economic impacts of the 2018 Approved Projects and Updated Corona Wind Projects during the development period are anticipated to be $128.8 million, with direct, indirect and induced (multiplier) impacts suggesting a $211.4 million impact from the development of the 2018 Approved Projects and Updated Corona Wind Projects (Tysseling, 2017). This equates to an estimated $132.7 million, with direct, indirect and induced (multiplier) impacts suggesting a $217.7 million impact from the development at a 3-percent increase to account for the updated wind and transmission areas. Once operational, the 2018 Projects and Updated Corona Wind Projects should generate an annual direct economic impact of approximately $82.7 million, and, when economic multipliers are considered, the annual impact from the 2018 Approved Projects and Updated Corona Wind Projects operation can be estimated to be approximately $118.0 million (Tysseling, 2017).

5.13.3 Protection Measures

Protection measures that would be implemented to reduce potential negative socioeconomic impacts from construction activities include:

Socio-1: Work with individual landowners to coordinate the timing of construction to minimize short-term impacts on agriculture.

5.13.4 Conclusion

The Updated Corona Gen-Tie System and Corona Wind Update would develop a relatively new and under-developed economic resource in the state of New Mexico—wind energy—that would be directly exported from the state along with the 2018 Approved Projects. Aside from the technology, innovation and capital investments developed in conjunction with the 2018 Approved Projects and Updated Corona Wind Project, this development creates new economic activity, value, and opportunity within New Mexico, which would be exported from the state. This is a highly valuable attribute of the 2018 Approved

Projects and Updated Corona Wind Projects, as it would not displace or capture existing commercial activities, but, instead, would create the most desirable form of economic development in its exportation of environmentally preferred New Mexico energy resources. In short, the 2018 Approved Projects and Updated Corona Wind Project would create new economic value from economic activities that are not currently a part of the New Mexico economy.

5.14 Communication Signals

5.14.1 Impact Assessment Methods

Assessment of impacts to communication signal resources, from the Updated Transmission Line Facilities construction, operation, and maintenance within the Updated Corona Gen-Tie System Corridor follows the impact assessment methodology described in Chapter 5.1 above and is discussed below. Construction, operations, and maintenance impacts are generally avoidable for communication signal resources.

5.14.2 Impacts Specific to the Updated Corona Gen-Tie System Corridor

The Updated Transmission Line Facilities are planned to avoid beam paths. Siting of the Updated Transmission Line Facilities would be completed outside of existing, known fresnel zones and would avoid inference with communication pathways. One (1) AM or FM station tower was identified within 35 miles of the Updated Corona Gen-Tie System Corridor. The Updated Transmission Line Facilities would avoid AM and FM station towers to the extent practicable if new tower facilities are developed.

5.14.3 Protection Measures

Protection measures that would be implemented to reduce potential negative communication signal impacts from construction activities or operation include:

Comm-1: Pattern Development shall minimize or mitigate any interference with electromagnetic communications, such as radio, telephone or television signals caused by any wind energy facility.

Comm-2: No individual tower facility shall be installed in any location where its proximity with fixed broadcast, retransmission or reception antenna for radio, television or wireless phone or other personal communications systems would produce electromagnetic interference with signal transmission or reception.

5.14.4 Conclusion

Microwave path and AM and FM station towers would be avoided by the Updated Transmission Line Facilities to the extent practicable; therefore, it is not expected that the proposed location of the Updated Transmission Line Facilities would unduly impair communication signals.

5.15 Radioactive Waste and Radiation Hazards

Electric transmission line and substation infrastructure do not generate or contain radioactive waste or radiation hazards. The Updated Transmission Line Facilities would not generate radioactive waste or radiation hazards, and, therefore are not addressed further in this ER.

5.16 Hazardous Materials

5.16.1 Impact Assessment Methods

Assessment of impacts from hazardous materials, from the Updated Transmission Line Facilities construction, operation, and maintenance within the Updated Corona Gen-Tie System Corridor follows the impact assessment methodology described in Chapter 5.1 above and is discussed below. Accidental spill of hazardous materials could occur with the construction, operation, and maintenance of the Updated Transmission Line Facilities. These hazards are described in more detail below.

5.16.2 Impacts Specific to the Updated Corona Gen-Tie System Corridor

During construction, use of trucks, heavy equipment, or stored supplies could result in accidental discharge of fuel, lubricants, and automotive fluids. Although the potential exists, any spills would be accidental, occasional, and of limited extent, and would be considered minor to negligible and temporary in duration. A SPCC Plan would be prepared by Pattern Development and would contain information regarding training, equipment inspections, maintenance and repair, spill prevention kits, and refueling operations for construction vehicles, with an emphasis on preventing spills. Hazardous materials would not be drained onto the ground or into streams or drainage areas. All construction waste including trash and litter, garbage, other solid waste, petroleum products, and other potentially hazardous materials would be removed to a disposal facility authorized to accept such materials weekly.

5.16.3 Protection Measures

Protection measures that would be implemented to reduce any potential negative hazardous materials impacts include:

Haz-1: Prepare a SPCC Plan.

Haz-2: Hazardous materials will not be drained onto the ground or into streams or drainage areas.

Haz-3: Construction waste including trash and litter, garbage, other solid waste, petroleum products, and other potentially hazardous materials will be removed to a disposal facility authorized to accept such materials weekly.

5.16.4 Conclusion

Impacts from hazardous materials would be avoided through the implementation of proper construction practices, development and implementation of a SPCC Plan, as well as the protection measures detailed above; therefore, it is not expected that the proposed location of the Updated Transmission Line Facilities would unduly impair important environmental resources from hazardous materials.

5.17 Safety

5.17.1 Impact Assessment Methods

Assessment of impacts to safety, from the Updated Transmission Line Facilities construction, operation, and maintenance within the Updated Corona Gen-Tie System Corridor follows the impact assessment methodology described in Chapter 5.1 above and is discussed below. Safety concerns can arise from the Updated Transmission Line Facilities construction, operation, and maintenance. These concerns are described in more detail below.

5.17.2 Impacts Specific to the Updated Corona Gen-Tie System Corridor

Pattern Development would develop a safety plan prior to construction to manage and reduce safety risk. Speed limits would be posted and followed to reduce traffic safety concerns on roadways. Proper construction practices would be followed to reduce injury to personnel and damage to property. In the unforeseen event that a safety issue arises, Pattern Development's safety plan would have procedures in place to address most safety situations. Pattern Development will comply with all manufacturer specifications and relevant Occupation Safety and Health Administration requirements to ensure the safety of residents, employees, contractors, livestock, the public, and other users of the land.

Construction of the Updated Transmission Line Facilities could cause wildfire ignition. O&M activities (e.g., welding, vehicle ignition), and the presence of energized transmission line facilities (e.g., arc ignition) could also cause wildfire ignition. Pattern Development and/or its contractors would notify federal, state, and local agencies of any fires and comply with all rules and regulations administered by the federal, state, and local land management agencies concerning the use, prevention, and suppression of fires, including any fire prevention orders that may be in effect at the time of the construction, operation,

or maintenance activity. Additionally, Torrance County emergency responders and fire districts will be contacted to ensure appropriate plans are in place at the Corona Wind Projects to quickly respond to any emergencies. Pattern Development will work with the departments to ensure the safety of the firefighters, Corona Wind Projects' employees, landowners, neighbors, livestock, and other users of the land. The Corona Wind Projects will have emergency response plans in place to respond to various natural disasters, even though the Updated Corona Gen-Tie System Corridor generally is not considered to be a high-risk site. An annual emergency response drill, in which local responders will be invited to participate, will be completed onsite to test the Corona Wind Projects' emergency response

Within the Updated Corona Gen-Tie System Corridor and Corona Wind Update, safety risks will be reduced as electrical substations and transformers will be located inside locked fences or enclosures and will be clearly marked to show that energized electrical equipment is located inside. In addition, Pattern Development will man a 24/7 monitoring center to monitor the substation and turbines. There will be signage on the substation fences with the monitoring center's phone number. Modern wind turbines are inherently unclimbable by the general public since there are no exterior ladders or lattice work and interior ladders are secured behind locked doors located at the bases of the turbine towers.

5.17.3 Protection Measures

Protection measures that would be implemented to reduce any potential safety impacts include:

Safe-1: Pattern Development and its contractors, as appropriate, will initiate discussions with local fire districts and regional fire prevention staff prior to construction to discuss emergency procedures and to provide transmission line safety training, including safety procedures for conducting fire suppression activities near a power line.

Safe-2: All vehicles will be equipped with appropriate fire suppression tools and equipment. Fire suppression equipment will include, but not be limited to, shovels, buckets, and fire extinguishers.

Safe-3: Smoking and equipment parking will be restricted to designated areas.

Safe-4: Pattern Development and/or its contractors will fuel all highway-authorized vehicles offsite to minimize the risk of fire. Fueling of construction equipment that is transported to the site via truck and is not highway authorized will be done in accordance with regulated construction practices and federal, state, and local laws.

Safe-5: Pattern Development will develop a safety plan prior to construction. The plan will include items such as medical emergency facilities and procedures, wildlife agency contacts and procedures, and inclement weather procedures.

Safe-6: Appropriate warning signage shall be placed on wind turbine towers, electrical equipment, and wind energy facility entrances.

Safe-7: To the extent practicable, the facility shall connect to existing substations, or if new substations are needed, minimize the number of new substations.

Safe-8: Electrical controls and control wiring and power lines shall be wireless or underground, except where wind farm collector wiring is brought together for connection to the transmission or distribution network, adjacent to that network.

5.17.4 Conclusion

Impacts from unsafe events would be reduced through the implementation of proper construction practices, as well as the protection measures detailed above; therefore, it is not expected that the proposed location of the Updated Transmission Line Facilities would unduly impair important environmental resources because of safety concerns.

5.18 Geographic Resources

5.18.1 Impact Assessment Methods

Assessment of impacts to geographic resources from the Updated Transmission Line Facilities construction, operation, and maintenance within the Updated Corona Gen-Tie System Corridor follows the impact assessment methodology described in Chapter 5.1 above and is discussed below. The Project is in the Great Plains region of New Mexico. Geographic resources identified in the region include state and national parks and monuments. The Updated Transmission Line Facilities were evaluated to determine whether the following types of impacts would occur:

- Diminishment of scenic resources within and from state or national parks and monuments by the addition of man-made elements to the natural landscape.
- Introduction of noise/air pollution to state or national parks and monuments.

5.18.2 Impacts Specific to the Updated Corona Gen-Tie System Corridor

As discussed in Section 5.11, there are no national parks or state parks in the vicinity of the Updated Corona Gen-Tie System Corridor. The closest national park is Salinas Pueblo Missions National Monument, which is approximately 28 miles west of the Updated Corona Gen-Tie System Corridor. The closest state parks are the Santa Rosa Lake State Park, Sumner Lake State Park, and Manzano Mountains State Park, all located more than 40 miles from the Updated Corona Gen-Tie System Corridor. Manzano Mountains State Park is the closest at 40 miles away. The Updated Transmission Line Facilities would result in minor emissions from construction vehicles and activities but would not impact the overall air quality in the region, including the national and state parks. Noise impacts (such as from construction activities) would be highly localized and would not impact noise level at the national or state parks.

As discussed in Section 5.9, two historic archaeological resources are reported with the Updated Corona Gen-Tie System Corridor. One site is associated with the railroad and the second is a small prehistoric lithic scatter. Impacts to known locations of cultural resources would be low because the Updated Transmission Line Facilities are intended to be designed around these areas. Cultural resource field surveys would be completed prior to any construction activity to reduce potential impacts from the Updated Transmission Line Facilities to unlocated sites. Any discoveries which may occur during construction would be managed through a UDP.

5.18.3 Protection Measures

Due to no anticipated impacts to geographic resources, no protection measures are proposed.

5.18.4 Conclusion

Impacts to geographic resources would be avoided by the Updated Transmission Line Facilities to the extent practicable; therefore, it is not expected that the proposed location of the Updated Transmission Line Facilities would unduly impair geographic resources.

5.19 Military Activities and Aviation

5.19.1 Impact Assessment Methods

Assessment of impacts to military and aviation activities from the Updated Transmission Line Facilities construction, operation, and maintenance within the Updated Corona Gen-Tie System Corridor follows the impact assessment methodology described in Chapter 5.1 above and is discussed below. Construction, operations, and maintenance impacts are generally avoidable in nature for military activities and aviation.

5.19.2 Impacts Specific to the Updated Corona Gen-Tie System Corridor

Three military training routes cross the Updated Corona Gen-Tie System Corridor. Pattern Development would work with FAA to request DNH for the Updated Transmission Line Facilities. Based on the height of the Updated Transmission Line Facilities and the location of military and aviation resources, the transmission line facility construction, operation, and maintenance within the Updated Corona Gen-Tie System Corridor would not impact military activities and aviation.

5.19.3 Protection Measures

Protection measures that would be implemented to reduce any potential negative military or aviation impacts from construction activities include:

Mil-1: Coordinate with military bases and aviation facilities as needed.

Mil-2: Use FAA approved lighting as required.

5.19.4 Conclusion

Impacts to military activities and aviation resources would be avoided by the Updated Transmission Line Facilities to the extent practicable; therefore, it is not expected that the proposed location of the Updated Transmission Line Facilities would unduly impair military activities and aviation resources.

5.20 Roads

5.20.1 Impact Assessment Methods

Assessment of impacts to roads from the Updated Transmission Line Facilities from construction, operation, and maintenance within the Updated Corona Gen-Tie System Corridor follows the impact assessment methodology described in Chapter 5.1 above and is discussed below. Construction, operations, and maintenance impacts are generally low, short term, and temporary in nature for roads.

5.20.2 Impacts Specific to the Updated Corona Gen-Tie System Corridor

Potential impacts for roads would be greatest during construction of the Updated Transmission Line Facilities. Construction equipment and increased traffic have the potential to degrade existing road conditions. Pattern Development would document pre-construction road conditions and return roads used for construction access to pre-construction condition or better once construction is completed. Increased road traffic from construction would be localized and short term based on where the Updated Transmission Line Facilities construction is occurring that day or week. Low impacts to roads in the

Updated Corona Gen-Tie System Corridor are anticipated based on localized, short term impacts, and Pattern Development's commitments to return roads used for construction to pre-construction conditions.

5.20.3 Protection Measures

Protection measures that would be implemented to reduce any potential negative road impacts from construction activities include:

Road-1: Pre-construction conditions will be documented, and Pattern Development will develop a road use agreement with NMDOT and Lincoln and Torrance County Road Maintenance Departments, as necessary.

Road-2: Construction speed limits will be established.

5.20.4 Conclusion

Based on localized, low, short term impacts, and Pattern Development's commitments to return roads used for construction to pre-construction conditions, as well as the protection measures detailed above, it is not expected that the proposed location of the Updated Transmission Line Facilities would unduly impair roads.

6.0 CONSULTATION AND COORDINATION

The following individuals and materials have contributed to the preparation of the Corona Wind Companies' ER for the Updated Corona Wind Project Area.

6.1 List of Preparers and Reviewers

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- Jared Garrand, Analyst Business Development
- Carla Najjar, Special Counsel
- Dan Najjar, Special Counsel

6.1.2 Burns & McDonnell Engineering Company, Inc.

- Paul Callahan, Project Principal
- Chris Knopp, Project Manager
- David Dean, Project Manager
- Bob Rowe, Senior Archeologist
- Crystal Bravo-Cogar, Senior Environmental Scientist
- Gregory Buck, Assistant Environmental Scientist
- Kyle Boatright, Geographic Integration Systems Specialist

6.2 Technical Reports Contributing to the Environmental Report

- *Critical Issues Analysis for the Proposed Ancho Wind Project* (Report, WEST Inc., March 2017a).
- *Critical Issues Analysis for the Proposed Cowboy Mesa Wind Project* (Report, WEST Inc., March 2017b).
- *Critical Issues Analysis for the Proposed Viento Loco Wind Project* (Report, WEST Inc., March 2017c).
- *Raptor Nest Survey, Pattern Wind Energy Project* (Report, WEST Inc., August 2017d).
- *Site Characterization Study, Pattern Wind Energy Project* (Report, WEST Inc., August 2017e).
- *The Economic and Fiscal Impact of the Corona Wind Project in New Mexico* (John C. Tysseling PhD, 2017).

- *Waters of the U.S. and Biological Resources Assessment for 10 Proposed Wind Turbine Locations and Access Roads at the Ancho Wind Proj*ect, Lincoln County, New Mexico (Report, Blanton & Associates, Inc., 2017a).
- *Waters of the U.S. and Biological Resources Assessment for 11 Proposed Wind Turbine Locations and Access Roads at the Viento Loco Wind Project*, Torrance County, New Mexico (Report, Blanton & Associates, Inc., 2017b).
- *Waters of the U.S. and Biological Resources Assessment for 15 Proposed Wind Turbine Locations and Access Roads at the Duran Mesa Wind Project*, Torrance County, New Mexico (Report, Blanton & Associates, Inc., 2017c).
- *Waters of the U.S. and Biological Resources Assessment for 16 Proposed Wind Turbine Locations and Access Roads at the Tecolote Wind Project*, Torrance County, New Mexico (Report, Blanton & Associates, Inc., 2017d).
- *Waters of the U.S. and Biological Resources Assessment for 21 Proposed Wind Turbine Locations and Access Roads at the Red Cloud Wind Project*, Torrance County, New Mexico (Report, Blanton & Associates, Inc., 2017e).

6.3 Recipients of the Environmental Report

- Lincoln/Torrance County Board of County Commissioners
- Lincoln/Torrance County Manager
- Lincoln/Torrance County Road Superintendent
- City of Corona City Council
- Mayor, Corona
- Corona City Manager
- City of Duran City Council
- Mayor, Duran
- Duran City Manager
- Corona Elementary/High School
- Estancia Elementary/Middle/High School
- Vaughn Elementary/High School
- New Mexico Environment Department
- New Mexico State Engineer
- New Mexico Attorney General
- New Mexico SLO

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Blanton & Associates, Inc. 2017b. *Waters of the U.S. and Biological Resources Assessment for 11 Proposed Wind Turbine Locations and Access Roads at the Viento Loco Wind Project, Torrance County, New Mexico.*

Blanton & Associates, Inc. 2017c. *Waters of the U.S. and Biological Resources Assessment for 15 Proposed Wind Turbine Locations and Access Roads at the Duran Mesa Wind Project, Torrance County, New Mexico.*

Blanton & Associates, Inc. 2017d. *Waters of the U.S. and Biological Resources Assessment for 16 Proposed Wind Turbine Locations and Access Roads at the Tecolote Wind Project, Torrance County, New Mexico.*

Blanton & Associates, Inc. 2017e. *Waters of the U.S. and Biological Resources Assessment for 21 Proposed Wind Turbine Locations and Access Roads at the Red Cloud Wind Project, Torrance County, New Mexico.*

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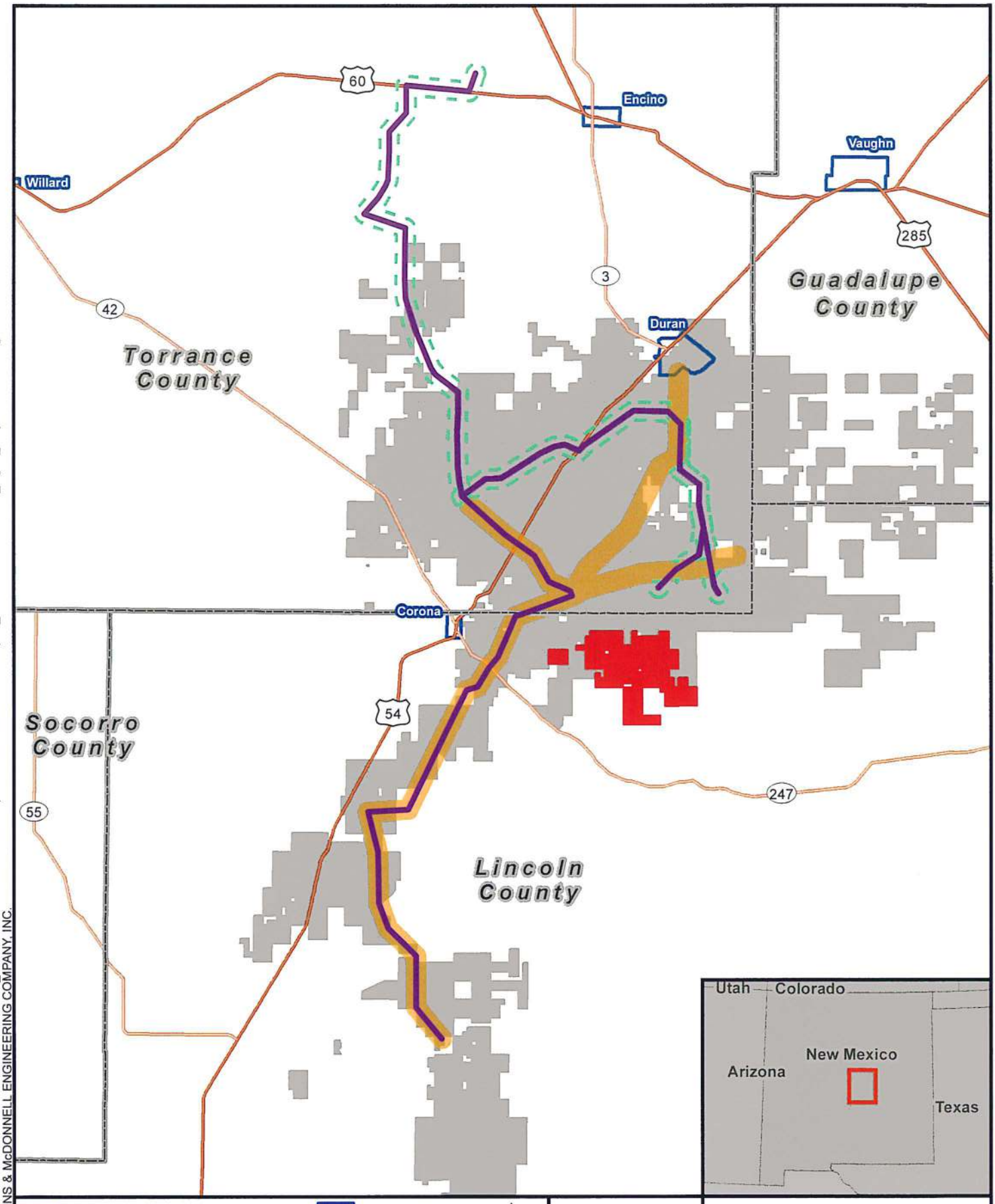
8.0 INDEX

APPENDIX 1 - EXHIBITS

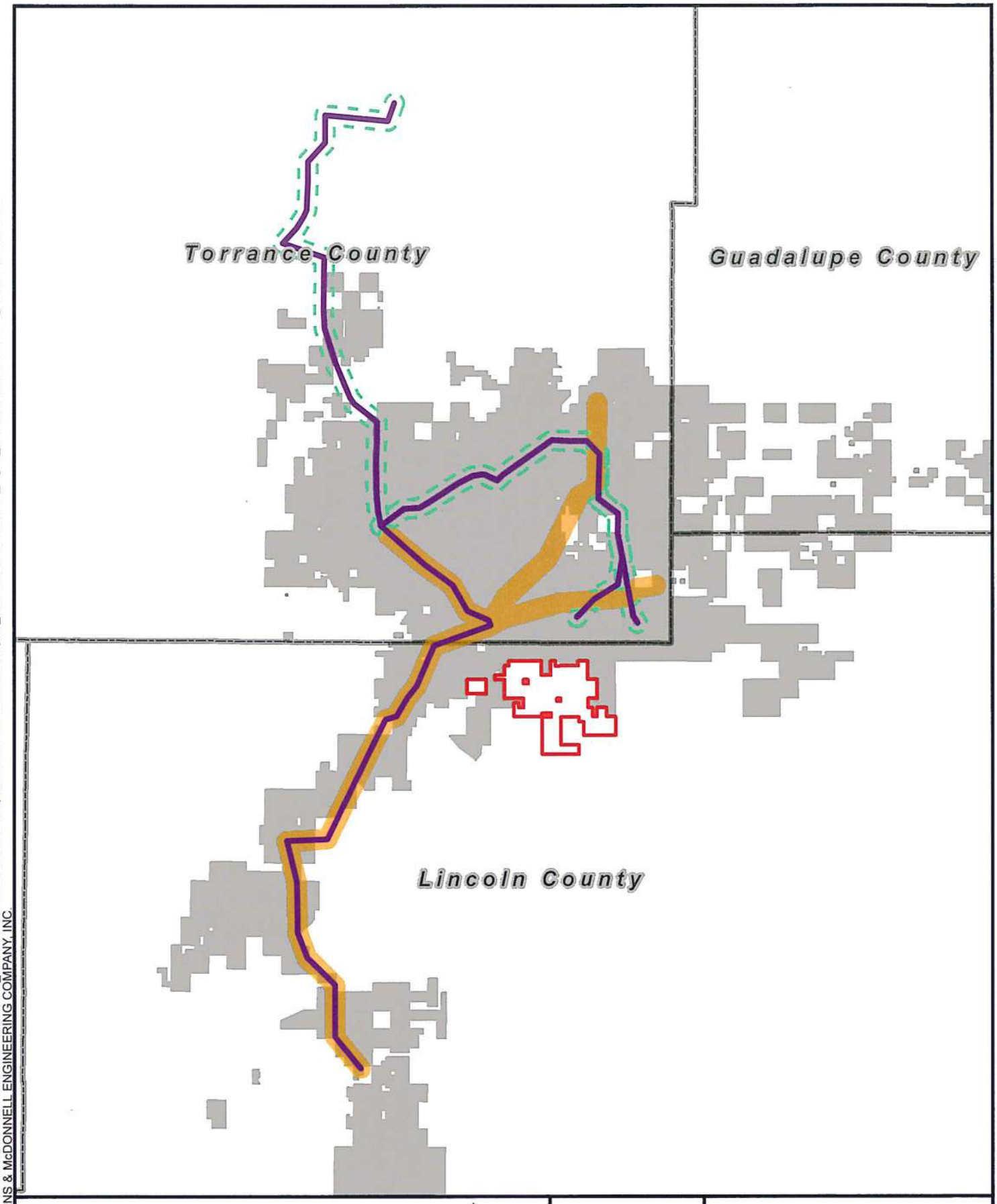


BURNS McDONNELL

Exhibit 1
Project Area
Pattern Development
Corona Wind Energy Project Supplement
Wind Project Area & Gen-Tie
Lincoln & Torrance County, NM

Source: Esri, Pattern Development, and Burns & McDonnell Engineering Company, Inc.

Issued: 12/13/2019



Proposed Transmission Line
One-Mile Transmission Line Buffer
Corona Wind Update
Approved Wind Project Area
Approved Transmission Line Buffer

NORTH

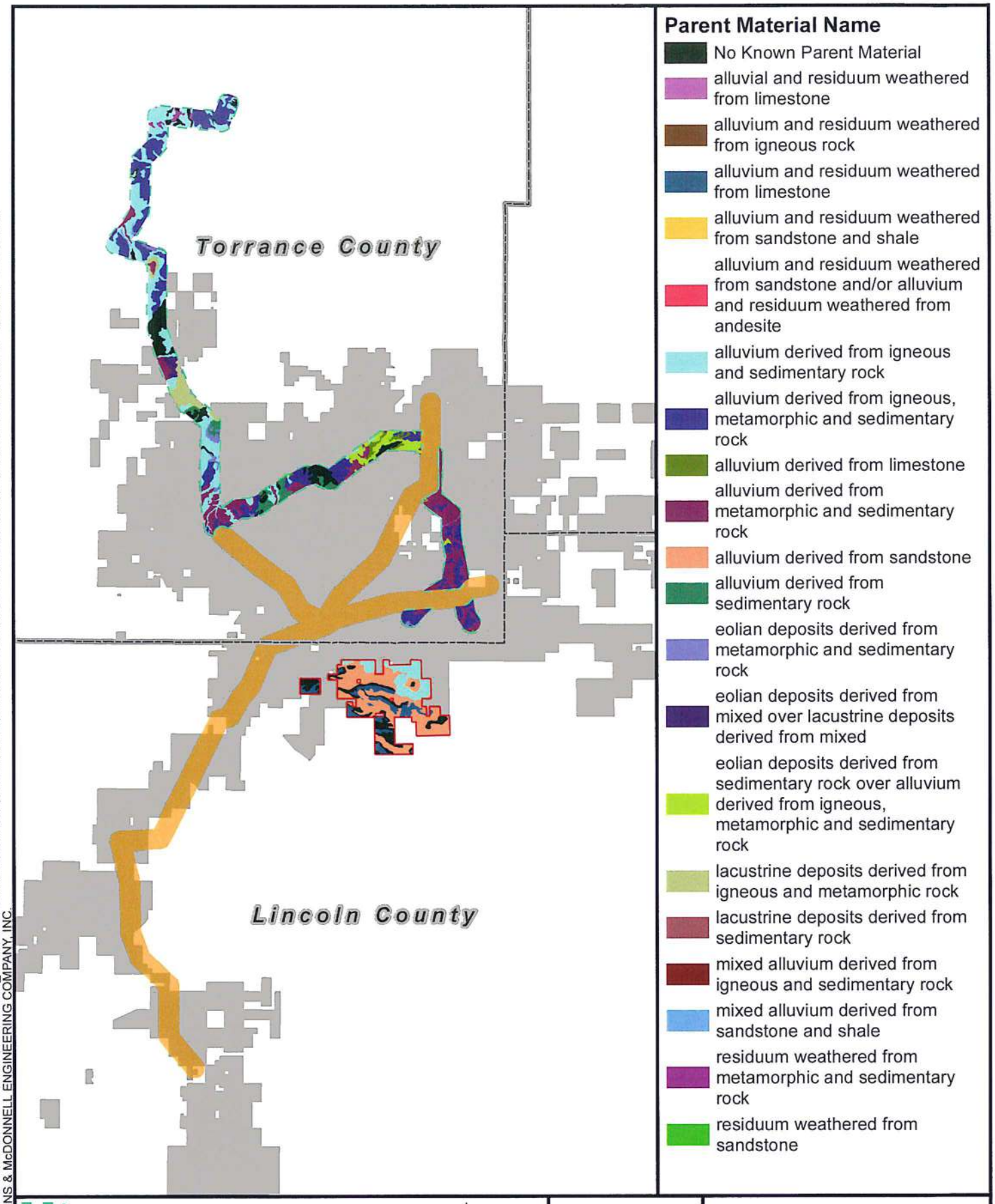
0 3.5 7
Scale in Miles

BURNS McDONNELL

Exhibit 2
Assessment Area
Pattern Development
Corona Wind Energy Project Supplement
Wind Project Area & Gen-Tie
Lincoln & Torrance County, NM

Source: Esri, Pattern Development, and Burns & McDonnell Engineering Company, Inc.

Issued: 12/13/2019



BURNS McDONNELL

Exhibit 3
Parent Material
Pattern Development
Corona Wind Energy Project Supplement
Wind Project Area & Gen-Tie
Lincoln & Torrance County, NM

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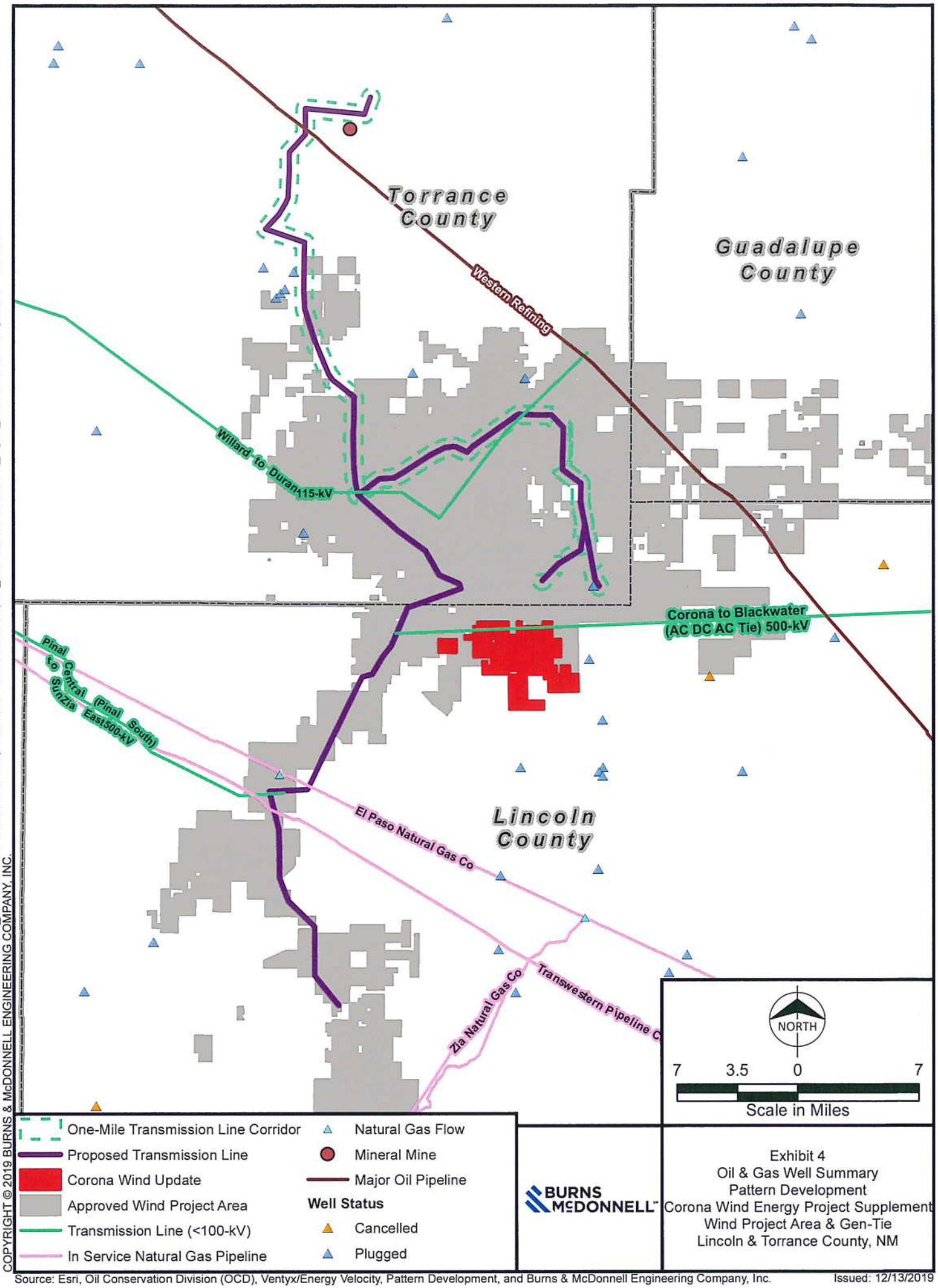
Source: Esri, SSURGO Soils Databases, Pattern Development, and Burns & McDonnell Engineering Company, Inc.

Issued: 12/10/2019



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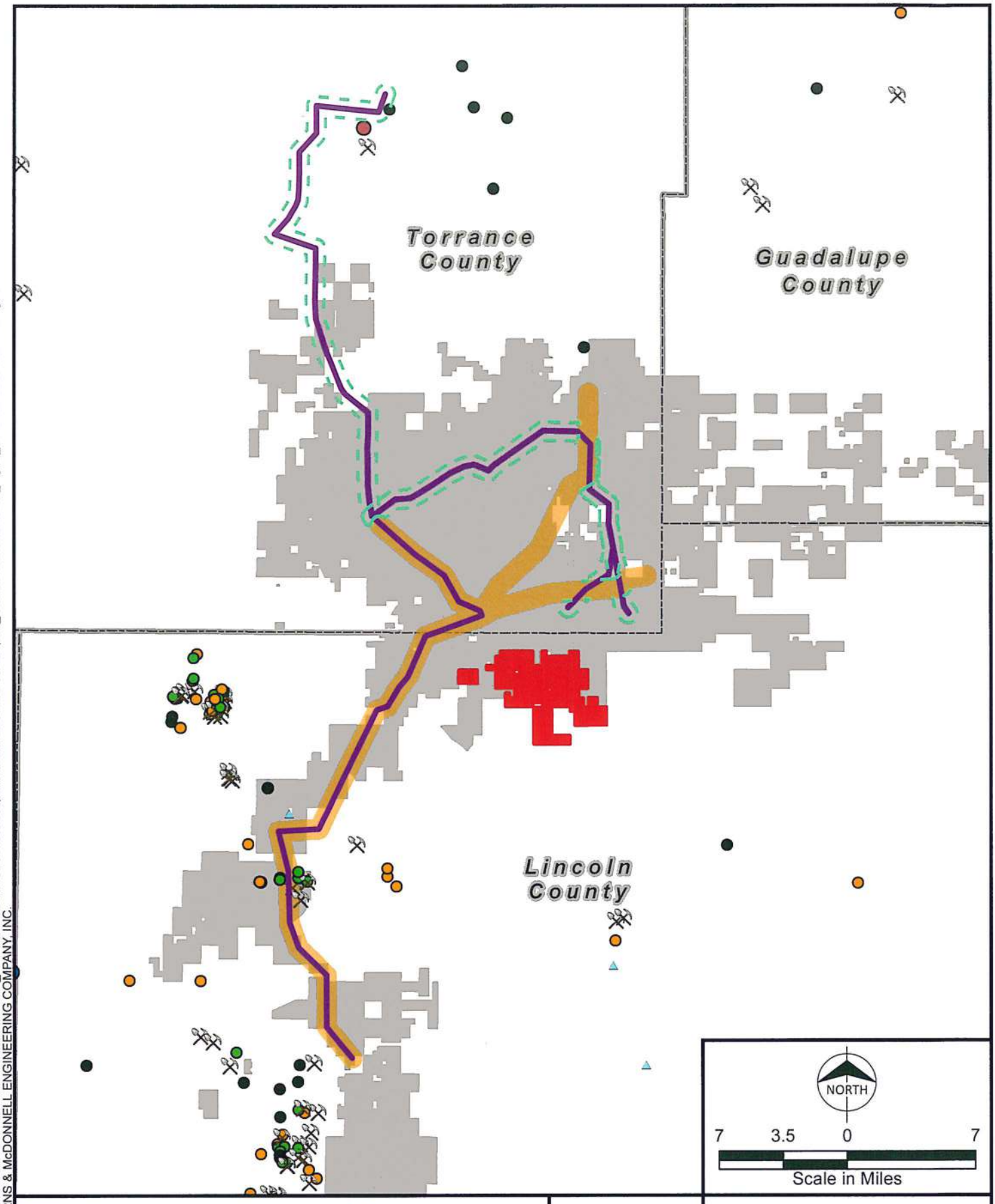
Source: Esri, Oil Conservation Division (OCD), Ventyx/Energy Velocity, Pattern Development, and Burns & McDonnell Engineering Company, Inc.

Issued: 12/13/2019

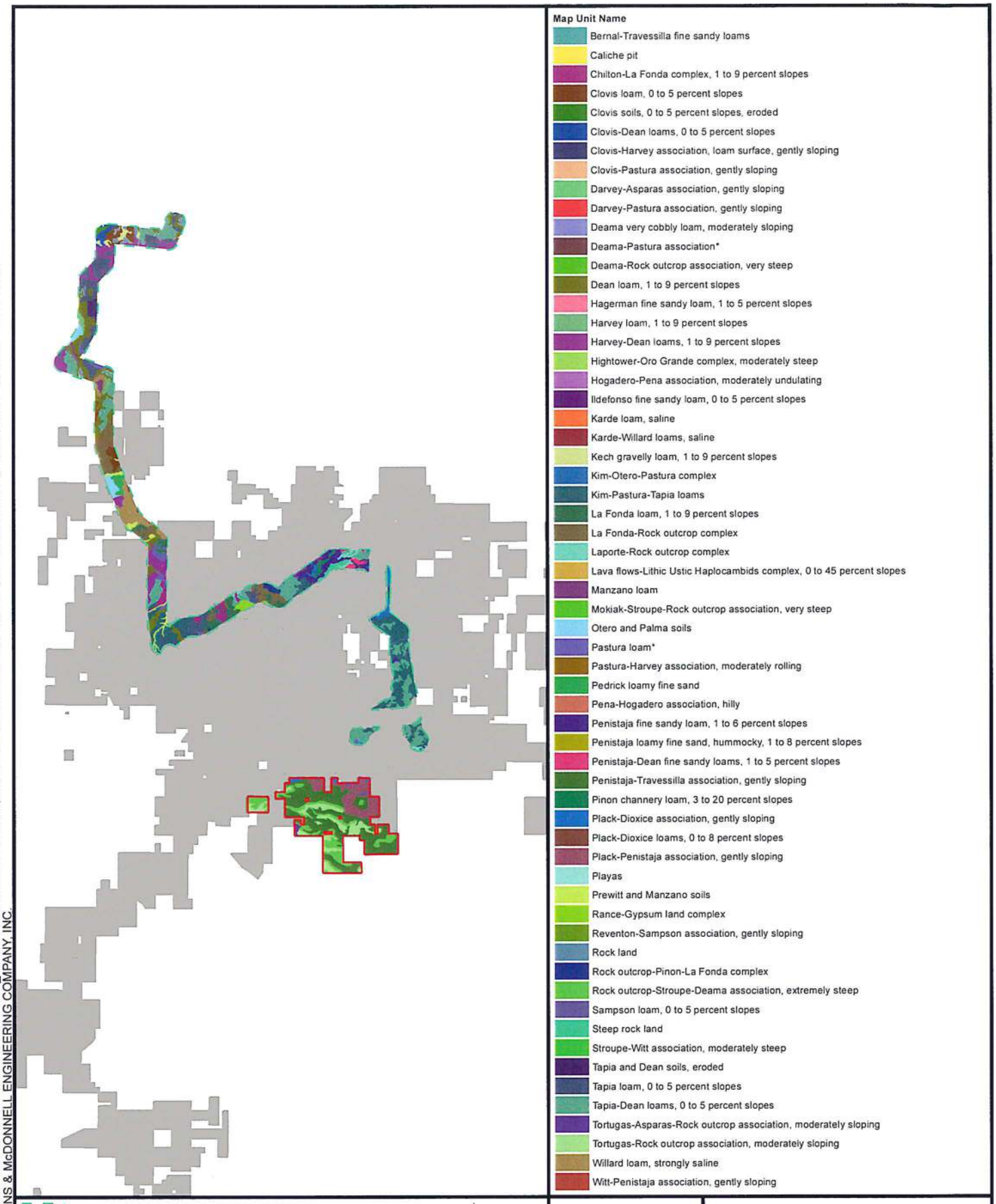


BURNS McDONNELL

Exhibit 5
Mineral Resources Map
Pattern Development
Corona Wind Energy Project Supplement
Wind Project Area & Gen-Tie
Lincoln & Torrance County, NM

Source: Esri, USGS-Mineral Resources Data System (MRDS), Pattern Development, and Burns & McDonnell Engineering Company, Inc.

Issued: 12/13/2019



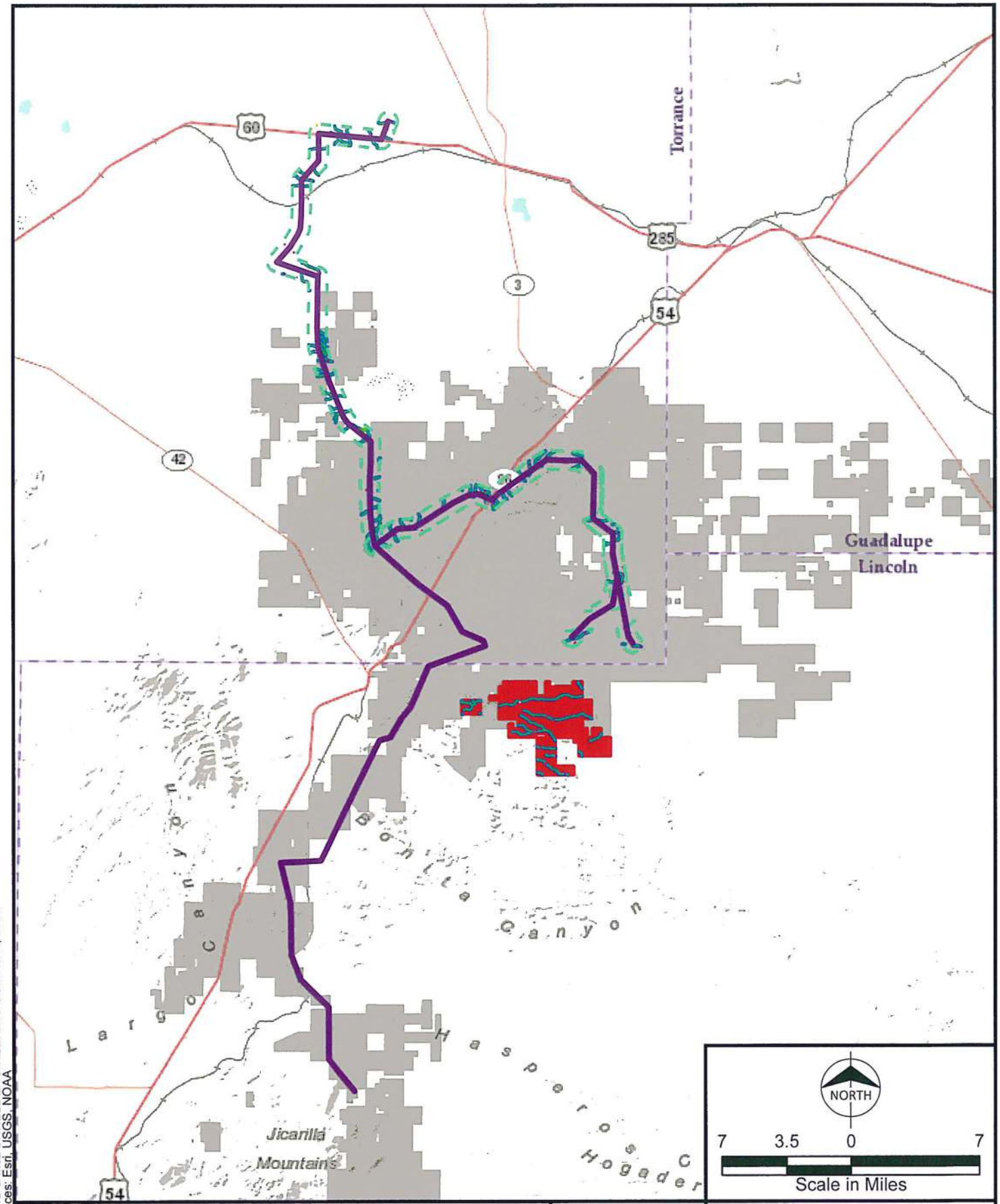
*Names shortened for generalization.

BURNS McDONNELL

Exhibit 6
Soils Summary
Pattern Development
Corona Wind Energy Project Supplement
Wind Project Area & Gen-Tie
Lincoln & Torrance County, NM

Source: Esri, SSURGO Soils Databases, Pattern Development, and Burns & McDonnell Engineering Company, Inc.

Issued: 12/10/2019



One-Mile Transmission Line Corridor
Proposed Transmission Line
Corona Wind Update
Approved Wind Project Area
NHD Waterbody
NWI Wetland
NHD Flowline

BURNS McDONNELL

Exhibit 7
Surface Waters
Pattern Development
Corona Wind Energy Project Supplement
Wind Project Area & Gen-Tie
Lincoln & Torrance County, NM

Source: Esri, USGS-National Hydrography Dataset (NHD), USFWS-National Wetland Inventory (NWI), Pattern Development, Ventyx/Energy Velocity, and Burns & McDonnell Engineering Company, Inc.

Issued: 12/13/2019

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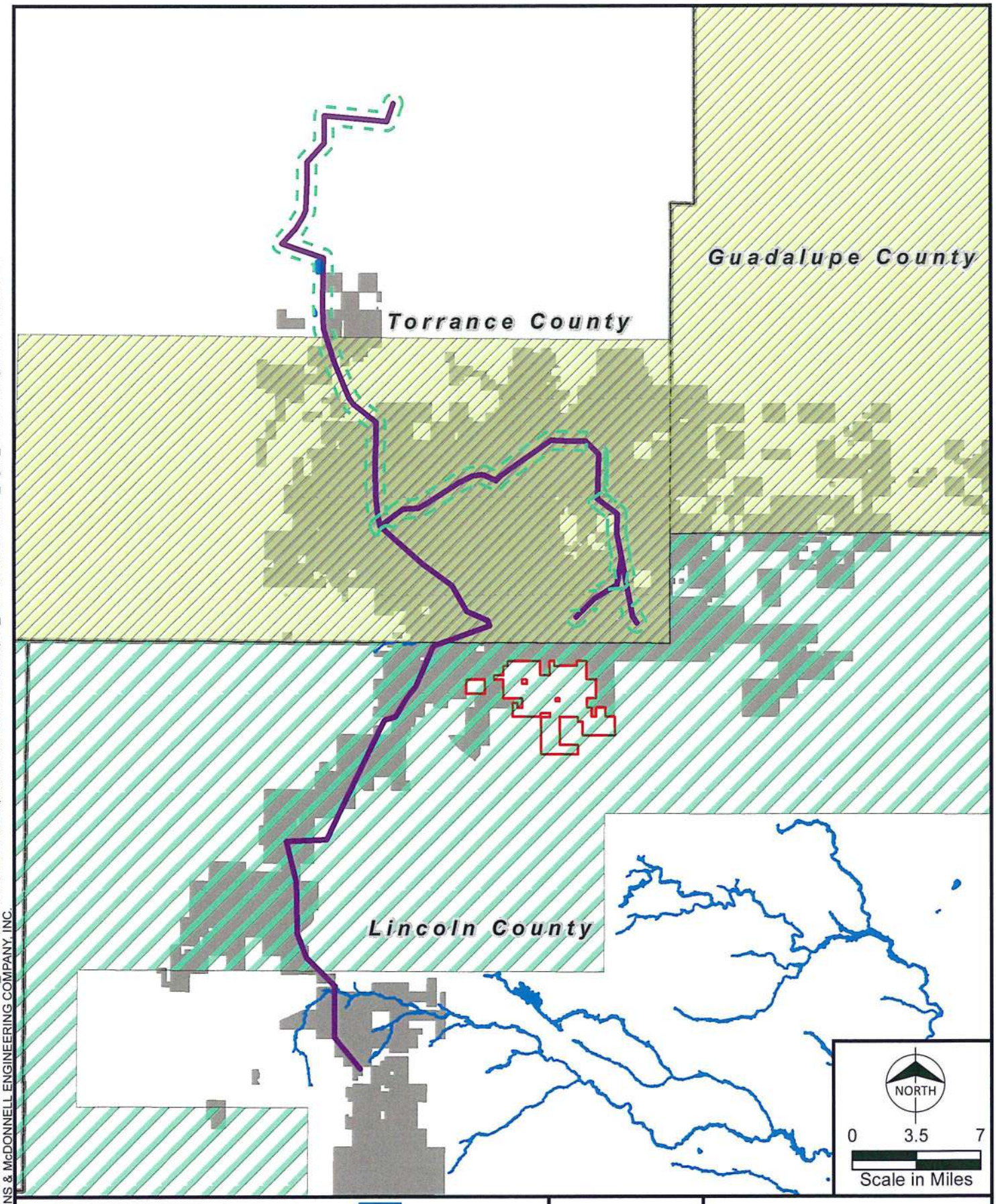
Service Layer Credits: Sources: Esri, USGS, NOAA



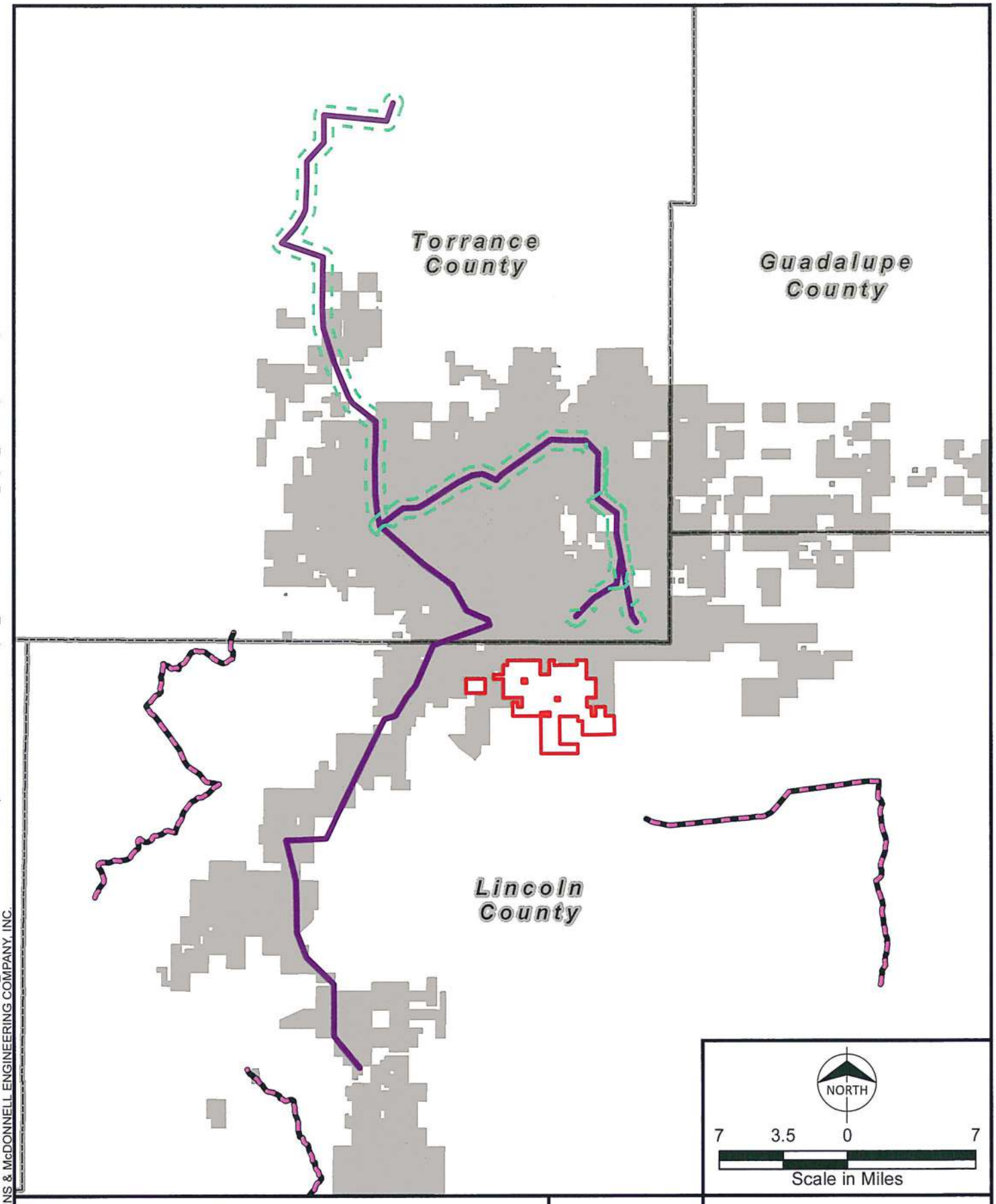
Proposed Transmission Line
One-Mile Transmisison Line Corridor
Corona Wind Update
Approved Wind Project Area
FEMA Designated Zone D
FEMA - Zone A
Unmapped Area

BURNS McDONNELL

Exhibit 9
Floodplain Summary
Pattern Development
Corona Wind Energy Project Supplement
Wind Project Area & Gen-Tie
Lincoln & Torrance County, NM

Source: Esri, FEMA, Pattern Development, and Burns & McDonnell Engineering Company, Inc.

Issued: 12/13/2019



BURNS McDONNELL

Exhibit 10
Breeding Bird Survey Routes
Pattern Development
Corona Wind Energy Project Supplement
Wind Project Area & Gen-Tie
Lincoln & Torrance County, NM

Source: Esri, Breeding Bird Survey, Pattern Development, and Burns & McDonnell Engineering Company, Inc.

Issued: 12/13/2019

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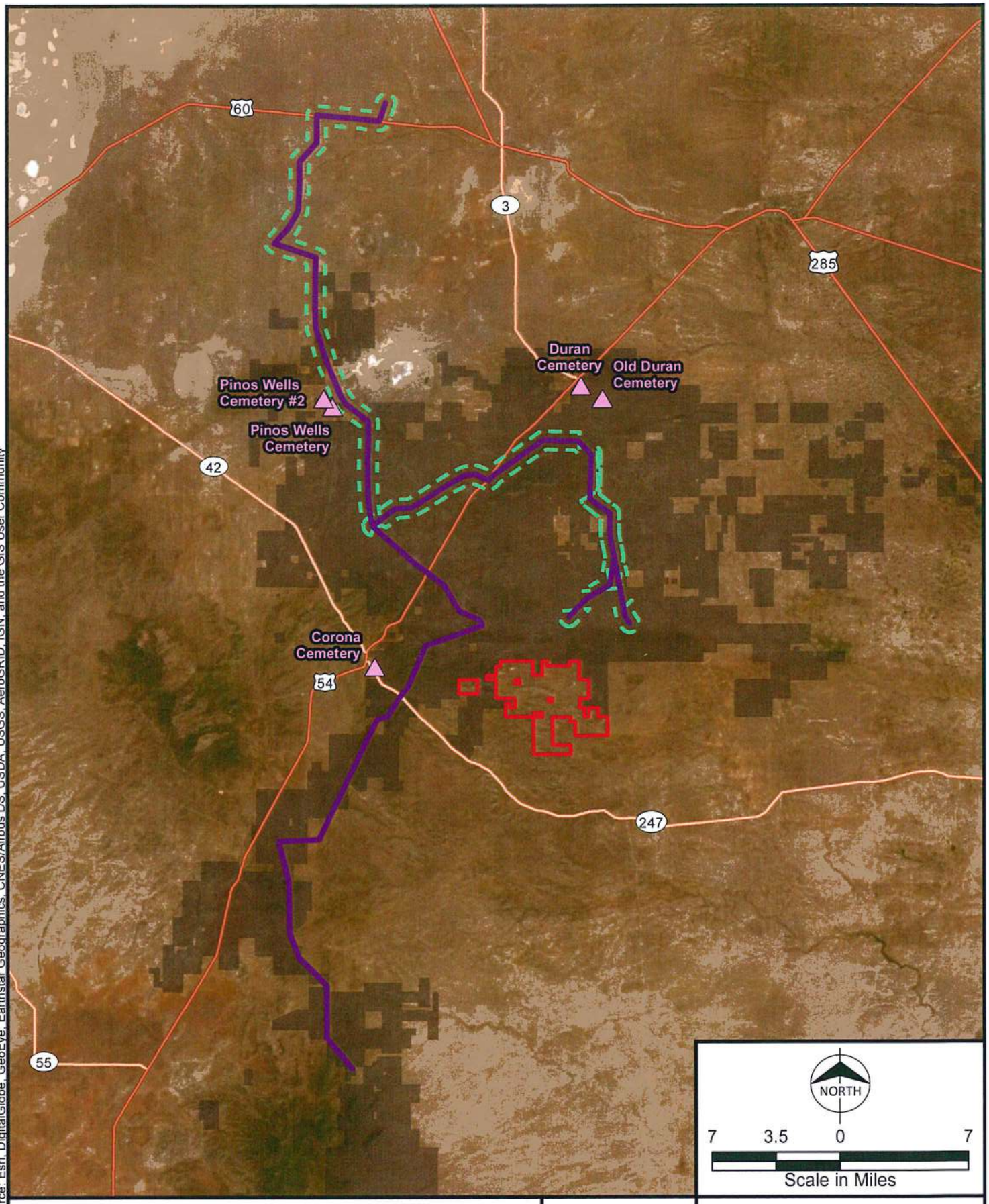


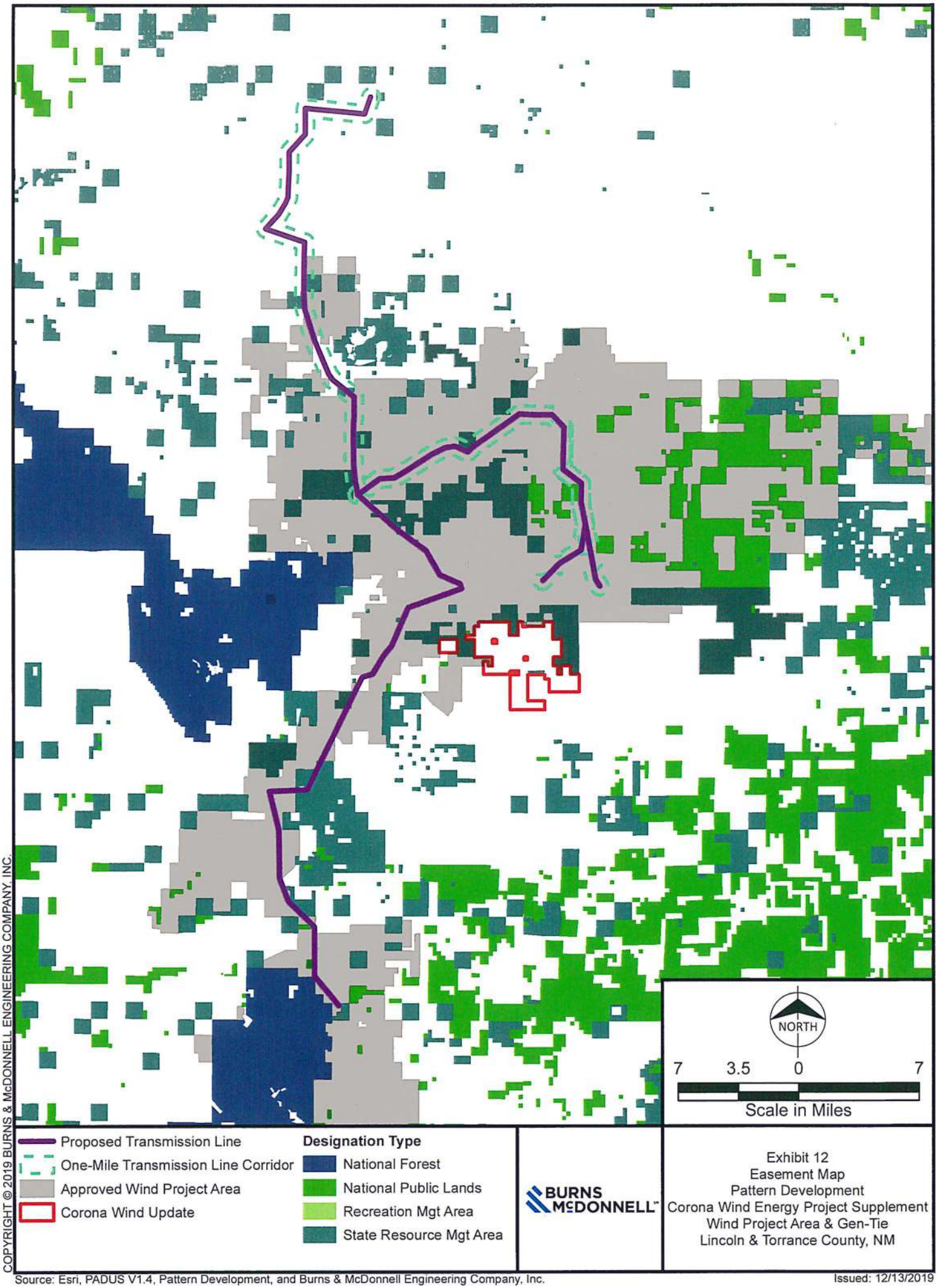
Proposed Transmission Line
One-Mile Transmission Line Corridor
Corona Wind Update
Approved Corona Wind Project Area
Cemetery

BURNS McDONNELL

Exhibit 11
Cemeteries
Pattern Development
Corona Wind Energy Project Supplement
Wind Project Area & Gen-Tie
Lincoln & Torrance County, NM

Source: Esri, Pattern Development, and Burns & McDonnell Engineering Company, Inc.

Issued: 12/13/2019



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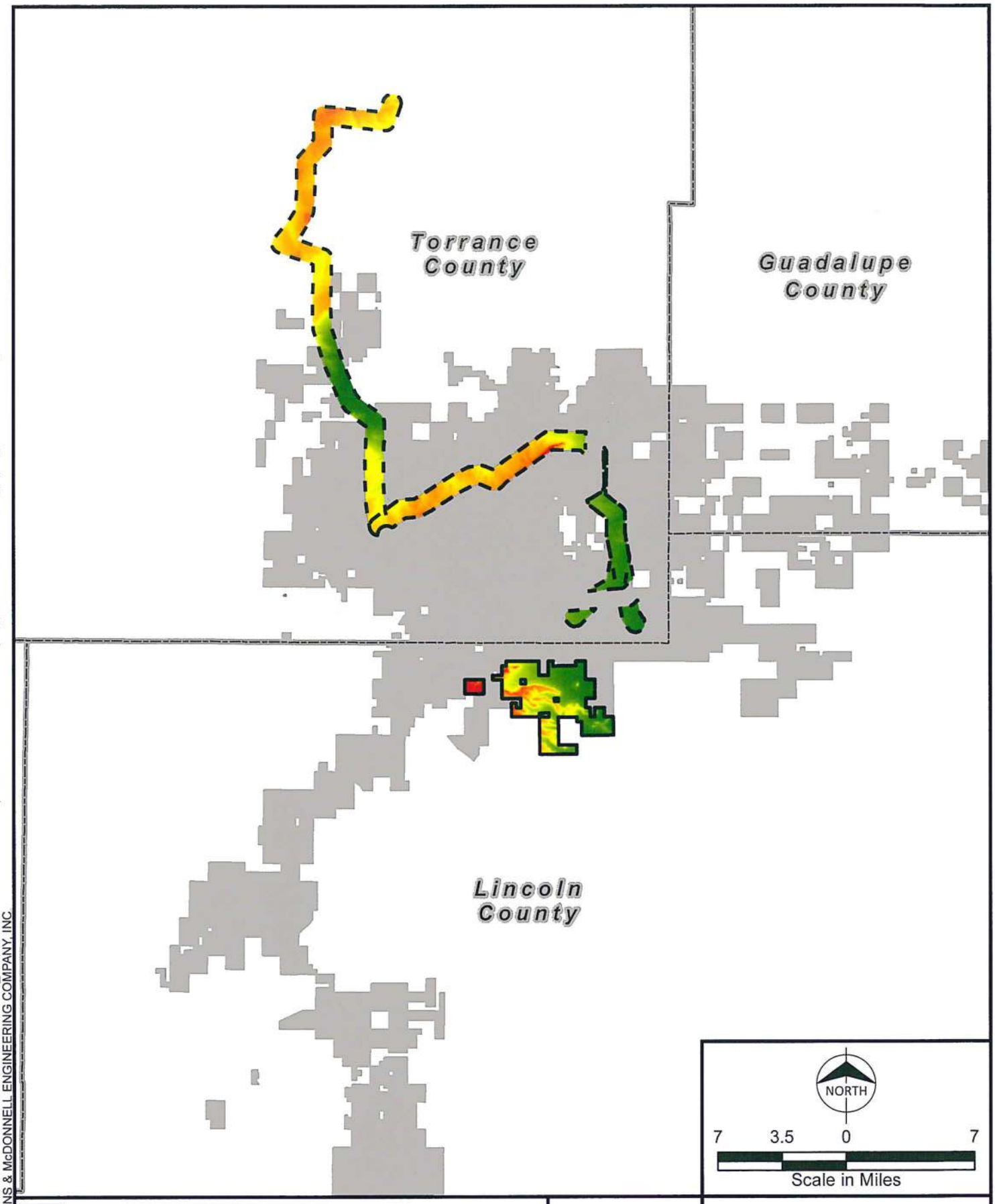
Source: Esri, PADUS V1.4, Pattern Development, and Burns & McDonnell Engineering Company, Inc.

Issued: 12/13/2019



BURNS McDONNELL

Exhibit 13
Elevation Map
Pattern Development
Corona Wind Energy Project Supplement
Wind Project Area & Gen-Tie
Lincoln & Torrance County, NM

Source: Esri, USGS, Pattern Development, and Burns & McDonnell Engineering Company, Inc.

Issued: 12/11/2019

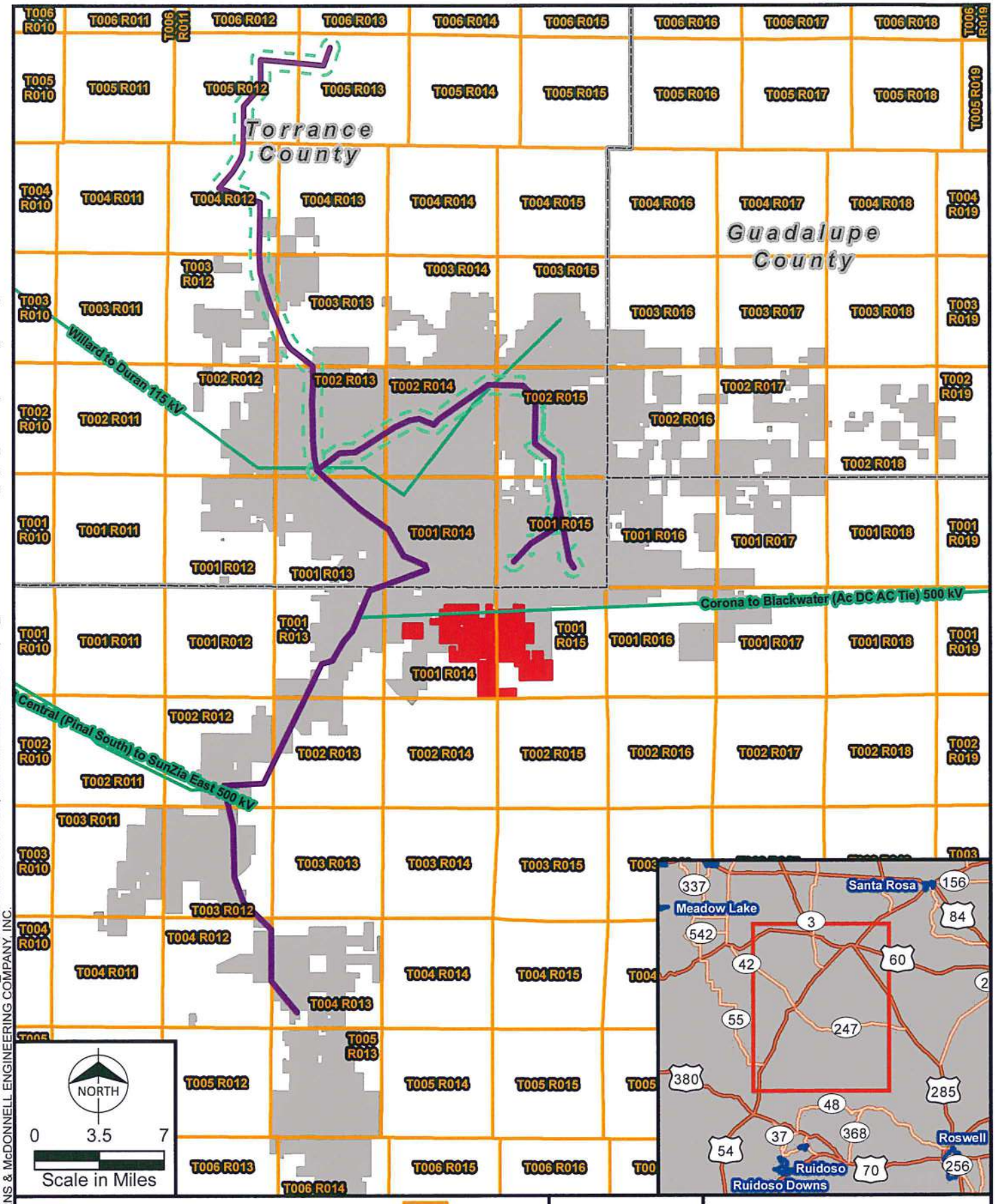
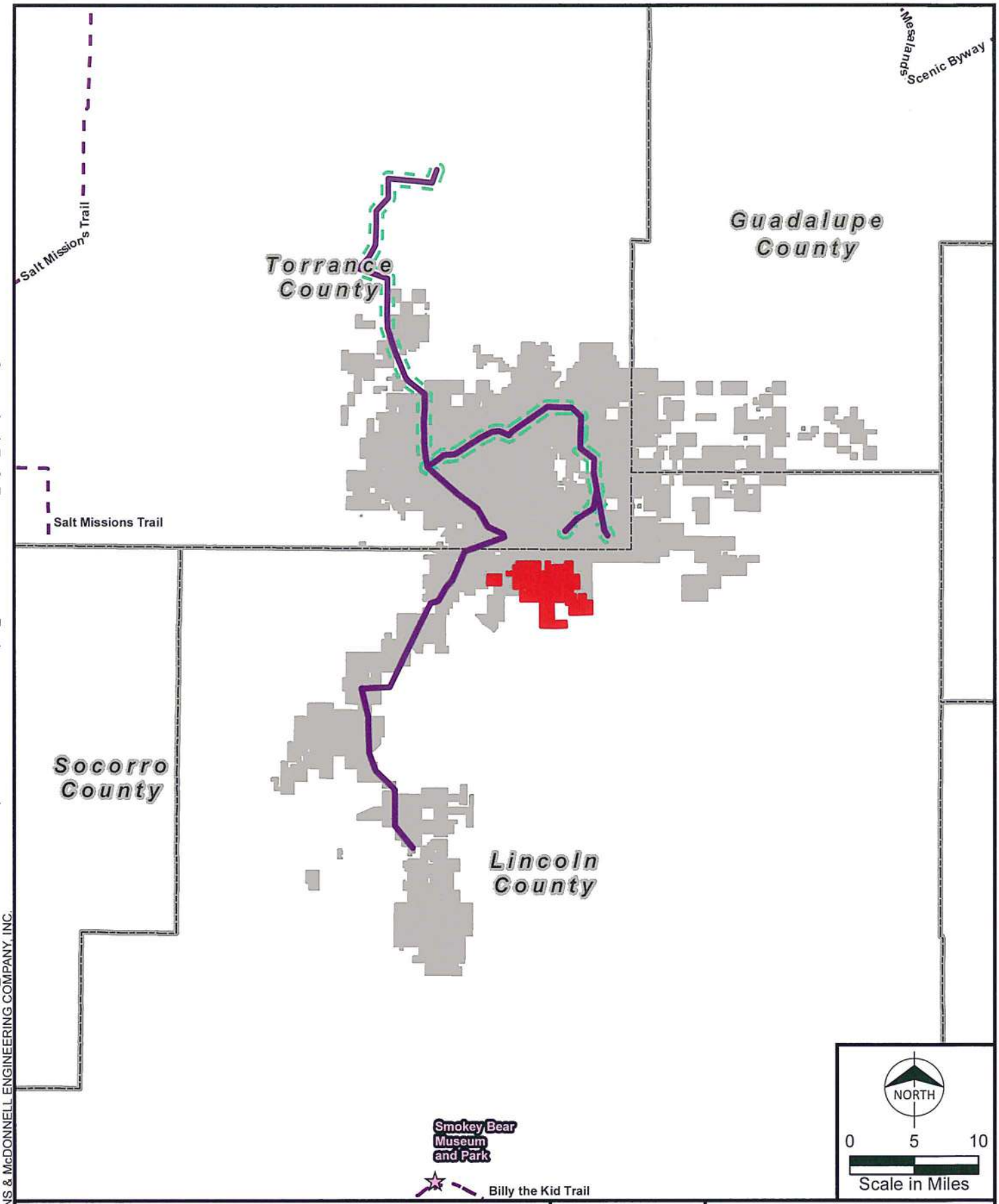


Exhibit 14
Boundary Summary
Pattern Development
Corona Wind Energy Project Supplement
Wind Project Area & Gen-Tie
Lincoln & Torrance County, NM

BURNS McDONNELL

Source: Esri, Census, Pattern Development, Ventyx/Energy Velocity, and Burns & McDonnell Engineering Company, Inc.

Issued: 12/13/2019



Proposed Transmission Line
One-Mile Transmission Line Corridor
Corona Wind Update
Approved Wind Project Area
American Byways
All Byways
Byway Place

BURNS McDONNELL

Exhibit 15
Byways & Trails
Pattern Development
Corona Wind Energy Project Supplement
Wind Project Area & Gen-Tie
Lincoln & Torrance County, NM

Source: Esri, Federal Highway Administration, Pattern Development, and Burns & McDonnell Engineering Company, Inc.

Issued: 12/13/2019

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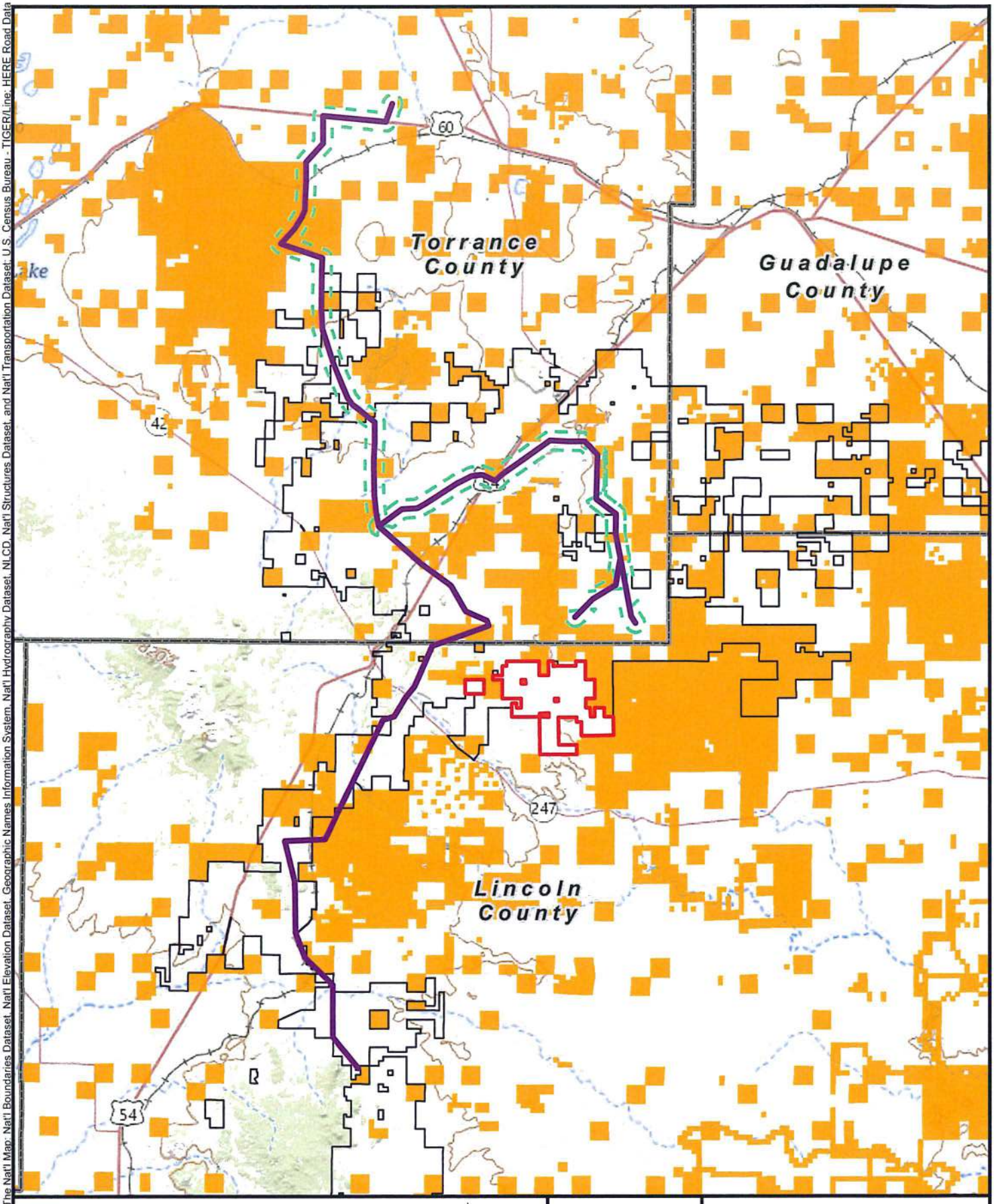

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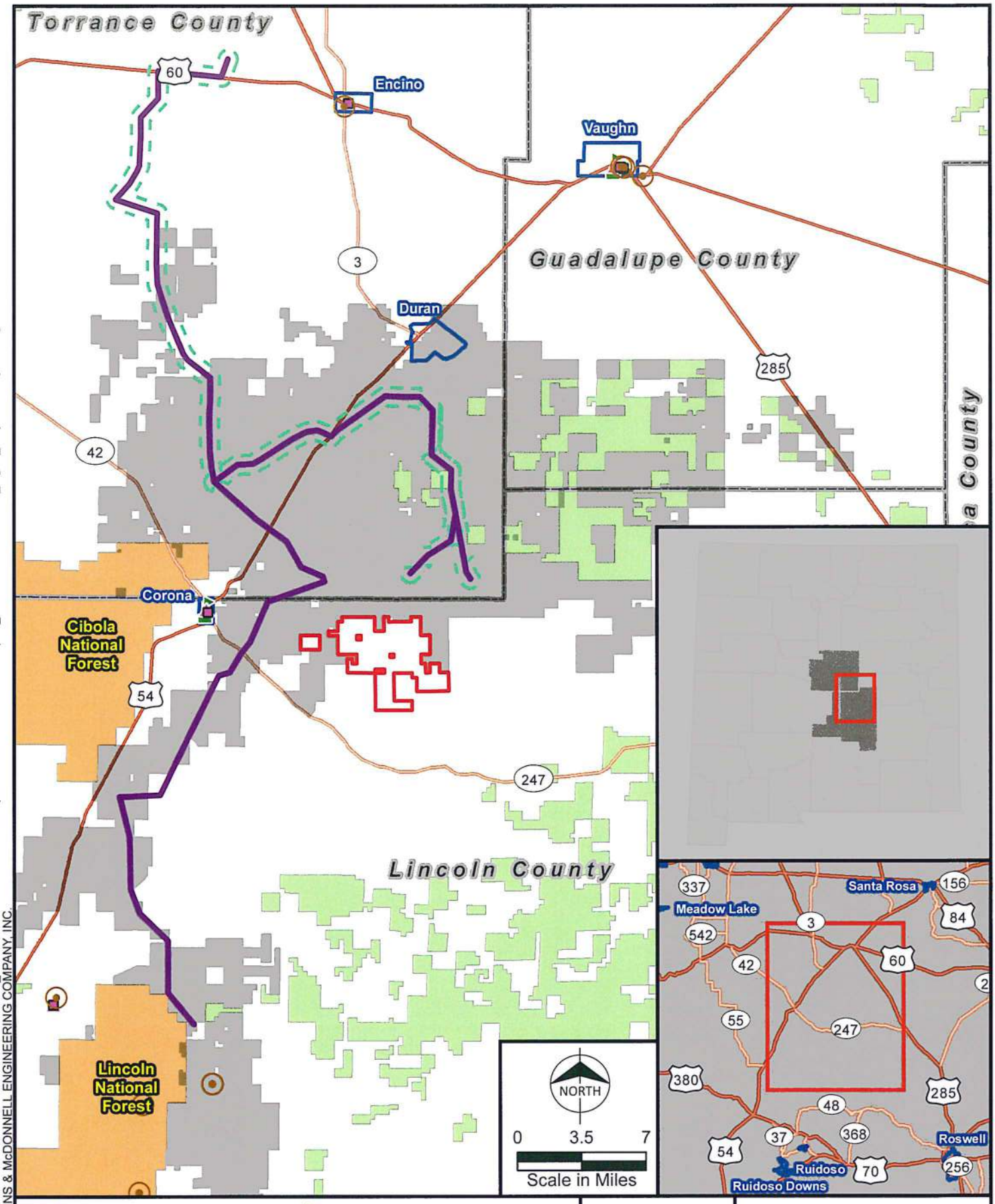
Service Layer Credits: USGS The Nat'l Map: Nat'l Boundaries Dataset, Nat'l Elevation Dataset, Geographic Names Information System, Nat'l Hydrography Dataset, NLCD, Nat'l Structures Dataset, and Nat'l Transportation Dataset; U.S. Census Bureau - TIGER/Line; HERE Road Data

BURNS McDONNELL

Exhibit 16
State Lands
Pattern Development
Corona Wind Energy Project Supplement
Wind Project Area & Gen-Tie
Lincoln & Torrance County, NM

Source: Esri, Earth Data Analysis Center (EDAC), Playa Lakes Venture, State Land Office, Pattern Development, and Burns & McDonnell Engineering Company, Inc. Issued: 12/13/2019



BURNS McDONNELL

Exhibit 17
Project Vicinity
Pattern Development
Corona Wind Energy
Project Supplement
Wind Project Area & Gen-Tie
Lincoln & Torrance County, NM

Source: Esri, Census, Pattern Development, and Burns & McDonnell Engineering Company, Inc.

Issued: 12/13/2019

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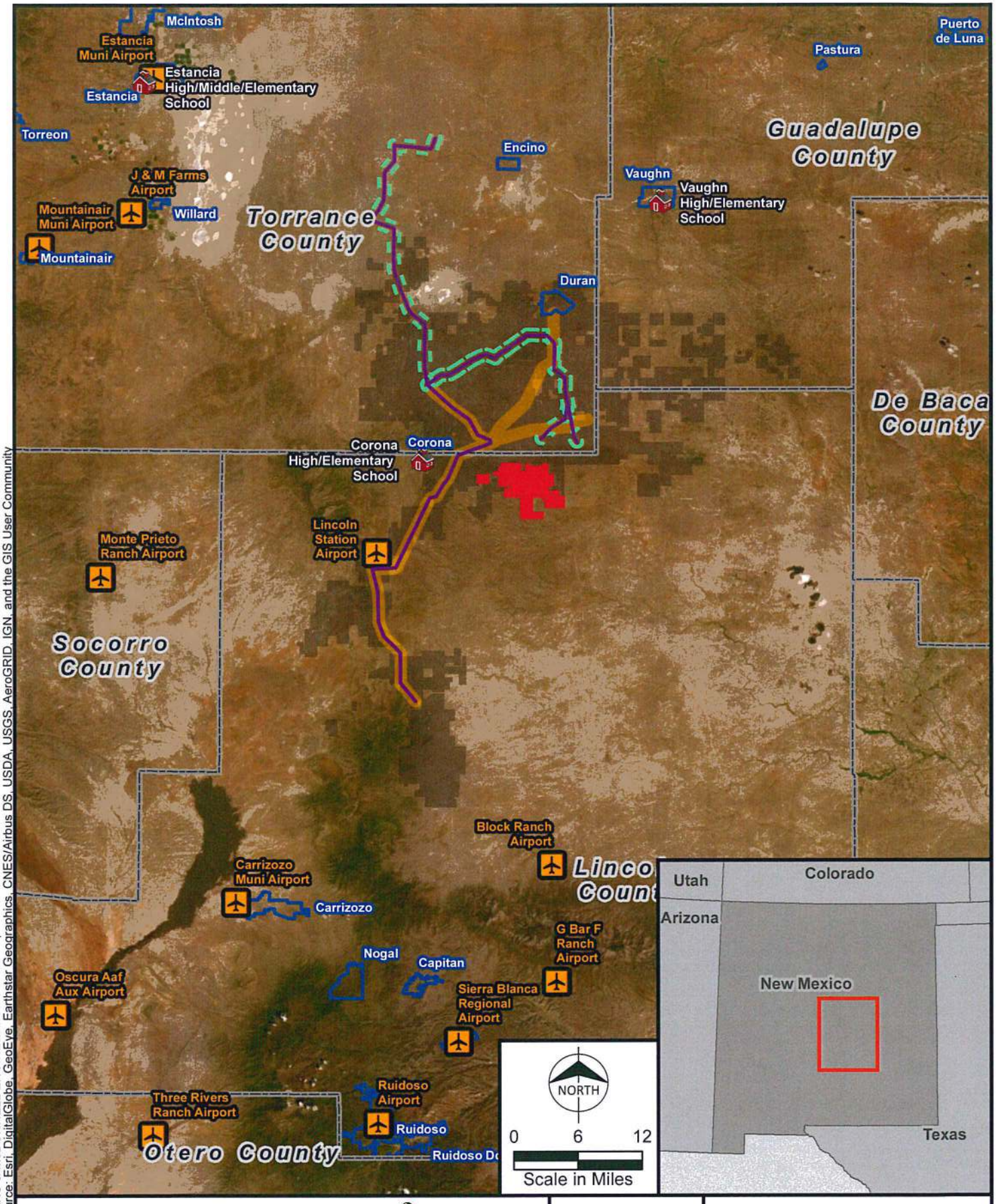

BURNS McDONNELL

Exhibit 18
General Vicinity Map
Pattern Development
Corona Wind Energy Project Supplement
Wind Project Area & Gen-Tie
Lincoln & Torrance County, NM

Source: Esri, Pattern Development, Ventyx/Energy Velocity, and Burns & McDonnell Engineering Company, Inc.

Issued: 12/13/2019

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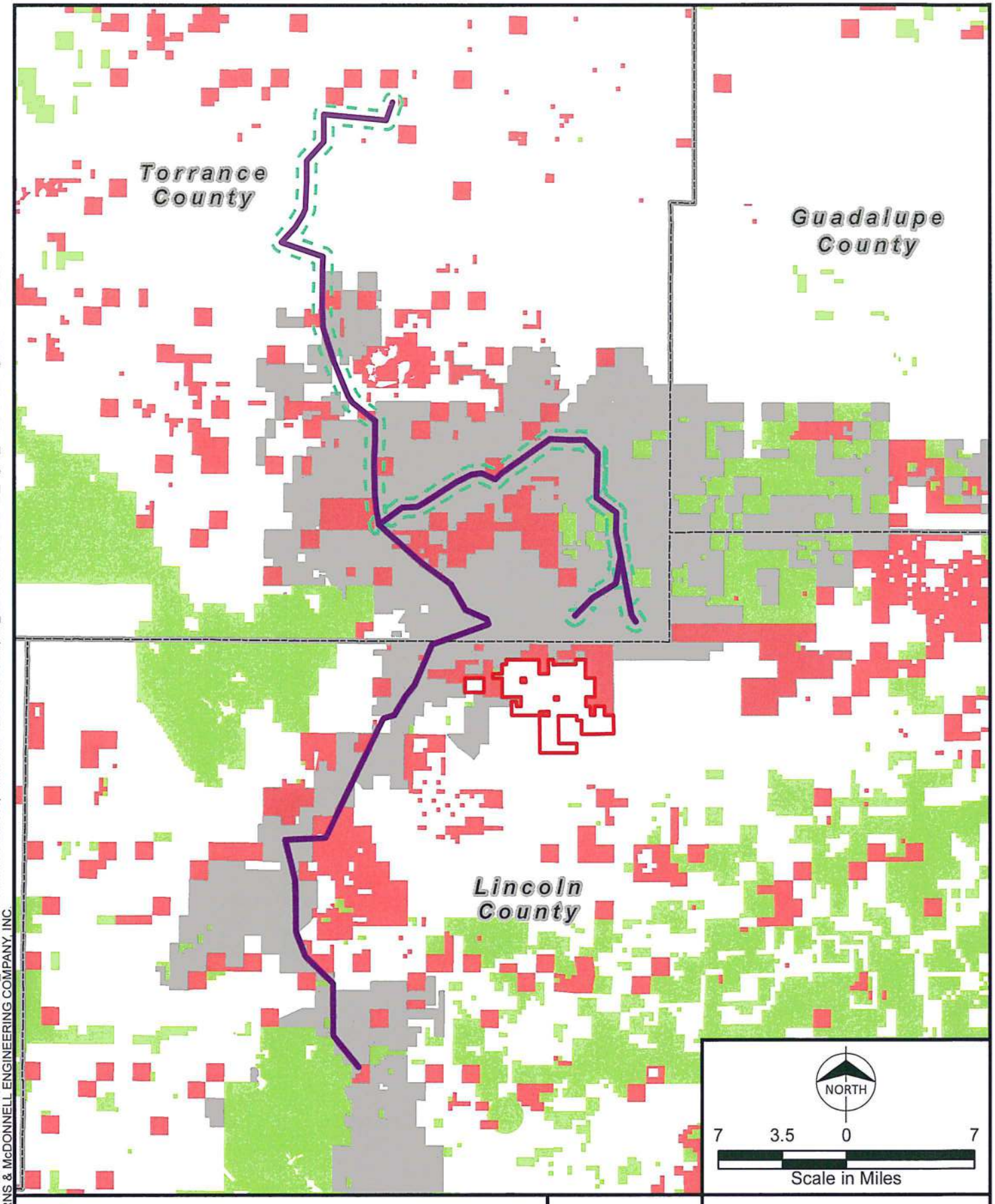

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Exhibit 19
GAP Analysis Program
Pattern Development
Corona Wind Energy Project Supplement
Wind Project Area & Gen-Tie
Lincoln & Torrance County, NM

Source: Esri, PADUS V1.4, Pattern Development, and Burns & McDonnell Engineering Company, Inc.

Issued: 12/13/2019

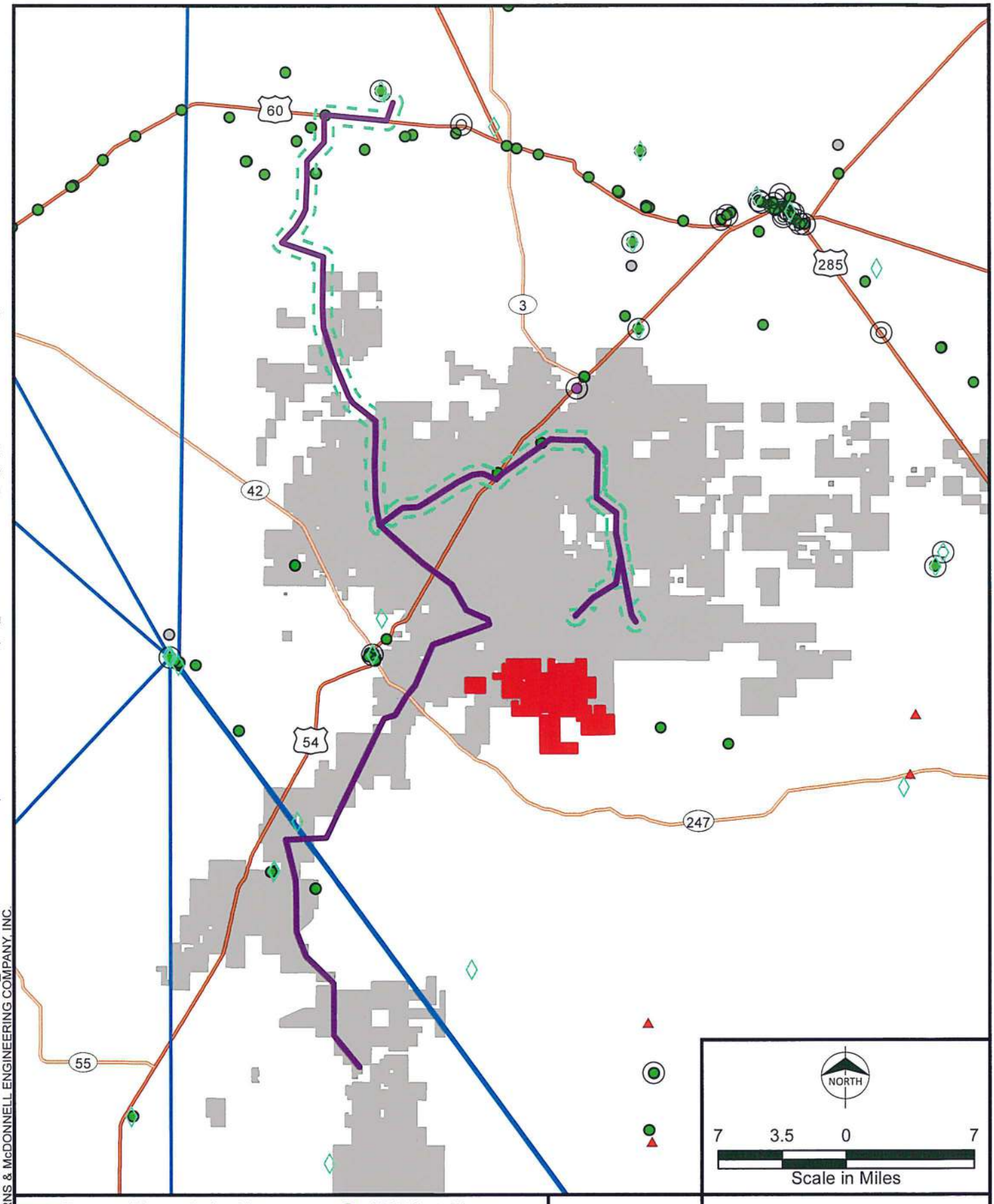

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Exhibit 20
Communications Map
Pattern Development
Corona Wind Energy Project Supplement
Wind Project Area & Gen-Tie
Lincoln & Torrance County, NM

Source: Esri, Census, Pattern Development, FCC, and Burns & McDonnell Engineering Company, Inc.

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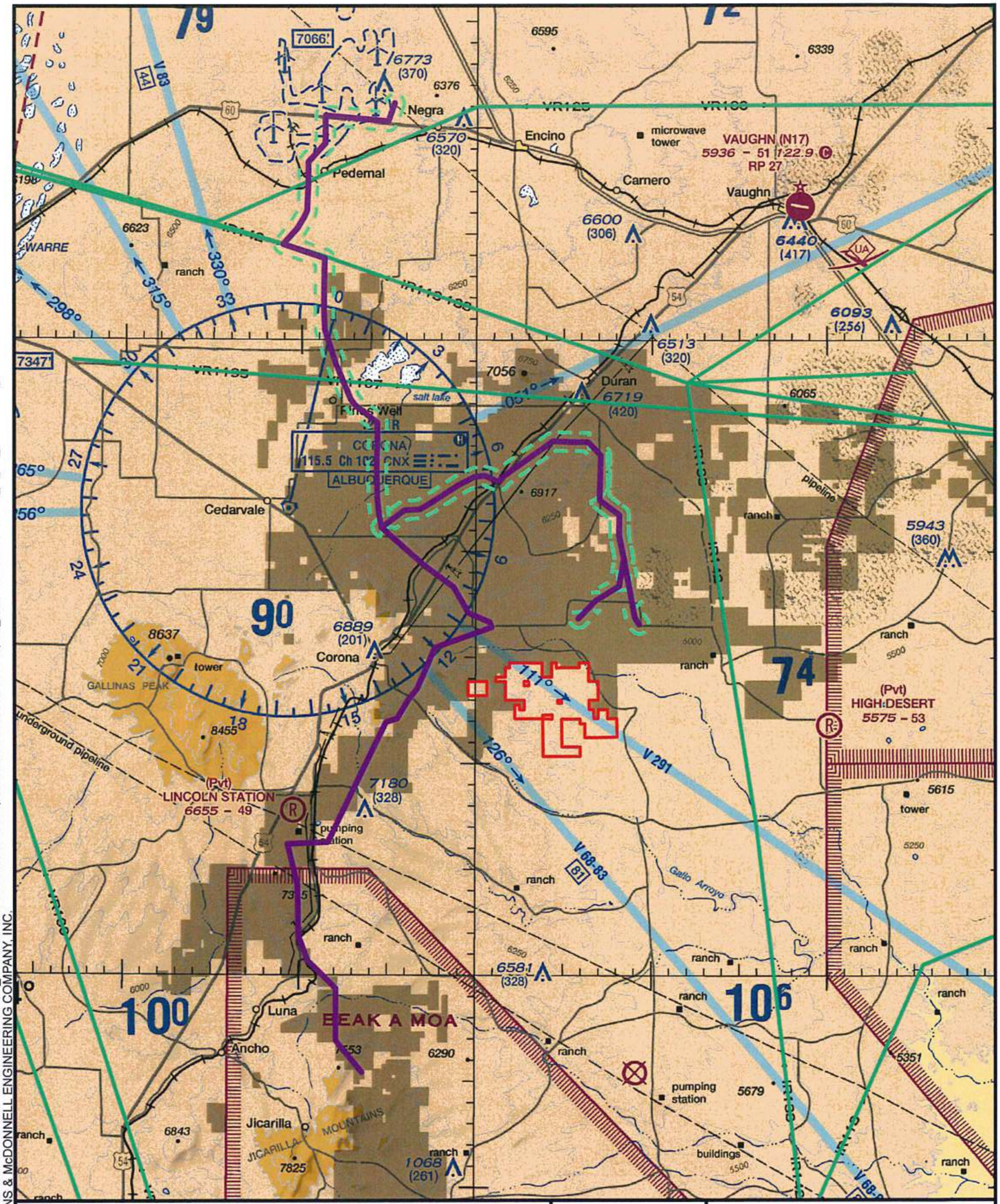

Proposed Transmission Line	
One-Mile Transmission Line Corridor	
Corona Wind Update	
Approved Wind Project Area	
Military Training Route	

NORTH

0 3.5 7

Scale in Miles

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Exhibit 21
Visual Flight Rules Map
Pattern Development
Corona Wind Energy Project Supplement
Wind Project Area & Gen-Tie
Lincoln & Torrance County, NM

Source: Esri, Pattern Development, FAA, and Burns & McDonnell Engineering Company, Inc.

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