Corona Wind Projects Environmental Report

Pattern Energy Group 2 LP

Corona Wind Projects
Project No. 101335

Final
3/2/2018

Exhibit CK-1

Corona Wind Projects
Environmental Report

prepared for

Pattern Energy Group 2 LP
Corona Wind Projects
New Mexico

Project No. 101335

Final
3/2/2018

prepared by

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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
BCR	Bird Conservation Region
BGEPA	Bald and Golden Eagle Protection Act
BISON-M	Biota Information System
BMPs	Best Management Practices
Burns & McDonnell	Burns & McDonnell Engineering Company, Inc.
CDBG	Community Development Block Grant
CFR	Code of Federal Regulations
CO	Carbon dioxide
DNH	Determination of No Hazard
EPA	U.S. Environmental Protection Agency
ER	Environmental Report
ESA	Endangered Species Act
ETZ	extraterritorial zone
ETZA	Extraterritorial Zoning Authority
ETZC	Extraterritorial Zoning Commission
FAA	Federal Aviation Administration

Abbreviation	Term/Phrase/Name
FHWA	Federal Highway Administration
GAP	USGS Gap Analysis Program
GLO	General Land Office
GRT	Gross Receipts Tax
IBA	Important Bird Areas
IPaC	Information, Planning, and Consultation System
IRBôs	Industrial Revenue Bonds
kcmil	Thousand Circular Mil
kV	kilovolt
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
NMED-SWQB	New Mexico Environment Department Surface Water Quality Bureau
NO_x	Carbon monoxide
NWI	National Wetlands Inventory
NWP	Nationwide Permit

Abbreviation	Term/Phrase/Name
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
PM	Particulate matter
PPA	Power Purchase Agreements
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
SWCD	Soil and Water Conservation District
SWPPP	Stormwater Pollution Prevention Plan
UDP	Unanticipated Discovery Protocol
UDP	Unanticipated Discovery Protocol
USGS	U.S. Geological Survey
VOCs	Volatile organic compounds
WMP	Water Management Plan
WOTUS	Waters of the U.S.

1.0 SUMMARY

This report responds to the requirement of the New Mexico Public Regulation Commission (the ñCommissionò) 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, 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.

Ancho Wind LLC, Cowboy Mesa LLC, Duran Mesa LLC, Red Cloud Mesa LLC, Tecolote Wind LLC, and Viento Loco LL, (collectively the ñCorona Wind Companiesò or ñJoint Applicantsò) propose to locate a transmission line and related substation facilities in Lincoln, Torrance, and Guadalupe Counties, New Mexico. These electrical facilities are anticipated to be 345-kV alternating current (AC) lines (Corona Gen-Tie System or the Project) and the associated right-of-way (ROW). The Corona Wind Companies are affiliates of Pattern Energy Group 2 LP (Pattern Development).

The Corona Gen-Tie System will interconnect with several specific generation projects collectively consisting of 1,950 MW to 2,200 MW nameplate capacity wind power facilities (Corona Wind Projects). The Corona Gen-Tie System consists of approximately 80 miles of transmission line within the approximately 300,000-acre Corona Wind Project area. The Corona Wind Project will interconnect to the SunZia Southwest Transmission Project (ñSunZia Transmission Projectò) 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 lines, or one AC and one direct current 500-kV line in New Mexico and Arizona. In either case, the first phase of the SunZia Transmission Project will be a 500-kV AC transmission line that will be utilized by the Corona Wind Projects.

The Corona Gen-Tie System will require a ROW width of approximately 180 feet 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, Ä62-9-3.2 to the extent such approval may be required by law.

Collection lines of 34.5-kV will connect each of the turbines in the Corona Wind Projects to new substations (ñGeneration Project Substationsò) to be located within each project area (Corona Wind

Project Area). The collection lines are expected to be buried underground unless local conditions make burial impracticable. Although information about the Corona Wind Project Area, as a whole, is discussed herein, the subject of this Environmental Report (ER) is the Corona Gen-Tie Study Corridor.

This ER addresses the affected environment (existing condition) for the environmental values provided in New Mexico Statutes Annotated (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). 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 Corona Gen-Tie Study Corridor, six step-up substations, and an 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 (collectively, the "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 Corona Gen-Tie Study Corridor alongside Best Management Practices (BMPs) that can help manage impacts.

2.0 INTRODUCTION AND PURPOSE AND NEED

The Corona Wind Companies are proposing to locate in Lincoln, Torrance, and Guadalupe Counties, New Mexico, approximately 80 miles of transmission line and related substation facilities with possible configurations of 345-kV AC lines and ROW (Exhibit 1). Although information about the Corona Wind Project Area as a whole is discussed herein to provide overall project context, the New Mexico statutes only require evaluation of the Corona Gen-Tie System.

2.1 Purpose and Need

The purpose and need of the Corona Gen-Tie System is to connect the Corona Wind Projects to the SunZia Transmission Project. The Sunzia Transmission Project will directly benefit the Corona Wind Projects. The electricity generated by the Corona Wind Projects will be transmitted through the SunZia Transmission Project to be sold to out-of-state purchasers located in Arizona, California, and/or Utah under Power Purchase Agreements (PPAs). The Transmission Project is being constructed in connection with the generation of renewable energy within Lincoln, Torrance, and Guadalupe Counties in the State of New Mexico. This is consistent with the 2015 "New Mexico Energy Policy & Implementation Plan" published by the Governor's office.

2.2 Decisions to be Made

The New Mexico location statute, NMSA 1978, Section 62-9-3.F provides the New Mexico Public Regulatory Commission shall approve the location of the transmission line unless the Commission finds that the location will unduly impair important environmental values. This report 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 Corona Wind Projects to the SunZia Transmission Project, to be located within the Corona Gen-Tie Study 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 Corona Gen-Tie Study Corridor. It is anticipated that there will be approximately 80 miles of 345-kV transmission line along with the related substation facilities that would transport electricity generated at the Corona Wind Projects to the SunZia Transmission Project. The proposed action also includes construction, operation, and maintenance of the required step-up substations within the Corona Gen-Tie Study 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. An adjacent switchyard and step-up station would also be constructed at the point of interconnection at the SunZia Transmission Project to convert the 345-kV electricity generated by the Corona Wind Projects to 500-kV for interconnection into the Sunzia Transmission Project.

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 would connect to the Sunzia 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 feet.

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 feet above the existing ground, depending on terrain and span length.

Structures spans would typically be 600 to 900 feet 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 feet, 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 feet, 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 feet 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 Corona Gen-Tie Study 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 transmission line (345-kV), which would transport the electricity of the proposed Corona Wind Projects to the SunZia Transmission Project where the voltage would then be increased to 500-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 Sunzia 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 feet (90 feet 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 Lincoln, Torrance, or Guadalupe County Roads Maintenance Departments and private landowners. Transmission line facilities on private lands would be obtained as private easements or ROWs.

3.2.4 Access Roads

The 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.

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.

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 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 Corona Gen-Tie System.

3.2.6 Construction Activities

The proposed Corona Gen-Tie System will use standard construction and operation procedures used for other transmission projects in the western United States. The construction of the Gen-Tie is expected to take approximately 12-18 months, depending on the results of interconnection studies and final design. The Corona Gen-Tie System's construction schedule projects activity commencing early 2019 and concluding by the end of 2020. The Corona Wind Projects and 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 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 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 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.

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.

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.

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.

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.

3.2.7 Operation and Maintenance

Operation and Maintenance of the Corona Wind Projects is anticipated to include the following.

3.2.7.1 Operation

After the constructed Gen-Tie has been energized, land uses compatible with safety regulations and activities associated with operations and maintenance (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 Gen-Tie. 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 Gen-Tie ROW would be grounded to prevent electrical shock and to meet NESC requirements.

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 not cross U.S. highways in Lincoln, Torrance, or Guadalupe Counties. State and county road use and crossings in Lincoln, Torrance, or Guadalupe Counties may be required and would be coordinated with the New Mexico Department of Transportation and the Lincoln, Torrance, or Guadalupe 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 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 Project 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 feet 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 Project site.

- **Substations**: Substations will be cleared, cleaned and removed from the Project 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 feet 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 Project site;

- **O & M building** Will be cleared, cleaned and removed from the Project 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 Winds Project 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 Project 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; 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 Corona Gen-Tie Study Corridor as well as the Corona Wind Project Area. The Corona Wind Project Area is shown in Exhibit 2 alongside the Corona Gen-Tie Study 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 and is called the Corona Gen-Tie Study 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.[1] This area of consideration is called the Corona Wind Project Area 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 Lincoln, Torrance, and Guadalupe Counties; the Corona Gen-Tie Study Corridor; and the Corona Wind Project Area.

1 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 December 2017 from https://www.env.nm.gov/air-quality/air-monitoring-network-2/.
- U.S. Environmental Protection Agency (EPA) in New Mexico. Accessed December 2017 from https://www.epa.gov/nm.

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

Air quality in Lincoln, Torrance, and Guadalupe Counties in which the Corona Gen-Tie Study Corridor is located is generally considered very good. For all criteria pollutants, the counties are in attainment. New Mexico Environmental Department (NMED), Air Quality Bureau reports Lincoln, Torrance, and Guadalupe Counties are in attainment of all national and state ambient air quality standards. The counties' attainment status is reflective of low population density and land use dominated by agriculture. Lincoln, Torrance, and Guadalupe Counties are below national and New Mexico state averages reported to EPA (EPA, 2017) for air quality index scores, levels of ozone, and levels of particulate matter, 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 Project Area

No unique air quality conditions are known to occur within the Corona Wind Project Area. Air quality conditions within the Corona Wind Project Area would be similar to what is described above for Lincoln, Torrance, and Guadalupe Counties 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, Torrance, and Guadalupe Counties; the Corona Gen-Tie Study Corridor; and the Corona Wind Project Area.

- U.S. Census Bureau*, Quick Facts*. Accessed December 2017 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 – Corona Gen-Tie Study Corridor

Lincoln, Torrance, and Guadalupe Counties are rural counties located in 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 Corona Gen-Tie Study 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 Project Area

No unique noise is known to occur within the Corona Wind Project Area. Noise within the Corona Wind Project Area would be similar to what is described above for the Corona Gen-Tie Study 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, Torrance, and Guadalupe Counties; the Corona Gen-Tie Study Corridor; and the Corona Wind Project Area.

- 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*. 2017. Guadalupe, Lincoln, and Torrance Counties, New Mexico. Accessed December 2017 from https://thedrillings.com/usa/new-mexico/.

4.4.2 Current Conditions and Trends, Regional Overview – Corona Gen-Tie Study 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 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. 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 no identified hydrocarbon extraction activities or mines located along the transmission line.

4.4.3 Current Conditions and Trends, Regional Overview – Corona Wind Project Area

Geological conditions for the Corona Wind Project Area are the same as previously described for the Corona Gen-Tie Study Corridor.

There are currently 3,192 oil/natural gas leases in Lincoln County on BLM administered lands (The Drillings 2017). 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. In Torrance County there are 2,469 exploration leases (The Drillings 2017). 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. Guadalupe County has 4,194 oil and natural gas leases (The Drillings 2017); however, most are located to the northeast and out of the Corona Wind Project Area in the Tucumcari Basin. There are currently no major exploration activities within the Corona Wind Project Area (Exhibit 4).

Mining has always been important to the economies of these three counties, but due to many of the mineral deposits being limited or the extraction process too expensive, all mines within the Corona Wind Project Area 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 2017). Torrance County has had 2,711 registered mines extracting iron, potassium, uranium, barium and silver and only 53 mines are currently active (The Drillings 2017). Guadalupe County has had 83 registered mines extracting copper, calcium, uranium, gypsum and vanadium but all the mines in the county have been shut down (The Drillings 2017). 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, Torrance, and Guadalupe Counties; the Corona Gen-Tie Study Corridor; and the Corona Wind Project Area.

- USDA Soil Survey Geographic (SSURGO) Database for New Mexico (2017). Accessed December 2017 from http://apps.cei.psu.edu/soiltool/.

4.5.2 Current Conditions and Trends, Regional Overview – Corona Gen-Tie Study 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 4-1 through Table 4-2 summarize the existing soil resources located within the Corona Gen-Tie Study Corridor of each county area where the transmission line occurs. For a visual representation of the soils locations within the Corona Gen-Tie Study Corridor, refer to Exhibit 6. As the Corona Gen-Tie Study Corridor does not extend into Guadalupe County, the existing soil resources within this region are not shown in the tables below.

Table 4-1: Lincoln County Soil Coverage Types

Soil Type	Acres
Clovis-Harvey association, loam surface, gently sloping	11
Darvey-Asparas association, gently sloping	23
Darvey-Pastura association, gently sloping	16
Mokiak-Stroupe-Rock outcrop association, very steep	40
Pena-Hogadero association, hilly	19
Penistaja-Travessilla association, gently sloping	196
Plack-Dioxice association, gently sloping	4
Plack-Dioxice loams, 0 to 8 percent slopes	18
Reventon-Sampson association, gently sloping	163

Rock outcrop-Stroupe-Deama association, extremely steep	80
Sampson loam, 0 to 5 percent slopes	10
Stroupe-Witt association, moderately steep	5

Source: USDA Soil Survey Geographic (SSURGO) Database for New Mexico (2017)

Table 4-2: Torrance County Soil Coverage Types

Soil Type	Acres
Bernal-Travessilla fine sandy loams	32
Clovis loam, 0 to 5 percent slopes	26
Harvey-Dean loams, 1 to 9 percent slopes	123
Kim-Otero-Pastura complex	70
Kim-Pastura-Tapia loams	211
Laporte-Rock outcrop complex	6
Otero and Palma soils	4
Pastura loam, 9 to 25 percent slopes	7
Penistaja fine sandy loam, 1 to 6 percent slopes	156
Penistaja loamy fine sand, hummocky, 1 to 8 percent slopes	9
Penistaja sandy clay loam, 1 to 6 percent slopes, eroded	7
Penistaja-Dean fine sandy loams, 1 to 5 percent slopes	11
Pinon channery loam, 3 to 20 percent slopes	40
Stony steep land	4
Tapia-Dean loams, 0 to 5 percent slopes	74
Willard loam, strongly saline	17

Source: USDA Soil Survey Geographic (SSURGO) Database for New Mexico (2017)

4.5.3 Current Conditions and Trends, Regional Overview – Corona Wind Project Area

Table 4-3 through Table 4-5 summarize the existing soil resources located within the Corona Wind Project Area of each county. For a visual representation of the soils locations within the Corona Wind Project Area, refer to Exhibit 6.

Table 4-3: Lincoln County Soil Coverage Types

Soil Type	Acres
Clovis-Harvey association, loam surface, gently sloping	5,967
Clovis-Pastura association, gently sloping	2,865
Darvey-Asparas association, gently sloping	9,349

Soil Type	Acres
Darvey-Pastura association, gently sloping	6,419
Deama-Pastura association, moderately sloping	2,748
Mokiak-Stroupe-Rock outcrop association, very steep	6,367
Pastura loam, gently sloping	7,765
Pastura-Harvey association, moderately rolling	2,512
Pastura-Partri association, gently sloping	783
Pena-Hogadero association, hilly	1,758
Penistaja-Travessilla association, gently sloping	11,816
Plack-Dioxice association, gently sloping	4,197
Plack-Dioxice loams, 0 to 8 percent slopes	6,758
Plack-Penistaja association, gently sloping	1,145
Rance-Tanbark silt loams, 2 to 9 percent slopes	4,999
Reventon-Sampson association, gently sloping	14,413
Rock outcrop-Stroupe-Deama association, extremely steep	4,455
Sharps silt loam, 2 to 5 percent slopes	834
Sharps-Rock outcrop association, moderately sloping	5,174
Stroupe-Witt association, moderately steep	2,913
Tanbark-Tortugas association, very steep	2,895
Tortugas-Asparas-Rock outcrop association, moderately sloping	8,775
Tortugas-Rock outcrop association, extremely steep	2,482
Tortugas-Rock outcrop association, moderately sloping	1,258

Source: USDA Soil Survey Geographic (SSURGO) Database for New Mexico (2017)

Table 4-4: Torrance County Soil Coverage Types

Soil Type	Acres
Bernal-Travessilla fine sandy loams	1,762
Chilton-La Fonda complex, 1 to 9 percent slopes	3,936
Clovis loam, 0 to 5 percent slopes	1,305
Dean loam, 1 to 9 percent slopes	1,606
Harvey loam, 1 to 9 percent slopes	965
Harvey-Dean loams, 1 to 9 percent slopes	15,692
Kim-Otero-Pastura complex	5,300
Kim-Pastura-Tapia loams	27,861
La Fonda loam, 1 to 9 percent slopes	6,181
La Fonda-Rock outcrop complex	2,148

Soil Type	Acres
Laporte-Rock outcrop complex	2,071
Manzano loam, saline substratum, 0 to 1 percent slopes	985
Otero and Palma soils	695
Pastura loam, 1 to 9 percent slopes	1,133
Penistaja fine sandy loam, 1 to 6 percent slopes	14,869
Penistaja loamy fine sand, hummocky, 1 to 8 percent slopes	4,654
Penistaja sandy clay loam, 1 to 6 percent slopes, eroded	726
Penistaja-Dean complex, 1 to 5 percent slopes	883
Penistaja-Dean fine sandy loams, 1 to 5 percent slopes	3,661
Pinon channery loam, 3 to 20 percent slopes	5,075
Prewitt and Manzano soils	887
Rance-Gypsum land complex	2,096
Rock outcrop-Pinon-La Fonda complex	1,311
Steep rock land	3,229
Tapia loam, 0 to 5 percent slopes	1,212
Tapia-Dean loams, 0 to 5 percent slopes	19,086

Source: USDA Soil Survey Geographic (SSURGO) Database for New Mexico (2017)

Table 4-5: Guadalupe County Soil Coverage Types

Soil Type	Acres
Cardenas-Palma loamy fine sands, 0 to 3 percent slopes	1,357
Clovis fine sandy loam, 0 to 3 percent slopes	4,348
Clovis-Pastura association, 0 to 3 percent slopes	2,541
Harvey-Darvey complex, 1 to 5 percent slopes	2,894
Harvey-Dean loams, 3 to 15 percent slopes	364
Palma fine sandy loam, 0 to 5 percent slopes	64
Pastura loam, 0 to 5 percent slopes	446
Pastura-Clovis association, 0 to 8 percent slopes	6,339
Pastura-Harvey association, 0 to 8 percent slopes	12,277
Pastura-Silver-Gabaldon complex, 0 to 5 percent slopes	2,848
Water	6
Winona-Gabaldon complex, 0 to 15 percent slopes	2,906
Winona-Rock outcrop complex, 15 to 30 percent slopes	679

Source: USDA Soil Survey Source: USDA Soil Survey Geographic (SSURGO) Database for New Mexico (2017)

4.6 Paleontological Resources

4.6.1 Data Sources

The following data sources were reviewed to assess paleontological resources of Lincoln, Torrance, and Guadalupe Counties; the Corona Gen-Tie Study Corridor; and the Corona Wind Project Area.

- Anderson, O.J., Jones, G.E., and Green, G.N. 1997. *Geological map of New Mexico: U.S. Geological Survey Open-file Report 97-52*. Accessed December 2017 from http://pubs.er.usgs.gov/publications/ofr9752.
- Lucas, S.G., 1993. The Chinle Group: revised stratigraphy and biochronology of Upper Triassic Nonmarine strata in the western United States. *Museum of Northern Arizona Bulletin, v. 59*, p. 27-50.

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

No formal paleontological work has been completed in the Corona Gen-Tie Study Corridor. The geology in the area consists of Permian deposits of the San Andreas Formation, Glorieta sandstone, Yeso Formation, and Artesia Group, all of which would have a low probability for the presence of paleontological deposits. These formations are from the Permian Period (298.9 – 252.17 my). Since that period, the original deposits 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 San Andreas Formation consists of deposits of limestone that create a karst landscape, which could contain potholes and caves in the area northeast of Jack's Peak in Lincoln County. The caves and potholes within karst landscapes in similar areas of New Mexico have been known to contain bones of megafauna from the Pleistocene; however, 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 – Corona Wind Project Area

The potential for paleontological resources in the Corona Wind Project Area is similar to that of the Corona Gen-Tie Study Corridor; however, the south-central area of Corona Wind Project Area 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 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, Torrance, and Guadalupe Counties; the Corona Gen-Tie Study Corridor; and the Corona Wind Project Area.

- 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: U.S. Geological Survey Open-file Report 97-52*. Accessed December 2017 from http://pubs.er.usgs.gov/publications/ofr9752.
- U.S. Environmental Protection Agency (EPA) in New Mexico. Retrieved December 2017 from https://www.epa.gov/nm.
- Playa Lakes Joint Venture (PLJV). 2016. Maps of Probable Playas, Roosevelt, New Mexico. Accessed December 2016 and September 2017. Available online: http://pljv.org/for-habitat-partners/mapsand-data/maps-of-probable-playas/
- FEMA Flood Map Service Center. Accessed December 2017 from https://msc.fema.gov/portal/search.
- USFWS National Wetlands Inventory (NWI) Data Mapper Accessed December 2017 from https://www.fws.gov/wetlands/data/mapper.html.
- U.S. Fish and Wildlife Service (USFWS). 2008. Birds of Conservation Concern 2008. December 2008. Division of Migratory Bird Management. Arlington, Virginia. Available online: https://www.fws.gov/migratorybirds/pdf/grants/BirdsofConservationConcern2008.pdf
- USGS National Hydrography Dataset (NHD) Accessed December 2017 from https://nhd.usgs.gov/tools.html.
- New Mexico Department of Game and Fish (NMDGF). 2016. Biota Information System of New Mexico: Report County TES Table for Roosevelt - New Mexico Wildlife of Concern. Biota Information System, NMDGF, Santa Fe, New Mexico. Accessed July 2017. Available online:

http://www.wildlife.state.nm.us/conservation/wildlife-species-information/threatened-andendangered-species/

- New Mexico Department of Game and Fish (NMDGF). 2012. Threatened and Endangered Species of New Mexico, 2012 Biennial Review. New Mexico Department of Game and Fish Conservation Services Division 2012 Biennial Review and Recommendation. October 1, 2012. Available online at: http://www.wildlife.state.nm.us/download/conservation/threatened-endangered-species/biennial-reviews/2012-Biennial-Review-Executive_Summary_and_Full_Text.pdf
- US Fish and Wildlife Service (USFWS). 2017a. Species by County Report. Environmental Conservation Online Service (ECOS), Lincoln, New Mexico. Information available at: https://ecos.fws.gov/ecp0/reports/species-by-current-range-county?fips=35027
- New Mexico Crucial Habitat Assessment Tool (NM CHAT). 2017. Crucial Habitat Data: New Mexico Habitat Information Extracted from Spatial Data. NMCHAT, Santa Fe, New Mexico. Accessed December 2017. Available online: http://nmchat.org/data-download.html
- Biota Information System of New Mexico (BISON-M). 2017. Report County Federal/State Species Status for Lincoln, terrace and Guadalupe Counties. New Mexico Department of Game and Fish (NMDGF), Santa Fe, New Mexico. Data query last accessed online February 2017. Homepage: http://www.bison-m.org; County species lists and species accounts available online from at: http://www.bison-m.org/reports.aspx?rtype=9
- Bat Conservation International (BCI). 2017. Bat Species: US Bats. BCI, Inc., Austin, Texas. Information available at: http://www.batcon.org and http://www.batcon.org/resources/media-education/species-profiles. Accessed December 2016
- eBird. 2017. eBird: An Online Database of Bird Distribution and Abundance. eBird, Cornell Lab of Ornithology, Ithaca, New York. Accessed July 2017. Available online: http://ebird.org/content/ebird/
- *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)

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

The Corona Wind Projects occurs mostly within the Arizona-New Mexico Mountains ecoregion (New Mexico Department of Game and Fish [NMDGF, 2006]) and more specifically within Western Great Plains Shortgrass Prairie and piñon-Juniper/Juniper savanna 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*). Common vegetation of the Arizona/New Mexico Mountain ecoregion includes ponderosa pine (*P. ponderosa*), junipers, oaks (*Q. spp*), and yuccas (*Yucca spp*) (WEST 2017 reports).

A review of the 2011 NLCD (NLCD, 2011; Homer et al., 2015) identified three major cover types in the Corona Gen-Tie Study Corridor: Grassland/Herbaceous 53 percent, Shrub/Scrub 40 percent and Evergreen Forest 6 percent. Table 4-6 below summarizes the NLCD cover types in the Corona Gen-Tie Study Corridor.

The Corona Wind Projects are situated in various watersheds throughout the area of development (Exhibit 7). Specifically, development would occur within the Gallo Arroyo watershed (HUC 13060006), which is a tributary of the Pecos River (U.S. Environmental Protection Agency 2017); the Eastern Estancia Watershed (HUC 13050002) (U.S. Geological Survey 2017); the Eastern Estancia (HUC 13050002) and the Upper Pecos (HUC 13060003); and the Arroyo del Macho watershed (HUC 13060005), which is a tributary of the Pecos River (U.S. Environmental Protection Agency 2017). Surface water features in the vicinity of the Corona Gen-Tie Study Corridor include ephemeral drainages and stream channels, stock ponds, and ephemeral playa lakes (to the north) Table 4-6 summarizes the NLCD types within the Corona Gen-Tie Study Corridor.

Table 4-6: National Land Cover Database Type Corona Gen-Tie Study Corridor Acreage

Shape	Area (Acres)	Percent
Developed, Open Space	3.24	0.2%

Shape	Area (Acres)	Percent
Evergreen Forest	94.78	6.2%
Shrub/Scrub	619.50	40.3%
Grassland/Herbaceous	819.92	53.3%
Total	**1,537.4**	**100%**

Source: 2011 National Land Cover Database (NLCD)

Wetlands, playa lakes, floodplains, and streams were inventoried for the Corona Gen-Tie Study Corridor. The NWI data documented 15. acres of wetlands within the Corona Gen-Tie Study Corridor. The NWI identified wetlands included three wetland types: freshwater emergent wetland, freshwater pond, and riverine (Exhibit 8). According to the NWI data, the Corona Gen-Tie Study Corridor has 41-miles of mostly unnamed intermittent or ephemeral stream features and no perennial steams (data from NHD).

The Corona Wind Project Area 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, however, no playa lakes occur within the Corona Gen-Tie Study Corridor or Corona Wind Project Area (PLJV 2017). Three acres of FEMA mapped floodplain fall within the Corona Gen-Tie Study Corridor (FEMA 2017) (see Table 4-7) (Exhibit 9).

Table 4-7: Corona Gen-Tie Study Corridor Wetland Table Based on the U.S. Fish and Wildlife Service National Wetland Inventory Data

Wetland Type	Sum of Acres	Percentage
Freshwater Emergent Wetland	3.5	23.6%
Freshwater Pond	0.0	0.2%
Riverine	11.5	76.2%
Total	**15.0**	**100%**

Source: USFWS NWI Data Mapper 2017

4.7.3 Current Conditions and Trends, Regional Overview – Corona Wind Project Area

The Corona Wind Project Area includes the water resource features similar to those described above for the Corona Gen-Tie Study Corridor. The Corona Wind Project Area has 1,525 acres of NWI wetlands, 41 miles of mostly unnamed intermittent or ephemeral streams, and 921 acres of mapped floodplain FEMA).

Table 4-8: Corona Wind Project Area Wetland Table Based on the U.S. Fish and Wildlife Service National Wetland Inventory Data

Wetland Type	Sum of Acres	Percentage
Freshwater Emergent Wetland	134.4	8.8%
Freshwater Forested/Shrub Wetland	0.1	0.1%
Freshwater Pond	89.6	5.9%
Riverine	1,300.5	85.3%
Total	**1,524.5**	**100%**

Source: USFWS NWI Data Mapper 2017

The Corona Wind Project Area includes many of the habitat and ecoregion features similar to those described above for the Corona Gen-Tie Study Corridor.

Table 4-9: National Land Cover Data Summary for the Corona Wind Project Area

Land Cover	Acres	Percentage
Barren Land Rock, Sand, Clay	114	0.1%
Developed, High Intensity	0	0.1%
Developed, Low Intensity	62	0.1%
Developed, Medium Intensity	9	0.1%
Developed, Open Space	1,019	0.1%
Emergent Herbaceous Wetlands	44	0.1%
Evergreen Forest	14,522	5%

Land Cover	Acres	Percentage
Grassland/Herbaceous	208,711	72%
Shrub/Scrub	65,845	23%
Total	**290,326**	**100%**

Source: National Land Cover Database (NLCD) 2011

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, Torrance, and Guadalupe Counties; the Corona Gen-Tie Study Corridor; and the Corona Wind Project Area.

- 2011 National Land Cover Database (NLCD) Data Downloads. Accessed December 2017 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 2017c)
- *Critical Issues Analysis for the Proposed Viento Loco Wind Project* (Report, WEST Inc., March 2017d)
- eBird, an online database of bird distribution and abundance. Accessed December 2017 from https://ebird.org/.
- New Mexico Crucial Habitat Assessment Tool (NM CHAT). Accessed December 2017 from http://nmchat.org/data.html.
- New Mexico Department of Game and Fish (NMDGF) Biota Information System (BISON-M)
- Playa Lakes Joint Venture (PLJV) Maps of Probable Playas Accessed December 2017 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 2017e)
- *Site Characterization Study, Pattern Wind Energy Project* (Report, WEST Inc., August 2017b)
- Southern Great Plains Crucial Habitat Assessment Tool (SGP CHAT) Accessed December 2017 from https://kars.ku.edu/geodata/maps/sgpchat/.
- The National Audubon Society (Audubon) Important Bird Areas (IBA) Accessed December 2017 from http://www.audubon.org/important-bird-areas.

- USFWS Environmental Conservation Online System Species Profiles Accessed December 2017 from https://www.fws.gov/southeast/conservation-tools/environmental-conservation-online-system/.
- USFWS Information, Planning, and Consultation System (IPaC) Accessed December 2017 from https://ecos.fws.gov/ipac/.
- USGS Gap Analysis Program (GAP) Protected Areas of the U.S. database Accessed December 2017 from https://gapanalysis.usgs.gov/padus/.
- USFWS NWI Data Mapper Accessed December 11, 2017 from https://www.fws.gov/wetlands/data/mapper.html.
- United States Geologic Survey (USGS) National Hydrography Dataset (NHD) Accessed December 2017 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)

4.8.2 Current Conditions and Trends, Regional Overview – Corona Gen-Tie Study 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 approximately 3 percent of the overall area of development (including both the Corona Gen-Tie Study Corridor and Corona Wind Project Area) 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 2017). These crucial habitat areas are most predominant on the southern and eastern sides of the Corona Wind Project Area. However, no crucial cougar wildlife corridors fall within the Corona Gen-Tie Study Corridor. Approximately 47 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.

4.8.2.1 Federally Listed Species

Five animals and one plant species that are either federally listed or considered an experimental, non-essential population under the Endangered Species Act (ESA) may potentially occur in Corona Gen-Tie Study Corridor (USFWS, 2017b). The New Mexico meadow jumping mouse (*Zapus hudsonius luteus*), Southwestern willow flycatcher (*Empidonax traillii extimus*), and Kuenzler hedgehog cactus (*Echinocereus fendleri var. kuenzleri*) are listed as federally endangered, and The Mexican spotted owl (*Strix occidentalis lucida*) is listed as federally threatened. These species are listed by the USFWS Information for Planning and Consultation (IPaC) service as "potentially affected by activities in this location" of the Corona Gen-Tie Study Corridor. The Peñasco least chipmunk (*Tamias minimus atristriatus*) is listed as candidate species under review for federal listing. The Northern aplomado falcon (*Falco femoralis septentrionalis*) is listed and as non-essential experimental population. The northern aplomado falcon, Mexican spotted owl, and Kuenzler hedgehog cactus could possibly be encountered within the Transmission Line Area (Table 4-10). The other listed species are considered very unlikely to be impacted due to their specific habitat not occurring within the Transmission Line Area.

Table 4-10: Federally Listed Species in Corona Gen-Tie Study 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 11 miles from the southern end of the Project. Evergreen forest within the Project may provide suitable nesting or wintering habitat.
northern aplomado falcon	*Falco femoralis septentrionalis*	EXPN	**Possible**. Species forages in open terrain with scattered shrubs, which is likely present in portions of the Project area.

Common Name	Scientific Name	Federal Status[a]	Likelihood of Occurrence
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.
Mammals			
New Mexico meadow jumping mouse	*Zapus hudsonius luteus*	E	**Not likely.** Corona Gen-Tie Study Corridor is not likely to include dense riparian, riverine, lacustrine, or otherwise suitable habitat.
Peñasco least chipmunk	*Tamias minimus atristriatus*	C	**Not likely.** The Corona Gen-Tie Study Corridor is not located within the known range of the subspecies.
Plants			
Kuenzler hedgehog cactus	*Echinocereus fendleri var. kuenzleri*	E	**Possible.** Corona Gen-Tie Study Corridor is likely to include suitable habitat.

Source: USFWS, 2017a
(a) E=Endangered, T=Threatened, C = Candidate, EXPN = Experimental Population

4.8.2.2 State-listed Species

State-listed endangered or threatened wildlife species are identified for counties (Lincoln, Torrance, and Guadalupe) in which the Corona Wind Projects is located (BISON-M, 2017), as shown in Table 4-11. These species include eight birds: brown pelican (*Pelecanus occidentalis*), southwestern willow flycatcher (*Empidonax traillii extimus*), bald eagle, Baird's sparrow (*Ammodramus bairdii*), peregrine falcon (*Falco peregrinus* and Arctic subspecies *F. p. tundrius*), and broad-billed hummingbird (*Cynanthus latirostris*). Three mammals are listed: Oscura Mountains Colorado chipmunk (*Tamis quadrivittatus oscutaensis*), Peñasco least chipmunk (*Tamias minimus atristriatus*), and spotted bat (*Euderma maculatum*). One amphibian: Sacramento mountain salamander (*Aneides hardii*) and one fish: White Sands pupfish (*Cyprinodon Tularosa*) are also listed.

Table 4-11: State Listed Wildlife Species

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 Name	Scientific Name	State Status[a]	Likelihood of Occurrence
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.
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)
spotted bat	*Euderma maculatum*	T	**Possible.** Cliff habitat generally lacking in Project, but species may forage within or migrate through area.
Amphibians			
Sacramento mountain salamander	*Aneides hardii*	T	**Not Likely.** Project is outside the known elevation range of this species.
Fish			
White Sands pupfish	*Cyprinodon tularosa*	T	**Not Likely.** Project is outside of species' known range and perennial water bodies appear to be absent from the Project.

Source: BISON-M, 2017
(a) E=Endangered, T=Threatened

4.8.2.3 Plants

Native botanical resources in the Corona Gen-Tie Study Corridor are indicative of high-plains species, which include a variety of grass species. The federally and state endangered Kuenzler's hedgehog cactus

(*Echinocereus fendleri var. kuenzleri*) is known to occur within the Corona Wind Project Area, and could potentially occur within the Corona Gen-Tie Study Corridor. The federally and state endangered Wright's Marsh Thistle Wright's (Cirsium wrightii) and Pecos Sunflower (*Helianthus paradoxus*) are both known to occur in Guadalupe County, but would be unlikely to occur as the Transmission Line Area would not fall within their known ecological range. Goodding's onion (*Allium gooddingii*) is state listed and known to occur in Lincoln County. Although the northernmost extent of the Lincoln National forest lies adjacent to the Project and there is potential for Goodding's onion to occur if suitable high-elevation open meadow and spruce-fir forest habitats were present, such habitat does not to occur within the Corona Wind Project Area (WEST, 2017a).

4.8.2.4 Bats

Eighteen bat species in New Mexico have ranges overlapping the Corona Gen-Tie Study Corridor and Corona Wind Project Area (BCI, 2017). None of these species is federally listed as threatened or endangered and only the spotted bat is state listed. (BISON-M, 2017).

4.8.2.5 Birds

Passerines, raptors, waterfowl, and waterbirds likely migrate through the Corona Gen-Tie Study 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, although these resources comprise less than 1 percent of the Corona Wind Projects. The Corona Wind Projects are located within the Shortgrass Prairie Bird Conservation Region (BCR) 18. In New Mexico, BCR 18 includes 16 Birds of Conservation Concern (BCC) (USFWS, 2008; WEST, 2017b), and all occur in the Corona Wind Projects' area (eBird, 2017). Of these 16 species, only the bald eagle is state-listed in the area where the Corona Wind Project will be developed (WEST 2017).

4.8.2.5.1 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, 2017). Bald eagles are uncommon breeders in New Mexico, with no more than five active breeding sites documented during a breeding season since a confirmed bald eagle nest was documented in 1979 (NMDGF, 2009). Documented nests are typically in areas with major rivers supporting high fish populations and with mature trees (NMDGF, 2009), none of which exist in the Corona Wind Projects, and the nearest bald eagle observation was about 11-miles south of the Corona Wind Projects in October 2014 (eBird, 2017). 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 2017; WEST 2017b). Potential bald eagle occurrence within the Corona Wind Project Area and Corona Gen-Tie Study 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 Transmission Line and Wind Project Areas may attract foraging bald eagles.

4.8.2.5.2 Golden Eagle

Golden eagles (*Aquila chrysaetos*) also are protected under the BGEPA and are known to occur in New Mexico year-round (eBird, 2017). Suitable breeding habitats (e.g., cliffs, large trees) are very rare in the Corona Gen-Tie Study Corridor. The Corona Gen-Tie Study Corridor contains suitable habitat for foraging, including grasslands. No active golden eagle nests were observed during a recent survey (WEST, April 2017).

4.8.2.5.3 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 Project Area and Corona Gen-Tie Study Corridor. The Corona Wind Project Area and Corona Gen-Tie Study Corridor contain foraging habitat for many grassland- and wetland-associated species. The Corona Gen-Tie Study Corridor 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). Few topographic features (e.g., prominent ridges, large bodies of water) occur in the Corona Gen-Tie Study Corridor that would regularly attract high concentrations of migrating raptors.

4.8.3 Current Conditions and Trends, Regional Overview – Corona Wind Project Area

4.8.3.1 Federally Listed Species

The larger geographic area of the Corona Wind Project Area includes an additional four federally listed species (two birds and two plants) from those noted in section 4.8.2.1 for the Corona Gen-Tie Study Corridor. The Corona Wind Project Area adds yellow-billed cuckoo (*Coccyzus americanus*), Piping plover (*Charadrius melodus)*, Pecos (=puzzle, =paradox) sunflower (*Helianthus paradoxus*) and Wright's marsh thistle (*Cirsium wrightii*) based on the IPaC report. None of these four additional species are likely to be encountered in the Corona Wind Project Area (Table 4-12)

Table 4-12: Federally Listed Species in Corona Wind Project Area

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 4 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.
Piping plover	*Charadrius melodus*	T	**Not Likely.** No suitable shoreline habitat occurs within the project.
Sprague's pipit	*Anthus spragueii*	C	**Possible.** This species nests in Great Plains Short Grass Prairie of grama and buffalo grass, which is likely present in portions of the Project area.
Mammals			
New Mexico meadow jumping mouse	*Zapus hudsonius luteus*	E	**Not likely.** Project is not likely to include dense riparian, riverine, lacustrine, or otherwise suitable habitat.
Peñasco least chipmunk	*Tamias minimus atristriatus*	C	**Not likely.** The Project is not located within the known range of the subspecies.
Plants			
Pecos (=puzzle, =paradox) Sunflower	*Helianthus paradoxus*	T	**Not likely.** Corona Gen-Tie Study Corridor is not located within the known extant range of the species.
Wright's Marsh Thistle	*Cirsium wrightii*	C	**Not likely.** Corona Gen-Tie Study Corridor is not located within the known extant range of the species.
Kuenzler hedgehog cactus	*Echinocereus fendleri var. kuenzleri*	E	**Possible.** Corona Gen-Tie Study Corridor is likely to include suitable habitat.

Source: USFWS, 2017a
(a) E=Endangered, T=Threatened, C=Candidate

4.8.3.2 State-listed Species

The Corona Wind Project Area includes State-listed endangered or threatened wildlife species similar to those described in section 4.8.2.2 for the Corona Gen-Tie Study Corridor.

4.8.3.3 Bats

Eighteen bat species in New Mexico have ranges overlapping the Corona Wind Project Area (Harvey et al. 2011, Bat Conservation International [BCI] 2016). None of these species is federally or state-listed as threatened or endangered (NMDGF 2016b). Potential bat roosting habitat within the Corona Wind Project Area is provided by human-made structures (e.g., buildings and bridges). Over 95 percent of the Corona Wind Project Area is herbaceous (grasslands), wetlands, open water, and scrub/shrub, which potentially provides foraging habitat for most bat species. When full, ponds may also attract foraging bats due to the increased abundance of insects. Smaller rock outcrops, man-made structures, and trees located throughout the Project may provide roosting opportunities for single bats or small colonies (West, 2017a)

4.8.3.4 Birds

Similar to the Corona Gen-Tie Study Corridor, passerines, raptors, waterfowl, and waterbirds likely migrate through the Corona Wind Project Area. When full, the complex of small ponds throughout the Corona Wind Project Area may attract migrating waterfowl, waterbirds, and raptors (PLJV, 2016). Harvested crops are rare in the Corona Wind Project Area. A Breeding Bird Survey routes near the Corona Wind Projects are shown on Exhibit 10.

4.8.3.4.1 Bald Eagle

Similar to the Corona Gen-Tie Study Corridor, documented bald eagle nests are typically in areas with major rivers supporting high fish populations and with mature trees (NMDGF, 2009), none of which exist in the Corona Wind Project Area. The nearest bald eagle was observed about 11 miles south of the Corona Wind Project Area in October 2014 (eBird, 2017). Potential bald eagle occurrence within the Corona Wind Project Area and Corona Gen-Tie Study 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 Project Area and Corona Gen-Tie Study Corridor may attract foraging bald eagles.

4.8.3.4.2 Golden Eagle

Golden eagles also are protected under BGEPA and are known to occur in New Mexico year-round (eBird, 2017). The Corona Wind Project Area contains several suitable breeding habitats (e.g., cliffs, large trees) for golden eagles. Similar to the Corona Gen-Tie Study Corridor, the Corona Wind Project

Area contains suitable habitat for foraging, including grasslands. No active golden eagle nests were observed during a recent survey (WEST, April 2017).

4.8.3.4.3 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 Project Area and Corona Gen-Tie Study 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, 2017). Two state-listed raptor species potentially occur in or near the Corona Wind Project Area: the bald eagle and peregrine falcon (NMDGF, 2016) 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 Project Area contains limited breeding habitat for most raptors. The Corona Wind Project Area 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 Project Area and Corona Gen-Tie Study Corridor contain foraging habitat for many grassland- and wetland-associated species. While no large reservoirs or lakes occur in the Corona Wind Project Area, there are many small ponds lakes that, when full, potentially attract concentrations of waterfowl, shorebirds, waterbirds, and raptors utilizing open fields for hunting (e.g., American kestrel, rough-legged hawk, red-tailed hawk, and northern harrier) (WEST, 2017a). The Corona Wind Project Area 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., longeared owl (*Asio otus*), great horned owl). Few topographic features (e.g., prominent ridges, large bodies of water) occur in the Corona Wind Project Area 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, Torrance, and Guadalupe Counties, the Corona Wind Project Area, and the Corona Gen-Tie Study Corridor.

- New Mexico Cultural Resource Information System (NMCRIS). Accessed November 2017 from https://nmcris.dca.state.nm.us.
- Bureau of Land Management General Land Office plats. Accessed November 2017 from https://glorecords.blm.gov/.
- Anderson, O.J., Jones, G.E., and Green, G.N. 1997. *Geological map of New Mexico: U.S. Geological Survey Open-file Report 97-52*. Accessed December 2017 from http://pubs.er.usgs.gov/publications/ofr9752.
- *Cultural Resources Survey of 11 Proposed Wind Turbine Locations at the Viento Loco Wind Project*, Torrance County, New Mexico (Report, Blanton & Associates, Inc., 2017b)
- *Cultural Resources Survey of 16 Proposed Wind Turbine Locations at Tecolote Wind Project*, Torrance County, New Mexico (Report, Blanton & Associates, Inc., 2017d)
- *Cultural Resources Survey of 21 Proposed Wind Turbine Locations and Access Roads at the Red Cloud Wind Project*, Torrance County, New Mexico (Report, Blanton & Associates, Inc., 2017e)
- *Cultural Resources Survey of 15 Proposed Wind Turbine Locations at the Duran Mesa Wind Project*, Torrance County, New Mexico (Report, Blanton & Associates, Inc., 2017c)
- *Cultural Resources Survey of 15 Proposed Wind Turbine Locations at the Cowboy Mesa Wind Project*, Torrance County, New Mexico (Report, Blanton & Associates, Inc., 2017f)
- *Cultural Resources Survey of 10 Proposed Wind Turbine Locations at the Ancho Project*, Lincoln County, New Mexico (Report, Blanton & Associates, Inc., 2017a)

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

The proposed Corona Gen-Tie Study Corridor crosses the route of two previously conducted linear projects and along the eastern edge of a 300-square-acre survey area, where 24 prehistoric sites were located. No prehistoric cultural resources sites are reported within the footprint of the proposed Corona Gen-Tie Study Corridor.

4.9.1.3 Current Conditions and Trends, Regional Overview - Corona Wind Project Area

In general, little archaeological work has been conducted within the Corona Wind Project Area; a total of 88 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 contain approximately half of the sites that have been recorded within the Corona Wind Project Area.

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 Projects indicate that undocumented cultural materials may be located within the Corona Wind Project Area, particularly around the major drainages and their tributaries.

4.9.2 Historic Cultural Resources

4.9.2.1 Data Sources

- *Cultural Resources Survey of 11 Proposed Wind Turbine Locations at the Viento Loco Wind Project*, Torrance County, New Mexico (Report, Blanton & Associates, Inc., 2017)
- *Cultural Resources Survey of 16 Proposed Wind Turbine Locations at Tecolote Wind Project*, Torrance County, New Mexico (Report, Blanton & Associates, Inc., 2017)
- *Cultural Resources Survey of 21 Proposed Wind Turbine Locations and Access Roads at the Red Cloud Wind Project*, Torrance County, New Mexico (Report, Blanton & Associates, Inc., 2017)
- *Cultural Resources Survey of 15 Proposed Wind Turbine Locations at the Duran Mesa Wind Project*, Torrance County, New Mexico (Report, Blanton & Associates, Inc., 2017)
- *Cultural Resources Survey of 15 Proposed Wind Turbine Locations at the Cowboy Mesa Wind Project*, Torrance County, New Mexico (Report, Blanton & Associates, Inc., 2017)
- *Cultural Resources Survey of 10 Proposed Wind Turbine Locations at the Ancho Project*, Lincoln County, New Mexico (Report, Blanton & Associates, Inc., 2017)

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

Along the proposed Corona Gen-Tie Study Corridor, five historic sites have been recorded. One of these historic sites is the remnants of a homestead and has been recommended to be eligible for listing on the National Register of Historic Places. Another site is a historic artifact scatter with no recommendation of eligibility, and the final three sites have no data in NMCRIS except for locations.

4.9.2.3 Current Conditions and Trends, Regional Overview – Corona Wind Project Area

There have been 36 historic sites which have been recorded throughout the Corona Wind Project Area, these primarily consist of isolated historic trash dumps or ruins of structures associated with ranching

activities. The historic sites of the area are associated with primarily ranching activities. No area historic research activities have been conducted within the Corona Wind Project Area, 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. These are primarily located in Lincoln County.

Data obtained from the available Genreal Land Office (GLO) plats for the area indicates that the Corona Wind Project Area was surveyed by the USGS between 1882 and 1922. The majority of objects identified from the plats are unnamed trails and roads. There are only two labled, one one the plat of Township 4 South, Range 12 East which contains the route of the Southwestern Railroad, and on Township 2 South, Range 12 East which contains the Cameleon Road. 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, Torrance, and Guadalupe Counties; the Corona Gen-Tie Study Corridor; and the Corona Wind Project Area.

- American Cemeteries 2017a Cemeteries of Torrance County. Accessed December 2017 from http://www.americancemeteries.org/new-mexico/torrance-county.
- 2017b Cemeteries of Guadalupe County. Accessed December 2017 from http://www.americancemeteries.org/new-mexico/guadalupe-county.
- 2017b Cemeteries of Lincoln County. Accessed December 2017 from http://www.americancemeteries.org/new-mexico/Lincoln-county.
- 2017a Churches of Torrance County. Accessed December 2017 from https://newmexico.hometownlocator.com/features/cultural,class,church,scfips,35057.cfm.
- 2017b Churches of Guadalupe County. Accessed December 2017 from https://newmexico.hometownlocator.com/features/cultural,class,church,scfips,350019.cfm.
- 2017c Churches of Lincoln County. Accessed December 2017 from https://newmexico.hometownlocator.com/features/cultural,class,church,scfips,35027.cfm.
- New Mexico Cultural Resources Information System. Accessed December 2017 from https://nmcris.dca.state.nm.us/NMCRISt/Security/SignIn.aspx.

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

None of the churches or known cemeteries are located near the Transmission Line Area. Unidentified formal and informal cemeteries associated with active and abandoned ranches could be within the footprint of the proposed Corona Gen-Tie Study Corridor.

4.10.3 Current Conditions and Trends, Regional Overview – Corona Wind Project Area

The Corona Wind Project Area contains a small number towns or hamlets with very small populations. Most of the churches that serve the area are either in Carrizozo or Vaughn, New Mexico. However, within the Corona Wind Project Area, three small active churches are identified, one each in Ancho and Corona in Lincoln County and Duran in Torrance County.

Two cemeteries are identified within the Corona Wind Project Area, one at Carrajal in Lincoln County and one near Duran in Torrance County. Additional unidentified formal and informal cemeteries associated with the active and abandoned ranches could be throughout the Corona Wind Project Area (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, Torrance, and Guadalupe Counties; the Corona Gen-Tie Study Corridor; and the Corona Wind Project Area:

- Environmental Protection Agency Ecoregions. Accessed November 2017 from https://www.epa.gov/eco-research/ecoregions.

4.11.2 Overview

The combined Corona Gen-Tie Study Corridor and Corona Wind Project Area encompasses approximately 300,000 acres of private land within the Southwestern Tablelands and Arizona/New Mexico Mountains Level III Ecoregions (U.S. Environmental Protection Agency, 2017), located within Torrance, Lincoln, and Guadalupe 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, and Bureau of Land Management (BLM) lands (Exhibit 12).

According to the U.S. Environmental Protection Agency Ecoregions (2017), 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 (2017) 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 – Corona Gen-Tie Study Corridor

Topography within the Corona Gen-Tie Study 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 Corona Wind Projects. Land use within the Corona Gen-Tie Study Corridor is primarily open range livestock grazing. Portions of the southern Corona Gen-Tie Study Corridor border the Jicarilla Mountains, located in the northeastern extent of the Lincoln National Forest, with several larger ridges and peaks. Elevation within the Corona Gen-Tie Study Corridor ranges from 5,955 to 7,100 feet (1,815 to 2,164 meters [m]) above mean sea level (see Exhibit 13).

Lincoln, Torrance, and Guadalupe Counties all 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. Guadalupe County is the fifth-least populous county in New Mexico and has a total area of 3,032 square miles. Several inhabitable residences are within the Corona Gen-Tie Study Corridor, and other scattered rural residences and small communities are nearby. Travelers in proximity to the Corona Gen-Tie Study Corridor would include local or regional traffic along New Mexico State Roads 54 and 247.

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

No designated federal or state scenic routes or byways are in the vicinity of the Corona Gen-Tie Study Corridor (New Mexico Department of Transportation [NMDOT], 2015; Federal Highway Administration [FHWA], 2017) (see Exhibit 15). The nearest scenic route is Historic Route 66, which is more than 35 miles north of the Corona Gen-Tie Study Corridor. Additionally, no national parks or state parks are in the vicinity of the Corona Gen-Tie Study Corridor. The closest national park is Salinas Pueblo Missions National Monument, which is approximately 15 miles west of the Corona Gen-Tie Study 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 35 miles from the Corona Gen-Tie Study Corridor. No known visually sensitive, cultural resource sites are in the vicinity of the Corona Gen-Tie Study Corridor. No known organized tourism activities are in or near the Corona Gen-Tie Study Corridor.

4.11.4 Current Conditions and Trends, Regional Overview – Corona Wind Project Area

The existing visual and scenic resources previously described for the Corona Gen-Tie Study Corridor are similar for the Corona Wind Project Area. Travelers in proximity to the Corona Wind Project Area would include local or regional traffic along New Mexico State Roads 3, 54, 247, and 285. Schools in vicinity of the Wind Project Area (within ¼ mile), include 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, Torrance, and Guadalupe Counties; the Corona Gen-Tie Study Corridor; and the Corona Wind Project Area.

- 2011 National Land Cover Database (NLCD)
- The National Map (USGS, 2017)
- Lincoln County Comprehensive Plan (August 2007)
- Lincoln Soil and Water Conservation District Land Use Plan (2015)
- Torrance County Comprehensive Plan (July 2003)
- Torrance County Zoning Ordinance (revised 2016)
- 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 – Corona Gen-Tie Study Corridor

4.12.2.1 Lincoln County

Lincoln County is located in south-central New Mexico and comprises 4,858 square miles, which range from sprawling ranch lands to mountain settings. Important natural features in Lincoln County include the Lincoln National Forest, Sacramento Mountains, Capitan Mountains, Bonito Lake, and the Valley of Fires lava fields. Three primary roadways serve Lincoln County: U.S. Highways 380, 70, and 54. Route 380 bisects the County, running east to west (Exhibit 16). Several small airports are throughout the County, including the Carrizozo, Block Ranch, G Bar F Ranch, Ruidoso Municipal, and Sierra Blanca Regional Airport. The Lincoln Station Airport, a privately owned airport (by El Paso Natural Gas), is located about 1.6 miles west of the Corona Gen-Tie Study Corridor (Exhibit 17). No military bases are located in the area.

The community of Ruidoso contains the largest population within Lincoln County and is located approximately 32 miles east of the Corona Gen-Tie Study Corridor. The community of Corona is the closest populated area, roughly 2 miles west of the Corona Gen-Tie Study Corridor. Several other small towns are scattered throughout the county. Major state and federal properties in the County include the Lincoln National Forest, Cibola National Forest, Smokey Bear Historical State Park, and scattered U.S.

Bureau of Land Management parcels (Exhibit 18 and Exhibit 19). According to the 2002 U.S. Census of Agriculture, there were 1,605,566 total acres of farm and ranch land spread over 343 farms in Lincoln County, leaving approximately 168,187 acres in development or vacant. Since 1987, there has been a 1.7 percent decrease in the number of farms and a 15 percent decrease in total farmland, indicating that land use is shifting from farming and ranching to development.

The Lincoln County Comprehensive Plan (August 2007) 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. Justifications in the Comprehensive Plan allow the local government to adopt ordinances that are stricter than state law and to support subsequent requests for Community Development Block Grant (CDBG) funds for specific projects. The Lincoln County Comprehensive Plan is used to guide the government's general approach and particular policies to be considered by elected officials, appointed boards, and Staff in decision-making. Lincoln County particularly intends the plan to be a unifying force that will cultivate cooperation between the county and the municipalities within.

Lincoln County has an approved subdivision ordinance and is in the process of updating it. The State of New Mexico issues building permits for the unincorporated area of the county, while the Village of Ruidoso issues building permits within its boundaries and its extraterritorial zone (ETZ), which applies within one mile of the Ruidoso Village limits. There is no zoning in the unincorporated part of the County except for a Special Zoning District in Alto and several extraterritorial zones including the Ruidoso Extraterritorial Zone and the Ruidoso Downs Extraterritorial Zone (which regulates a recently annexed subdivision). There are also historical preservation regulations in the town of Lincoln and airport zoning regulations. The Extraterritorial Zoning Authority (ETZA) acts as the governing body for zoning in an extraterritorial zone, while the Extraterritorial Zoning Commission (ETZC) acts as the planning commission for the extraterritorial zone.

The Lincoln Soil and Water Conservation District Land Use Plan (2015) is developed from the long-range priority concerns and objectives in the Lincoln County Water Management Plan (WMP). This plan was adopted as the Comprehensive Plan of the Lincoln Soil and Water Conservation District (SWCD). The mission of the Lincoln SWCD is to protect and improve the quality of water, soil, and natural resources by providing programs and services to the residents and owners of Lincoln County to implement conservation practices.

The Corona Elementary/High School is located about 3 miles west of the Corona Gen-Tie Study Corridor boundary and provide pre-kindergarten through 12th grade. The school has approximately 35 students and 6 staff members (Exhibit 17).

Lincoln County has a variety of outdoor recreational opportunities, including golf courses, fishing spots, and ski areas. In addition, the Lincoln National Forest has 225 miles of hiking trails, and the Capitan Wilderness Area provides 11 total hiking trails. Lincoln County itself does not operate any outdoor open space areas, including parks or playgrounds, nor does it operate any other recreational facilities.

4.12.2.2 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, agricultural businesses still play a large role in all three counties. Much of the 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 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 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 Edgewood contains the largest population within Torrance County and is located approximately 48 miles north of the Corona Gen-Tie Study Corridor. The community of Duran is the closest populated area, roughly 0.08 miles west of the Corona Gen-Tie Study Corridor (from the edge of the Corona Gen-Tie Study Corridor to the edge of the municipality). 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 U.S. Bureau of Land Management parcels (Exhibit 18 and Exhibit 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. It establishes a basis for regulations and programs necessary to manage current and future land development within the jurisdiction of Torrance County. The 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 this 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. 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 Land Use Plan (2009-2019) promotes stewardship of natural resources by providing leadership, education, technical, and financial assistance to the residents of the District.

The Estancia Elementary/Middle/High School serves approximately 890 students and covers grades pre-kindergarten through 12th grade. The school is located approximately 40 miles north of the Corona Gen-Tie Study 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.

4.12.2.3 Guadalupe County

Guadalupe County is the fifth-least populous county in New Mexico and has a total area of 3,032 square miles. It is located in the northeastern quadrant of New Mexico and is a rural, minority-majority county with a population of 4,300. Agriculture is of great economic importance to the entire county as its’

location and natural resources have, historically, allowed communities to be built around both large and small cattle and sheep operations. Torrance County is located to the west and Lincoln County to the southwest. Major state and federal lands include Santa Rosa Lake State Park, Sumner Lake State Park, and scattered U.S. Bureau of Land Management parcels (Exhibit 19).

The county government of Guadalupe is found in the county seat of Santa Rosa. Land use regulations within Guadalupe County are governed by New Mexico state rules and regulations. The largest town in proximity to the Transmission Line Area is the town of Vaughn, located approximately 12 miles north. No military bases are located in the county. The Vaughn Elementary/High School serves approximately 90 students and covers grades pre-kindergarten through 12th grade. The school is located approximately 15 miles north of the Corona Gen-Tie Study Corridor boundary. The City of Santa Rosa has 15 separate lakes and streams and 4 city parks. Numerous fishing opportunities are available at almost all of the city parks and along the Pecos River.

4.12.3 Current Conditions and Trends, Regional Overview – Corona Wind Project Area

The existing conditions previously identified for the Corona Gen-Tie Study Corridor for land use also apply for the Corona Wind Project Area. However, the Corona Elementary/High School is located about 0.1 mile west of the Corona Wind Project Area boundary; the Vaughn Elementary/High School is located approximately 10 miles north of the Corona Wind Project Area; and the Estancia Elementary/Middle/High School is located approximately 33 miles north of the Corona Wind Project Area boundary.

4.13 Socioeconomics

4.13.1 Data Sources

The following data source was reviewed to assess the existing socioeconomic conditions of Lincoln, Torrance, and Guadalupe Counties; the Corona Gen-Tie Study Corridor; and the Corona Wind Project Area.

- 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 – Corona Gen-Tie Study 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 less than a 2-hour drive from the Corona Gen-Tie Study 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.

Guadalupe County is the smallest of the three counties by geographic area, and also has roughly a quarter of the population of the other two counties. Lincoln County has both the largest population and the largest geographic area. Torrance County, however, has the greatest population density of the three counties. An overview of the area's population demographics is shown in Table 4-12.

Table 4-12: Study Area Counties

County	Population	Geographic Area (Square Miles)	Population Density (people/square mile)
Guadalupe	4,376	3,032	1.4
Lincoln	16,622	4,832	3.4
Torrance	15,302	3,346	4.6
Study Area Total	**36,300**	**11,209**	**3.2**

Source: The Economic and Fiscal Impact of the Corona Wind Project in New Mexico (2017)

Santa Rosa, with a 2016 estimated population of 2,680, is the county seat of Guadalupe County, and is also the only community in the county with a population exceeding 1,000. 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 Interstate 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 Corona Wind Projects would be developed, as a whole, comprises 1.74 percent of New Mexico's population.

The area where the 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 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 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 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 Corona Wind Projects would be developed compares with $24,012 for the state of New Mexico. The higher proportion of the area where the 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 Corona Wind Projects will occur.

The largely rural, sparsely populated area where the Corona Wind Projects will occur is dominant land use 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 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 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 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 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 Corona Wind Projects will occur.

Table 4-13 presents an agricultural profile for the area where the 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 4-13: 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: The Economic and Fiscal Impact of the Corona Wind Project in New Mexico (2017)

The role of agriculture in the area economy, where the 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 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 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 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 Corona Wind Projects will be developed, highlights the ready supply of construction firms and workers from the larger population centers surrounding the Corona Gen-Tie Study Corridor and Wind Project Area.

4.13.3 Current Conditions and Trends, Regional Overview – Corona Wind Project Area

The existing socioeconomics and economy previously described for the Corona Gen-Tie Study Corridor are similar for the Corona Wind Project Area.

4.14 Communication Signals

4.14.1 Data Sources

The following data sources were reviewed to assess the existing communication signals of Lincoln, Torrance, and Guadalupe Counties; the Corona Gen-Tie Study Corridor; and the Corona Wind Project Area.

- FCCinfo; based on publicly available data from the Federal Communication Commission. Accessed on December 2017 from http://www.fccinfo.com/disclaimerphp.

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

Lincoln, Torrance, and Guadalupe 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 Corona Gen-Tie Study Corridor, with an expanded search to 35 miles from the edge of the Corona Gen-Tie Study Corridor endpoints boundary, indicates that no microwave towers, antenna structure registration towers, or AM/FM/TV towers are present (Exhibit 20).

4.14.3 Current Conditions and Trends, Regional Overview – Corona Wind Project Area

Communication signal conditions within the Corona Wind Project Area are similar to what is described above for the Transmission Line Area.

4.15 Radioactive Waste and Radiation Hazards

Electric transmission line and substation infrastructure do not generate or contain radioactive waste or radiation hazards. The transmission line facilities 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 Corona Gen-Tie Study 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 Corona Gen-Tie Study Corridor does not contain any known safety concerns. Chapter 5, Section 5.17 describes potential safety concerns associated with construction, operation, and maintain 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, Torrance, and Guadalupe Counties; the Corona Gen-Tie Study Corridor; and the Corona Wind Project Area.

- National Park Service Physiographic Provinces (NPS, 2017)
- 2011 National Land Cover Database (NLCD)
- The National Map (USGS, 2017)

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

The area where the Corona Wind Projects will be developed is located within the Great Plains physiographic province (NPS, 2017). 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 feet, decreasing to 2,000 feet. 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 Corona Wind Project Area or the Corona Gen-Tie Study Corridor.

No national parks or state parks are in the vicinity of the Corona Wind Projects. The closest national park is Salinas Pueblo Missions National Monument, which is more than 15 miles away, and the closest state park is Sumner Lake State Park, which is more than 35 miles away.

4.18.3 Current Conditions and Trends, Regional Overview – Corona Wind Project Area

No additional geographic are resources within the Corona Wind Project Area; however, 36 historic sites have been recorded throughout the Corona Wind Project Area, primarily consisting 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, Torrance, and Guadalupe Counties; the Corona Gen-Tie Study Corridor; and the Corona Wind Project Area.

- VFR Map 2017, Digital Aviation LLC (http://vfrmap.com/tos.html)
- New Mexico Military Bases Map 2017 (https://militarybases.com/new-mexico/)

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

No military bases occur within the Corona Gen-Tie Study Corridor; nor do military training routes intersect the Corona Gen-Tie Study Corridor (Exhibit 21). Pattern Development would request Determination of No Hazard (DNH) from the FAA for any transmission line structures over 200 feet (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 Project Area

No military bases occur within the Corona Wind Project Area. Exhibit 21 identifies military training routes that intersect the Corona Wind Project Area, occurring within the northeast portion of development. Pattern Development would request DNH from the FAA for any transmission line structures over 200 feet (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, Torrance, and Guadalupe Counties; the Corona Gen-Tie Study Corridor; and the Corona Wind Project Area.

- New Mexico Department of Transportation (NMDOT)

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

Lincoln, Torrance, and Guadalupe Counties are rural counties in central New Mexico with a sparse network of state, county, and private roads within the area where the Corona Wind Projects will be developed. Pattern Development will work with NMDOT and the Lincoln, Torrance, and Guadalupe County Road Maintenance Departments to determine current road conditions for construction access prior to the start of any construction. State Highways 54, 42, 285, 3 and several east-west and north-south segments of county roads traverse the Corona Wind Projects.

4.20.3 Current Conditions and Trends, Regional Overview – Corona Wind Project Area

Existing road conditions within the Corona Wind Project Area are similar to those described above for the Corona Gen-Tie Study Corridor.

5.0 ENVIRONMENTAL EFFECTS

5.1 Introduction

This chapter addresses whether the proposed Corona Gen-Tie Study Corridor, step-up substation(s) and switchyard (collectively, the "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 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 is addressed, as well as additional resource areas identified by Staff. These are: air resources; noise; geology and mineral resources; soil 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 Corona Gen-Tie Study Corridor together with BMPs that can help manage impacts.

Implementation of the proposed transmission line facilities could affect the existing condition of the environment. Effects can occur directly or indirectly within the Corona Gen-Tie Study Corridor. Direct effects are those that occur through direct or immediate interaction of the proposed transmission line facilities with environmental components. Indirect effects are those that are somewhat distant from the 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 Gen-Tie (approximately 30 years) were considered long-term impacts. Permanent impacts are those that would be anticipated to remain for the life of the Gen-Tie and beyond.

For each resource area review below, this report: describes the potential ground disturbance and environmental effects that may occur due to the transmission line facilities; identifies the protection measures that the Corona Wind Companies proposes to avoid and minimize impacts; and summarizes the potential for the 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 transmission line facilities construction, operation, and maintenance within the Corona Gen-Tie Study 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 Corona Gen-Tie Study 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), particulate matter (PM), small amounts of SO_2, and trace amounts of hazardous air pollutants. Construction contractors and their equipment would be required to comply with all emissions standards. If 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 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 Corona Gen-Tie Study Corridor.

5.2.2.2 Operations and Maintenance

During operation of the 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 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 right-of-way 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 transmission line facilities, as well as the protection measures detailed above, it is not expected that the proposed location of the 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 transmission line facility construction, operation, and maintenance within the Corona Gen-Tie Study 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 Corona Gen-Tie Study Corridor

The existing noise levels in the Corona Gen-Tie Study Corridor within rural parts of Lincoln, Torrance, and Guadalupe Counties is relatively low. The primary existing sources of noise in the Corona Gen-Tie Study Corridor are traffic along 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 Corona Gen-Tie Study Corridor. Noise impacts from construction of 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 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) 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 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 transmission line facilities construction, operation, and maintenance within the Corona Gen-Tie Study Corridor follows the impact assessment methodology described in Section 5.1 above and is discussed below.

5.4.2 Impacts Specific to the Corona Gen-Tie Study Corridor

There are no identified operational hydrocarbon facilities or unique geological features located within the Corona Gen-Tie Study Corridor, and impacts from the construction, operation, and maintenance of the transmission line facilities are not anticipated. There are no known faults or landslide areas in the Corona

Gen-Tie Study Corridor, and, therefore, impacts from the construction, operation, and maintenance of the 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 landslides in the Transmission Line Area.

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 transmission line facilities, it is not expected that the proposed location of the 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 transmission line facilities from construction, operation, and maintenance within the Corona Gen-Tie Study 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 permanent soil would be lost due to the permanent footprint of transmission line facilities.

5.5.2 Impacts Specific to the Corona Gen-Tie Study 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 Corona Gen-Tie Study 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 transmission line facility operations would consist of soil disturbances necessary to maintain the 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 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 Environmental Protection Agency 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 transmission line facilities would result in minor long-term loss of that acreage to other productive soil uses. The total permanent footprint of transmission line facilities would range from approximately 20 to 60 acres inside the Corona Gen-Tie Study Corridor, equaling less than one-tenth of 1 percent of the Corona Gen-Tie Study 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 about of permanent soil loss as well as the protection detailed above, it is not expected that the proposed location of the 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 transmission line facilities construction, operation, and maintenance within the Corona Gen-Tie Study Corridor follows the impact assessment methodology described in Section 5.1 above and is discussed below.

5.6.2 Impacts Specific to the Corona Gen-Tie Study 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 Permian deposits of the San Andreas Formation, Glorieta sandstone, Yeso Formation, and Artesia Group, all of which would have a low probability for the presence of paleontological deposits. 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 Corona Gen-Tie Study 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 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 transmission line facilities construction, operation, and maintenance within the Corona Gen-Tie Study 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 Corona Gen-Tie Study Corridor

5.7.2.1 Surface Water

The potential sources of surface water resource impacts from the 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 Corona Gen-Tie Study Corridor, low impacts to surface water are anticipated from the transmission line facilities.

In addition to soil-disturbance activities, impacts to surface waters may include stream crossings by 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 transmission line facilities based on the low number of streams in the Corona Gen-Tie Study 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 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. 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 transmission line facilities would affect groundwater to any extent. Any impacts to groundwater would be low impacts for short duration and consist mainly of temporary sedimentation. Excavations for 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 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, as well as field investigations, 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. No jurisdictional waters of the U.S. would be impacted by construction within the Corona Gen-Tie Study Corridor or access roads, as currently designed. Therefore, no Section 404 permit, Section 10 permit, or Section 401 water quality certification would be required.

It is noted that, prior to onsite investigations, several ephemeral streams were identified that crossed proposed access roads within the Corona Wind Project Area of development; however, field investigations revealed that none of these ephemeral streams exhibited a defined bed and bank or an OHWM, and were vegetated with the same species as occurring in the upland areas. The lack of an OHWM or wetland vegetation indicated that the drainage did not meet the criteria of a Waters of the U.S. (WOTUS). Based on the lack of an OHWM and the lack of hydrophytic vegetation, the ephemeral drainages did not contain the requisite features of a WOTUS and are not expected to be subject to Section 404 of the Clean Water Act. In any case, avoidance BMPs are implemented irrespective of formal WOTUS status.

The potential wetlands identified by NWI and PLJV would be verified in the field and inventoried and/or delineated to determine the actual locations of wetlands prior to construction of the transmission line facilities. This information would be provided to the design team so direct impact to wetlands can be avoided. 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. 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 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 Corona Gen-Tie Study Corridor, avoidance of water resources by transmission line facilities, and the protection measures detailed above, it is not expected that the proposed location of the 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 transmission line facility construction, operation, and maintenance within the Corona Gen-Tie Study 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 Corona Gen-Tie Study Corridor

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

Five animal species (New Mexico meadow jumping mouse, Peñasco least chipmunk, Mexican spotted owl, Northern aplomado falcon, and the southern willow flycatcher) federally listed under the ESA may potentially occur in the Corona Gen-Tie Study Corridor (WEST, 2017b). The southwestern willow flycatcher and Peñasco least chipmunk are unlikely to occur within the Corona Wind Projects due to the absence of suitable habitat. There is limited potential for the Mexican spotted owl to occur within the Corona Project's forested areas. The New Mexico meadow jumping mouse is unlikely to occur as it requires specialized wetland habitat near seasonal or perennial streams

A total of 13 state-listed endangered or threatened wildlife species are identified for the area where the Corona Wind Projects will be developed (NMDGF, 2016) and described above in Section 4.4. Of these 13 species, bald eagle, Baird's sparrow, peregrine falcon, and spotted bat may occur in the Corona Gen-Tie Study Corridor as migrants, but suitable habitat is not present (WEST, 2017). The Corona Gen-Tie Study 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 transmission line facilities in the Corona Gen-Tie Study Corridor.

One special status plant population, Kuenzler's hedgehog cactus, could occur in the Corona Gen-Tie Study Corridor; however, impacts to special status plant species from the transmission line facilities would be minimal based on the low likelihood of special status plant species to occur in this area. Disturbed ground would be restored as close to preconstruction conditions as possible through the use of approved native seed mixes and noxious weed control.

5.8.2.2 Raptors, Eagles, and Birds

Raptor, eagle, and migratory bird species are known to use the Corona Gen-Tie Study Corridor for breeding, foraging, and migration (WEST, 2017b). If transmission line facility 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 Migratory Bird Treaty Act (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 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.

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 (WEST, 2017). Potential water resources are limited to scattered playa lakes, stock ponds, and ephemeral 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 Corona Gen-Tie Study Corridor (WEST, 2017). Collision risks to cranes 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 feet). 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 risk, 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 Corona Gen-Tie Study Corridor; as well as the protection measures detailed above, it is not expected that the proposed location of the 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 Wind Project area, would, as a whole, avoid or minimize impacts to environmental resources. Although studies have been conducted on the 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 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 transmission line facilities.

5.9.1 Methods and Impact Types

Assessment of impacts to cultural, historic, and archaeological resources from transmission line facilities construction, operation, and maintenance within the Corona Gen-Tie Study 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 Corona Gen-Tie Study Corridor prior to any ground disturbance on public as well as private property.

5.9.2 Impacts Specific to the Corona Gen-Tie Study Corridor

Five historic archaeological resources are reported with the Corona Gen-Tie Study Corridor. All five sites are associated with ranching activities. Impacts to known locations of cultural resources would be low because the 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 transmission line facilities to unlocated sites. Any discoveries which may occur during construction would be managed through an Unanticipated Discovery Protocol (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 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 transmission line facilities construction, operation, and maintenance within the Corona Gen-Tie Study 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 Corona Gen-Tie Study Corridor

Within the Corona Gen-Tie Study Corridor, there are no known churches or cemeteries. No impacts to known locations of religious resources are expected to occur because religious resources may be avoided by the transmission line facilities. Cultural resource field surveys would be completed prior to any construction activity to reduce potential impacts from the transmission line facilities. Siting of 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 or cemeteries within the Corona Gen-Tie Study 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 transmission lines 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 Wind Project area, would, as a whole, avoid or minimize impacts to environmental resources. Although studies have been conducted on the 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 transmission line facilities.

Based on the compatibility of the transmission line facilities with the current land uses within the Corona Gen-Tie Study Corridor; impacts to land uses from location of the transmission line facilities would be largely temporary and limited in area during construction; and the large majority of the Corona Gen-Tie

Study 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 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 transmission line it is not expected that the proposed location of the 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 transmission line facility construction, operation, and maintenance within the Corona Gen-Tie Study Corridor follows the impact assessment methodology described in Chapter 5.1 above and is discussed below. Construction, operation, maintenance of the transmission line facilities would introduce new features into the visual landscape of the Corona Gen-Tie Study Corridor. The transmission line facilities were evaluated to determine whether the following types of impacts would occur:

- Proximity of the transmission line and/or structures 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 Corona Gen-Tie Study Corridor

New transmission structures, conductors, substation components, and cleared ROW areas would change the visual characteristics in the vicinity and the viewshed of the transmission line facilities. However, the transmission line facilities would not differ from other transmission lines and substations in the vicinity. For residences located near the transmission line and residents traveling area roads in the Corona Gen-Tie Study 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 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 transmission line. Each new substation would be an added visual element in the existing landscape.

There are no designated scenic routes or byways in the vicinity of the Project. The nearest scenic route is Historic Route 66, more than 35 miles away. The Mesalands Scenic Byway is located over 30 miles northeast. 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, there are no national parks or state parks in the vicinity of the Project. The closest national park is Salinas Pueblo Missions National Monument, which is more than 15 miles away, and the closest state park is Sumner Lake State Park, which is more than 35 miles away. Finally, there are no known significant, visually sensitive historic sites in the vicinity of the Project.

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 feet 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 right-of-way 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 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 transmission line facility construction, operation, and maintenance within the Corona Gen-Tie Study 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. Transmission line facilities tend to restrict certain activities but may or may not change the land use. Construction, operation, and maintenance of the 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 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 Corona Gen-Tie Study Corridor

5.12.2.1 Agricultural Land Use Impacts

The lands crossed by the 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 feet 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 transmission line 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 transmission line 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 transmission line 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 transmission line, approximately one or two 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 transmission line facilities.

Six 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

Lincoln and Guadalupe Counties do not have any zoning regulations that apply to the transmission line facilities. As party of Lincoln County's Economic and Development Vision and Goals, the vast open acres of farm and ranchland are envisioned to potentially be used to produce solar and wind energy to supplement farmers' incomes, promote business development in areas outside Ruidoso, and better distribute employment around the south-central part of the county. The transmission line facilities are consistent with the county's recommended Land Use Policy, which emphasizes private property rights and development as necessary for economic vitality.

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. 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 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 State Land Office (SLO) for these portions of the 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. An application has been submitted to the SLO for lands within the Corona Gen-Tie Study Corridor, including the Corona Gen-Tie Study Corridor, and as of the submittal of this application, it is in process.

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 transmission line facilities. The Corona Elementary/High School is located about 3 miles west of the Corona Gen-Tie Study Corridor boundary. Siting of 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 transmission line facilities. There are no parks and recreational areas in close proximity to the Corona Gen-Tie Study

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 transmission line facilities with the current land uses within the Corona Gen-Tie Study Corridor, impacts to land uses from location of the transmission line facilities would be largely temporary and limited in area during construction. The large majority of the Corona Gen-Tie Study 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 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 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 transmission line facility construction, operation, and maintenance within the Corona Gen-Tie Study 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 Corona Wind Projects 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 Corona Wind Projects.
- 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 Corona Gen-Tie Study Corridor

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

Over 30 years of operations, the overall Corona Wind 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 Corona Wind Projects are estimated to be nearly $1.4 billion, and the direct, indirect, and induced economic benefits of the Corona Wind Projects are estimated to produce a present value of $2.0 billion (Tysseling, 2017).

The Corona Wind Projects align directly with several of the specific goals of the New Mexico State Energy Plan. A significant attribute of the Corona Wind Projects is the development of the SunZia Transmission Project transmission facilities. Moreover, several other objectives of the State Energy Plan are achieved by the Corona Wind 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 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 fresh water consumption in the energy sector; and
- Establish the energy foundation of new and improved infrastructure in electric power transmission.

Development of electric generation facilities comprising the Corona Wind 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 Corona Wind Projects' 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 revenues streams would be a stable foundation of economic activity anticipated for at least the 30-year life of the Corona Wind Projects' financing, and would likely continue beyond that time. Additionally, the Corona Wind Projects 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 Corona Wind Projects' facilities (Tysseling, 2017). These developments would occur over approximately 300,000 acres across the three counties, and would introduce significant new economic activities for decades to come.

The Corona Wind Projects are estimated to create 1,186 total full time equivalent jobs during construction, with an estimated 356 of those jobs source from local labor sources (Tysseling, 2017). Payroll during the development phase would add approximately $55.9 million in income to the local labor

force for the Project construction alone. The bulk of these short-term impacts would occur in 2018 to 2020.

Pattern Development estimates that of the total capital expenditures during construction of the Corona Wind Projects, it is likely that $116.3 million in contracts would flow to local construction service providers (Tysseling, 2017).

Once construction is completed and operations commence, the 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 wind generation facilities 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 $13.9 $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 Corona Wind 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 $3.5 million per year (Tysseling, 2017).

The direct economic impacts of the 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 Corona Wind Projects (Tysseling, 2017). Once operational, the 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 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 Corona Wind Projects 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. Aside from the technology, innovation and capital investments developed in conjunction with the Corona Wind Projects, 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 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 Corona Wind Projects 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 transmission line facility construction, operation, and maintenance, within the Corona Gen-Tie Study 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 Corona Gen-Tie Study Corridor

The transmission line facilities are planned to avoid beam paths. Siting of transmission line facilities would be completed outside of existing, known fresnel zones and would avoid inference with communication pathways. No AM or FM station towers were identified within or near the Corona Gen-Tie Study Corridor. The 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 transmission line facilities to the extent practicable; therefore, it is not expected that the proposed location of the 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 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 transmission line facility construction, operation, and maintenance, within the Corona Gen-Tie Study 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 transmission line facilities. These hazards are described in more detail below.

5.16.2 Impacts Specific to the Corona Gen-Tie Study 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 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 transmission line facility construction, operation, and maintenance, within the Corona Gen-Tie Study Corridor follows the impact assessment methodology described in Chapter 5.1 above and is discussed below. Safety concerns can arise from transmission line facility construction, operation, and maintenance. These concerns are described in more detail below.

5.17.2 Impacts Specific to the Corona Gen-Tie Study 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 OSHA requirements to ensure the safety of residents, employees, contractors, livestock, the public, and other users of the land.

Construction of the transmission line facilities could cause wildfire ignition. Operation and maintenance 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, Lincoln, Torrance and Guadalupe 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 Corona Gen-Tie Study Corridor generally is not considered to be a high-risk site. An annual emergency response drill, which local responders will be invited to participate, will be completed onsite, to test the Corona Wind Projects emergency response

Within the Corona Wind Project Area, 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 will monitor the substation and turbines. There will be signage on the substation fences with the 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 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 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 transmission line facility construction, operation, and maintenance within the Corona Gen-Tie Study 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 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 Corona Gen-Tie Study Corridor

As discussed in Section 5.11, there are no national parks or state parks in the vicinity of the Corona Gen-Tie Study Corridor. The closest national park is Salinas Pueblo Missions National Monument, which is approximately 15 miles west of the Corona Gen-Tie Study Corridor, and the closest state parks are the Santa Rosa Lake State Park, Sumner Lake State Park, and Manzano Mountains State Park, all located more than 35 miles from the Corona Gen-Tie Study Corridor. 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, five historic archaeological resources are reported with the Corona Gen-Tie Study Corridor. All five sites are associated with ranching activities. Impacts to known locations of cultural resources would be low because the transmission line facilities would be designed to avoid these areas. Cultural resource field surveys would be completed prior to any construction activity to reduce potential impacts from the 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 transmission line facilities to the extent practicable; therefore, it is not expected that the proposed location of the 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 transmission line facility construction, operation, and maintenance, within the Corona Gen-Tie Study 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 Corona Gen-Tie Study Corridor

Approximately 10 military training routes occur in the vicinity of the Project; however, none of these routes conflict with the Corona Gen-Tie Study Corridor. Pattern Development would work with FAA to

request DNH for the transmission line facilities. Based on the height of transmission line facilities and the location of military and aviation resources, the transmission line facility construction, operation, and maintenance, within the Corona Gen-Tie Study 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 transmission line facilities to the extent practicable; therefore, it is not expected that the proposed location of the 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 transmission line facilities from construction, operation, and maintenance within the Corona Gen-Tie Study Corridor follows the impact assessment methodology described in 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 Corona Gen-Tie Study Corridor

Potential impacts for roads would be greatest during construction of 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 transmission line facilities construction is occurring that day or week. Low impacts to roads in the Corona Gen-Tie Study 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, Torrance, and Guadalupe 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, well as the protection measures detailed above, it is not expected that the proposed location of the 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 Gen-Tie, substation(s), and switchyard.

6.1 List of Preparers and Reviewers

6.1.1 Pattern Development

- Adam Cernea Clark, Manager Environmental and Natural Resources
- Crystal Coffman, Manager Business Development
- Carla Najjar, Special Counsel
- Dan Najjar, Special Counsel

6.1.2 Burns & McDonnell

- Paul Callahan, Project Principal
- Chris Knopp, Project Manager
- Bob Rowe, Senior Archeologist
- Cody Clark, Biologist
- Brian Parker, Geographic Integration Systems Manager
- 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 2017)
- *Critical Issues Analysis for the Proposed Cowboy Mesa Wind Project* (Report, WEST Inc., March 2017)
- *Critical Issues Analysis for the Proposed Viento Loco Wind Project* (Report, WEST Inc., March 2017)
- *Cultural Resources Survey of 10 Proposed Wind Turbine Locations at the Ancho Project*, Lincoln County, New Mexico (Report, Blanton & Associates, Inc., 2017)
- *Cultural Resources Survey of 11 Proposed Wind Turbine Locations at the Viento Loco Wind Project*, Torrance County, New Mexico (Report, Blanton & Associates, Inc., 2017)
- *Cultural Resources Survey of 15 Proposed Wind Turbine Locations at the Duran Mesa Wind Project*, Torrance County, New Mexico (Report, Blanton & Associates, Inc., 2017)
- *Cultural Resources Survey of 15 Proposed Wind Turbine Locations at the Cowboy Mesa Wind Project*, Torrance County, New Mexico (Report, Blanton & Associates, Inc., 2017)

- *Cultural Resources Survey of 16 Proposed Wind Turbine Locations at Tecolote Wind Project*, Torrance County, New Mexico (Report, Blanton & Associates, Inc., 2017)
- *Cultural Resources Survey of 21 Proposed Wind Turbine Locations and Access Roads at the Red Cloud Wind Project*, Torrance County, New Mexico (Report, Blanton & Associates, Inc., 2017)
- *Raptor Nest Survey, Pattern Wind Energy Project* (Report, WEST Inc., August 2017e)
- *Site Characterization Study, Pattern Wind Energy Project* (Report, WEST Inc., August 2017b)
- *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., 2017)
- *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., 2017)
- *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., 2017)
- *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., 2017)
- *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., 2017)

6.3 Recipients of the Environmental Report

- Lincoln/Torrance/Guadalupe County Board of County Commissioners
- Lincoln/Torrance/Guadalupe County Manager
- Lincoln/Torrance/Guadalupe 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 State Land Office

7.0 LITERATURE CITED

2011 National Land Cover Database (NLCD). (2017). *Data Downloads*. Retrieved December 2017 from https://www.mrlc.gov/nlcd2011.php.

American Cemeteries. (2017a). *Cemeteries of Guadalupe County*. Retrieved December 2017 from http://www.americancemeteries.org/new-mexico/guadalupe-county.

American Cemeteries. (2017b). *Cemeteries of Lincoln County*. Retrieved December 2017 from http://www.americancemeteries.org/new-mexico/Lincoln-county.

American Cemeteries. (2017c). *Cemeteries of Torrance County*. Retrieved December 2017 from http://www.americancemeteries.org/new-mexico/torrance-county.

American Cemeteries. (2017d). *Churches of Guadalupe County*. Retrieved December 2017 from https://newmexico.hometownlocator.com/features/cultural,class,church,scfips,350019.cfm.

American Cemeteries. (2017e). *Churches of Lincoln County*. Retrieved December 2017 from https://newmexico.hometownlocator.com/features/cultural,class,church,scfips,35027.cfm.

American Cemeteries. (2017f). *Churches of Torrance County*. Retrieved December 2017 from https://newmexico.hometownlocator.com/features/cultural,class,church,scfips,35057.cfm.

Anderson, O.J., Jones, G.E., and Green, G.N. (1997). *Geological map of New Mexico: U.S. Geological Survey Open-file Report 97-52*. Retrieved December 8, 2017 from http://pubs.er.usgs.gov/publications/ofr9752.

Barr Engineering Company. (2017). *Preliminary Geotechnical Engineering Report Sunzia Wind Project*.

Bat Conservation International (BCI). (2017). *Bat Species: US Bats*. Retrieved December 2016 from http://www.batcon.org and http://www.batcon.org/resources/media-education/species-profiles.

Blanton & Associates, Inc. (2017a). *Cultural Resources Survey of 10 Proposed Wind Turbine Locations at the Ancho Project, Lincoln County, New Mexico*.

Blanton & Associates, Inc. (2017b). *Cultural Resources Survey of 11 Proposed Wind Turbine Locations at the Viento Loco Wind Project, Torrance County, New Mexico*.

Blanton & Associates, Inc. (2017c). *Cultural Resources Survey of 15 Proposed Wind Turbine Locations at the Cowboy Mesa Wind Project, Torrance County, New Mexico*.

Blanton & Associates, Inc. (2017d). *Cultural Resources Survey of 15 Proposed Wind Turbine Locations at the Duran Mesa Wind Project, Torrance County, New Mexico*.

Blanton & Associates, Inc. (2017e). *Cultural Resources Survey of 16 Proposed Wind Turbine Locations at Tecolote Wind Project, Torrance County, New Mexico*.

Blanton & Associates, Inc. (2017f). *Cultural Resources Survey of 21 Proposed Wind Turbine Locations and Access Roads at the Red Cloud Wind Project, Torrance County, New Mexico*.

Blanton & Associates, Inc. (2017a). *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.*

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.*

Broadhead, R.F. (1997). *Subsurface geology and oil and gas potential of the Estancia Basin, New Mexico*. (157, 54p). Socorro: New Mexico Bureau of Geology and Mineral Resources Bulletin.

Bureau of Land Management. (2017). *General Land Office plats*. Retrieved November 2017 from https://glorecords.blm.gov/.

Digital Aviation LLC. (2017). *VFR Map*. Retrieved 2017 from http://vfrmap.com/tos.html.

eBird. (2017). *eBird: An Online Database of Bird Distribution and Abundance*. Ithaca: Cornell Lab of Ornithology. Retrieved July 2017 from http://ebird.org/content/ebird/.

Environmental Protection Agency (EPA). (2017). *Ecoregions*. Retrieved November 2017 from https://www.epa.gov/eco-research/ecoregions.

Federal Emergency Management Agency (FEMA). (2017). *Flood Map Service Center*. Retrieved December 2017 from https://msc.fema.gov/portal/search.

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). 2011 National Land Cover Database. *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).

Lincoln County. (2017). *Lincoln County Comprehensive Plan*.

Lincoln County. (2015). *Lincoln Soil and Water Conservation District Land Use Plan*.

Lucas, S.G. (1993). *The Chinle Group: Revised Stratigraphy and Biochronology of Upper Triassic Nonmarine Strata in the Western United States.* (v. 59, p. 27-50). Museum of Northern Arizona Bulletin.

Mid-Region Council of Governments. (2013). *Comprehensive Land Use Plan for Torrance County, New Mexico*.

Military Bases. (2017). *New Mexico Military Bases Map 2017*. Retrieved 2017 from https://militarybases.com/new-mexico/.

National Park Service Physiographic Provinces. (2017). Retrieved 2017 from https://www.nps.gov/subjects/geology/physiographic-provinces.htm.

New Mexico Crucial Habitat Assessment Tool (NM CHAT). (2017). *Crucial Habitat Data: New Mexico Habitat Information Extracted from Spatial Data*. Retrieved December 2017 from http://nmchat.org/data-download.html.

New Mexico Cultural Resource Information System (NMCRIS). (2017). Retrieved November 2017 from https://nmcris.dca.state.nm.us.

New Mexico Department of Game and Fish. (2017). Biota Information System of New Mexico (BISON-M). *County Federal/State Species Status for Lincoln, terrace and Guadalupe Counties.* Retrieved February 2017 from http://www.bison-m.org and http://www.bison-m.org/reports.aspx?rtype=9.

New Mexico Department of Game and Fish. (2017). Biota Information System of New Mexico (BISON-M). *Report County TES Table for Roosevelt - New Mexico Wildlife of Concern.* Retrieved July 2017 from http://www.wildlife.state.nm.us/conservation/wildlife-species-information/threatened-andendangered-species/.

New Mexico Department of Game and Fish. (2012). Threatened and Endangered Species of New Mexico, 2012 Biennial Review. *New Mexico Department of Game and Fish Conservation Services Division 2012 Biennial Review and Recommendation.* Retrieved October 1, 2012 from http://www.wildlife.state.nm.us/download/conservation/threatened-endangered-species/biennial-reviews/2012-Biennial-Review-Executive_Summary_and_Full_Text.pdf.

New Mexico Environmental Department. (2017). Air Quality Bureau. *Air Monitoring Network.* Retrieved December 2017 from https://www.env.nm.gov/air-quality/air-monitoring-network-2/.

Playa Lakes Joint Venture (PLJV). (2016). *Maps of Probable Playas, Roosevelt, New Mexico*. Retrieved December 2016 and September 2017. Available online: http://pljv.org/for-habitat-partners/mapsand-data/maps-of-probable-playas/.

Playa Lakes Joint Venture (PLJV). (2017). *Maps of Probable Playas*. Retrieved December 2017 from https://pljv.org/for-habitat-partners/maps-and-data/maps-of-probable-playas/.

Sites Southwest LLC. (2007). *Lincoln County Comprehensive Plan*.

Southern Great Plains Crucial Habitat Assessment Tool. (2017). Retrieved December 2017 from https://kars.ku.edu/geodata/maps/sgpchat/.

The Drillings. (2017). *Guadalupe, Lincoln, and Torrance Counties, New Mexico*. Retrieved December 2017 from https://thedrillings.com/usa/new-mexico/.

The National Audubon Society. (2017). *Important Bird Areas (IBA).* Retrieved December 2017 from http://www.audubon.org/important-bird-areas.

The Board of County Commissioners of Torrance County. (2016). *Torrance County Zoning Ordinance.*

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

U.S. Census Bureau. (2017). *Quick Facts*. Retrieved December 2017 from https://www.census.gov/quickfacts/fact/table/US/PST045217.

U.S. Department of Agriculture. (2017). Soil Survey Geographic (SSURGO). *Database for New Mexico*. Retrieved December 2017 from http://apps.cei.psu.edu/soiltool/.

U.S. Fish and Wildlife Service (USFWS). (2008). Division of Migratory Bird Management. *Birds of Conservation Concern 2008*. Retrieved December 2008 from https://www.fws.gov/migratorybirds/pdf/grants/BirdsofConservationConcern2008.pdf

U.S. Fish and Wildlife Service (USFWS). (2017a). *Environmental Conservation Online System Species Profiles*. Retrieved December 2017 from https://www.fws.gov/southeast/conservation-tools/environmental-conservation-online-system/.

U.S. Fish and Wildlife Service (USFWS). (2017b). *Information, Planning, and Consultation System (IPaC)*. Retrieved December 2017 from https://ecos.fws.gov/ipac/.

U.S. Fish and Wildlife Service (USFWS). (2017c). National Wetlands Inventory (NWI). *Data Mapper*. Retrieved December 11, 2017 from https://www.fws.gov/wetlands/data/mapper.html.

U.S. Fish and Wildlife Service (USFWS). (2017d). *Species by County Report. Environmental Conservation Online Service (ECOS)*. Retrieved December 2017 from https://ecos.fws.gov/ecp0/reports/species-by-current-range-county?fips=35027.

U.S. Geologic Survey (USGS). (2017). *National Hydrography Dataset (NHD)*. Retrieved December 2017 from https://nhd.usgs.gov/tools.html.

U.S. Geologic Survey (USGS). (2017). *Gap Analysis Program (GAP) Protected Areas of the U.S. Database.* Retrieved December 2017 from https://gapanalysis.usgs.gov/padus/.

U.S. Geologic Survey (USGS). (2017). *The National Map*. Retrieved Month 2017 from https://nationalmap.gov/.

WEST Inc. (2017a). *Critical Issues Analysis, Proposed Ancho Wind Project.*

WEST Inc. (March 2017b). *Critical Issues Analysis, Proposed Cowboy Mesa Wind Project*.

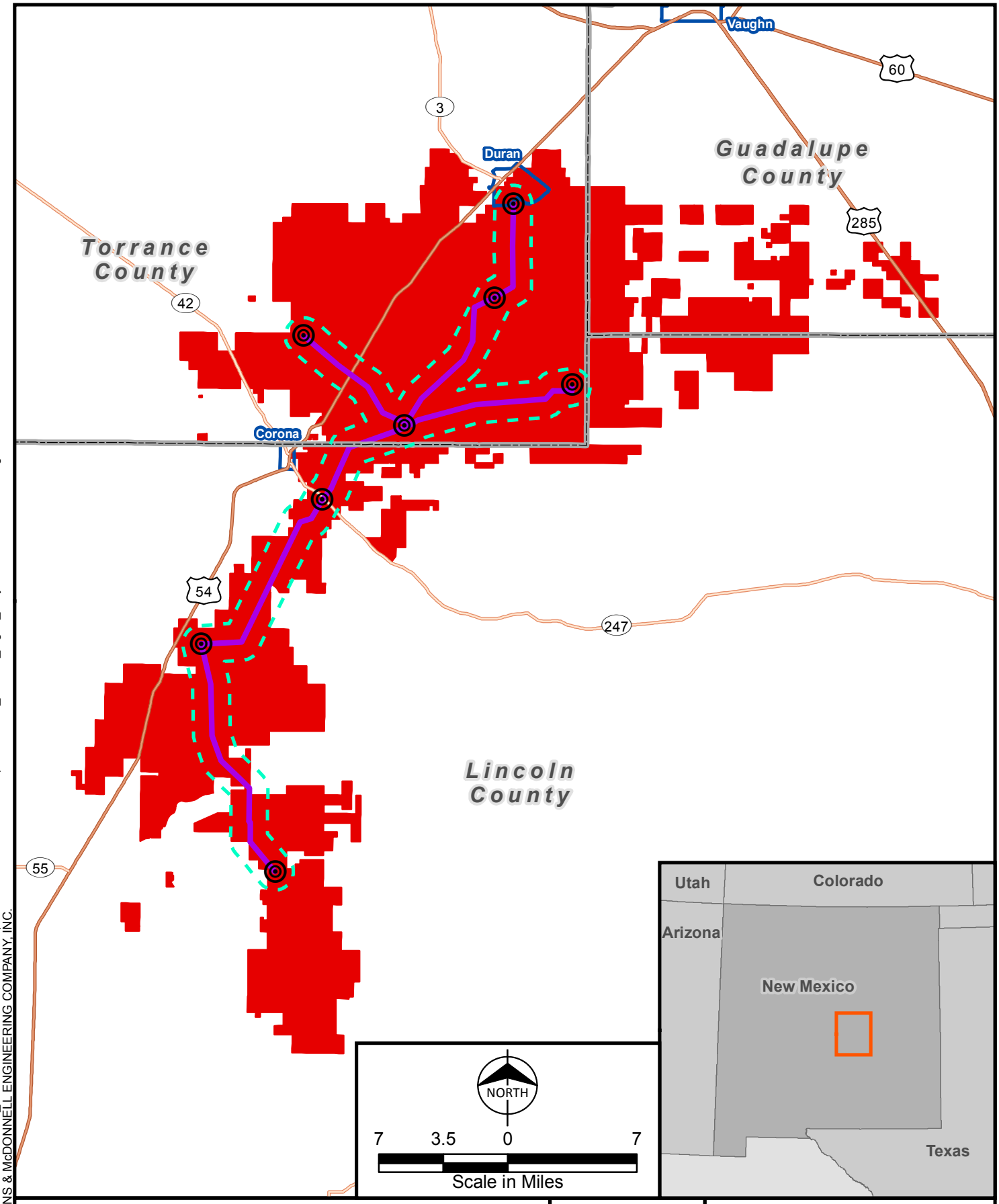
WEST Inc. (March 2017c). *Critical Issues Analysis, Proposed Viento Loco Wind Project*.

WEST Inc. (August 2017d). *Raptor Nest Survey, Pattern Wind Energy Project*.

WEST Inc. (August 2017e). *Site Characterization Study, Pattern Wind Energy Project*.

8.0 INDEX

APPENDIX 1 - EXHIBITS

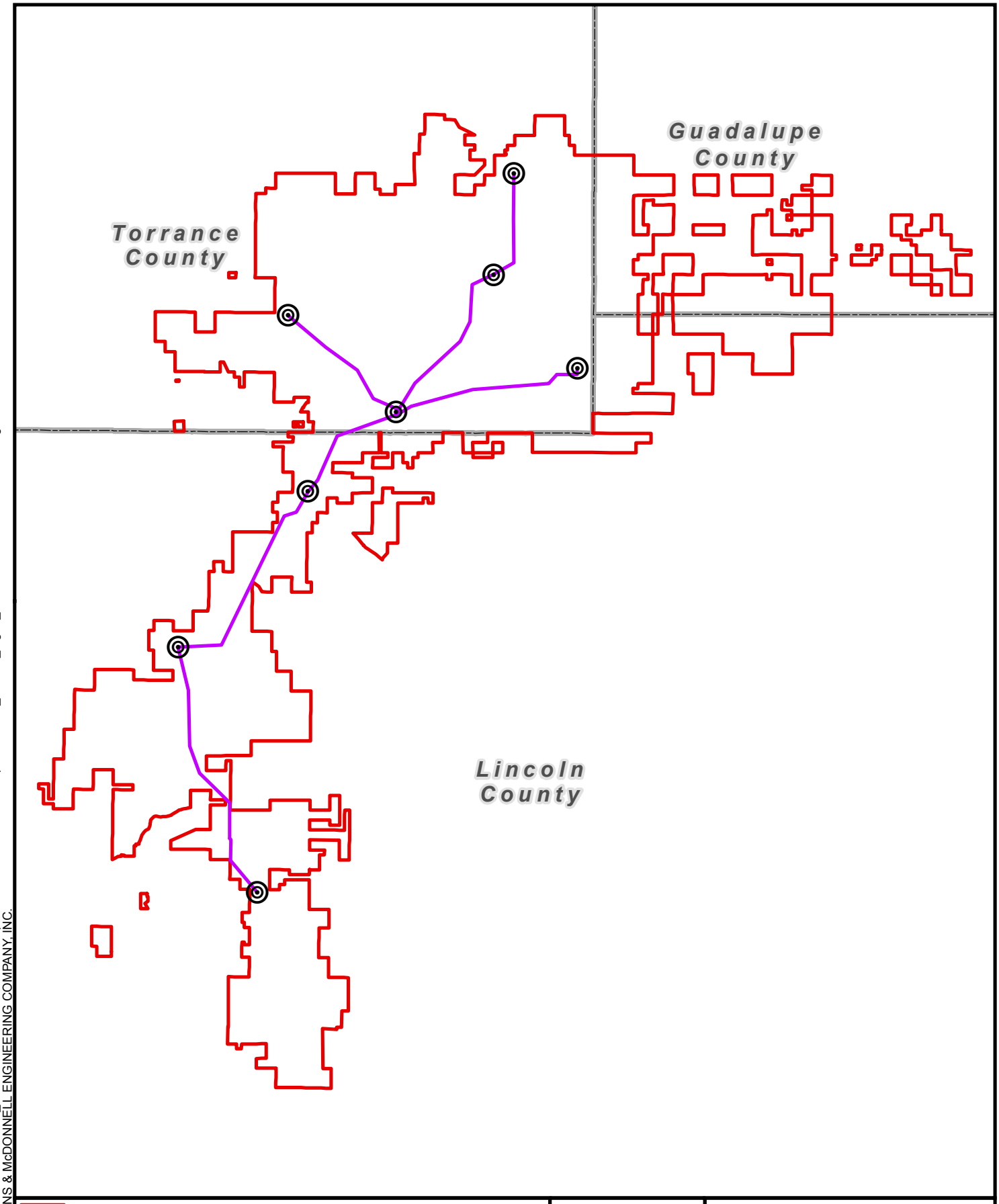


BURNS McDONNELL

Exhibit 1
Project Area
Pattern Development
Corona Wind Energy Project
Guadalupe, Lincoln,
& Torrance Counties, NM

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

Issued: 3/1/2018



Wind Project Area
Transmission Line
County Boundary
Substation

NORTH

6.5 3.25 0 6.5

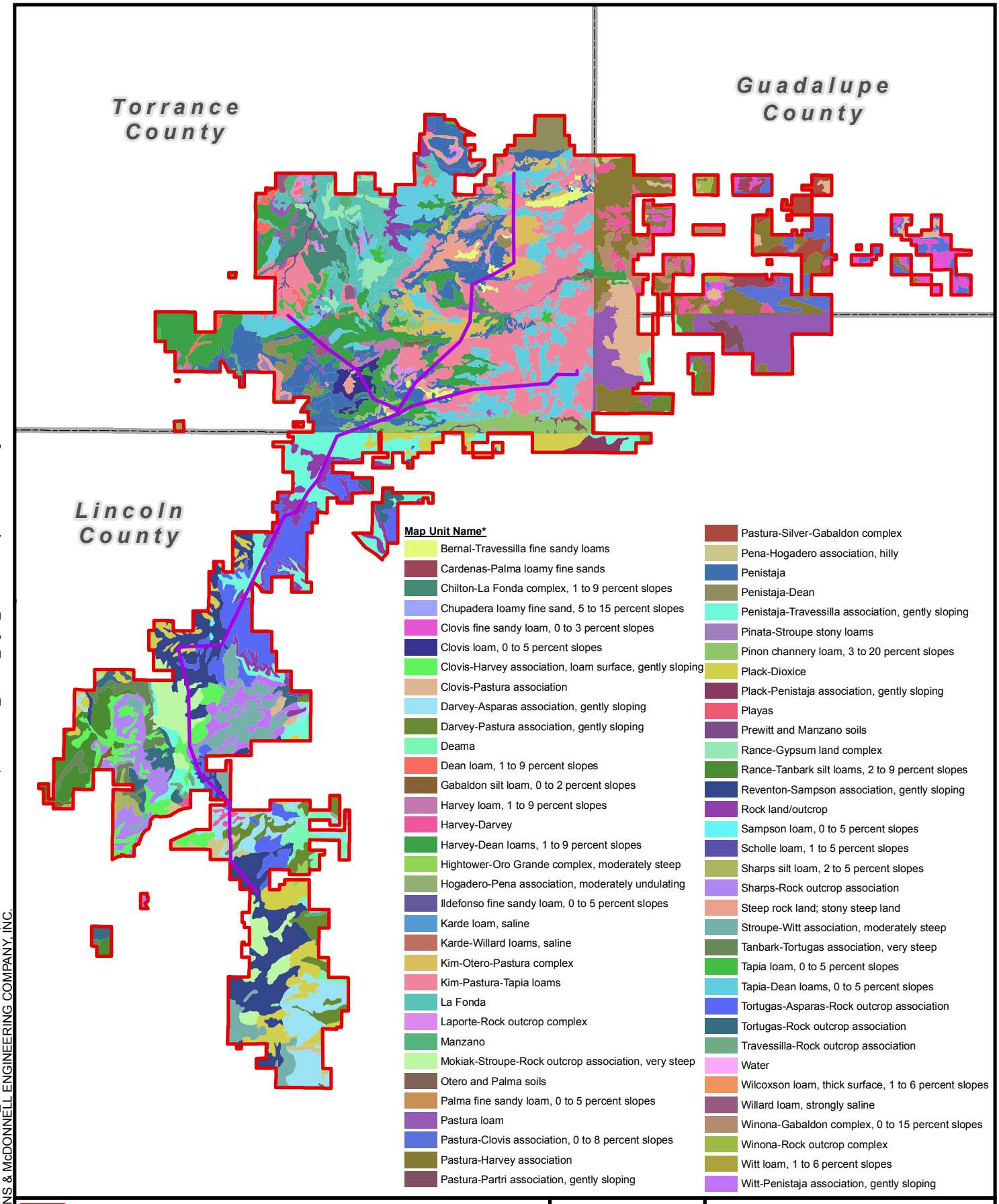
Scale in Miles

BURNS McDONNELL

Exhibit 2
Assessment Area
Pattern Development
Corona Wind Energy Project
Guadalupe, Lincoln,
& Torrance Counties, NM

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

Issued: 3/1/2018



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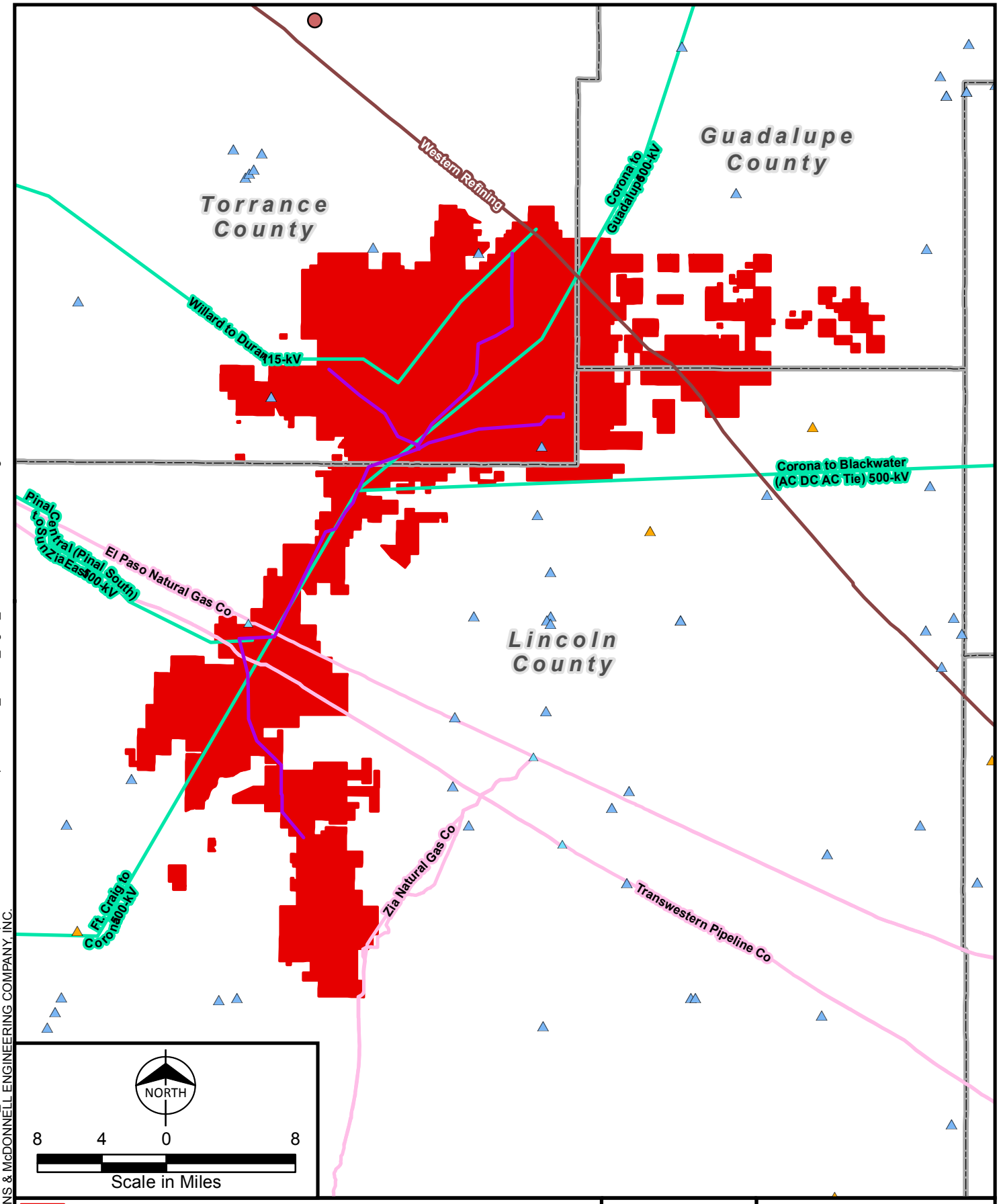
Source: Esri, SSURGO Soils Databases, Pattern Development, and Burns & McDonnell Engineering Company, Inc.

Issued: 3/1/2018



Wind Project Area
Transmission Line (Proposed)
Transmission Line (<100-kV)
Major Oil Pipeline
In Service Natural Gas Pipeline
Natural Gas Flow
Mineral Mine

Well Status

Cancelled
Plugged

BURNS McDONNELL

Exhibit 4
Oil & Gas Well Summary
Pattern Development
Corona Wind Energy Project
Guadalupe, Lincoln,
& Torrance Counties, NM

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

Issued: 3/1/2018

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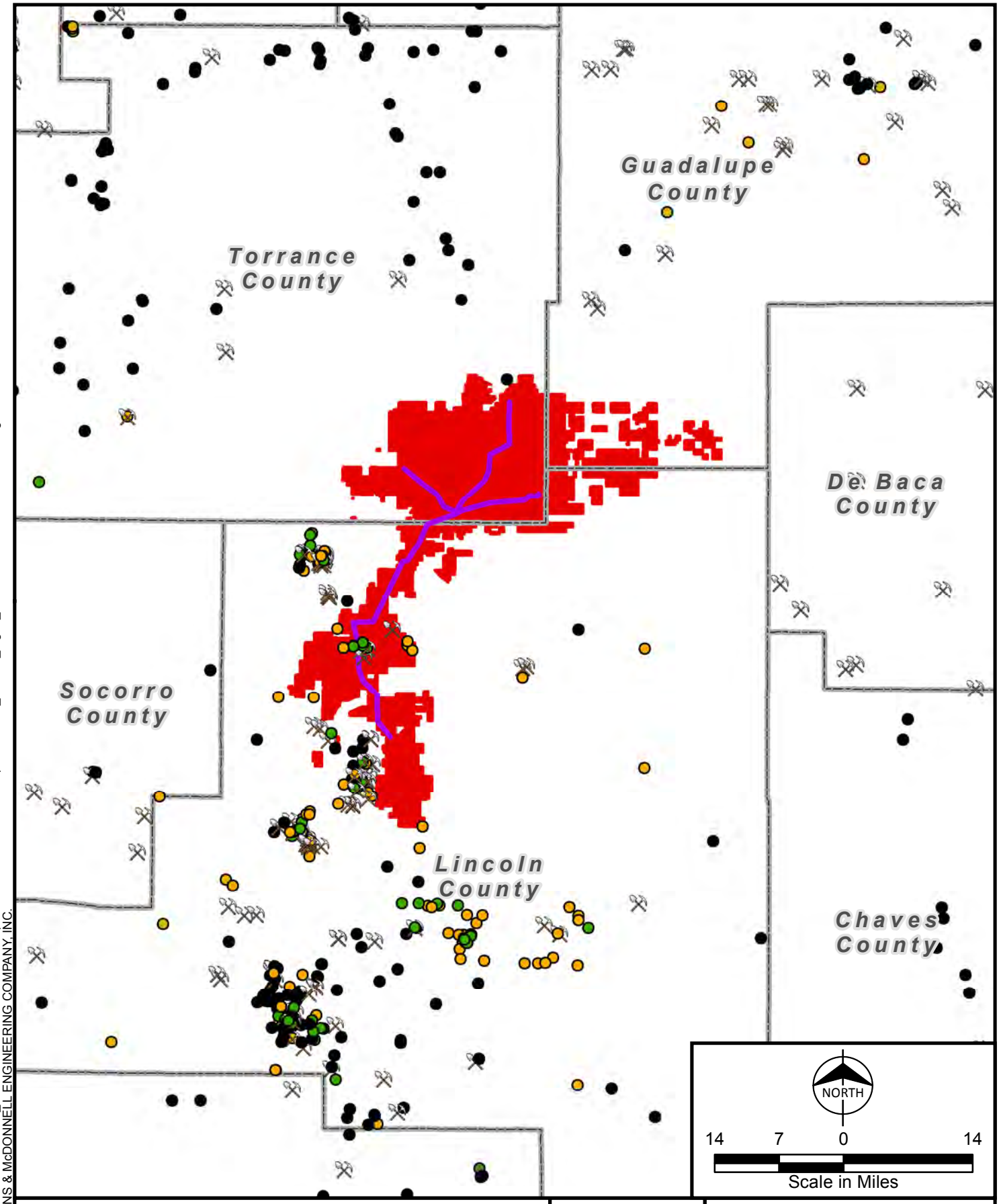

Wind Project Area

Transmission Line

Producers, Past Producers, and Plants

Status

- Occurrence
- Prospect
- Unknown

BURNS McDONNELL

Exhibit 5
Mineral Resources Map
Pattern Development
Corona Wind Energy Project
Guadalupe, Lincoln,
& Torrance Counties, NM

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

Issued: 3/1/2018

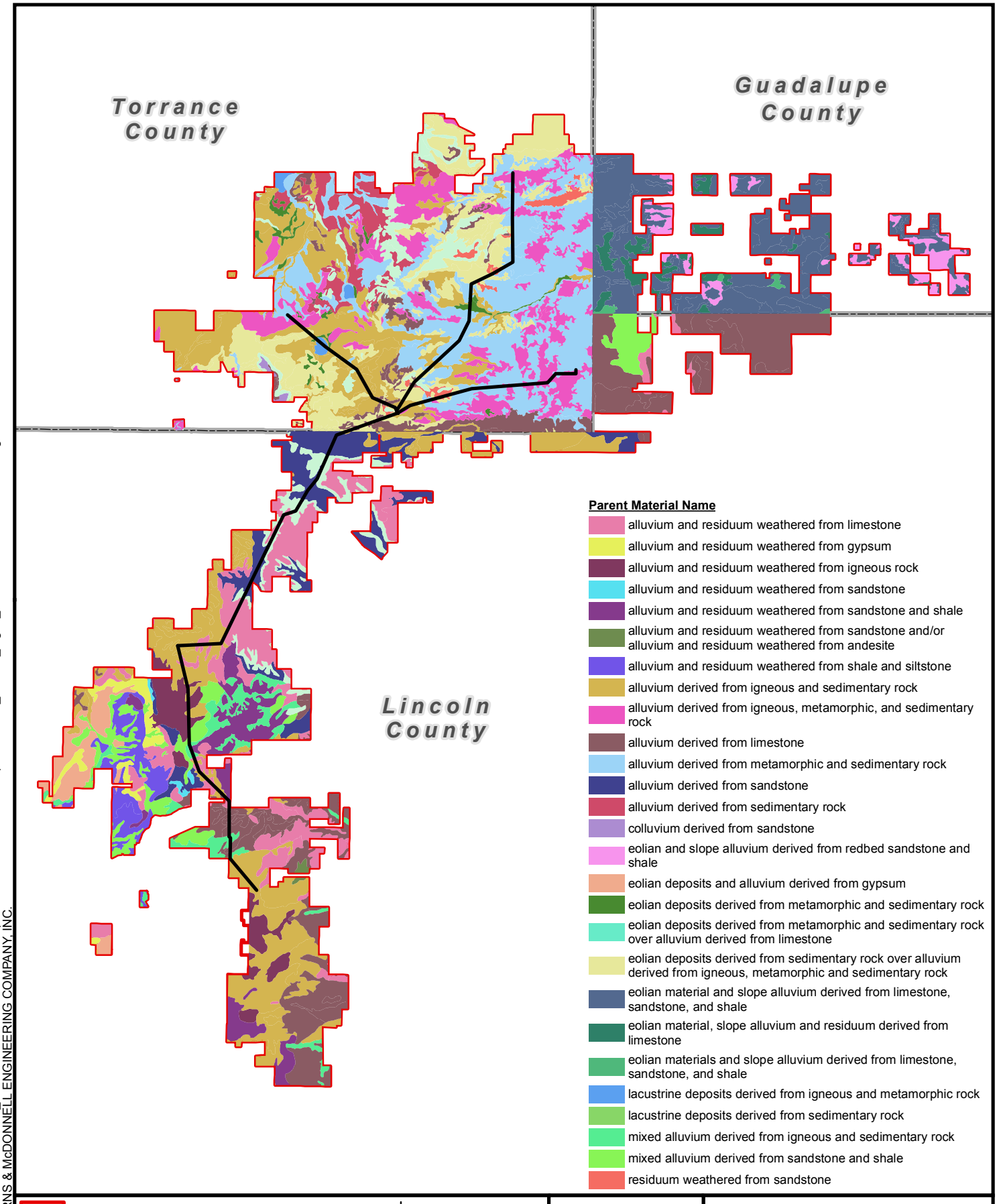

Exhibit 6
Parent Material
Pattern Development
Corona Wind Energy Project
Guadalupe, Lincoln,
& Torrance Counties, NM

BURNS McDONNELL

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

Issued: 3/1/2018

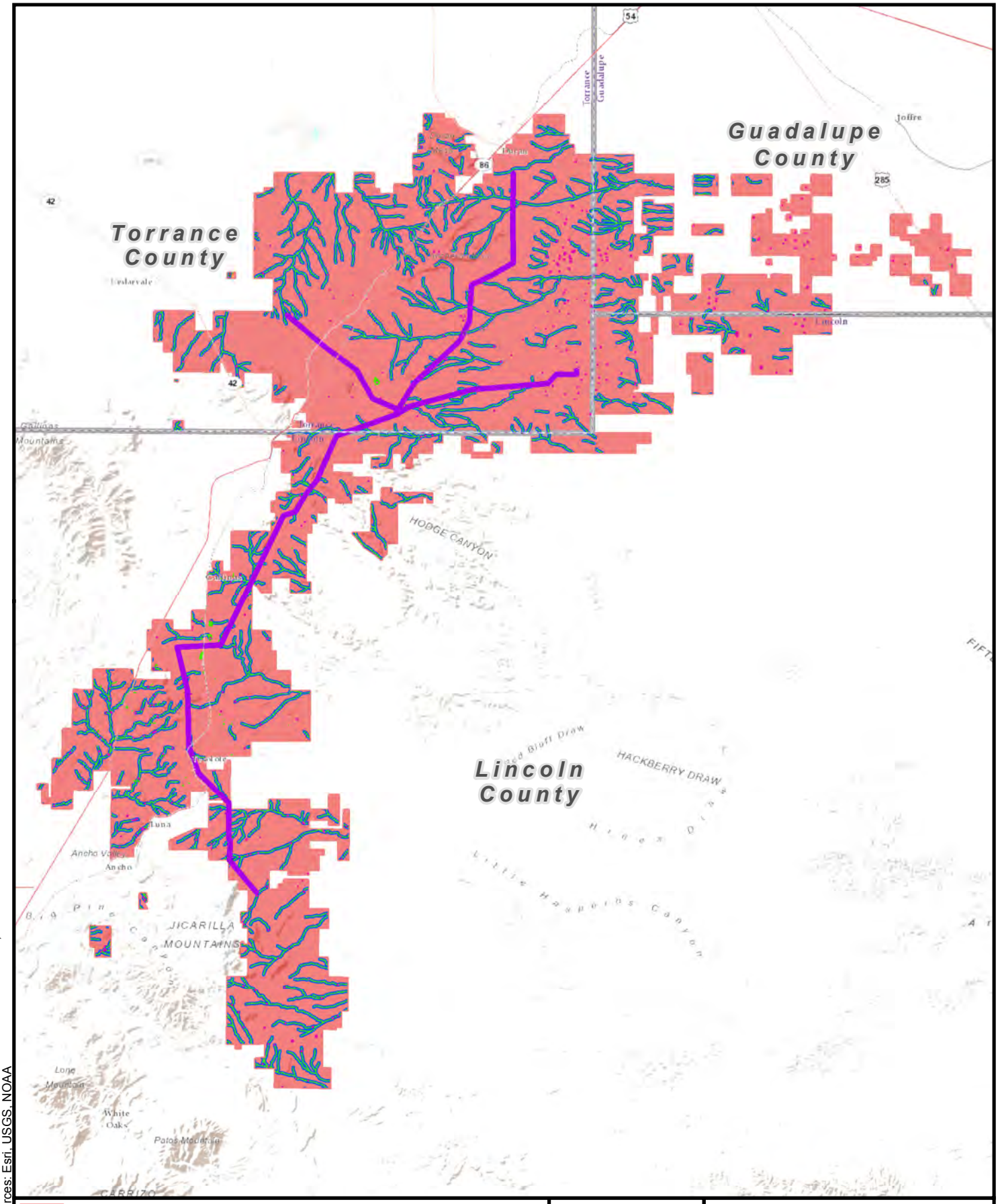
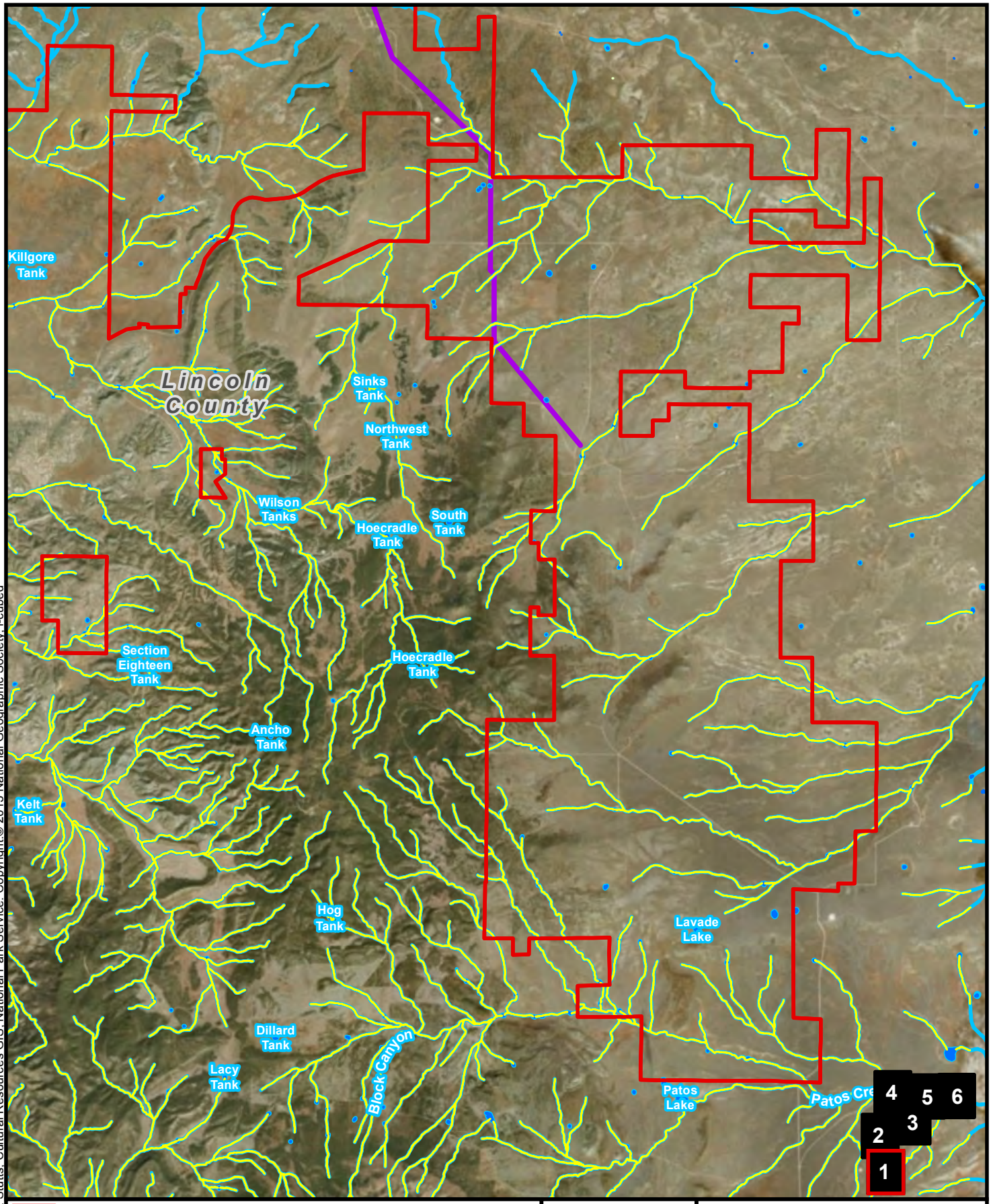


Exhibit 7
Surface Waters
Pattern Development
Corona Wind Energy Project
Guadalupe, Lincoln,
& Torrance Counties, NM

BURNS McDONNELL

Issued: 3/1/2018

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



Wind Project Area
Transmission Line
County Boundary
NHD Feature
Freshwater Emergent Wetland
Freshwater Pond
Riverine

NORTH

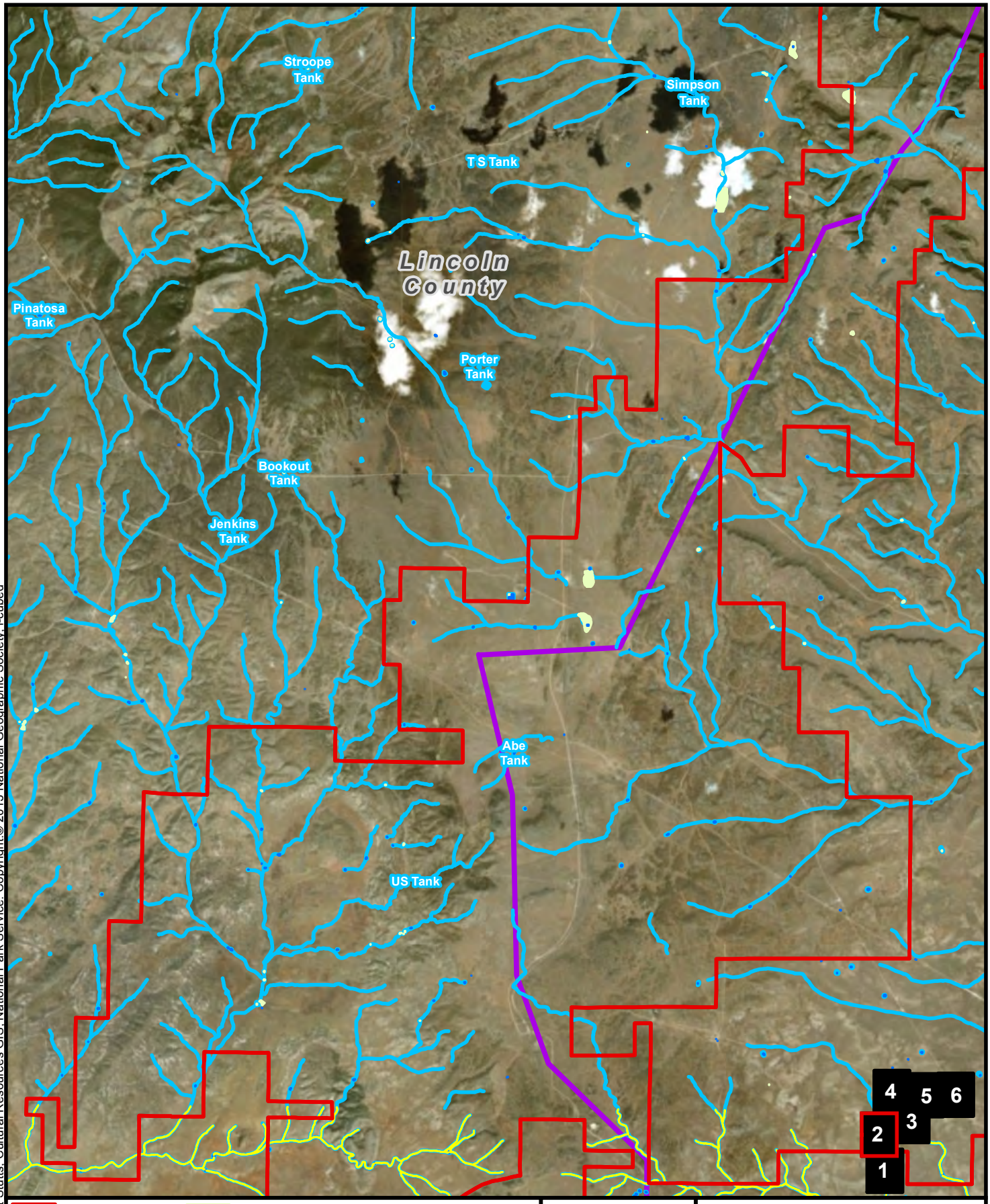
0 1 2
Scale in Miles

BURNS McDONNELL

Exhibit 8
NWI Map
Pattern Development
Corona Wind Energy Project
Guadalupe, Lincoln,
& Torrance Counties, NM
Page 1 of 6

Source: Esri, USFWS-National Wetland Inventory (NWI), USGS-National Hydrography Dataset (NHD), Playa Lakes Joint Venture, Pattern Development, and Burns & McDonnell Engineering Company, Inc.

Issued: 3/1/2018



Wind Project Area
Transmission Line
County Boundary
NHD Feature
Freshwater Emergent Wetland
Freshwater Pond
Riverine

NORTH

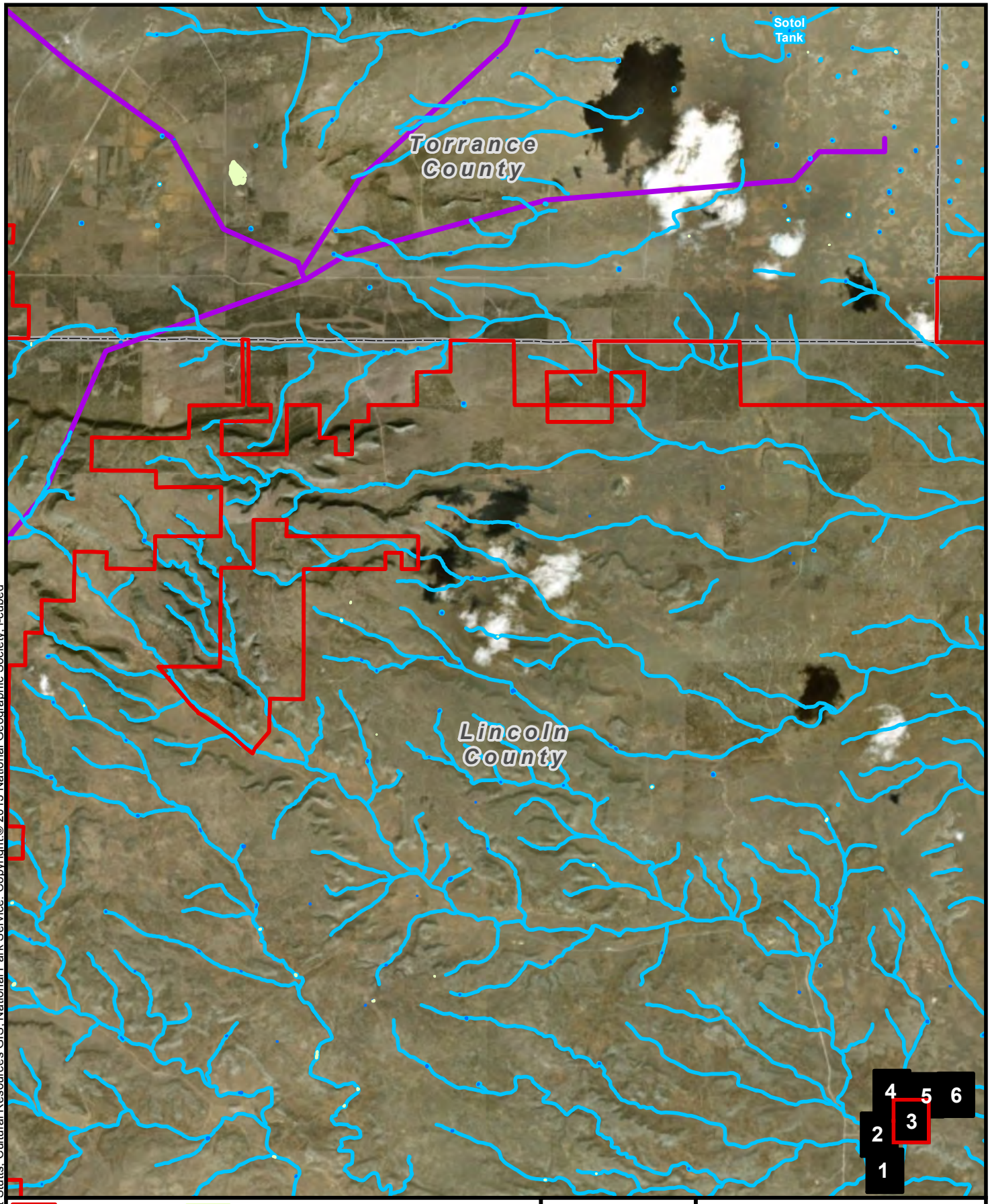
0 1 2
Scale in Miles

BURNS McDONNELL

Exhibit 8
NWI Map
Pattern Development
Corona Wind Energy Project
Guadalupe, Lincoln,
& Torrance Counties, NM
Page 2 of 6

Source: Esri, USFWS-National Wetland Inventory (NWI), USGS-National Hydrography Dataset (NHD), Playa Lakes Joint Venture, Pattern Development, and Burns & McDonnell Engineering Company, Inc.

Issued: 3/1/2018



Wind Project Area
Transmission Line
County Boundary
NHD Feature
Freshwater Emergent Wetland
Freshwater Pond

NORTH

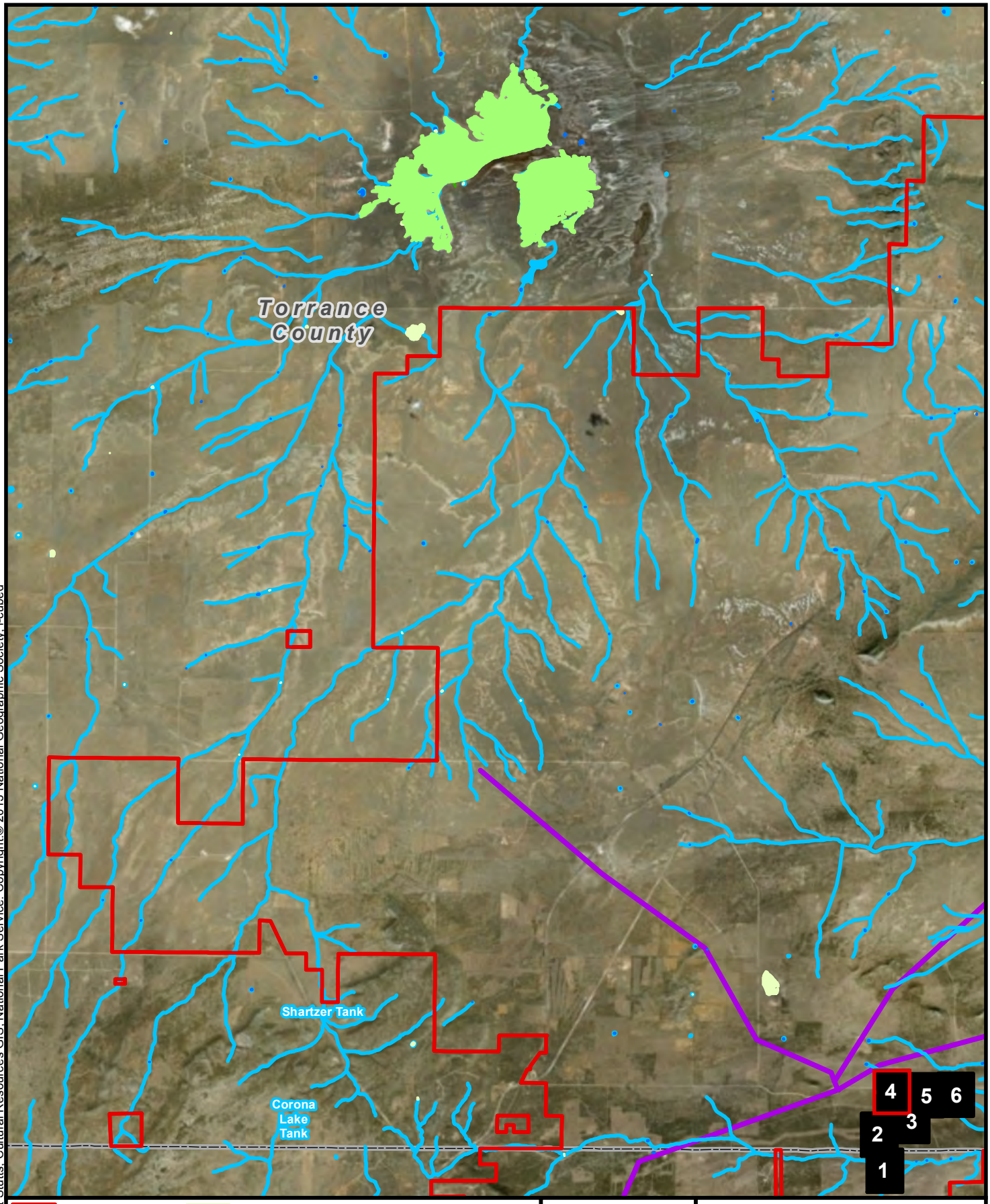
0 1 2
Scale in Miles

BURNS McDONNELL

Exhibit 8
NWI Map
Pattern Development
Corona Wind Energy Project
Guadalupe, Lincoln,
& Torrance Counties, NM
Page 3 of 6

Source: Esri, USFWS-National Wetland Inventory (NWI), USGS-National Hydrography Dataset (NHD), Playa Lakes Joint Venture, Pattern Development, and Burns & McDonnell Engineering Company, Inc.

Issued: 3/1/2018



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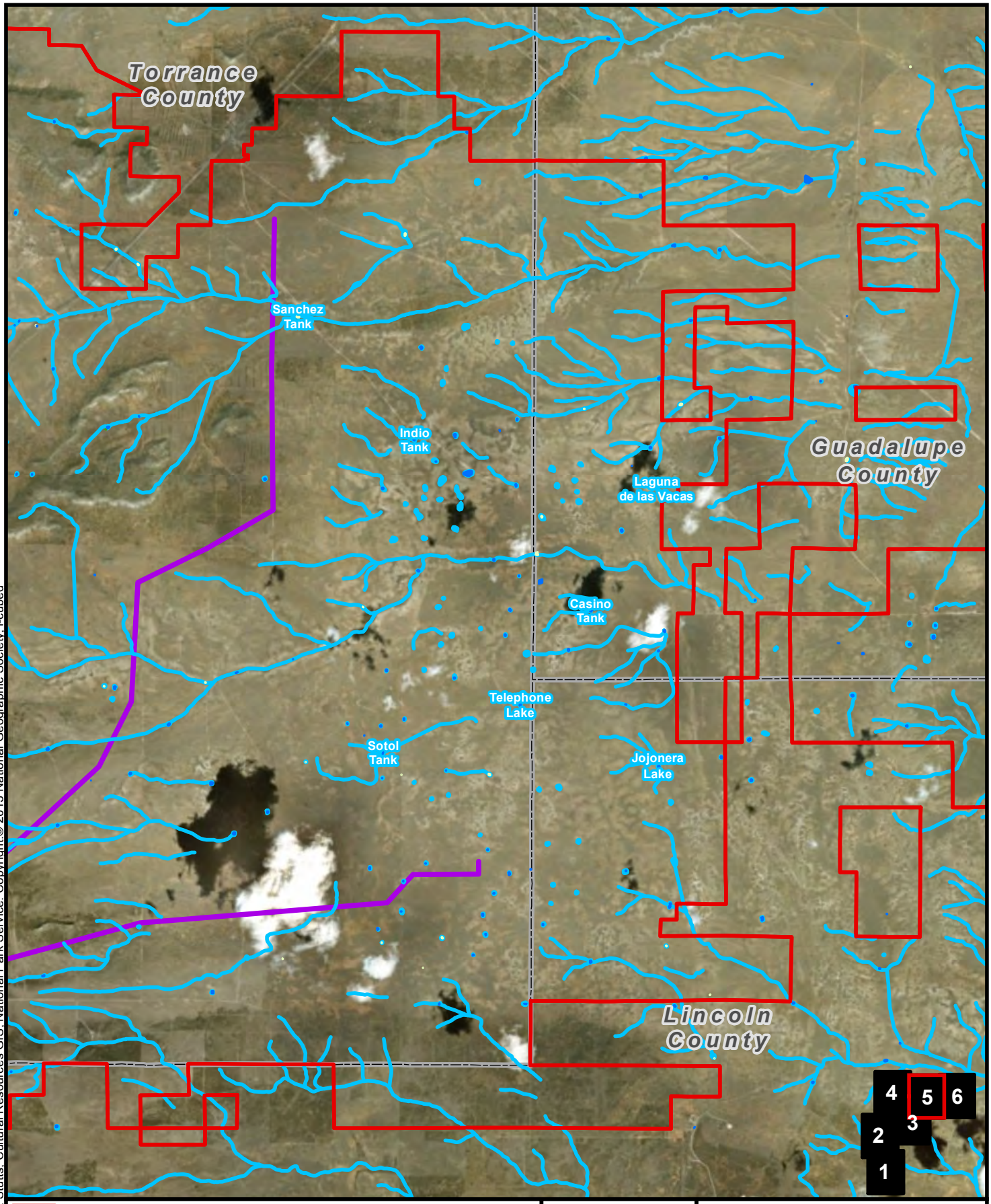
BURNS McDONNELL

Exhibit 8
NWI Map
Pattern Development
Corona Wind Energy Project
Guadalupe, Lincoln,
& Torrance Counties, NM
Page 4 of 6

Source: Esri, USFWS-National Wetland Inventory (NWI), USGS-National Hydrography Dataset (NHD), Playa Lakes Joint Venture, Pattern Development, and Burns & McDonnell Engineering Company, Inc.

Issued: 3/1/2018



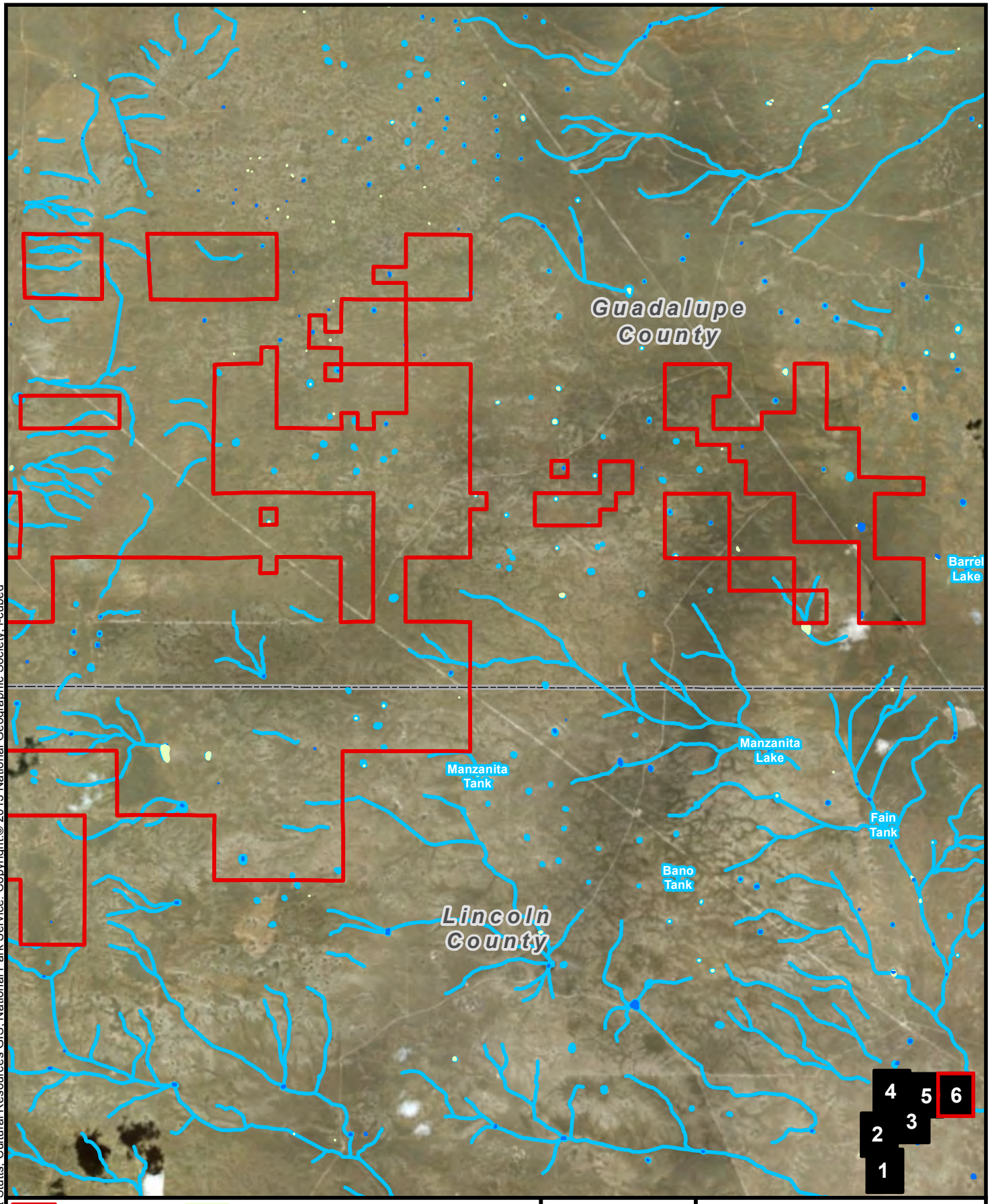
Wind Project Area
Transmission Line
County Boundary
NHD Feature
Freshwater Emergent Wetland
Freshwater Forested/Shrub Wetland
Freshwater Pond
NORTH
0 1 2
Scale in Miles

BURNS McDONNELL

Exhibit 8
NWI Map
Pattern Development
Corona Wind Energy Project
Guadalupe, Lincoln,
& Torrance Counties, NM
Page 5 of 6

Source: Esri, USFWS-National Wetland Inventory (NWI), USGS-National Hydrography Dataset (NHD), Playa Lakes Joint Venture, Pattern Development, and Burns & McDonnell Engineering Company, Inc.

Issued: 3/1/2018



Wind Project Area
County Boundary
NHD Feature
Freshwater Emergent Wetland
Freshwater Pond

NORTH

0 1 2
Scale in Miles

BURNS McDONNELL

Exhibit 8
NWI Map
Pattern Development
Corona Wind Energy Project
Guadalupe, Lincoln,
& Torrance Counties, NM
Page 6 of 6

Source: Esri, USFWS-National Wetland Inventory (NWI), USGS-National Hydrography Dataset (NHD), Playa Lakes Joint Venture, Pattern Development, and Burns & McDonnell Engineering Company, Inc.

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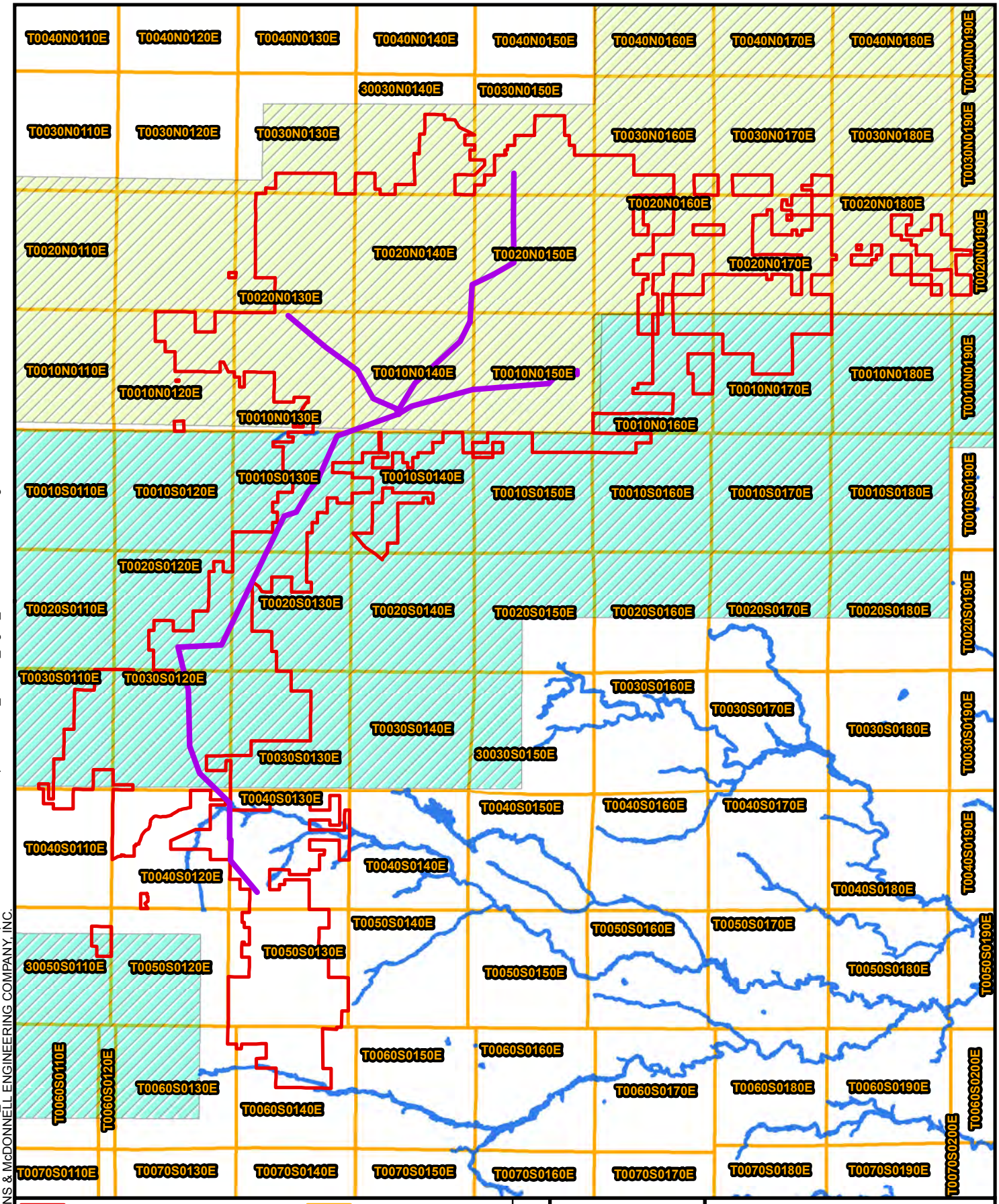

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Source: Esri, FEMA, Pattern Development, and Burns & McDonnell Engineering Company, Inc.

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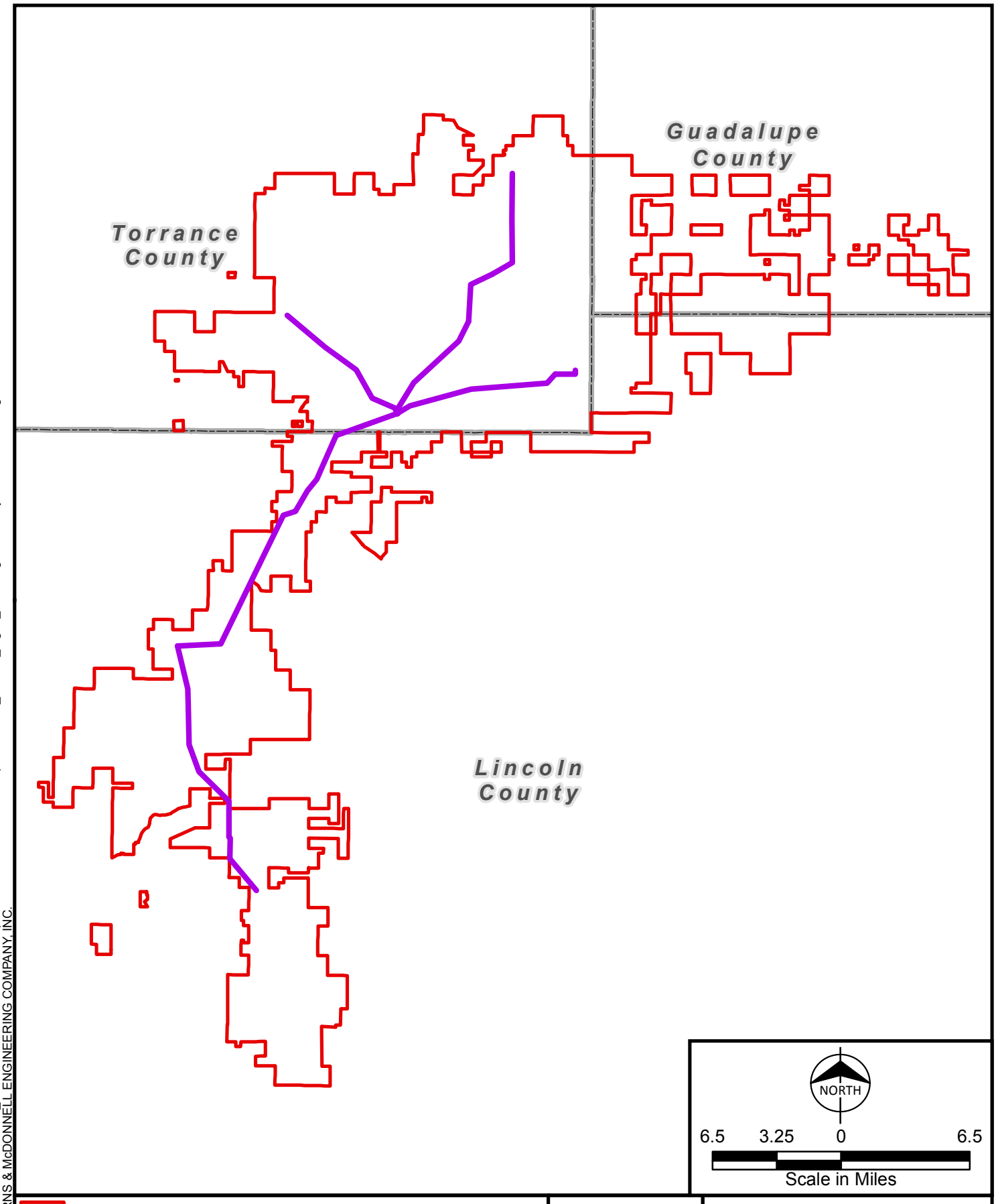
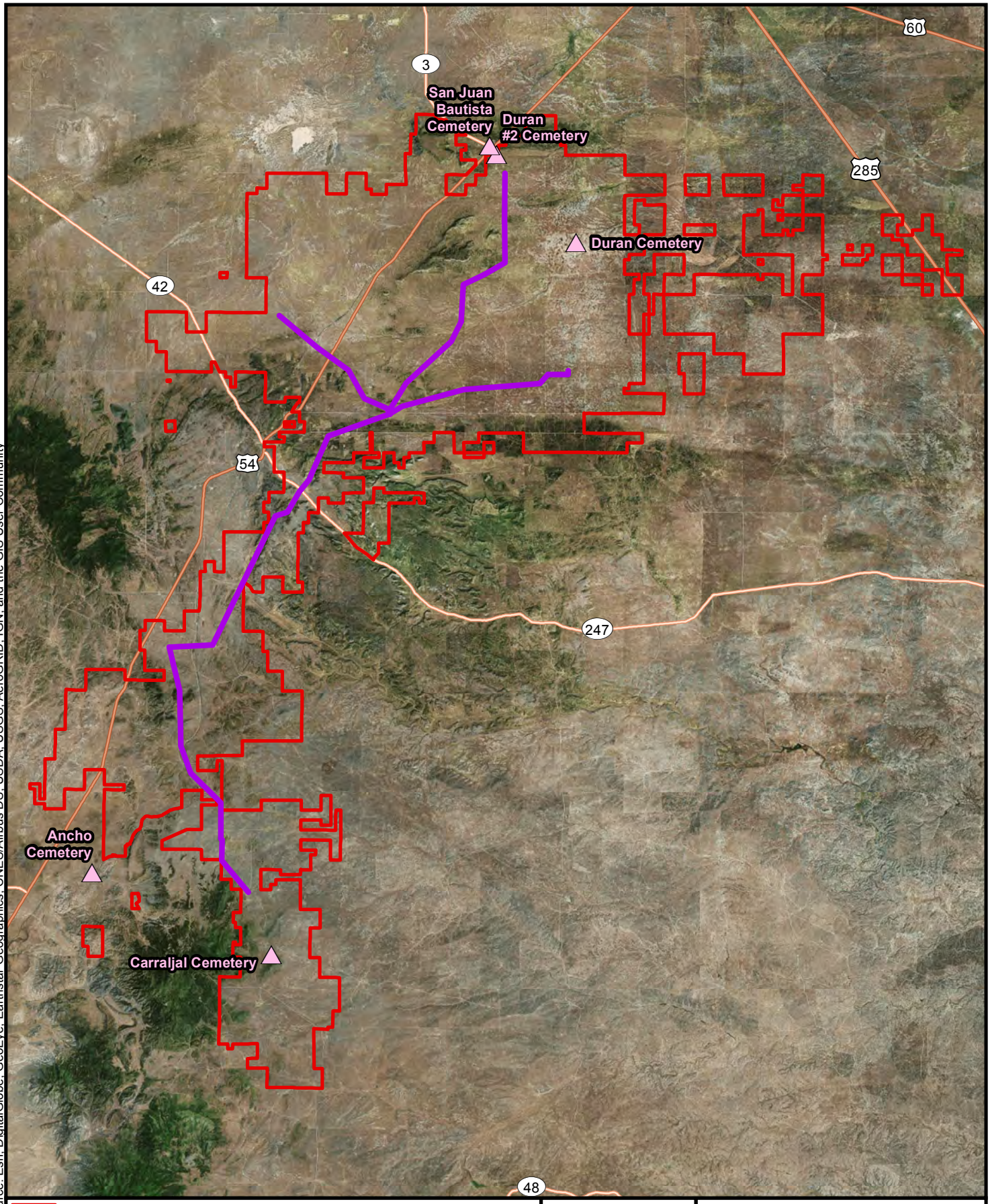


Exhibit 10
Breeding Bird Survey Routes
Pattern Development
Corona Wind Energy Project
Guadalupe, Lincoln,
& Torrance Counties, NM

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

Issued: 3/1/2018



Wind Project Area
Transmission Line
Cemetery
Highways
Major Roads

NORTH

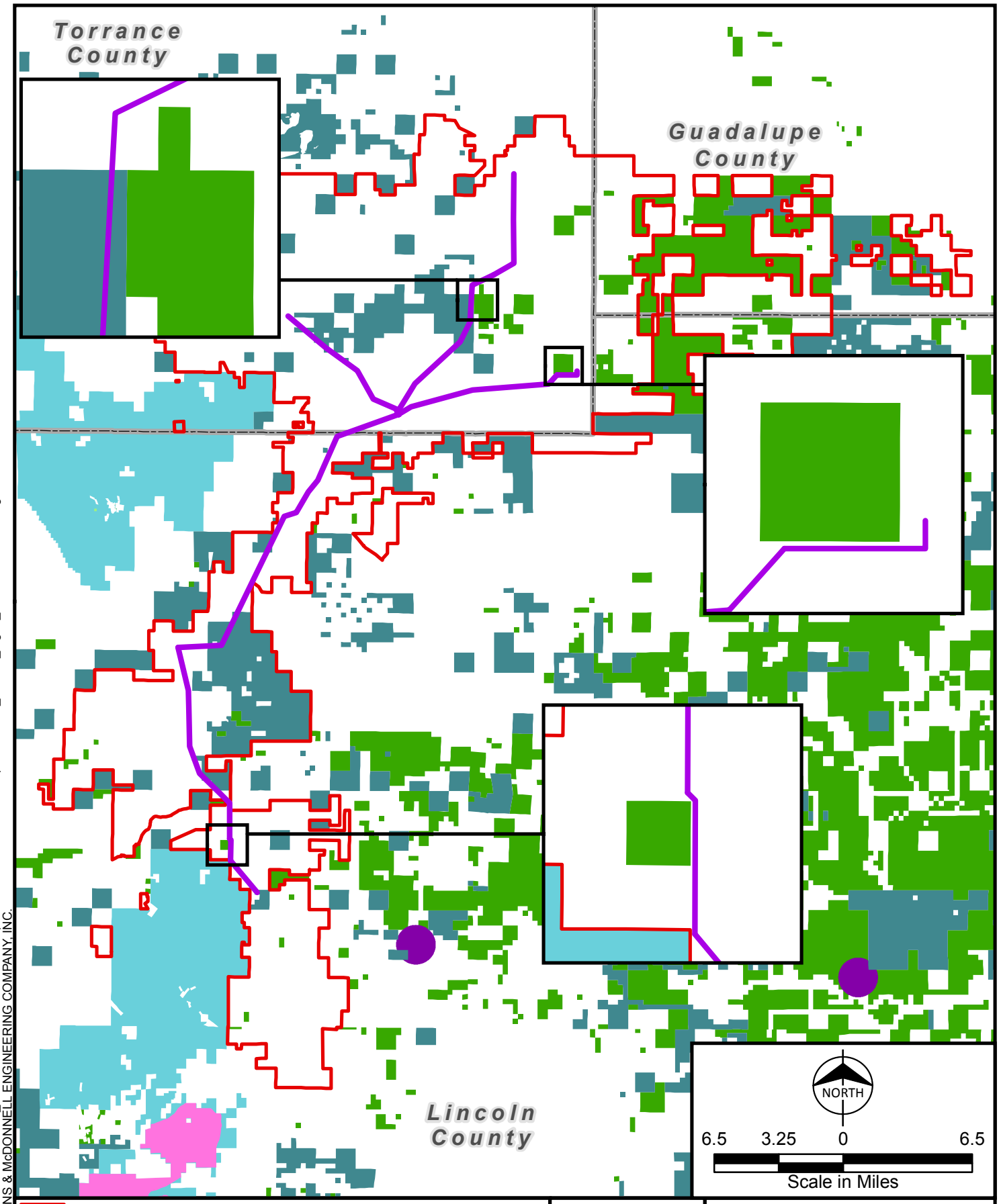
6.5 3.25 0 6.5
Scale in Miles

BURNS McDONNELL

Exhibit 11
Cemeteries
Pattern Development
Corona Wind Energy Project
Guadalupe, Lincoln,
& Torrance Counties, NM

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

Issued: 3/1/2018

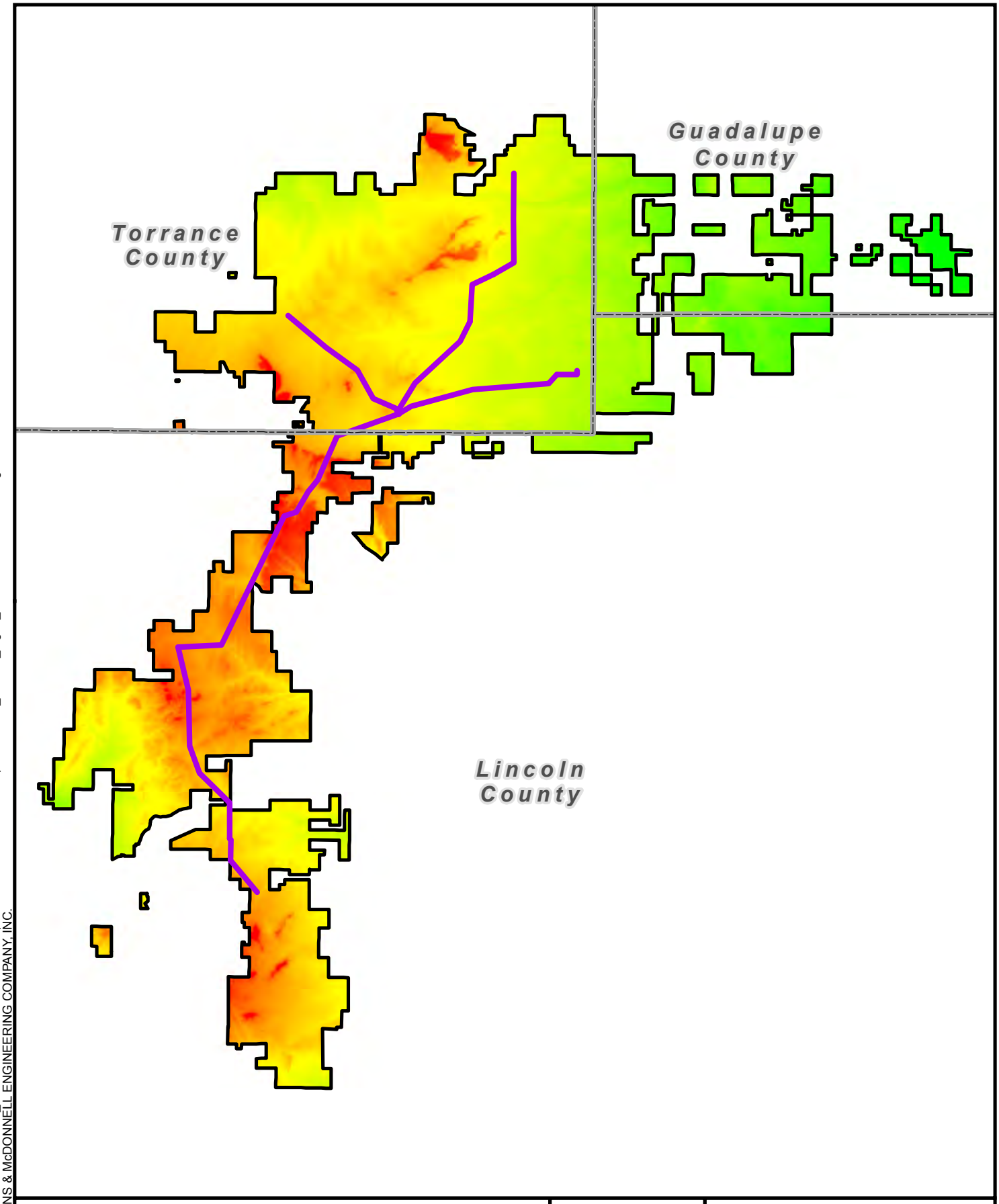


BURNS McDONNELL

Exhibit 12
Easement Map
Pattern Development
Corona Wind Energy Project
Guadalupe, Lincoln,
& Torrance Counties, NM

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

Issued: 3/1/2018



Wind Project Area
County Boundary
Transmission Line

Elevation (Meters)
High : 2,259
Low : 1,663

NORTH

6.5 3.25 0 6.5
Scale in Miles

BURNS McDONNELL

Exhibit 13
Elevation Map
Pattern Development
Corona Wind Energy Project
Guadalupe, Lincoln,
& Torrance Counties, NM

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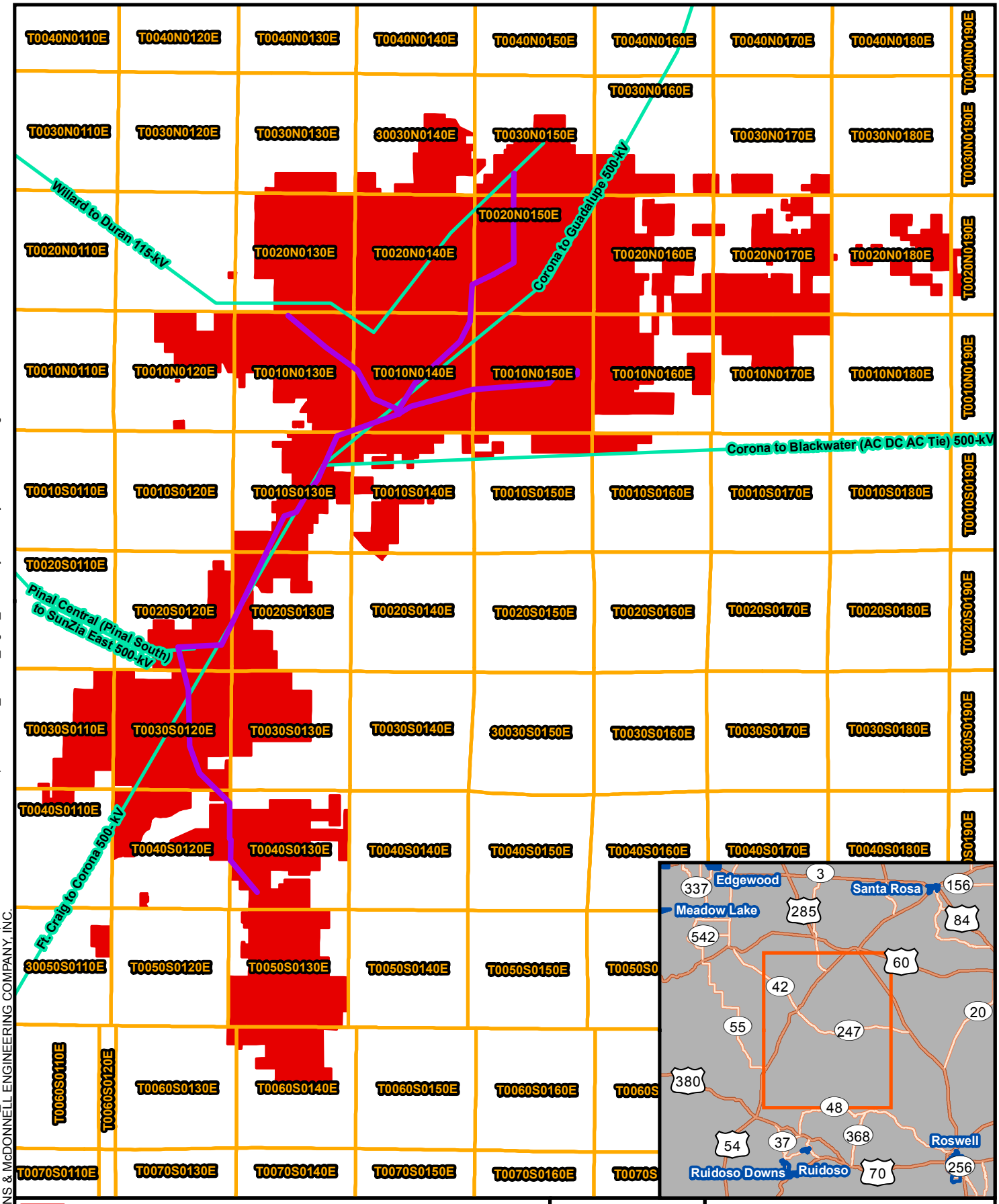
Source: Esri, USGS, Pattern Development, and Burns & McDonnell Engineering Company, Inc.

Issued: 3/1/2018



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

Issued: 3/1/2018

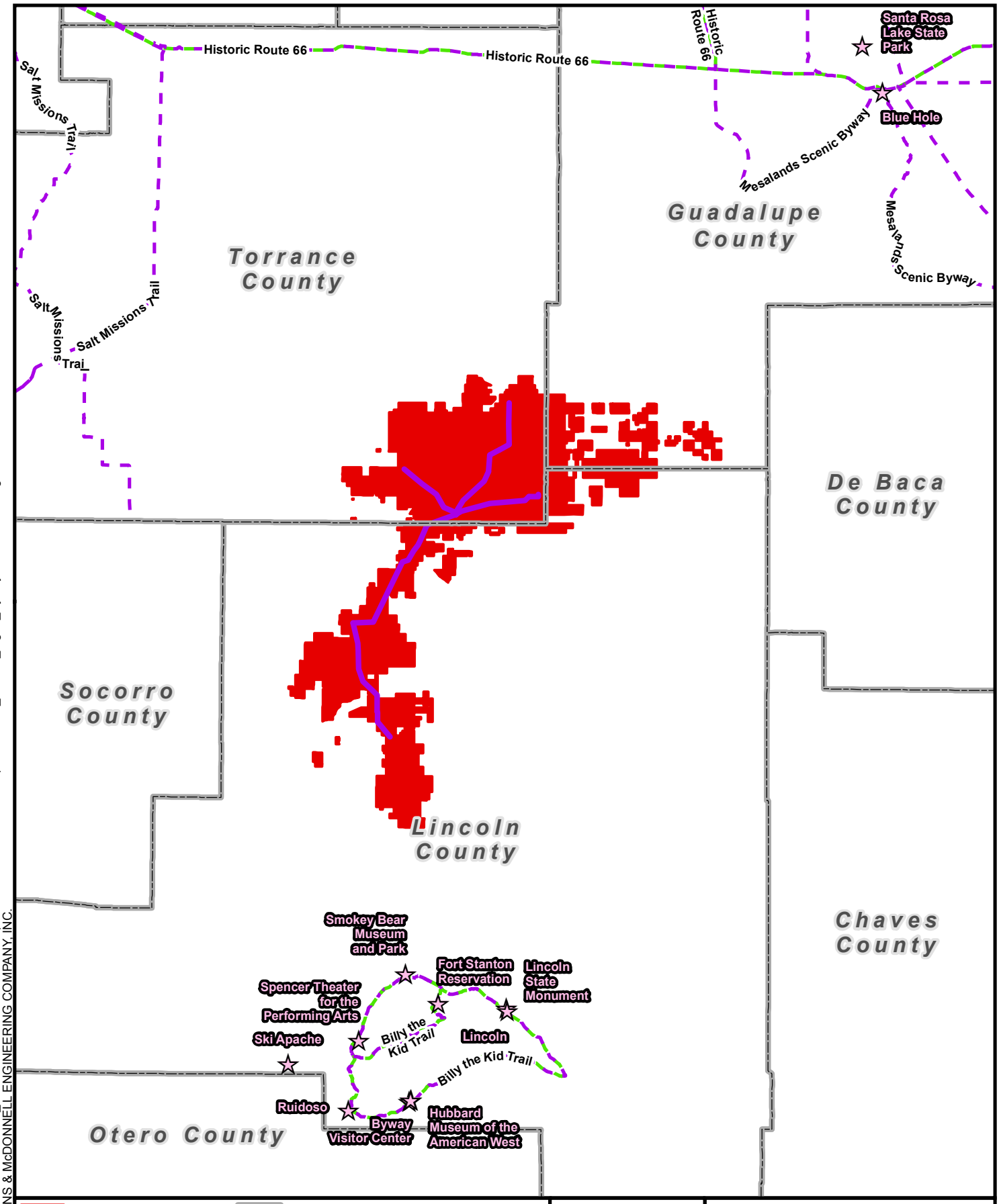

Exhibit 15
Byways & Trails
Pattern Development
Corona Wind Energy Project
Guadalupe, Lincoln,
& Torrance Counties, NM

Path: Z:\Clients\ENS\PatternSCH\d\101335_CoronaWindENR\Studies\Geospatial\DataFiles\ArcDocs\Report\101335_Corona_Fig15_Byways.mxd kdboatright 3/1/2018

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

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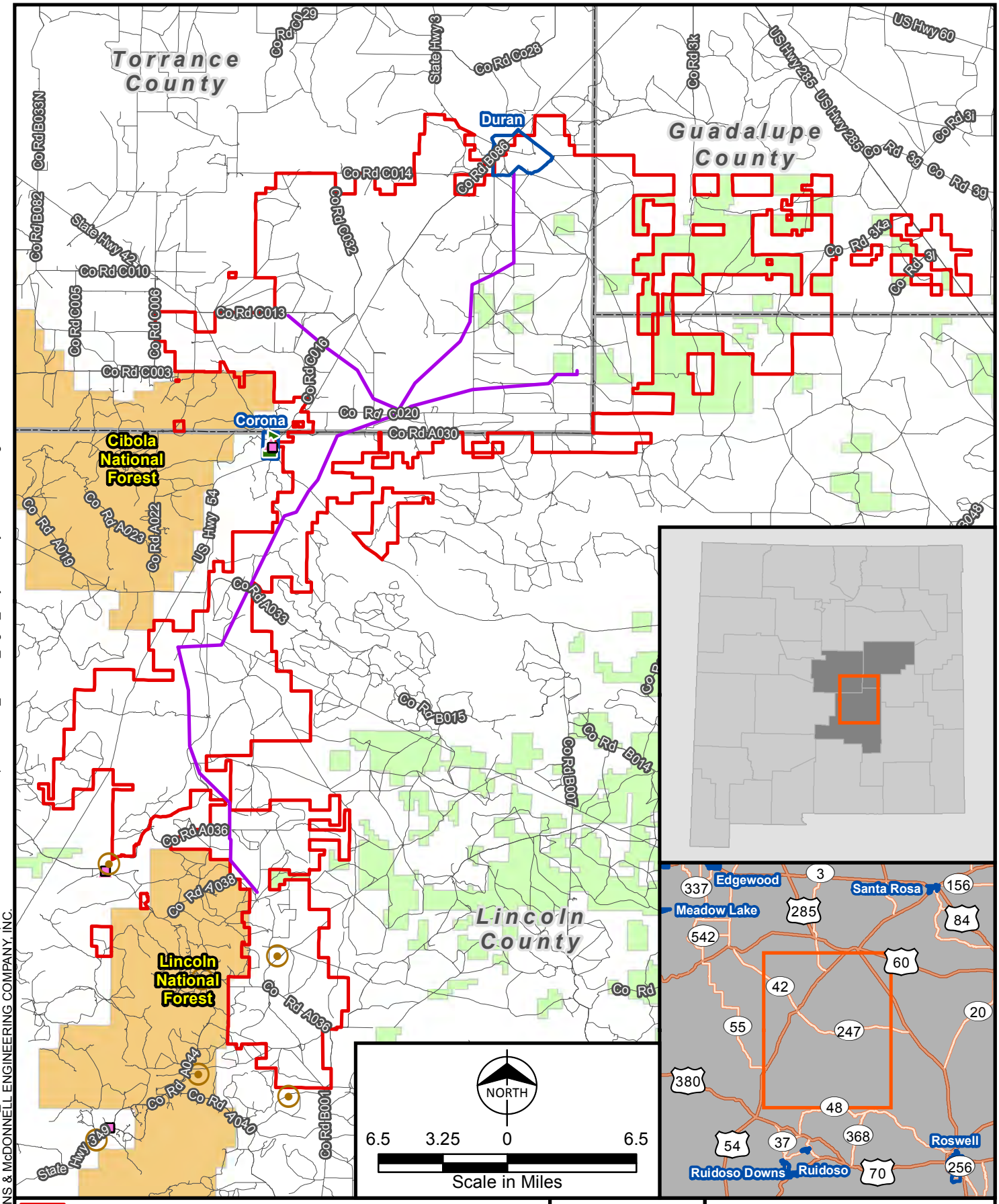

Wind Project Area
Transmission Line
Public Building
Institution
County Boundary
School
Place of Worship
Municipality

Federal Land Administrator

Bureau of Land Management
Forest Service

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Exhibit 16
Project Vicinity
Pattern Development
Corona Wind Energy Project
Guadalupe, Lincoln,
& Torrance Counties, NM

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

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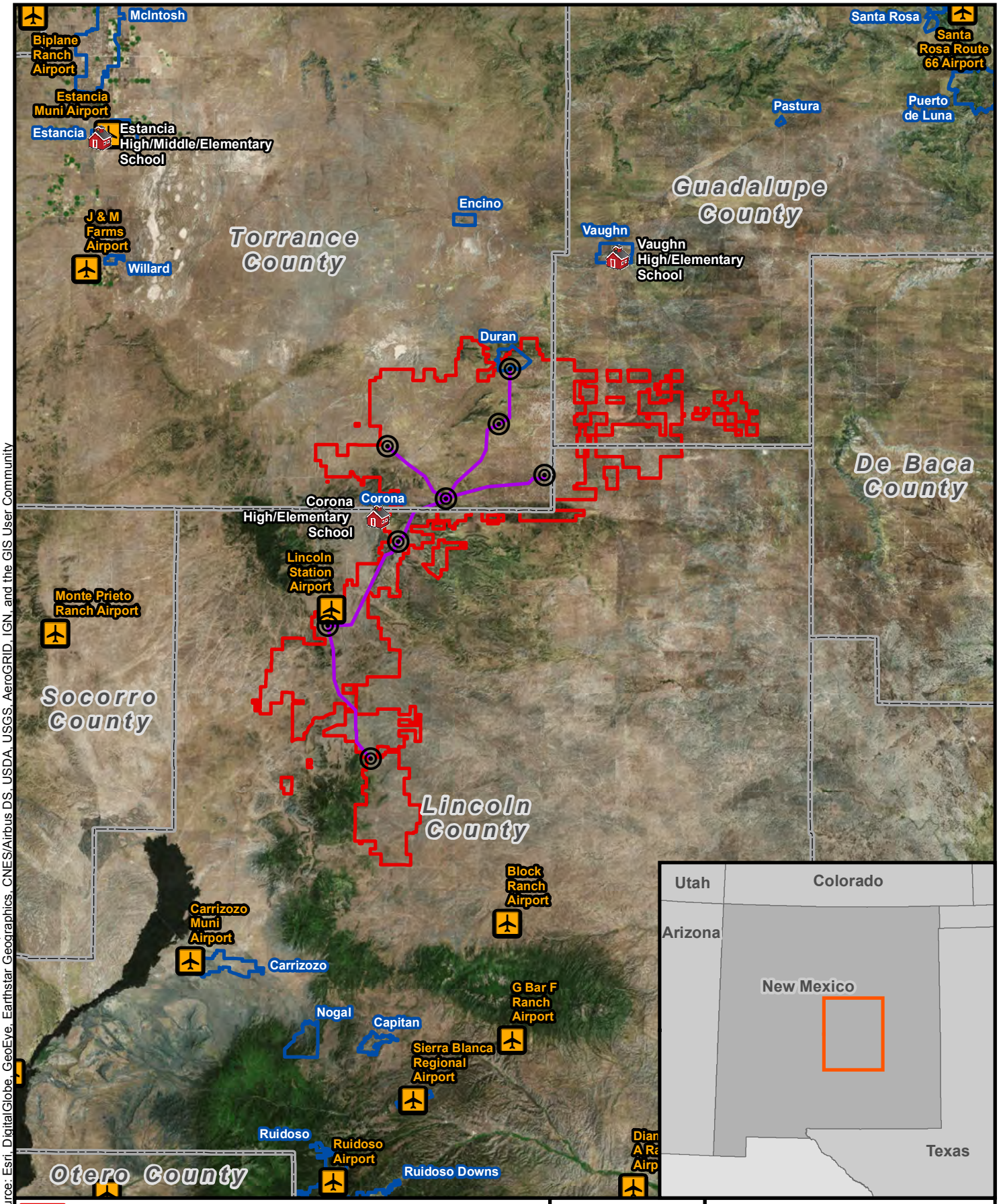

Exhibit 17
General Vicinity Map
Pattern Development
Corona Wind Energy Project
Guadalupe, Lincoln,
& Torrance Counties, NM

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Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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

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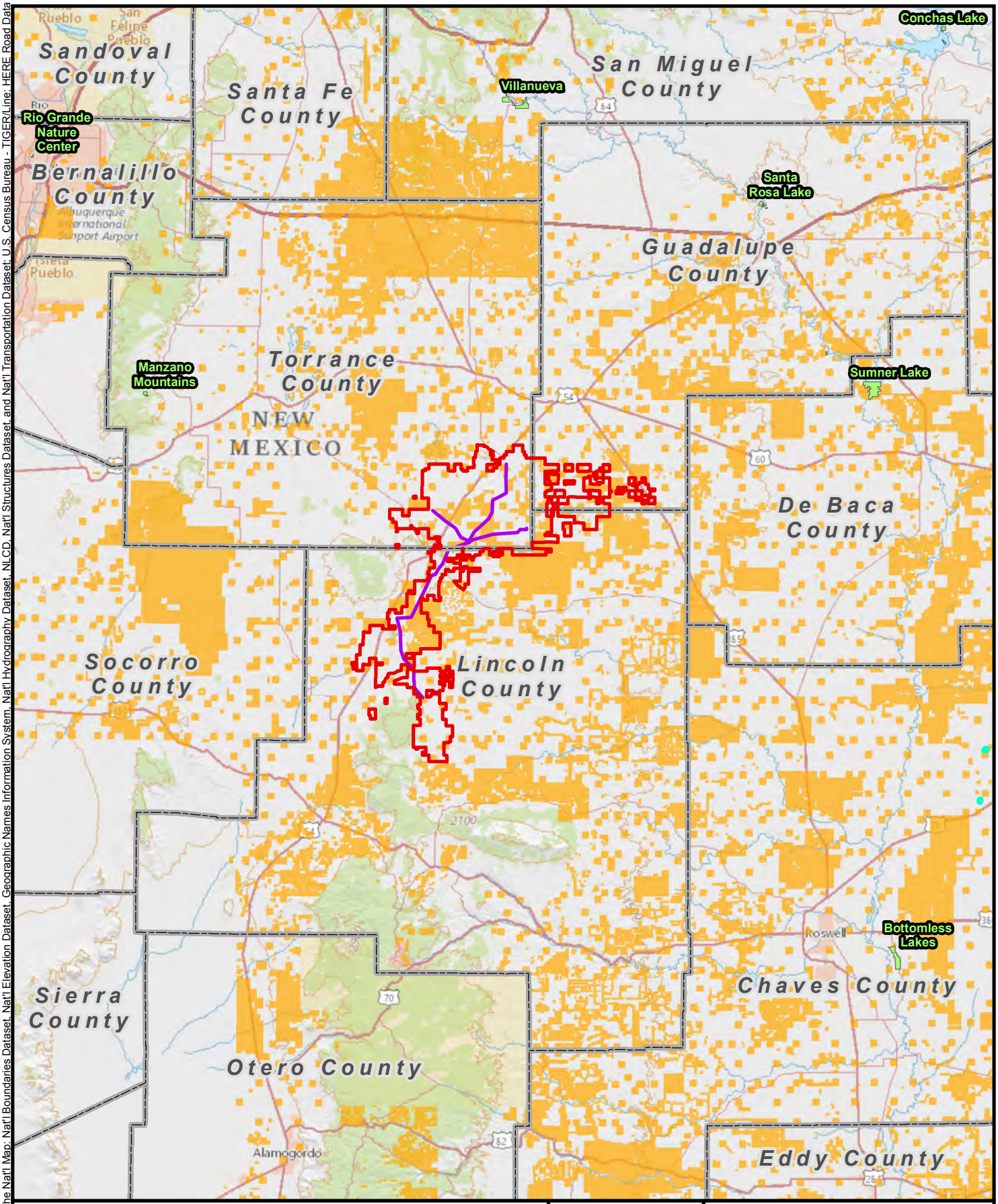

Exhibit 18
State Parks
Pattern Development
Corona Wind Energy Project
Guadalupe, Lincoln,
& Torrance Counties, NM

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

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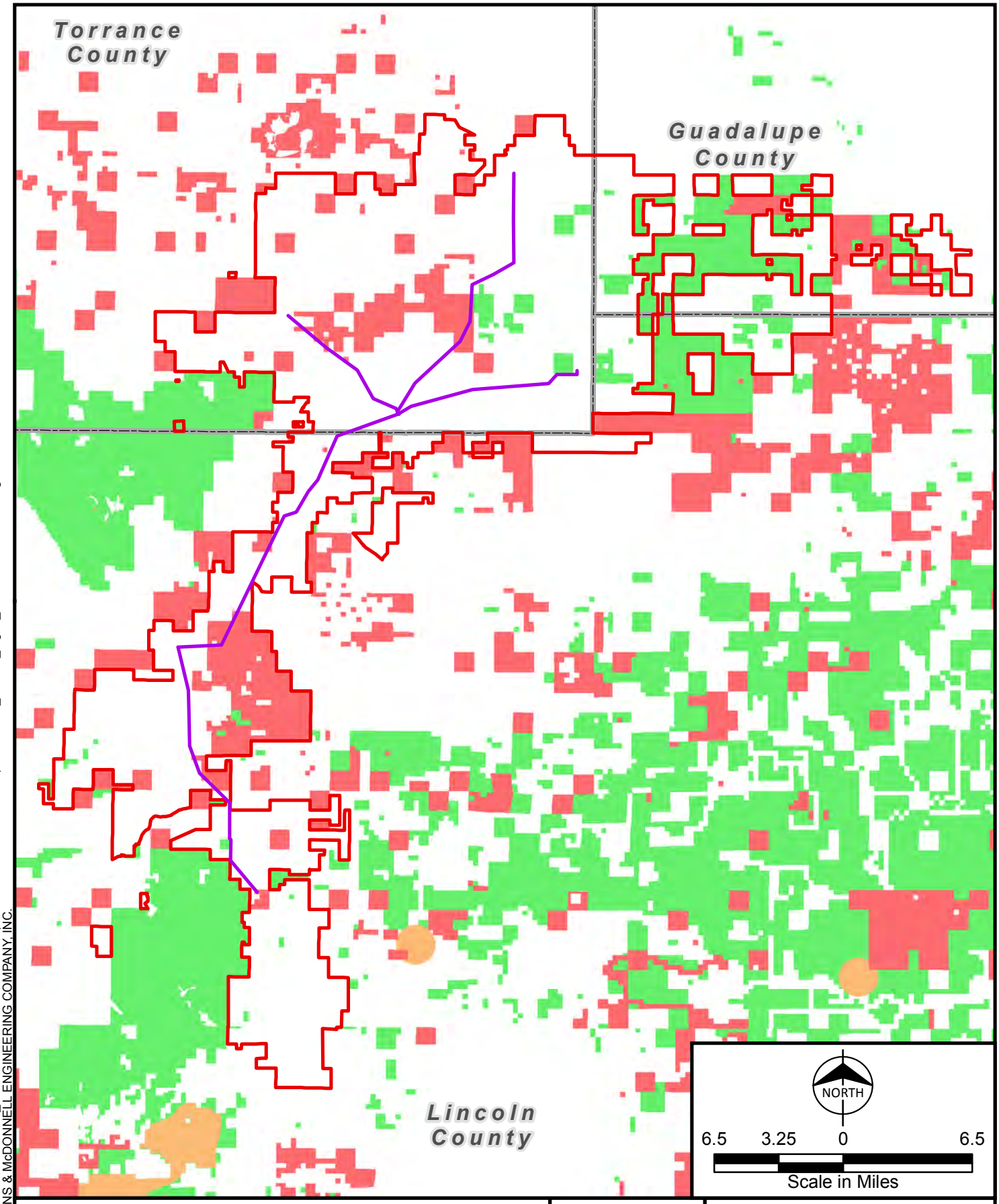

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Exhibit 19
GAP Analysis Program
Pattern Development
Corona Wind Energy Project
Guadalupe, Lincoln,
& Torrance Counties, NM

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

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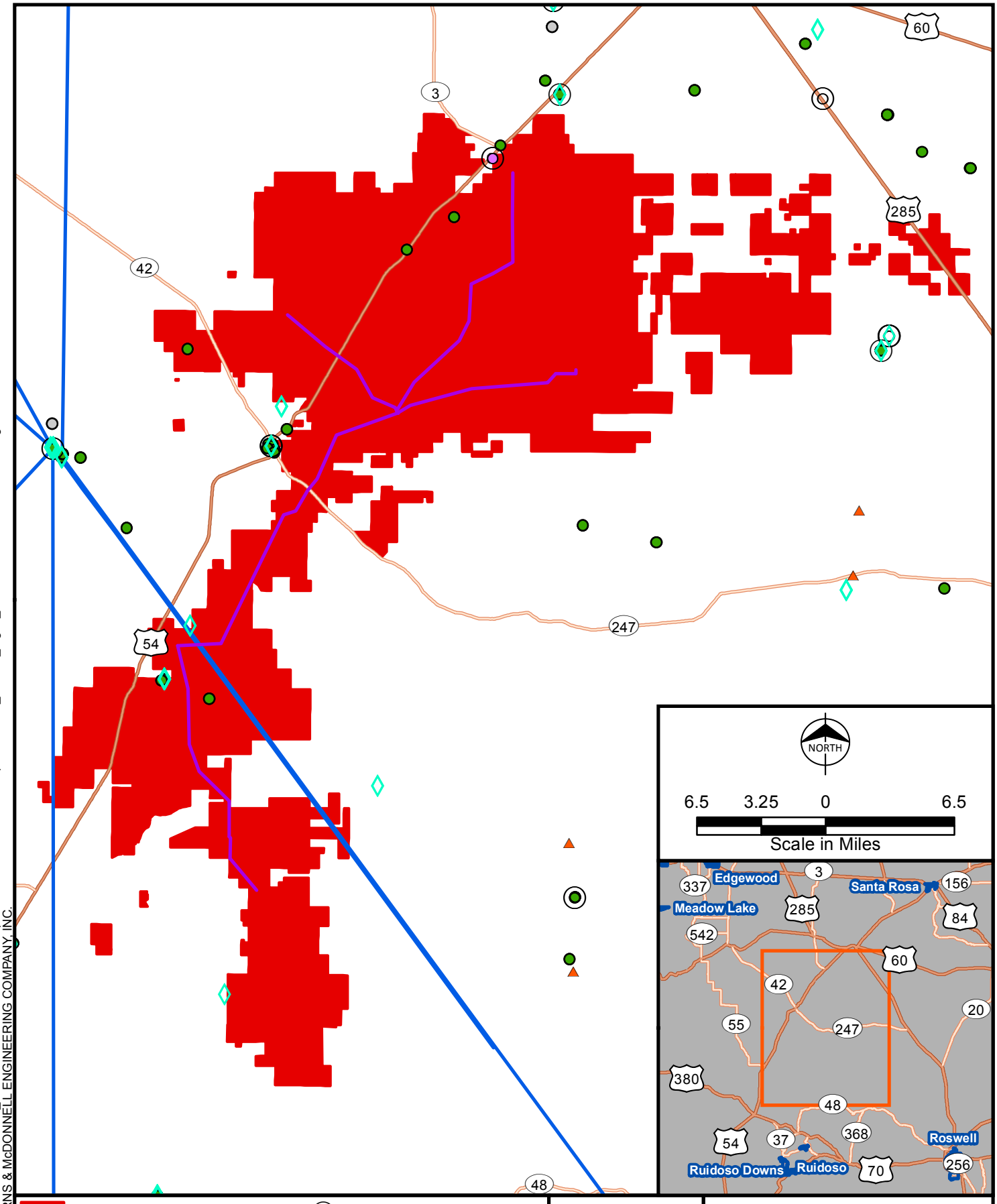

Wind Project Area
Transmission Line
Approximate Beam Path
LM Communication Tower
LM Private Tower
ASR Tower
Microwave Tower
Cell Tower
Paging Tower

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Exhibit 20
Communications Map
Pattern Development
Corona Wind Energy Project
Guadalupe, Lincoln,
& Torrance Counties, NM

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

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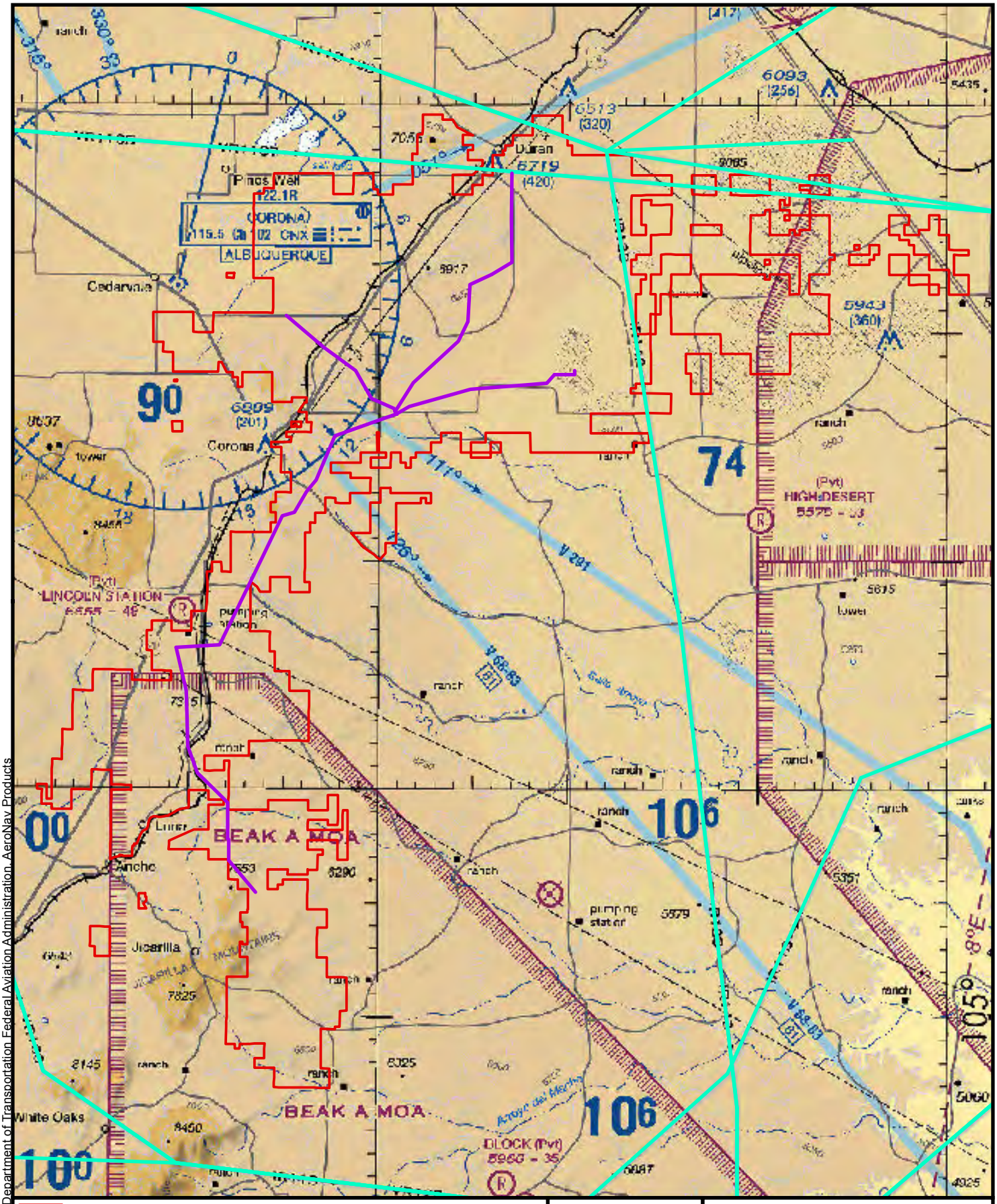

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Service Layer Credits: US Department of Transportation Federal Aviation Administration, AeroNav Products

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

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