DRAFT ENVIRONMENTAL ASSESSMENT

SUMMITWIND FARM

GRANT AND ROBERTS COUNTIES, SOUTH DAKOTA
DOE/EA 1979

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Prepared by: Western Area Power Administration
Upper Great Plains Region

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1. DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

1.1 Site Description

The proposed SummitWind Farm (the Project) is a community wind farm developed by SummitWind Farm, LLC (the Project proponent). The proposed Project will consist of up to 41 wind turbine generators with a maximum generating capacity of up to 80 megawatts (MW). The proposed Project area encompasses approximately 13,700 acres in Grant and Roberts Counties, which are located south of the Town of Summit, South Dakota along the Coteau des Prairies. *See* Figure 1.1.1: Regional Location Map. The proposed area, comprised of grasslands, lakes and wetlands, was historically classified as rural residential or agricultural land and was used for cropland, hay field and pasture purposes. Interstate-29 runs north-south through the middle of the Project area. Although the majority of the Project lies within the historic Sisseton-Wahpeton Oyate Reservation, the entire Project is on privately owned land and is therefore not governed by the Tribal Planning Council.

The Project proponent selected the Project area for a number of reasons including presence of a superior wind resource, access to transmission interconnection, and community support for wind energy development.

1.2 The Federal Actions

The Project proponent seeks to interconnect the Project to the United States Department of Energy (DOE) Western Area Power Administration (Western) transmission system via the Summit 115-kV Substation in Roberts County.

The Project will require certain actions from the United States Fish and Wildlife Service (USFWS) because many landowners in the Project area have USFWS-managed grassland and wetland easements on their properties. There are approximately 1210.7 acres of grassland easements and 223.9 acres of wetland easements in the Project area. Although the proposed Project would not disturb any wetland easements, construction of the Project would affect grassland easements both temporarily and permanently. *See* Table 1.2-1: Proposed USFWS Easement Disturbance and Table 1.2-2: Proposed Acreage per Type of Disturbance on USFWS-managed Easements.

Table 1.2-1: Proposed USFWS Easement Disturbance

	Grassland Easement	Wetland Easement
Total Area (acres)	1210.7	223.9
Temporary Disturbed (acres)	14.56	0.00
Permanent Disturbed (acres)	1.54	0
Temporary Disturbed (%)	1.20%	0.00%
Permanent Disturbed (%)	0.13%	0.00%

The USFWS has four federal actions available to address potential impacts to its grassland easements: (1) Exchange USFWS-managed grassland easements for grassland easement acreage permanently impacted by wind turbines; (2) Obtain a Right-of-way (ROW) over USFWS-managed grassland easements for the project transmission line; and (3) Obtain a Special Use Permit for temporary construction disturbance to USFWS-managed grassland easements.

Table 1.2-2: Proposed Acreage per Type of Disturbance on USFWS-managed Easements

Type	Temporary Disturbance (Acres)	Permanent Disturbance (Acres)	Temporary + Permanent Disturbance (Acres)
Grassland Easement	14.56	1.54	16.10
Wetland Easement	0.00	0.00	0.00
Private Land not under Easement	225.87	23.88	249.75
Total	240.43	25.42	265.85

The Project proponent has made every effort to avoid mapped wetlands in the Project area so the Project would likely not require a Clean Water Act (CWA) Section 404 Wetland Permit from the United States Army Corps of

Engineers. The Project proponent is currently performing field wetland delineations to verify whether a CWA permit would be required.

The Project is a federal action under section 102(2) of the National Environmental Policy Act (NEPA), the Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (40 CFR Parts 1500-1508), DOE NEPA Implementing Procedures (10 CFR Part 1021), and other applicable regulations. Western prepared this Environmental Assessment (EA) under these regulations to describe the analysis of environmental effects of the proposed Project and alternatives, including the No Action Alternative.

At the request of Western, the USFWS is participating as a cooperating agency in the preparation of this EA.

Western and the USFWS are also preparing a Programmatic Environmental Impact Statement (PEIS) to evaluate the impacts of wind energy development in Western's Upper Great Plains Region (all or parts of Iowa, Minnesota, Montana, Nebraska, North Dakota, and South Dakota), and on the USFWS's grassland and wetland easements in North Dakota, South Dakota, and Montana (available online at http://www.plainswindeis.anl.gov/documents/dpeis/index.cfm). The PEIS identifies conservation strategies, best management practices, and comprehensive environmental review procedures for evaluating future wind energy projects. After the agencies finalize the draft PEIS and issue Record of Decisions (ROD), the SummitWind EA will officially tier off of the final PEIS. In the event that the agencies have not yet issued RODs, however, the draft PEIS will simply serve as an influential reference document to the SummitWind EA.

Section 106 of the National Historic Preservation Act of 1966 (NHPA) requires federal agencies to take into account the effects of their undertakings on historic properties, and afford the Advisory Council on Historic Preservation a reasonable opportunity to comment. The actions taken to satisfy Section 106 consultation requirements for this Project are discussed in Section 2.12, Existing Conditions, Anticipated Impacts and Anticipated Conservation Measures for Cultural Resources. A list of the state agencies (including the South Dakota State Historic Preservation Office), Native American Tribes and associated entities contacted to date can be found in Section 3.0, Agencies Contacted/Consulted.

1.3 Proposed Action

The proposed Project will be located in Grant County within the Township of Summit, South Dakota, approximately 30 miles north of Watertown, South Dakota.

The proposed action will consist of the following components:

- Up to 41 SWT-2.3-108 (2.3) MW Siemens turbines;
- 1 or 2 permanent meteorological (met) towers;
- Underground electrical collection lines;
- Access roads and public road improvements;
- Operations and maintenance (O&M) facility;
- 4.5 mile transmission line; and
- Point of Interconnection (POI).

1.3.1 Proposed Facilities

The Project will consist of wind turbine generators and transformers connected by new private access roads, a system of buried electrical collection lines and a 4.5 mile transmission line, which will bring power to a substation and POI where it will enter the Western transmission system. Western and the Project proponent will have ongoing discussions and studies to determine the final electrical system design and interconnection details. The Project will also include a communications system that permits programmed independent operation and remote supervision of the Project wind turbines.

Turbines

The Project will consist of up to 41 SWT 2.3-108 (2.3 MW) Siemens turbines. The turbines operate automatically and self-start when the wind speed reaches an average of about 3 to 4 meters per second (m/s). The output increases, at an approximately linear rate, with the wind speed until the wind speed reaches 11 to 12 m/s. At this point, the power is regulated at rated power. If the average wind speed exceeds the maximum operational limit of 25 m/s, the wind turbine is shut down by feathering of the blades. When the average wind speed drops back below the restart average wind speed, the system resets automatically.

All turbines will be equipped with a supervisory control and data acquisition (SCADA) system that allows operators to remotely control and monitor the turbines. Siemens WebWPS SCADA system offers remote control and a variety of status views and useful reports from a standard internet web browser. The status views present information including electrical and mechanical data, operation and fault status, meteorological data and grid station data.

All turbines will be equipped with a lightning protection system.

Rotor

The SWT 2.3-108 Siemens rotor consists of three blades mounted upwind of the tower. The power output is controlled by pitch regulation. The rotor speed is variable and is designed to maximize the aerodynamic efficiency. The rotor diameter is 108 meters (354 feet), with a sweep area of 9,144 m^2 (2.3 acres) and a rotor speed of 6 to 16 revolutions per minute (rpm).

Tower

The SWT 2.3-108 tower has a hub height of 80 meters (262 feet) and is made of steel. The tower has internal ascent and direct access to the yaw system and nacelle.

Met Tower(s)

The Project will include one or two permanent met towers that are fitted with multiple sensors to track and monitor wind speed, direction and temperatures. These sensors collect wind data and support performance testing of the turbines. The met towers will be connected to the wind farm's central SCADA system. The permanent towers will consist of a central lattice structure supported by three to four sets of guy wires and will be 80 to 100 meters (262 to 328 feet) tall. The Project proponent anticipates that each tower will be a galvanized steel structure and will have wind monitoring instruments suspended at the end of booms attached perpendicular to the tower. The Project proponent would mount red aviation warning lights at the top of all towers, as required by the Federal Aviation Administration (FAA). Buried electrical lines will connect each tower directly to a power source at the nearest distribution line and provide the power necessary to run the warning lights and wind testing equipment. The Project proponent would site the met towers upwind of the prevailing wind direction within the Project area. Each met tower will also have a grounding system similar to that of the wind turbines.

Buried Cable Collection Systems

Where practical, the Project proponent would route buried electrical collection lines to follow Project access roads and field edges; however, portions of the buried electrical collection lines will cross agricultural fields. The high voltage underground cables are fed through trenches and into conduits at the transformers at each turbine. The cables run to the transformers' high voltage (34.5-kV) compartment and are connected to the terminals. Low voltage cables are fed through a set of underground conduits from the transformer pad to the bus cabinet inside the base of the wind turbine tower. The Project proponent would inspect and test the system prior to energization.

When possible, the Project proponent would install underground collection lines by performing direct burial via cable plow, rock saw, or trencher . An area 20 feet wide on either side of the cable path must be cleared of woody vegetation and will be partially disturbed by the tracks of the installation machinery. Where surface restoration is required, the Project proponent would use a restoration Bobcat or small bulldozer to ride over and smooth out the disturbed area.

O&M Facility

The O&M facility will include a main building with offices, a storage yard for spare parts and maintenance equipment, restrooms, a workshop area, outdoor parking facilities, a turnaround area for larger vehicles, outdoor lighting and a gated access with partial or full perimeter fencing. The O&M facility area will be leveled and graded and will serve as a central base for Project operation. The main O&M building will house the command center of the Project's SCADA system. The building will be linked by fiber optic cables to each of the turbines through the SCADA system, which will allow an operator to control critical functions and monitor the overall performance of each turbine. The Project proponent estimates that the main O&M building will be up to 8,000 square feet in size and will require up to five acres of disturbance area. The Project proponent would determine the final design and architecture of the O&M facility prior to construction and comply with all required building standards and codes.

POI

The proposed POI will be at the Summit 115-kV Substation in Roberts County. The POI will mechanically connect the Project to the utility grid and provide fault protection. The exact footprint of the POI will depend largely on the utility requirements and the grid line characteristics at the POI. All of the main outdoor electrical equipment and control house will be installed on concrete foundations that are designed for the soil conditions at the substation.

1.3.2 Pre-Construction Process

The Project proponent conducted preconstruction surveys and studies to confirm the feasibility of the proposed actions and to show alternatives to minimize or avoid impacts to existing environmental resources.

Completed environmental studies:

- Site Characterization Study of the SummitWind Resource Area, inclusive of the Tier 1 and Tier 2 studies consistent with the Voluntary Land-based Wind Energy Guidelines;
- Fixed Point Bird Use Interim Report;

- Raptor Nest Survey;
- Microwave Beam Path Study;
- Visual Assessment;
- Shadow Flicker Study;
- Acoustic Analysis Study;
- Desktop Geotechnical Study; and
- Desktop Archaeological Study.

Ongoing environmental studies:

- Consultation with the USFWS to avoid and minimize impacts to Grassland and wetland easements;
- Fixed-Point Bird Use Surveys;
- Grassland Breeding Bird Survey;
- Bat Studies (Acoustic Monitoring);
- Butterfly Studies;
- Wetland Delineations;
- Bird and Bat Conservation Strategy;
- Biological Assessment Preparation; and
- Archaeological and Cultural Surveys (Area of Potential Effect as determined by WAPA and Sisseton Wahpeton Oyate).

Other Due Diligence:

- Over 4 years of on-site met tower data from two 60 meter met towers.
- Turbine setback considerations per Grant County zoning ordinance.

1.3.2.1 Construction Activities.

Civil Works and Access Roads

Construction of the Project would consist of many civil works and physical improvements to the land, including:

- Installation of sediment and erosion controls and other conservation measures.
- Clearing and grading of laydown areas, work zones, parking areas, etc.
- Clearing and grading of areas where Project infrastructure will be installed.
- Public road improvements.
- Creation of access roads.

Wherever possible, the Project proponent would upgrade existing roads and farm drives to use as Project access roads in order to minimize impacts to both active agricultural areas and wetlands. Where an existing road or farm drive is unavailable or unsuitable, the construction contractor would

construct new gravel-surfaced access roads. Road construction will typically involve installation of soil erosion and sediment control measures, topsoil stripping in agricultural lands and grubbing of stumps, as necessary. The construction contractor would stockpile stripped topsoil along the road corridor for use in site restoration. Any grubbed stumps would be chipped and spread, buried in upland non-agricultural/non-grassland areas, or otherwise appropriately disposed of with the approval of the landowner or environmental inspector. Following removal of topsoil, subsoil would be graded and compacted. As needed, geotextile fabric or grid would be laid down to provide additional support to overlaying rock. Once rough grade is achieved, base rock would be spread and compacted to create a road base. A capping rock would then be spread over the road base and roll compacted to finished grade.

During construction of the Project, access road installation and use could result in temporary disturbance of a maximum width of 50 feet, with temporary road corner radii of up to 150 feet. In agricultural areas, the construction contractor would strip and stockpile topsoil along the access road to prevent construction vehicles from driving over undisturbed soil and adjacent agricultural fields. Up to a 56-foot wide area may be disturbed for moving, or "walking," the tower erection crane. Maximum permanent road width including graded side-slopes will be 17 feet. Once construction is complete, the Project proponent would restore any temporarily disturbed areas, de-compact soil as necessary, remove rocks from agricultural areas, and reestablish pre-construction contours.

During the operation of the Project, access roads leading to the turbines will generally consist of a 17-foot wide compacted gravel surface and a 2-foot wide shoulder on either side to blend with the surrounding contours, allow for proper drainage and accommodate crane equipment moving safely between the individual turbine sites. Where roads are necessary on USFWS grassland easements, the Project proponent would make the roads the minimum size necessary for safe construction and operation. Temporary impacts will be downsized whenever practicable.

Foundation Design and Construction

The Project will require foundations for each turbine, transformer pad, junction box, substation equipment and the O&M facility. The construction contractor would typically install wind turbines by installing sediment and erosion control and then stripping and stockpiling topsoil within a 150-foot radius (or less) around each tower. After the construction contractor prepares a turbine workspace, it would construct a foundation in several stages, including: hole excavation, outer form setting, rebar and bolt cage assembly, casting and finishing of the concrete, removal of the forms, backfilling and compacting, construction of the pad transformer foundation,

and foundation site area restoration. The purpose of the foundation for a wind turbine is to give the tower stability below the pedestal, which connects it to the tower.

A wind turbine foundation may be either a concrete caisson or a spread footer or equivalent, as specified by the Project engineer. The Project proponent anticipates using a spread foot foundation containing approximately 350-400 cubic yards of concrete and measuring approximately 10-12 feet deep and approximately 50-60 feet in diameter and contains. After it is cured, the construction contractor would bury and backfill the foundation with the excavated on-site material. The foundation pedestal will have a diameter about the size of the bottom tower section and will either be flush with the ground surface or extend above grade.

Turbine Erection

The construction contractor would deliver all turbine components to the Project site on flatbed transport trucks and would offload main components at the individual turbine sites. The construction contractor would use a large erection crane to erect the turbine. This crane will be based on a gravel rectangular crane pad measuring approximately 100 feet by 60 feet. The turbine erection process includes multiple stages:

- Setting of the bus cabinet and ground control panels on the foundation;
- Erection of the tower (in 3-4 sections);
- Erection of the nacelle, assembly and erection of the rotor, connection and termination of the internal cables; and
- Inspection and testing of the electrical system prior to energization.

The erection crane(s) will move from one tower to another along a designated crane path. This path will generally follow Project access roads and will only cross or minimally affect existing public roads (where permitted and practical). Upon departure of the crane from each tower site, the construction contractor would undertake all required site restoration activities, including removal of all temporary material present in crane paths. In agricultural fields, restoration would also include subsoil de-compaction (as necessary), rock removal, spreading of stockpiled topsoil, and reestablishing preconstruction contours.

Whenever possible, the Project proponent would limit crane crossings of natural gas pipeline infrastructure to existing all-year roads. The Project proponent would plan and coordinate with facility owners/operators to use of heavy equipment near natural gas pipelines and ensure that everyone takes the proper precautions to protect the pipeline, construction personnel and equipment operators.

The Project proponent is not planning any overland erection crane crossings on USFWS easement interests.

Cable Collection Systems

Installation of underground cables typically begins after the roads, turbine foundations and transformer pads are complete for a particular row of turbines. On USFWS easements, the construction contractor would trench the cables in the same footprint as the roads.

Direct burial via a trencher or rock saw involves the installation of bundled cable in a similar fashion to cable plow installation. The trencher or rock saw uses a large circular blade or "saw" to excavate a small open trench. The trencher blade creates an approximately 14-inch wide trench with a sidecast area immediately adjacent to the trench. Similar to a cable plow, this direct burial method installs the cable a minimum of 48 inches below the surface and requires only minor clearing and surface disturbance (up to 15 to 25 feet wide from the installation machinery and any stockpiled brush). In active agricultural land (crop, hay or pastureland), up to two parallel collection line circuits can be installed by trenching without the need to strip and segregate topsoil. The construction contractor would replace sidecast material via a Bobcat or small bulldozer fitted with an inverted blade. All areas would be returned to preconstruction grades, and restoration efforts would be as described above for cable plow installation. Although the Project proponent does not expect to run more than two circuits in parallel through active agricultural fields in the current collection system layout, doing so would require stripping the topsoil, soil stockpiling/segregation, soil replacement, soil re-grading, and soil stabilization (seeding and mulching) following installation. The construction contractor would repair any drainage tile lines that are inadvertently cut or damaged during installation of the buried cable as part of the restoration effort.

Where buried cable is proposed to cross buried natural gas facilities, the construction contractor would protect and preserve the staking, marking or other designations for underground facilities until they are no longer required for proper and safe excavation. The construction contractor would stop work and notify the on-call center for remarking if any facility mark is removed or is no longer visible. The construction contractor would have an observer assist the equipment operator when operating excavation equipment around known underground facilities. The equipment operator performing the excavation would observe and protect the tolerance zone around underground natural gas facilities as determined by the crossing agreements and federal and state law. Protection of exposed underground facilities is as important as preventing damage to the facility while digging. The owners of natural gas pipeline infrastructure will likely have specific

protocols that must be used for the exposure of buried natural gas facilities. There may also be restrictions placed upon how close powered equipment may be used in relation to natural gas facilities.

Substation and Transmission Line

The construction of the Project substation involves several stages of work including, but not limited to, grading of the area, the construction of several foundations for the transformers, breakers, control houses, the erection and placement of the steel work and all outdoor equipment, and electrical work for all of the required terminations. Once complete, the Project proponent would perform a rigorous inspection and execute a commissioning test plan prior to energization of the substation.

Substation construction work requires the use of several pieces of heavy machinery, including: a bulldozer, a drill rig and concrete trucks for the foundations, a trencher, a backhoe, front-end loaders, dump trucks for import of clean back fill, transportation trucks for the materials, boom trucks and cranes for off-loading of the equipment and materials, concrete trucks for areas needing slurry backfill, man-lift bucket trucks for the steel work and pole-line work, etc. The construction schedule for the interconnection substation facilities is largely dictated by the delivery schedule of major equipment such as the main transformers, breakers, capacitors, outdoor relaying equipment, the control house, etc. The transmission owner (Western) is generally responsible for the construction of the interconnection facility, as they would own and maintain it.

The construction of the POI station should occur within the same timeframe as the Project substation. In general appearance, the POI station would be very similar to the substation, but would have more steel poles structures and high voltage switch breakers with no transformers.

The Project requires the construction of approximately 4.5 miles of new electrical transmission line along an existing transmission line corridor to the Summit 115-kV Substation in Roberts County. The Project proponent would site the 4.5 mile electric transmission line in as direct a route as possible to the Summit 115 kV Substation. The transmission line would run parallel to the existing Western Summit to Watertown 115 kV transmission line.

Temporary and Permanent Construction Disturbance Impacts

Temporary construction impacts are those short-term impacts that occur during the period that a project is being built. Permanent impacts refer to impacts that are associated with the built and operating project. The assumptions used to calculate the temporary and permanent land disturbance impacts associated with the Project are provided in Table 1.3.2—1 below.

Table 1.3.2—1: Disturbance Assumptions

Project Component	Temporary Disturbance	Permanent Disturbance
Access Roads	50' Wide corridor less any temporary disturbance from collector, wind turbines, and permanent disturbance	17' wide corridor less permanent disturbance from wind turbines
Crane Walks	56' Wide corridor less any temporary disturbance from access road, collector, wind turbines, and permanent disturbance	None
Laydown Area	10 acres	None
O&M Building	All permanent	5000 sq. ft. plus 10,000 sq. ft. parking lot
Overhead Collection Lines	None	None
Overhead Transmission Line	50' Wide corridor and 50' radius around poles	60 sq. ft. per pole instance
Substation	50' outside substation area	Approximate substation area
Turbines	150' radius less any permanent disturbance	30' radius
Underground Collection Lines	20' Wide corridor less any temporary disturbance from wind turbines, and permanent disturbance	None

The Project proponent estimates that the temporary disturbance for the Project is 240.43 acres, or 1.8 percent of the approximately 13,700 acre Project area. The Project proponent estimates that the permanent disturbance for the Project is 24.91 acres, or less than 0.18% of the Project area.

Commissioning

Plant commissioning follows mechanical completion of the Project. The Project proponent would begin commissioning of the Project by preparing a detailed plan that includes testing and energizing Project components by placing locks and tags on breakers to ensure safety and allow for fault

detection prior to the energization of any one component of the system. Once the substation is energized, the Project proponent would test individual turbines extensively, commission them, and bring them online separately. Commissioning does not require any heavy machinery.

1.3.2.2 Construction Waste Management and Reclamation

Debris associated with construction may include construction materials such as packaging material, crates, reels, and parts wrapping. This debris may also include excess excavated soil and removed vegetation. The Project proponent would remove materials with salvage value from the Project area for reuse. Excavated soils would be back-filled within the area of permanent disturbance and restored in compliance with applicable guidelines. If necessary, the Project proponent would temporarily store solid waste, including topsoil or other excavated materials not otherwise disposed of, within the corridor or within the temporary construction easements and then transport it to appropriate disposal facilities in accordance with federal, state, and local regulations.

Project reclamation is generally completed during suitable weather after all construction activities have been completed. Reclamation would initially consist of grading to replace the approximate original contour and drainage of disturbed areas. Grading would include removal of any temporary structures. Following grading, the Project proponent would spread salvaged topsoil and blend it with adjacent areas to provide a growth medium for vegetation. Soil that has been compacted by equipment operation would be tilled to alleviate compaction. Where natural regrowth of vegetation is not anticipated, the Project proponent would reseed disturbed areas in accordance with landowner agreements or with regionally native species. The Project proponent would coordinate with USFWS regarding disturbance on grassland easement.

1.3.2.3 Project O&M

The O&M facility would serve as a central base for Project operation and would include a main building with offices, a storage yard for spare parts and maintenance equipment, restrooms, a workshop area, outdoor parking facilities, a turnaround area for larger vehicles, outdoor lighting and a gated access with partial or full perimeter fencing. The Project proponent would level and grade the O&M facility area. The main O&M building would house the command center of the Project's SCADA system. The building would be linked by fiber optic cables to each of the turbines through the SCADA system, which would allow an operator to control critical functions and the overall performance of each turbine. The Project proponent expects the main O&M building to be approximately 5,000 square feet in size, plus a 10,000

square feet parking lot and approximately five acres of disturbance area. The Project proponent would determine the final design and architecture of the O&M facility prior to construction and comply with all required building standards and codes.

The Project proponent would be responsible for maintenance of any new access roads.

Maintenance Schedule

The amount of downtime due to scheduled maintenance is predictable from year to year. The proposed Project operating plan will likely include a planned outage schedule cycle that consists of wind turbine generator inspections and maintenance after the first 3 months of operation, a break-in diagnostic inspection, and subsequent services every 6 months.

- First Service Inspection: Performed within 3 months of commissioning.
- Bi-Annual Service Inspection: Performed within 6 months of first inspection and every year the Project is operational.
- Annual Service Inspection: Performed within 1 year of commissioning and every year the Project is operational.

These rigorous 6-month routines include: inspections and testing of all safety systems; inspection of wear-and-tear on components such as seals, bearings, bushings, etc.; lubrication of the mechanical systems; electronic diagnostics on the control systems; pre-tension verification of mechanical fasteners; and overall inspection of the structural components of the wind turbine generators. Blades are also inspected to maintain overall aerodynamic efficiency. Blade washing may be necessary to remove insect debris and grime that can diminish the Project's aesthetics.

Individual wind turbines are taken off-line for maintenance, leaving the remaining wind turbines in that string fully operational. Electrical equipment such as breakers, relays, and transformers generally require weekly visual inspections, which do not affect overall availability. Required testing and calibrations every 1-3 years may cause outages. To the extent practical, the Project proponent would schedule short-term off-line routine maintenance procedures to coincide with periods of little or no generation (i.e. low wind) to minimize the impact to the amount of overall generation.

Unscheduled Maintenance

Modern wind power projects are very reliable. However, several components and systems of an individual wind turbine, such as the mechanical, electrical, or computer controls, can require forced, non-routine outages. The majority of outages are caused by auxiliaries and controls, not the heavy rotating machinery. The Project proponent would complete frequent

inspections of heavy machinery to detect problems early on and prevent complete operational failure.

Although the newer control systems include a high level of detection and diagnostic capability, they normally require frequent minor adjustments in the first few months of operation. As a result, availabilities of a wind power project are generally lower in the first few months until they are fully tuned. Once a wind plant is properly tuned, unplanned outages are generally rare and downtime is generally limited to the routine service schedule.

The Project proponent would stock the O&M facility with sufficient spare parts to support maintenance efforts during operation. The modular design of modern wind turbines results in the majority of parts being "quick-change" in configuration, especially in the electrical and control systems. This modularity and the fact that all of the turbines are identical allows for the swapping of components quickly between turbines to determine root causes of failures. As part of their supply agreements, major turbine equipment vendors guarantee the availability of spare parts for 20 years.

1.3.3 Decommissioning

The term of the Power Purchase Agreement, the condition of the equipment, and evolution of power generation technology will ultimately determine the useful life of the turbines. Once constructed, the cost to operate and maintain a wind farm is comparable to other forms of power generation. Therefore, the strength of the Project's economics relies primarily on the creditworthiness of the entity purchasing the power and much less so on the financial strength of the Project's owner. Improvements in wind turbine design or efficiency gains from competing technologies may eventually trigger the decommissioning of individual units or the entire Project; however, the Project may repower with more advanced wind technology. The cost of decommissioning the wind turbines will be offset by the salvage value of the towers and the turbine components.

The Project proponent would follow Grant County's zoning ordinance for decommissioning, restoration and abandonment of the Project. During decommissioning, the Project proponent would restore the footprint of the permanently impacted grassland easements back to grasslands according to USFWS specifications and the area would revert back to full easement protection.

1.4 Alternatives

1.4.1 Preliminary Alternatives Screening

Development of a wind energy project is a highly iterative process. The Project proponent considered several alternative locations for Project infrastructure and eliminated options due to economic and environmental reasons throughout the early stages of planning. The Project proponent developed the Project layout over a period of more than three years. The placement of wind turbines is based upon the wind energy resource, the availability of leasable land, the setback constraints in the zoning ordinance, the avoidance of sensitive environmental resources, and constructability considerations.

The Project proponent conducted many preliminary studies to aid in the selection process and eliminate inappropriate sites from consideration. For example, the Project proponent conducted a Tier 2 Site Characterization Study of the SummitWind Resource Area (Tier 2 Study) consistent with the requirements of Chapter 3 of the USFWS Land-Based Wind Energy Guidelines (USFWS 2012b). Section 1.3.2 of this EA lists other preconstruction studies that the Project proponent has completed or is currently undertaking. These studies have already led to layout modifications. For example, as an early mitigation avoidance approach, the Project proponent adjusted the transmission line and the locations of several turbines in order to avoid all mapped wetlands and USFWS wetland easements. After field consultation with the USFWS, the Project proponent also adjusted the locations of four proposed turbines, moving them away from an active bald eagle nest and off of native grassland.

In addition, the Project proponent considered an alternate interconnection approach requiring construction of a 30-mile overhead electric transmission line to the Big Stone Substation in Big Stone, South Dakota. The Project proponent eliminated this alternative after determining that it would result in greater ground disturbance and visual impacts. However, should Western choose the No Action Alternative, described below, it is possible that the Project proponent would reconsider an interconnection in Big Stone.

1.4.2 No Action Alternative

Under the No Action Alternative, Western would not grant an interconnection agreement to SummitWind Farm.

1.5 Purpose and Need for the Proposed Action

1.5.1 General Purpose and Need

South Dakota has a Renewable Portfolio Standard requiring that 10 percent of all retail electricity sales in the state be obtained from renewable and recycled energy by 2015. Although South Dakota has already met its retail

electricity targets, energy from the Project would significantly contribute to the state's overall energy needs and may help serve energy export goals to neighboring states over the next 30 years.

According to the Energy Information Administration (EIA), "South Dakota is one of the least-populated states, and its total energy consumption is among the lowest in the nation. However, it is among the top 10 in total energy consumption per capita." Although South Dakota has limited fossil fuel resources, it has significant renewable energy potential. More than one-fourth of the households in South Dakota use electricity as their primary energy source for home heating. The National Renewable Energy Laboratory (NREL) estimates that 88 percent of South Dakota's land area has high wind power potential and EIA estimates that South Dakota has the fifth-largest wind resource in the United States.

The Proposed Action would also provide much needed income to Grant County, South Dakota and its residents by way of landowner agreements, taxes and payments in lieu of taxes, construction expenses, and jobs. The Project proponent estimates that the Project's total capital investment (including turbine cost) would be $155 million.

1.5.2 Applicant Purpose and Need

The Project proponent is an independent power producer in the business of developing renewable energy power generation facilities for profit. The purpose of the Project proponent is to help entrepreneurial individuals, companies and communities generate their own renewable wind power.

1.5.3 Agency Purpose and Need

The Project proponent, as an Interconnection Customer, requests to interconnect its proposed Project with Western's Summit-Watertown 115 kV transmission line at the Summit 115-kV Substation in Roberts County. Western's purpose and need is to consider and respond to the interconnection request in accordance with its Open Access Transmission Service Tariff (Tariff) and the Federal Power Act. Western's Tariff is filed with the Federal Energy Regulatory Commission (FERC) for approval.

Under the Tariff, Western offers capacity on its transmission system to deliver electricity when capacity is available. The Tariff also contains terms for processing requests for the interconnection of generation facilities to Western's transmission system. In reviewing interconnection requests, Western must ensure that existing reliability and service is not degraded. Western's Tariff provides for transmission and system studies to ensure that system reliability and service to existing customers are not adversely

affected by new interconnections. These studies also identify system upgrades or additions necessary to accommodate the proposed project and address whether the upgrades/additions are within the project scope.

1.6 Authorizing Actions

Federal, state, and local agencies have jurisdiction over certain aspects of the Project. Authorizing actions and agencies are summarized in Table 1.6-1: SummitWind Farm Regulatory Authorizations.

Table 1.6-1: SummitWind Farm Regulatory Authorizations

Regulatory Action/Statute	**Agency**
Federal	
National Environmental Policy Act (NEPA)	Western
Large Generator Interconnection Agreement (LGIA)	Western
Section 7 of Endangered Species Act (ESA) Consultation	Western, U.S. Fish and Wildlife Service (USFWS)
Migratory Bird Treaty Act (MBTA)	Western, U.S. Fish and Wildlife Service (USFWS)
The Bald and Golden Eagle Protection Act (BGEPA)	Western, U.S. Fish and Wildlife Service (USFWS)
Special Use Permit (SUP), Right-of-Way Permit, Compatibility Analysis of Disturbed Easements, Exchange of Grassland and Wetland Easements	U.S. Fish and Wildlife Service (USFWS)
Form 7460-1. Notice of Proposed Construction	Federal Aviation Administration (FAA)
Section 106 of National Historic Preservation Act Consultation	Western, State Historical Preservation Office (SHPO), and Tribal Nations
Native American Graves Protection and Repatriation Act (NAGPRA) Compliance	Western and Tribal Nations
American Indian Religious Freedom Act	Western and Tribal Nations
State	
Overweight/Oversized Permits	South Dakota Department Of Transportation (SDDOT)
Road Approach/Access Permit	South Dakota Department Of Transportation (SDDOT)
Utility Crossing Permit	South Dakota Department Of Transportation (SDDOT)
Aeronautical Hazard Permit	South Dakota Department Of Transportation (SDDOT)
National Pollutant Discharge	South Dakota Department of

Regulatory Action/Statute	Agency
Elimination System (NPDES), General Construction Storm Water and Spill Prevention Control and Countermeasures (SPCC) Plan	Environment and Natural Resources (DENR)
Section 401, Clean Water Act (CWA)	South Dakota Department of Environment and Natural Resources (DENR)
State Threatened and Endangered Species Consultation	South Dakota Game, Fish and Parks (GFP)
Notice to Telecommunications Companies	South Dakota Codified Law SDCL 49-32-3.1
Local	
Right-of-Way	Grant County
Overweight and over width permit	Grant County
Conditional Use Permit: wind farm and transmission line.	Grant County
Building Permits: towers, collection lines, feeder lines, buildings, and substation.	Grant County
Soil Erosion and Sediment Control Plan	Grant County
Right-of-Way (for POI alternative transmission Line)	Roberts County Highway Department

1.7 Public Participation

Public involvement is one of the most important requirements of the NEPA process, especially for enabling the affected community to guide the scope of the NEPA analyses to be conducted.

Western and the Project proponent have consulted with several federal, state, local, and tribal agencies during the creation of this document. Western and the Project proponent invited local tribal officials to a meeting at the Dakota Magic Casino in Hankinson, North Dakota to discuss the Project and the scope of the EA on February 11, 2014 . In addition, the Project proponent held a public scoping meeting on February 12, 2014 in Summit, South Dakota. A Public Scoping Report is attached as Appendix A of this EA.

The public will have the opportunity to comment upon this draft EA document. Comments can be sent until December 29, 2014 to:

Via mail:
Mr. Micah Reuber

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2. EXISTING CONDITIONS, ANTICIPATED IMPACTS AND ANTICIPATED CONSERVATION MEASURES

2.1 Geology and Soils

This section evaluates the geological and soil resources in the vicinity of the proposed Project. The analysis presented in this section is supplemented by a Desktop Geological and Geotechnical Study prepared by Haley & Aldrich, Inc.

2.1.1 Existing Conditions

2.1.1.1 Regional Project Settings

The proposed Project encompasses approximately 13,700 acres in Grant and Roberts Counties in the northeastern corner of South Dakota. The Project area is located in the Northern Glaciated Plains ecoregion in the Central Lowlands physiographic province (EPA 2013). The Central Lowlands province is characterized by a generally flat to gently rolling landscape composed of glacial drift and other glacially-deposited materials (WAPA 2013).

The Project area is situated on the Coteau des Prairie (Coteau), a regionally-extensive flatiron-shaped upland plateau that resulted from several advances and retreats of glacial ice lobes and rises from the surrounding Central Plains lowlands (DWNR 1986). The Coteau is approximately 100 miles wide, nearly 200 miles long, rises about 1,300 feet above the surrounding eastern lowlands drained by the Minnesota River, and rises about 700 feet above the James River lowlands located to the west, forming a regional hydrogeological divide between the two river basins (Gilbertson 1990).

Ground surface elevations across the Project area range from approximately 1,180 to 2,050 feet above sea level, with the more elevated portions of the Project situated along a northwest-to-southeast trending spine of a glacial moraine belt that generally forms the Project area borders to the northeast.

From the moraine ridge, Project area elevations generally decrease and slope downward both to the southeast and to the northeast directions.

2.1.1.2 Geological Setting

Bedrock directly below the Project area is the Pierre Shale bedrock, the youngest bedrock unit in the region, part of a thick succession of undifferentiated Late Cretaceous-age marine and non-marine sedimentary rocks comprised of sandstones, marls, limestones, and shales (Gilbertson 1990). The Project proponent does not expect to encounter shallow bedrock as part of the excavation or construction of the Project.

According to South Dakota's Department of Environment and Natural Resources (DENR), beginning about 2 million years ago, continental glaciers extended generally southward across North America and covered eastern South Dakota several times. The South Dakota DENR claims that as each ice sheet advanced, it transported large volumes of rock debris frozen into the lower layers of ice. Glaciers with a very thick and heavy ice sheet scoured and smoothed off the terrain whereas thin glaciers overrode obstacles. As the ice melted, sediment called glacial drift was left behind. The majority of the geology in Grant and Roberts Counties was created by Illinoian glacial sediments.

The Coteau plateau landform was constructed by these successional glacial ice advances and retreats which deposited layers of glacial tills and other glacial moraine deposits up to 700 feet thick in southern and western Grant County (Gilbertson 1990). The Project area is situated on three geomorphic areas reflecting different types of glacial till deposits or glacial moraine deposits.

The Toronto Till Plain on the western edge of the Project area is estimated to be 50 to 120 feet thick. It is characterized by broad, rounded hills separated by numerous stream valleys that lead to the Big Sioux River. The Toronto Till contains characteristic Cretaceous-age rock fragments and is overlain by an estimated 5 feet of loess soils, which are generally considered unsuitable for foundation support of wind turbine structures.

The Bemis Moraine Complex makes up the majority of the Project area and is composed of a narrow ridge (moraine) and an eastern belt of the related ground moraine (Gilbertson 1990). It is characteristically covered in cobbles and boulders, a factor influencing the ease of excavation. The kame and kettle topography found behind the moraine has few streams and closed depressions flanked by boulder-strewn ridges and low, somewhat linear hills (Gilbertson 1990).

The northeastern edge of the Project area is located on the Altamont-Gary Moraine Complex, a very stony glacial moraine surface littered with potholes, most of them filled with lakes (Gilbertson 1990). Ground surface elevations decline from west to east, and local relief varies by 75 to 80 feet. The glacial moraine till at the surface is about 100 feet thick (Gilbertson 1990).

2.1.1.3 Soils

Soil formation results from the complex interactions between geologic material, climate, topography, vegetation, organisms, and time. The classification of soils is based on their degree of development (into distinct layers or horizons) and their dominant physical and chemical properties. Mollisols are the predominant soils in South Dakota and the proposed Project area. These soils have developed from loess parent materials and are commonly very dark-colored, organic-rich, mineral soils that are found in the plains of North and South Dakota and northern Montana. Mollisols are base-rich throughout and highly fertile. These soils typically develop under grasslands; however some have formed under a forest ecosystem. These soils are typically present in subhumid to subarid climates that have a moderate to pronounced seasonal moisture deficit and are mainly used as cropland, pasture, or rangeland.

Soil associations in the Project area were derived from the United States Department of Agriculture National Resource Conservation Service (NRCS) on-line Soil Survey Geographic Soils Data (SSURGO) mapping tool (NRCS 2013). Soil associations consist of major and minor soil units which provide a broad perspective of the soils and landscapes in an area. The following three soil associations are located within the Project area:

- Forman-Buse-Aastad Association – This association developed on a glacial moraine and consists of deep well-drained and moderately well-drained loamy soils on uplands. Slopes range from nearly-level to hilly; they are steeper along the sides of entrenched drainageways. There are sloughs and closed depressions throughout the association. In some areas within the association, few-to-many stones are scattered on the ridgetops. In many areas, the drainage pattern is poorly defined, but can be well-defined in areas of rolling-to-steep soils associated with entrenched drainageways. Aastad soils are subject to flooding.

- Renshaw-Fordville-Devide Association – This association formed on glacial outwash plains and glacial moraines in uplands and terraces and consists of somewhat excessively drained to somewhat poorly drained loamy soils of variable thickness. The association is nearly

level to moderately steep and is formed over sand and gravel substrate. The slopes are predominantly nearly-level to gently undulating, and are steeper on the moraines and on side slopes of drainageways. Slopes are well-defined along the larger drainageways.

- Vienna-Lismore Association – This association makes up the majority of the Project area. Formed on upland glacial till plains, this association generally consists of deep well-drained and moderately well-drained, nearly-level to strongly-sloping silty soils. The landscape consists of gentle rises that have long smooth slopes leading to small drainageways. Slopes are predominantly nearly-level to moderately sloping, but they are strongly sloping in areas adjacent to entrenched drainageways. In some places, a few closed depressions dot the landscape. The drainage pattern is well defined.

2.1.1.4 Paleontological Resources

Based on the geology and depth-to-bedrock below the Project area, the possibility of encountering paleontological remains or fossils during Project development is considered unlikely. Fossils most commonly appear in sedimentary rock formations. As the Pierre Shale bedrock is inferred to be several hundred feet below the ground surface, it is unlikely to be impacted during Project construction.

2.1.1.5 Geological Hazards

The potential geologic hazards that could be significant at wind project sites include seismic ground shaking, ground rupture, liquefaction, slope instability subsidence and settlement, expansive soils, and flooding. These hazards are described in detail in the Desktop Geological and Geotechnical Study and summarized below.

Based on the United States Geological Survey Quaternary Fault and Fold database, there are no recognized or mapped Quaternary faults in proximity to the Project area. Similarly, based on the United States Geological Survey's National Seismic Hazard Maps, there is a low risk of ground shaking due to seismic activity within the Project area. The peak horizontal acceleration, expressed as a percentage of acceleration due to the force of gravity with a 2 percent probability of exceedance in 50 years, is 0.0 to 0.02, which is considered insignificant ground shaking. Ground rupture, a break and planar slip within soils, and liquefaction, a loss in shear strength resulting in the soil acting like a liquid, typically result from earthquakes and seismic events.

The major determinants of slope stability are: slope angle; soil or rock structure; topography; precipitation; overall landslide susceptibility; and previous landslide incidences (WAPA 2013). Because the Project is located in relatively flat areas of generally low relief, slope instability is not likely to be a significant hazard.

Ground subsidence and settling can be caused by: deep, collapsible soils; seismic activity; karst features; hydrocompaction from withdrawal of groundwater or hydrocarbons; or underground mining. Because the underlying soils at the Project are dense glacial tills and glacial moraines, subsidence and settling is considered unlikely. Additionally, expansive soils, which are soils that can shrink and swell in response to changes in moisture, have not been noted in the Project vicinity.

Since better wind conditions are present at higher elevations and wind turbines are generally placed outside of floodplain areas, flooding is not a likely hazard.

2.1.2 Potential Impacts of the Alternatives

Wind energy development would have a number of impacts on soils in and around the Project area, most of which relate to the effects of ground-disturbing activities. Impacts to bedrock are unlikely for this Project and therefore potential impacts to bedrock are not discussed.

The Project proponent expects the majority of impacts on soil resources to occur during the construction phase of the Project when there are ground-disturbing activities. Common impacts include soil compaction, soil horizon mixing, wind erosion, water erosion, sedimentation, and soil contamination. These impacts could affect other resources such as air, water, vegetation, and wildlife.

As noted in the draft Upper Great Plains (UGP) Wind PEIS, site characterization activities would be of short duration and would not require significant site modifications. The Project proponent would implementing best management practices (BMP) and mitigation measures to reduce soil compaction and control soil erosion and surface runoff to ensure that impacts would be negligible and would contribute to the success of future reclamation efforts.

Construction of a typical wind facility would result in impacts on soil resources in an area equivalent to the total area for all components (i.e., wind tower foundations, cable trays or trenches, control building, equipment storage areas, conditioning facilities, substations, roads and temporary workspace areas). Direct adverse impacts of ground-disturbing activities

relate mainly to the increased potential for soil compaction, soil horizon mixing, erosion, sedimentation of nearby lakes, rivers, and streams, and soil contamination. The degree of impact depends on site-specific factors such as soil properties, slope, vegetation, weather, and distance to surface water. Erosional gullies formed on excavated land and the increased drainage may also contribute to soil erosion into natural drainages. Compaction by vehicles or heavy equipment reduces infiltration and promotes surface runoff. Soil erosion due to wind is also increased by ground disturbance. Ground disturbance and soil erosion rates would be potentially high during construction, but relatively local and temporary. Erosion rates and runoff potential are naturally lower at project sites located on relatively level terrain and in arid climates.

Because native tallgrass prairie is one of the most endangered ecosystems in the world, the Project proponent has minimized potential Project impacts by locating as many Project facilities as possible on cropland and previously farmed land.

After construction, the Project proponent would implement proper BMPs and mitigation measures to stabilize soil conditions during Project construction. Once the Project area is stabilized, adverse impacts are expected to be small because O&M activities would not substantially increase the potential for soil disturbance. By implementing BMPs and mitigation measures to reduce soil compaction and control soil erosion and surface runoff during the O&M of the Project, the Project proponent would reduce soil-related impacts to negligible or low levels.

Decommissioning would involve ground-disturbing activities that could increase the potential for soil disturbance. Ground disturbance and soil erosion rates would be potentially high during decommissioning (though less than during the construction phase), but would be temporary and local. Erosion rates and runoff potential are naturally lower at project sites located on relatively level terrain and in arid and semiarid climates. By implementing BMPs and conservation measures to minimize disturbance, the Project proponent would reduce soil-related impacts during decommissioning to negligible or low levels.

Overall, temporary impacts to geology and soils will be negligible. Only 1.8 percent of the approximately 13,700 acre Project area would be impacted during construction. Permanent impacts to geology and soils would be even smaller, impacting less than 0.18 percent of the Project area. Furthermore, by implementing the conservation measures from the draft UGP Wind PEIS during construction and operations, the Project proponent would prevent any significant environmental impacts to the project area.

The No Action Alternative would have no direct impact to geology or soils. However, selection of the No Action Alternative could potentially cause the Project proponent to reconsider the previously rejected interconnection alternative at the Big Stone Substation in Big Stone, South Dakota, which would require the construction of a 30-mile electric transmission line. Constructing this new transmission line could result in greater impacts to geology and soils.

2.1.3 Proposed Conservation Measures

The Project proponent has adopted conservation measures for the Project, as applicable, from the draft UGP Wind PEIS. The main objective of the mitigation measures for soil resources is to preserve the health and functioning of Project area soils by minimizing or controlling the ground-disturbing activities that cause impacts to the soil. Preserving the pre-construction condition of Project area soils is an essential step in reducing impacts on other important resources, especially water quality and vegetation.

The Project proponent would base erosion-control measures on an assessment of site-specific conditions and would include minimizing the extent of disturbed areas, stabilizing disturbed areas, and protecting slopes and channels in the Project area. Measures to control sedimentation would focus on retaining sediment on-site and implementing controls along the Project perimeter.

Prior to construction, the Project would require the completion of geotechnical engineering and hydrology studies that characterize site conditions related to drainage patterns, soils (including erosion potential), vegetation, surface water bodies, land subsidence, and steep or unstable slopes. Many of the mitigation measures mentioned in the draft UGP Wind PEIS would be contained in the Stormwater Pollution Prevention Plan (SWPPP) and the other plans and permits required for the Project.

The conservation measures for soil resources from the draft PEIS include:

- Avoiding placement of wind energy facilities in areas with unsuitable seismic, liquefaction, slope, subsidence, settling, and flooding conditions.
- Using existing roads and disturbed areas to the extent possible.
- Siting new roads to follow natural land contours avoiding excessive slopes.
- Siting new roads to avoid stream crossings and wetlands and minimize the need to cross drainage bottoms.

- Surfacing new roads with aggregate materials, wherever appropriate.
- Restricting heavy vehicles and equipment to improved roads to the extent practicable.
- Controlling vehicle and equipment speed on unpaved surfaces.
- Conducting construction and maintenance activities when the ground is frozen or when soils are dry and native vegetation is dormant.
- Stabilizing disturbed areas that are not actively under construction using methods such as erosion matting or soil aggregation, as site conditions warrant.
- Salvaging topsoil from all excavation and construction activities to reapply to disturbed areas once construction is completed.
- Disposing of excess excavation materials in approved areas to control erosion.
- Isolating excavation areas (and soil piles) from surface water bodies using silt fencing, bales, or other accepted appropriate methods to prevent sediment transport by surface runoff.
- Using earth dikes, swales, and lined ditches to divert local runoff around the work site.
- Reestablishing the original grade and drainage pattern to the extent practicable.
- Reseeding disturbed areas with a native seed mix and re-vegetate disturbed areas immediately following construction.

2.2 Air Resources

This section of the EA discusses the climate and air quality in the Project area. Specifically, this section analyzes the likely impacts of the Project on air quality during construction and operation. This section also proposes conservation measures for potentially adverse impacts.

2.2.1 Existing Conditions

South Dakota has a typical continental climate with extreme summer heat and cold winters. Temperature extremes have ranged from -58°F to 120°F. Large ranges of daily, monthly, and annual temperatures are the result of the State's geographical location and continental influence on regional weather patterns. According to South Dakota State University (SDSU), the 30 year average annual precipitation for Grant and Roberts Counties from 1971-2000 was 21-23 inches (SDSU, 2014). Located in central North America, South Dakota is within a continental weather pattern that produces cyclones and anticyclones.

As of this writing, there are currently no designated nonattainment areas for all criteria pollutants in South Dakota. The air quality monitoring station closest to the Project area is located in Watertown, South Dakota. Only

particulate matter (dust) is monitored at this location. South Dakota is located in the high plains, which are subject to periods of droughts and high winds. These are the main ingredients for fugitive dust problems. Fugitive dust is identified as dust from mining activity, gravel roads, construction activity, street sanding operations, and wind erosion from agricultural fields.

According to the EIA, in 2011 South Dakota ranked 47th in the U.S. for carbon dioxide emissions at 15.1 metric tons. In 2011, South Dakota received 77 percent of its total net electricity from renewable sources, wind and hydroelectric power (EIA, 2014).

2.2.2 Potential Impacts of the Alternatives

The Project proponent would obtain the appropriate permits from Grant County and state and federal agencies prior to construction. Grant County does not require air dispersion modeling for potential air quality impacts resulting from construction activities, which would be localized and temporary in nature. However, the Project proponent would be required to comply with conservation measures and BMPs as a result of the permits and plans required for the Project.

Air quality impacts could result from construction equipment emissions and fugitive dust from earth moving activities. These construction activities could release air emissions of criteria pollutants, volatile organic compounds (VOCs), greenhouse gases (GHGs) (e.g., carbon dioxide (CO_2)), and small amounts of hazardous air pollutants (HAPs) (e.g., mercury [Hg]). If a concrete batch plant is temporarily needed, the operation of diesel generators for the batch plant and storage piles of sand or aggregates might be additional air emission sources. The operation of ancillary equipment associated with concrete processing, such as small mixers, vibrators, and concrete pumps, would generate air emissions in small amounts. Construction activities for a wind energy development project would typically last for six to twelve months. Accordingly, potential impacts of construction activities on ambient air quality are expected to be minor and temporary in nature.

As noted in the draft UGP Wind Energy PEIS, the greatest potential for air emissions and adverse air quality impacts would result from soil disturbances during the site preparation phase caused by the intense use of heavy equipment over a short time period (through release of fugitive dust). However, the Project proponent can greatly reduce the potential for air quality impacts by implementing the appropriate conservation measures. For example, the Project proponent selected a remote agricultural area for the Project. Although construction activities could have some impacts at the

nearest residence, the Town of Summit already likely has heightened levels of particulates from agricultural activities and therefore construction is expected to make a negligible contribution to existing air concentration levels.

The No Action Alternative would have no direct impact on air quality. However, selection of the No Action Alternative could potentially cause the Project proponent to reconsider the previously rejected interconnection alternative at the Big Stone Substation in Big Stone, South Dakota, which would require the construction of a 30-mile electric transmission line. Constructing this new transmission line could result in greater construction-related impacts to air quality.

The Project proponent expects the operation of the proposed Project to have an overall benefit on air quality. Conventional power plants burning fossil fuels are major sources of criteria pollutants, VOCs, and GHGs. The burning of some fossil fuels, such as coal, also results in emissions of HAPs. There are no direct air emissions from operating wind turbines because no fossil fuels are combusted. Accordingly, wind energy facilities would generate very low levels of air emissions during the operation period.

During operations, emissions from the Project would include minor dust and engine exhaust emissions from vehicles and heavy equipment associated with maintenance activities as well as wind erosion from bare ground and access roads. The Project proponent expects negligible VOC emissions during the routine maintenance activities of applying lubricants, cooling fluids, and greases. A small amount of combustion-related emissions may be produced during periodic operation of diesel emergency generators as part of preventative maintenance (e.g., two hours per month) and possibly from the heating system for space heating of O&M facilities including the office and maintenance shop. These emissions would not exceed air quality standards or have any impacts on climate change.

The operation phase associated with the proposed transmission line would generate very small amounts of criteria pollutants, VOCs, GHGs, and HAPs from periodic site inspection and maintenance. In addition, transmission lines may produce minute amounts of ozone (O3) and nitrogen oxides associated with corona discharge (i.e., the breakdown of air near high-voltage conductors). All these emissions during the operation phase would be quite small; therefore, potential impacts on ambient air quality would be negligible.

Operation of the Project would avoid considerable amounts of criteria pollutants and HAP emissions that would otherwise have been generated from power plants burning nonrenewable and emission-producing fossil

fuels. The Project could substantially improve adverse impacts on ambient air quality by reducing visibility impairment, ecological damage caused by acid rain, and elevated O3 and PM concentrations that are associated with respiratory and cardiovascular diseases.

According to DOE a single 1 MW wind turbine can displace 1,800 tons of CO_2 in 1 year (equivalent to planting 1 square mile of forest). This means the proposed 80-100 MW Project has the capability of avoiding up to 180,000 tons of CO_2 annually (DOE, 2011).

For the No Action Alternative, there would be no incidental air quality impacts associated with routine maintenance and operation activities of the wind farm and transmission line. However, the substantial air quality and climate benefits associated with the operation of the wind farm would not occur if the wind farm is not constructed.

In conclusion, the Project area is not in a sensitive, non-attainment zone. Temporary Project impacts for the POI associated with air quality would be negligible and would be controlled by the conservation measures from the draft UGP Wind PEIS. The Project would have an overall positive environmental impact on air quality during operations.

2.2.3 Proposed Conservation Measures

The Project proponent has taken conservation measures for the Project, as applicable, from the draft UGP Wind PEIS.

As mentioned in Section 1.4.1, the Project proponent has already avoided and minimized placement of wind energy facilities on USFWS grassland easement interests and has located facilities near existing roads to minimize the need for construction of new access roads to the greatest extent practicable.

General conservation measures applicable to multiple phases of Project development include the following:

- Use of surface access roads, on-site roads, and parking lots with aggregates or that maintain compacted soil conditions to reduce dust generation.
- Post and enforce lower speed limits on dirt and gravel access roads to minimize airborne fugitive dust.
- Minimize potential environmental impacts from the use of dust palliatives by taking the necessary measures to keep the chemicals out of sensitive terrestrial habitats and streams. The application of dust

palliatives must comply with federal, state, and local laws and regulations.

- Ensure that all pieces of heavy equipment meet emission standards specified in the State Code of Regulations and conduct routine preventive maintenance, including tune-ups to manufacturer specification to ensure efficient combustion and minimum emissions.
- Employ fuel diesel engines in facility construction and maintenance that use ultra-low sulfur diesel, with a maximum 15 ppm sulfur content.
- Limit idling of diesel equipment to no more than 10 minutes unless necessary for proper operation.

Conservation measures applicable during construction activities include the following:

- Stage construction activities to limit the area of disturbed soils exposed at any particular time.
- Water unpaved roads, disturbed areas (e.g., scraping, excavation, backfilling, grading, and compacting), and loose materials generated during project activities as necessary to minimize fugitive dust generation.
- Install wind fences around disturbed areas if windborne dust is likely to impact sensitive areas beyond the site boundaries (e.g., nearby residences).
- Spray stockpiles of soils with water, cover with tarpaulins, and/or treat with appropriate dust suppressants, especially when high wind or storm conditions are likely. Vegetative plantings may also be used to limit dust generation for stockpiles that will be inactive for relatively long periods.
- Train workers to comply with speed limits, use good engineering practices, minimize the drop height of excavated materials, and minimize disturbed areas.
- Cover vehicles transporting loose materials when traveling on public roads and keep loads sufficiently wet and below the freeboard of the truck in order to minimize wind dispersal.
- Inspect and clean tires of construction-related vehicles, as necessary, so they are free of dirt/mud prior to entering paved public roadways.
- Clean (e.g., through street vacuum sweeping) visible trackout or runoff dirt from the construction site off public roadways.

The proposed Project would have few emission sources during operations. No additional mitigation measures are considered necessary, but some of the dust control measures proposed for construction may be applicable to minimize fugitive dust emissions during routine maintenance activities.

Decommissioning activities generally mirror construction activities; thus, the same mitigation measures should be applied during decommissioning as would be applied during construction.

2.3 Water Resources

This section of the EA discusses the wetlands, surface waters and ground water resources in the Project area. Specifically, this section analyzes the likely impacts of the Project on water resources during construction and operation. This section also proposes conservation measures for potentially adverse impacts.

2.3.1 Existing Conditions

The proposed Project is located within the Upper Great Plains sub-region of the Upper Mississippi Hydrologic Region. Land use within this Hydrologic Region is primarily agricultural (70 percent) and forest (25 percent), with about 5 percent urbanized. Mean annual discharge (including tributaries) is 126,285 ft^3/s (3,576 m^3/s). Water quality is hard and slightly alkaline. Nitrate-N and total phosphorus (from fertilizers) are low in the headwaters and increase downstream.

Based on a desktop review of USFWS National Wetland Inventory (NWI) maps, National Hydrography Dataset (NHD), Google Earth imagery, and topographic maps, a number of relatively small freshwater emergent wetlands and ponds occur in the northeast portion of the Project area that appear hydrologically connected to a larger system of wetlands and lakes. This includes Summit Lake and Twin Lakes, which are located east of the Project area. The wetlands appear to be isolated prairie-pothole wetlands of various sizes, but are likely hydrologically connected via groundwater. In the north-central portion of the Project area, water drains to the north - northwest; drainage channels are intermittent. Upper tributaries appear to be primarily swales in farm fields and pastures while main-stem drainages appear to have defined channels. In this part of the Project area, water flows from the east side of Interstate 29 to the west side under bridges or culverts that allow uninterrupted flow into the Big Sioux River. In the western and southern parts of the Project area, water flows to the west via intermittent channels into the Indian River, which ultimately flows into the Big Sioux River. These intermittent channels appear to be primarily swales in farm fields and pastures with few adjacent wetlands or ponds along the channels.

Based on the NWI mapping data, there are approximately 308 acres of wetlands and ponds, not including streams and rivers, within the 13,700 acre Project area. Therefore, based on NWI data, less than 2 percent of the

total Project area is mapped as wetlands or open water. The vast majority of these NWI mapped wetlands (approximately 87 percent) are characterized as freshwater emergent wetland, while most of the remaining NWI wetlands are freshwater ponds (approximately 12 percent). The Project proponent is overseeing ongoing field delineation to verify the NWI data because it can sometimes under-predict wetland resources.

2.3.2 Potential Impacts of the Alternatives

The proposed Project's use of water resources, the degradation of water quality, and the alteration of natural flow systems all relate to construction phase activities that are temporary in nature and short in duration. The Project proponent has remapped the Project to avoid all NWI mapped wetlands.

Water would be needed for various construction activities, including drinking water for site workers, concrete mixing, dust suppression, and vehicle washing. If the Project proponent does not transport water to the site, it would likely obtain water during the construction phase from local surface water bodies or groundwater wells, depending on their availability. Water withdrawals from local streams or rivers could potentially reduce streamflow and groundwater recharge. Groundwater withdrawals could potentially lower the water table and change the direction of groundwater flow. The magnitude of these impacts would depend on the volume of water required for the construction phase and the capacities of available water resources. Water use impacts during the construction phase would be localized and short in duration.

Water quality degradation of both surface water and groundwater resources is an important concern for any activity that involves land disturbance. For surface water bodies (rivers, streams, lakes, and wetlands), one of the leading water quality issues is soil erosion. Sediment loading in surface water is caused when ground disturbance occurs and the loosened material is transported off-site during storm water events. Increased sediment transport raises streambeds and fills in adjacent wetlands. Sediment that remains suspended in surface water can degrade aquatic wildlife habitat and damage commercial and recreational fisheries. Sediment loading also increases the cost of water treatment for municipal and industrial users. Soil erosion can also degrade the quality of surface water by introducing other kinds of contaminants (e.g., crop nutrients) and changing its pH.

Groundwater quality degradation occurs mainly through infiltration at the recharge location. Shallow, unconfined aquifers with a high rate of recharge are generally more susceptible to contamination than deep aquifers with an overlying (impermeable) confining unit and a low rate of recharge. Recharge

typically occurs in areas of high elevation (like hills or plateaus), but can also occur in stream valleys. Recharge areas for a given location may be in close proximity or some distance away; therefore, it is important to understand the groundwater flow regime for aquifers in the vicinity of a construction site, especially if they are sources of drinking water. Recharge rates are generally a function of climate (i.e., how much precipitation occurs in an area) and soil characteristics (e.g., porosity, degree of compaction, and ground slope). In an area where land disturbance has occurred, contamination can be introduced to groundwater directly through the leaching of soils and infiltration of spills or leaks at the surface, or indirectly through recharge by a surface water body that has been contaminated. Soil compaction, which also occurs in disturbed areas (mainly from the weight of heavy vehicles and equipment), tends to reduce infiltration rates and increase surface runoff.

Ground-disturbing activities related to the excavation and installation of wind towers and construction of ancillary structures and related infrastructure could adversely impact surface water quality if not properly mitigated. Ground-disturbing activities that could contribute to adverse water quality impacts include vegetation clearing, excavating, trenching, dewatering sites, stockpiling excavated soil and building roads. Building access roads, with associated culverts within streams, could also affect water quality during the construction period due to increased soil erosion. Accidental spills or leaks from transformers and other liquid-filled devices at substations also have the potential to adversely impact the quality of nearby surface water bodies and shallow aquifers (although the potential for accidental releases is lessened by the standard use of spill containment systems at substations). Increased surface runoff resulting from soil compaction during access road construction could affect sediment loads in nearby surface water bodies. Erosion rates and runoff potential are naturally lower at project sites located on relatively level terrain and in arid and semiarid climates; however, implementing BMPs and mitigation measures to minimize soil compaction and control soil erosion and surface runoff would further reduce potential impacts to water quality.

Executive Order 11990, "Protection of Wetlands," requires all federal agencies to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands (U.S. President 1977). Impacts to jurisdictional wetlands (those under the regulatory jurisdiction of section 404 of the CWA) would require permitting by the Corps; however, permitting for wetland impacts may also be required by state agencies. Because of these requirements, the Project proponent would avoid wetlands when siting the Project. The Project proponent does not expect the large built components of the Project (including wind turbine generators, the staging area, the O&M facility, the collection station and the interconnection substation) to impact any wetlands. The Project proponent

has substantially rerouted the proposed Project in order to avoid all mapped wetlands. Field delineations are currently in progress in order to verify that there are no wetlands in the proposed disturbed Project area. If new wetlands are discovered in the Project area, the Project proponent would attempt to reroute project facilities to the greatest extent practicable. If this is not possible, the Project proponent would apply for a federal wetland permit and employ the wetland conservation measures from the draft UGP Wind PEIS.

Stormwater permits may be required for excavation sites where shallow groundwater is present and dewatering is necessary. Since only portable sanitary facilities would be used by site workers during the construction phase, discharge permits for managing sanitary discharges would not be required.

Water use during the O&M phase would be mainly for periodic cleaning of wind turbine rotor blades to eliminate dust and insect buildup. Water for cleaning blades is generally needed in only arid climates that do not get enough rainfall to keep the blades clean. The Project proponent may bring in water for this purpose from an offsite source, which means that there should not be any impacts to surface water or groundwater. For some wind energy projects, the Project proponent may construct O&M facilities that require the development of wells to provide water for drinking and sanitation purposes. In such cases, the water requirements would likely be relatively small and impacts on surface water or groundwater resources would also be small.

Accidental spills or leaks from transformers and other liquid-filled devices at substations may adversely impact the quality of nearby surface water bodies and shallow aquifers during the O&M phase (although the potential for accidental releases is lessened by the standard use of spill containment systems at substations). Herbicides, if they are used to control noxious weeds and vegetation growth around towers and access roads, could also degrade water quality in nearby surface water bodies and shallow aquifers.

Decommissioning would involve ground-disturbing activities that could increase the potential for soil compaction (i.e., soil erosion, surface runoff, and sedimentation of nearby lakes, rivers, and streams) and thus potentially affect the quality of water in nearby surface water bodies. Ground disturbance and soil erosion rates would be potentially high (although less than during the construction phase), but they would be temporary and local. Erosion rates and runoff potential are naturally lower at project sites located on relatively level terrain and in arid and semiarid climates. If a well is developed to supply drinking and sanitation water for an O&M facility, the Project proponent would cap the well during decommissioning unless the

facility plans on continuing use for some other purpose. Implementing BMPs and mitigation measures to minimize soil compaction and control soil erosion and surface runoff, as well as following standard practices for capping wells, would reduce water quality or quantity impacts during decommissioning to negligible or low levels.

The No Action Alternative would have no direct impact to water resources. However, selection of the No Action Alternative could potentially cause the Project proponent to reconsider the previously rejected interconnection alternative at the Big Stone Substation in Big Stone, South Dakota, which would require the construction of a 30-mile electric transmission line. Constructing this new transmission line could result in greater impacts to water resources.

2.3.3 Proposed Conservation Measures

The following discussion on conservation measures for the Project has been drawn, as applicable, from the draft UGP Wind PEIS.

The main objective of the BMPs and minimization measures for water resources is to protect the quality and quantity of water in natural water bodies in and around a wind energy project. Many of the proposed conservation measures would be components of the various plans required by State of South Dakota and local agencies to mitigate the impacts of the proposed Project, such as: the Drainage, Erosion, and Sedimentation Control Plan; the Vegetation Management Plan; the Habitat Restoration and Management Plan; and the Stormwater Pollution Protection Plan. The Project proponent would create, revise, or amend such plans as necessary to account for changes in site conditions as the proposed Project proceeds from construction through O&M to the decommissioning phase. The Project proponent would obtain all applicable federal, state, and county permits and fulfill permit conditions.

The following conservation measures for water resources are part of the proposed Project:

- Minimize the extent of land disturbance to the extent possible.
- Use existing roads and disturbed areas to the extent possible.
- Site new roads to avoid crossing streams and wetlands and minimize the number of drainage bottom crossings to the extent possible.
- Apply standard erosion control BMPs to all construction activities and disturbed areas (e.g., sediment traps, water barriers, erosion control matting) as applicable to minimize erosion and protect water quality.
- Apply erosion controls relative to possible soil erosion from vehicular traffic.

- Identify and avoid unstable slopes and local factors that can cause slope instability (groundwater conditions, precipitation, seismic activity, high slope angles, and certain geologic landforms).
- Identify areas of groundwater recharge and discharge and evaluate their potential relationship with surface water bodies and groundwater quality.
- Avoid creating hydrologic conduits between two aquifers (e.g., upper and lower).
- Construct drainage ditches only where necessary; use appropriate structures at culvert outlets to prevent erosion.
- Avoid altering existing drainage systems, especially in sensitive areas such as erodible soils or steep slopes.
- Clean and maintain catch basins, drainage ditches, and culverts regularly.
- Limit herbicide and pesticide use to non-persistent, immobile compounds and apply them using a properly licensed applicator in accordance with label requirements.
- Dispose of excess excavation materials in approved areas to control erosion and minimize leaching of hazardous materials.
- Reestablish the original grade and drainage pattern to the extent practicable.
- Reseed (non-cropland) disturbed areas with a native seed mix and revegetate disturbed areas immediately following construction.
- Ensure that any wells are properly filled and capped during decommissioning.

Although the Project has avoided all mapped wetlands, the project Proponent is overseeing ongoing field delineation. It is unlikely that the Project would temporarily or permanently impact wetlands. However, the Project proponent would undertake a suitable on-site or off-site compensatory mitigation project, if required, to mitigate for unavoidable permanent wetland and stream impacts associated with the Project,. The Project Proponent would develop a suitable compensatory mitigation project in consultation with the South Dakota DENR and the Corps during the Joint Application for Permit process.

The Project proponent is not proposing any mitigation for indirect or temporary impacts to wetlands or streams because the Project would not result in any loss or permanent conversion of wetland acreage. However, the Project proponent would minimize any temporary impacts to wetlands/streams identified during field delineation during Project construction and implement, as necessary, appropriate construction methodologies, erosion and sedimentation control plans, and required natural resource protection measures.

2.4 Vegetation

2.4.1 Existing Conditions

This section describes the general vegetation, including rare plants, invasive species and noxious weeds within the Project area, based on the Tier 2 Study, existing data and field observations.

2.4.1.1 Vegetation Communities

The proposed Project area is located in both the Prairie Coteau and Big Sioux Basin of the Northern Glaciated Plains ecoregions. The dominant land cover types within the Project area are grasslands, (pasture and hay fields, approximately 53 percent of land cover within the Project area) and cultivated cropland, (soybeans (*Glycine max*), corn (*Zea mays*) and spring wheat (*Triticum aestivum*), approximately 40 percent of land cover)). The Project area also contains a small amount of open water and emergent wetlands, shrubland and forestland, totaling approximately 3 percent of land cover (United States Department of Agriculture National Agricultural Statistics Service [NASS 2012]).

2.4.1.2 Rare Plant Population

According to the USFWS, the only federally listed plant species with potential to occur in the Project area is the western prairie fringed orchid (*Platanthera praeclara*) (USFWS, 2014). This species is listed as having the potential to occur in Roberts County, however, there were no known populations in the County as of October 2012 (USFWS South Dakota Field Office [SDFO] 2012). The western prairie fringed orchid is a perennial orchid of tallgrass prairies and wet meadows and is commonly associated with big bluestem (*Andropogon gerardii*), little bluestem (*Schizachyrium scoparium*), switchgrass (*Panicum virgatum*), and Indiangrass (*Sorghastrum nutans*). It is believed to be extirpated from South Dakota, possibly due to conversion of prairie to cropland and habitat fragmentation, competitive exotic plants, and chemical applications associated with agriculture. Based on the plant's habitat requirements and the scarcity of that habitat within the Project area, it is unlikely to occur; however, the Project proponent should perform surveys if potential habitat for the species would be impacted (WEST, 2014).

The proposed Project occurs within the Northern Tallgrass Prairie ecoregion. Tallgrass prairie once covered more than 200 million acres (over 809,372.5 hectares [ha]). Today less than 4 percent of the original tallgrass prairie remains; people have converted the majority of tallgrass prairie to cropland. Dakota Tallgrass Prairie Wildlife Management Area was created to help maintain the biodiversity of this ecoregion and slow habitat fragmentation

because fragmented areas are vulnerable to pesticide drift and contamination, soil erosion, and general degradation. The Tallgrass Prairie Wildlife Management Area occurs within or close to the SWRA (WEST, 2014).

The Project proponent understands that special care should be given to avoid damage to unfragmented landscapes and high quality prairie. The Project proponent would identify grasslands and grassland easements that may be disturbed as development efforts continue. A grasslands delineation study is the primary step to determine the exact size and extent of the grasslands in the Project area.

2.4.1.3 Noxious and Invasive Weeds

A noxious weed is any plant designated by a governmental agency as injurious to public health, agriculture, recreation, wildlife or property. An invasive species is an organism that is non-native and is able to rapidly spread, aggressively alter its new environment, and cause harm to the economy, environment, or human health. Prior to construction, the Project proponent would survey areas that would be disturbed for noxious and invasive weeds.

2.4.2 Potential Impacts of the Alternatives

The Project proponent anticipates that impacts to vegetation communities during construction and operation would be negligible because only a small portion of the Project area would be affected and to the Project proponent would employ the conservation measures in the draft UGP PEIS. While the footprint of permanent structures is expected to occupy approximately 0.18 percent of the Project area (Denholm et al. 2009), the area temporarily disturbed by construction activities would be approximately 1.8 percent of total Project area.

The proposed Project would temporarily affect 240.43 of the 13,700 acres within the Project area. The majority of non-agricultural plant communities within the Project area that would be affected are former pasture and prairie communities. (*See* Table 2.4.2-1: Proposed Temporary Disturbance Impacts on Vegetation Communities).

Table 2.4.2-1 Proposed Temporary Disturbance Impacts on Vegetation Communities

Vegetation Community	Access Roads	Crane Walks	Laydown Area	Sub-station	Tur-bines	Under ground Collec-tion Lines	Trans-mission Lines	Total Distur-bance

Vegetation Community	Access Roads	Crane Walks	Laydown Area	Sub-station	Tur-bines	Under ground Collec-tion Lines	Trans-mission Lines	Total Distur-bance
Agriculture (cropland, hayfields, pasture)	22.51	39.71	10.0	0.90	41.13	21.12	11.17	146.55
Developed	0.00	0.11	0.00	0.00	0.00	0.17	1.42	1.70
Farmsteads/ Rural Homes	0.00	0.59	0.00	0.00	0.00	0.41	0.00	0.99
Grasslands	8.98	26.43	0.00	0.00	20.49	17.77	14.69	88.36
Grasslands Associated with Drainage	0.02	1.59	10.0	0.00	0.00	0.13	0.00	1.74
Grasslands Associated with Wetlands	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Shrubs / Trees	0.00	0.07	0.00	0.00	0.00	0.21	0.81	1.09
Wetlands	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total (acres)	31.51	68.50	10.00	0.90	61.62	39.81	28.09	240.43

Factors associated with wind energy development that may result in impacts to plant communities include ground disturbance and modification, hydrologic changes, decreased water quality, changes in soil characteristics, deposition of fugitive dust, and accidental releases of hazardous materials.

Plant communities would experience long and short-term direct and indirect impacts from site preparation, earthmoving, and excavation activities associated with construction of staging areas, access roads, foundations, and electrical interconnect corridors. Vegetation may be adversely affected by injury or mortality of vegetation, fugitive dust, exposure to contaminants, and the introduction of invasive species.

Direct impacts would primarily be associated with the mortality of the vegetation and loss of habitat present within the footprint of permanent structures, including turbine towers and access roads. All vegetation would be cleared from the construction footprint, including construction laydown,

equipment assembly, and staging areas. These areas may also require grading.

Indirect impacts to plant communities near construction areas may result from site development activities. Effects of habitat loss and modification include the fragmentation of remaining native habitat. Reductions in the size, number, or isolation of remaining habitat areas can result in long-term changes in species composition or structural changes and reductions in biodiversity. The fragmentation of larger undisturbed high quality habitat is more significant than construction in previously disturbed or fragmented habitat. Increased shading in prairie habitats adjacent to permanent structures could result in slight changes in species composition; however, any changes would likely be relatively insignificant. Changes in forest or woodland interiors from tree removal or clearing of adjacent areas can include result in increased light levels, reduced soil moisture, increased transpiration, introduction of shade-intolerant species, and increased browsing. Additional decline or mortality of trees near the construction boundary may subsequently occur. However, as noted above, there are few trees present within the Project area so tree removal would be limited.

Soils disturbed by construction activities may be a source of fugitive dust or sedimentation during the construction period. Soils excavated for tower foundations would be stockpiled for a period of time before excavations are backfilled. The deposition of airborne dust on plants in nearby habitats may result in reduced growth and reproduction; however, because deposition would generally be temporary and minimization measures would be implemented (i.e. mulch, silt fence) impacts to plant communities would likely be of short duration. In agricultural areas, the generation of fugitive dust as a result of wind energy development would only negligibly contribute to existing dust generation.

Erosion of exposed soils may result in sedimentation of wetlands near construction areas or downstream wetlands receiving storm water runoff. However, the Project proponent would mitigate adverse effects by implementing appropriate erosion and sediment control mechanisms. Sedimentation may reduce plant growth, particularly to native species sensitive to disturbance. Biodiversity may be reduced in wetland communities as sensitive species are displaced by species more tolerant of disturbance. Changes in community composition may also include the increase or establishment of invasive plant species. Although the effects of sedimentation associated with a wind energy project may not be widespread, they could result in long-term impacts on local wetland communities in certain circumstances. However, because of regulatory requirements limiting the generation of fugitive dust and release of sediments it is likely that impacts from these factors would be minor.

Plant communities adjacent to Project construction areas could be affected by hydrologic changes such as reduced infiltration and increased runoff from exposed or compacted soils. Alterations of surface drainage patterns, including stream crossings along Project roads or access roads, could result in hydrologic changes in wetlands. Hydrologic changes could result in long-term changes in wetland plant community composition, including the increase or establishment of invasive species. Changes in local hydrology may also occur if the Project proponent withdraws water for the production of concrete at an on-site batch plant or performs dewatering excavations for tower foundations. Locally reduced groundwater levels may affect nearby wetlands that are supported by groundwater discharge; however, impacts from water use or dewatering during construction would be localized and temporary. Trenching for the installation of power cables may also alter surface and subsurface flows, resulting in long-term changes in the hydrology of wetlands along or near the cable line. The Project proponent expects excavations for foundations, roadways, and underground collector lines to be relatively shallow and occur in a minimal amount of land within the overall Project area. The Project proponent expects impacts to plant communities to be minimal since hydrologic changes would be very localized and temporary.

Construction equipment and vehicles brought to the Project site may introduce seeds or other propagules of invasive plant species. Such species can become established and spread rapidly, displacing native species and sometimes forming monocultures over extensive areas and decreasing habitat quality. Invasive species could also become established in undisturbed native communities near the Project, or become established on soils disturbed by Project activities and spread to adjacent areas. The Project proponent will utilize appropriate mitigation measures to minimize the spread of noxious weeds and invasive species within the Project area.

The Project proponent would reestablish plant communities Project completion in temporary use areas, such as concrete batch plants, material laydown areas, and staging areas. Although native plant communities may be restored on disturbed sites, the species composition may vary considerably from local plant communities. Revegetation success and timeframe would depend on the climate, soils, and plant community types within the Project area. The Project proponent would use appropriate plant species and methods during the restoration processes for the Project.

Hazardous materials used and stored on the Project site may include diesel fuel, transmission fluid, glycol-based coolant, or dielectric fluids, as well as chemicals that may be used in turbine preparation or assembly. Accidental releases of these materials may impact plant communities in the vicinity of

the spill. The magnitude of impacts would depend on the type and volume of material spilled, the location, and habitat affected. However, because only small volumes of these hazardous materials are kept at the Project area on a short-term basis, an uncontained spill would likely be relatively small and affect only a limited area. In addition, the Project proponent would implement required spill prevention and response plans to limit potential impacts from a spill, should one occur.

The proposed Project would have negligible permanent impacts on vegetation communities, permanently affecting 24.91 of the 13,700 acres within the Project area, or approximately 0.18 percent of the Project area. (*See* Table 2.4.2-2: Proposed Permanent Disturbance Impacts on Vegetation Communities).

2.4.2-2 Proposed Permanent Disturbance Impacts on Vegetation Communities

Vegetation Community	Access Roads	O&M Building	Overhead Transmis-sion Line	Substation	Turbines	Total Disturbance
Agriculture (cropland, hayfields, pasture)	13.85	0.35	0.01	1.50	1.84	17.55
Developed	0	0.00	0.003	0.00	0.00	0.00
Farmsteads/ Rural Homes	0	0.00	0.00	0.00	0.00	0.00
Grasslands	6.47	0.00	0.037	0.00	0.88	7.39
Grasslands Associated with Drainage	0.02	0.00	0.00	0.00	0.00	0.02
Grasslands Associated with Wetlands	0	0.00	0.00	0.00	0.00	0.00
Shrubs/ Trees	0	0.00	0.012	0.00	0.00	0.01
Wetlands	0	0.00	0.000	0.00	0.00	0.00
Total	20.34	0.35	0.062	1.50	2.72	24.97

Activities associated with the O&M of the proposed Project would include mowing and weed control as part of a site vegetation management program. Mowing would maintain plant communities in early stages of ecological succession and could prevent reestablishment of some desirable species. Plant community succession would remain restricted over the lifetime of the facility. The Project proponent may perform a licensed application of herbicides in addition to, or instead of, mowing to control vegetation near access roads, utility and transmission corridors, support buildings, and turbine towers. Herbicide applications could result in impacts to non-target

species from aerial drift during application or from herbicides transported by surface water runoff. However, requirements that herbicides be applied by properly licensed applicators in accordance with label and application permit directions make such effects unlikely.

Hazardous materials, such as transmission lubricating oils, coolants, paints or other corrosion-control coatings, herbicides, solvents, and fuels would be present on the Project site in limited quantities during the O&M of the Project. An accidental spill of herbicides may result in environmental concentrations exceeding licensed levels, and these herbicides may migrate off-site and affect native vegetation in surrounding areas. Because of the relatively small amount of fuel and other chemicals expected to be stored and used at the Project, however, the Project proponent expects that an accidental release of these materials would impact only a small area of the Project site. Thus, the Project proponent expects impacts to vegetation from exposure to accidental fuel or pesticide releases to be very localized and minor. Similarly, the Project proponent expects to only generate or store relatively small amounts of other hazardous materials at the Project site and therefore predicts that any resulting accidental releases would be small and primarily affect vegetation at the release location.

The O&M of transmission lines may also require tree and/or brush cutting or herbicide use as part of a ROW management program. However, as mentioned above, the Project proponent expects maintenance of ROWs in grassland and cropland habitats to require minimal activity and result in little or no change in plant community characteristics.

Impacts on plant communities during decommissioning would be similar in nature to the impacts resulting from original site development and construction. The Project proponent expects disturbance of habitats to primarily occur in previously disturbed areas. Storage and work areas would likely be required for decommissioning; however, the Project proponent may expand fuel or waste storage areas for these operations. Disturbance from excavation would be less than that associated with new construction at those locations where tower foundations and buried power cables are left in place. Disturbed areas would be returned to original grade, compacted soils would be restored, and native plant communities would be reestablished. Ground disturbance and soil erosion rates would be potentially high (although less than during the construction phase), but they would be temporary and local.

The accidental release of fuels, lubricants, solvents, or hazardous materials during decommissioning could impact plant communities in the vicinity of a spill.

The No Action Alternative would have no direct impact on vegetation resources. However, selection of the No Action Alternative could potentially cause the Project proponent to reconsider the previously rejected interconnection alternative at the Big Stone Substation in Big Stone, South Dakota, which would require the construction of a 30-mile electric transmission line. Constructing this new transmission line could result in greater impacts to vegetation resources.

2.4.3 Proposed Conservation Measures

During the construction phase, the draft UGP PEIS provides a variety of conservation measures to minimize the potential for construction activities to affect vegetation resources. In addition to BMPs and mitigation measures identified for other resource areas such as soils, water, air quality, and noise, the following measures would be applicable during construction activities for wind energy projects:

- Minimize the size of areas in which soil would be disturbed or vegetation would be removed.
- Reduce habitat disturbance by keeping vehicles on access roads and minimizing foot and vehicle traffic through undisturbed areas.
- Initiate habitat restoration of disturbed soils and vegetation as soon as possible after construction activities are completed. Restore areas of disturbed soil using weed-free native grasses, forbs, and shrubs, in consultation with land managers and appropriate agencies such as State or County extension offices or weed boards.
- Develop a plan for control of noxious weeds and invasive plants that could occur as a result of new surface disturbance activities at the site. The plan should address monitoring, weed identification, the manner in which weeds spread, and methods for treating infestations. Require the use of certified weed-free mulching.
- Establish a controlled inspection and cleaning area for trucks and construction equipment arriving from locations with known invasive vegetation problems. Visually inspect construction equipment arriving at the project area and remove and contain seeds that may be adhering to tires and/or other equipment surfaces. Regularly monitor access roads and newly constructed utility and transmission line corridors for the establishment of invasive species. Initiate weed control measures immediately upon evidence of the introduction or establishment of invasive species.
- Do not use fill materials that originate from areas with known invasive vegetation problems.

During the operations phase, the draft UGP PEIS provides a variety of conservation measures to minimize impacts on vegetation resources, including the following:

- Monitor access roads, utility and transmission line corridors, and tower site areas regularly for the establishment of invasive species. Implement weed control measures immediately upon evidence of the introduction of invasive species.
- Monitor tower site areas regularly for damage from erosion, washouts, and rutting. Initiate corrective measures immediately upon evidence of damage.

2.5 Wildlife

The evaluation of wildlife in this section is primarily focused on the Project area, but will also include some regional discussion because of the mobility of wildlife and presence of migratory birds. Existing literature and other information related to species distributions (with special focus on endangered, threatened, proposed, candidate, and sensitive species), migration pathways, wetlands and unique habitat within the Project area were reviewed. Information in this section is based upon the Tier 2 Study.

2.5.1 Existing Wildlife Conditions

2.5.1.1 Existing Wildlife Species

The Project proponent has not compiled a comprehensive and detailed list of wildlife species for the Project. However, the species of greatest concern as they relate to wind energy projects throughout the U.S. and in the UGP region (federal and state listed species, birds, and bats) are well known, and the Project proponent considered them in preparation of this EA and development of the Project. Extensive avian surveys have been conducted, the details of which are described below.

Based on the existing land cover, species associated with grasslands, shrublands, and croplands would likely be the most common species within the Project area and the surrounding region. In general, native land cover types that cover most of the Project area, including wetlands and grasslands, are not unique in the region. However, there are potential concerns regarding loss of native habitat. Because the land cover is not unique to the region, it is not likely to attract or concentrate bird or bat species compared to surrounding areas. However, several large wetland areas are located to the east and north of the Project area and several Dakota Tallgrass Prairie Wildlife Management Areas occur within or adjacent to the Project area. These areas may potentially attract bird and bat species.

Bats

According to WEST, seven species of bats are likely residents or migrants of the Project area, including the big brown bat (*Eptesicus* fuscus), eastern red bat (*Lasiurus borealis*), hoary bat (*Lasiurus cinereus*), silver-haired bat (*Lasionycteris noctivagans*), northern long-eared bat, little brown bat (*Myotis lucifugus*) and tricolored bat (*Perimyotis subflavus*) (WEST, 2014a).

Avian Species

WEST conducted multiple site visits from September 5 through December 18, 2013 as part of their avian surveys (WEST, 2014). The surveys included seven point locations throughout the Project area. Waterfowl were the most abundant bird type recorded, accounting for approximately 51 percent of observations. Three species (12.5 percent of all species) accounted for 74.6 percent of all observations: mallard (*Anas platyrhynchos*), Canada goose (*Branta canadensis*), and Franklin's gull (*Leucophaeus pipixcan*). All other individual species accounted for approximately 5 percent or less of the observations. WEST recorded 20 individual diurnal raptor observations within the Project area, representing five species. The most commonly recorded raptor species were red-tailed hawk (*Buteo jamaicensis*) (eight observations) and northern harriers (*Circus cyaneus*) (seven observations).

WEST did not observe any bald eagles (*Haliaeetus leucocephalus*) or golden eagles (*Aquila chrysaetos*) during the point counts. However, WEST has observed an active bald eagle nest approximately one mile east of the north central Project boundary. WEST is monitoring the nest from a distance for activity and will continue to evaluate the situation. The Project proponent is consulting, and will continue to consult, with the USFWS and South Dakota Game, Fish and Parks (SDGFP).

Two bird species of primary interest to wind energy development in the central and north-central United States are whooping cranes (*Grus americana*) and sharp-tailed grouse (*Tympanuchus phasianellus*). WEST did not observe any whooping cranes or sharp-tailed grouse leks (mating displays) during the surveys, although it did see individual sharp-tailed grouse (WEST, 2014). The sharp-tailed grouse is not state or federally listed but is a species of interest and monitored by the SDGFP.

2.5.1.2 Federal and State Threatened and Endangered Species

The Endangered Species Act (ESA) and Bald and Golden Eagle Protection Act (BGEPA), as administered by the USFWS, mandate protection of species federally listed as threatened or endangered and their associated habitats.

The ESA makes it unlawful to "take" a listed species without special exemption. Take is defined as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect or attempt to engage in any such conduct." Significant modification or degradation of listed species' habitats is considered "harm" under ESA regulations and projects that have such potential require consultation with USFWS and may require the issuance of an incidental take permit or mitigation measures to avoid or reduce impacts to these species. Candidate species only receive statutory protection from the USFWS after they are listed as a threatened or endangered species. However, federal agencies may elect to provide candidate species with protection even when they are not listed, and Western currently does so.

Six animal species listed by the USFWS as federally endangered, threatened, proposed, or candidate species to be listed as endangered or threatened, are known to or have the potential to occur in Grant and Roberts Counties. These species are: the endangered Topeka shiner (*Notropis topeka*), piping plover (*Charadrius melodus*), and Poweshiek skipperling (*Oarisma poweshiek*); the threatened Dakota skipper (*Hesperia dacotae*); and the proposed for listing as endangered northern long-eared bat (*Myotis septentrionalis*). WEST did not observe any federally listed species during the site visits.

Although the migratory path of the whooping crane (*Grus Americana*) is generally outside of the area of Grant and Roberts counties, the endangered whooping crane may migrate through the Project area. The Dakota skipper and Poweshiek skipperling may occur in tracts of native grassland habitat that surround the Project area, or may already exist within it. The northern long-eared bat may occur or migrate within the Project area because there is limited roosting (i.e., trees and buildings) and foraging habitat potential. It is unlikely that the bat would hibernate in or around the Project site due to the lack of caves and mines (WEST, 2014a).

In their technical services letter dated July 25, 2013, the USFWS only noted the potential for Dakota skipper and Poweshiek skipperling occurrence in the actual Project area, but this was prior to the proposed listing for northern long-eared bat.

South Dakota has an extensive list of state-listed endangered, threatened, and Species of Greatest Conservation Need, as designated by the SDGFP. WEST conducted a preliminary review of the birds and mammals (birds and bats are most likely impacted by wind facility development) from the State's list and found five bird species (Osprey, Bald Eagle, Peregrine Falcon, Whooping Crane, and Piping Plover) and one mammal species (the state threatened northern river otter), with the potential to occur in or near the Project area (WEST, 2014).

Whooping Crane

The whooping crane is a federally-listed endangered bird, with a 2011 winter population of 281 birds (WEST, 2014a). One self-sustaining wild population of whooping cranes currently exists in the world. Most whooping cranes migrate between breeding grounds in Wood Buffalo National Park, Canada and wintering areas in Aransas National Wildlife Refuge, Texas. Individuals depart the breeding ground in Canada and travel south through Northwest Territories, Alberta, Saskatchewan, Montana, North Dakota, South Dakota, Nebraska, Kansas, and Oklahoma, and reach the wintering ground on the Texas coast.

During migration, most birds pass through the central portion of South Dakota, and the defined migration corridor is about 65 miles to the west of the Project area, but whooping cranes may be found outside of the corridor. While migrating through South Dakota, cranes typically utilize shallow wetlands and marshes, the edges and sandbars of shallow rivers, and agricultural fields near a water source. It is unlikely that whooping cranes regularly migrate through the Project area or make substantial use of the Project area for roosting and foraging given distance the from the main migratory corridor (WEST, 2014a). WEST did not observe any whooping cranes during the 2013 surveys (WEST, 2014a and WEST, 2014b).

Topeka Shiner

The Topeka shiner is a federally-listed endangered species that is a small minnow native to the streams of the prairie. This small fish (up to about three inches in length) prefers small, quiet streams with clean gravel or sand substrates and vegetated banks. Declines in Topeka shiner abundance could be related to habitat degradation, sedimentation, impoundments of tributaries, and water quality declines. Although the shiner is not known to occur in the Project area, the predicted distribution does include the Project area and its immediate vicinity. Therefore, precautions should be exercised when working near waters in the Project area. As most wind projects are built on the higher ground, direct impacts from the turbines would not be expected. However, roads and power lines between turbines may cross these drainages. If impacts cannot be avoided to the streams, additional survey efforts and consultations with appropriate agencies may be needed.

Northern River Otter

The northern river otter (*Lontra canadensis*) is a state-listed threatened mammal. Riparian vegetation along a wetland margin is a key habitat

feature. Such vegetation may attract beavers (*Castor canadensis*), which enhance areas for river otters by creating foraging habitat and denning areas. Beaver bank dens, either active or abandoned, are important sites for temporary otter denning or resting. River otters often use fallen trees or logjams for shelter or foraging. River otter sightings have been recorded in Grant and Roberts counties. The northern river otter has the potential to occur within the Project area, as river habitat is available, but impacts from the development of the Project are unlikely because the Project proponent does not expect any stream area impacts (WEST, 2014a).

Poweshiek Skipperling

The Poweshiek skipperling is a small moth-like butterfly dependent on high quality tallgrass prairie and riparian areas with sedges. The Poweshiek skipperling population is declining in part due to habitat loss and degradation, so the butterfly was federally listed as endangered under the ESA in October 2014 (USFWS 2014). It has been found in recent years in North and South Dakota, Iowa, Minnesota, Wisconsin, and Michigan. In South Dakota, the butterfly has been found throughout the northeastern counties, including Grant and Roberts Counties; the South Dakota populations appear to be declining as well. If suitable habitat exists within the SWRA, Poweshiek skipperling surveys may be needed (WEST, 2014a). Proposed critical habitat is present on USFWS fee-title land 1.5 miles outside the Project area.

Dakota Skipper

The Dakota skipper butterfly is federally listed as threatened under the ESA (USFWS 2014). This small butterfly (1-1.5 inch [2.5-3.8 cm] wingspan) is found in the northeastern counties of South Dakota. The Dakota skipper is found in native, tallgrass, alkaline prairie, particularly in rolling pastures near wetlands. Conservation efforts include protection of remaining tracts of undisturbed native prairie. Because the Project contains native grasslands, there is the possibility for this species to occur in the Project area, and populations are known to occur east of the Project area, including in Grant County (WEST, 2014a), (WAPA, 2013). Proposed critical habitat is present on USFWS fee-title land 1.5 miles outside the Project area.

Northern Long-Eared Bat

The northern long-eared bat was recently proposed for federal listing as an endangered species (USFWS 2013e, 2013c). The northern long-eared bat may occur within the SWRA because there is limited roosting (i.e., trees and buildings) and foraging habitat potential and they may migrate through the

area, but it is unlikely to hibernate in or around the site due to the lack of caves and mines.

2.5.2 Potential Impacts of the Alternatives

Anticipated construction-related impacts to wildlife, with special attention to listed threatened and endangered species, are outlined in the following section based on the current Project area and studies conducted to date. The Project proponent expects impacts to wildlife to be limited to incidental injury and mortality due to construction activity and vehicular movement, construction-related silt and sedimentation impacts on aquatic organisms, habitat disturbance or loss associated with clearing and earth-moving activities, and displacement of wildlife due to increased noise and human activities.

In general, most wildlife species known or suspected to be present within the Project area do not use disturbed agricultural land within the area as their primary habitat. As a result, there would be minimal impact to most species. Impacts to avian species include collisions with wind turbines, transmission lines, and guyed met towers. The Project proponent would limit the risk of collisions from the Project by using modern turbine and associated facility designs (e.g., tubular rather than lattice towers, buried electrical interconnect, unguyed meteorological towers, etc.) and developing an ABPP. The POI is located 4.5 miles north of the Project area and an electric transmission line would be built to connect the Project with the POI. By siting the proposed transmission line parallel to an existing transmission line, the Project proponent has minimized the potential for new negative impacts on wildlife, such as collision mortality. Further, by employing the conservation measures from the draft UGP Wind PEIS, the Project proponent would drastically reduce any impacts associated with the transmission line.

As discussed above, listed wildlife species documented in the vicinity of the Project area utilize a variety of habitats, including wetlands, water bodies, and grasslands. The Project proponent has sited project components to avoid wetlands, streams, and grasslands to the extent practicable. The agricultural lands being affected are generally not high quality grassland habitat; therefore, the habitat being impacted by Project construction is unlikely to receive significant use by listed threatened and endangered species. However, to the extent that these species occur in the area, Project construction may result in limited disturbance or displacement of these species due to human activity and noise, or direct mortality impacts, especially during the short term construction period.

Habitat alteration and disturbance resulting from the operation of turbines and other wind farm infrastructure can make a site unsuitable or less

suitable for nesting, foraging, resting, or other wildlife use. Overall, the footprint of turbine pads, roads, and other Project infrastructure represents a very small percentage of the site following construction and restoration of the Project site. Therefore, overall land use is relatively unchanged by wind power development. However, the true amount of wildlife habitat altered by a wind power project can extend beyond the functional project footprint, due to the presence of tall structures and increased human activity.

The No Action Alternative would have no direct impact on wildlife. However, selection of the No Action Alternative could potentially cause the Project proponent to reconsider the previously rejected interconnection alternative at the Big Stone Substation in Big Stone, South Dakota, which would require the construction of a 30-mile electric transmission line. Constructing this new transmission line could result in greater impacts to wildlife.

2.5.3 Proposed Conservation Measures

The Project proponent would implement conservation measures to reduce impacts related to construction activity through careful site design (e.g., utilizing existing roads, avoiding sensitive habitat, and minimizing disturbance to the extent practicable), adherence to designated construction limits, and avoidance of off-limit sensitive areas.

The Project proponent may implement a variety of BMPs and conservation measures at wind energy projects to reduce potential ecological impacts. Many of the BMPs and conservation measures for soils (Section 2.1.3), air quality (section 2.2.3), water resources (Section 2.3.3), and vegetation (Section 2.4.3) would also reduce potential ecological impacts. In addition, the Project proponent may monitor the various phases of wind energy development to identify potential concerns and direct actions to address those concerns. Monitoring data can be used to track the condition of ecological resources, to identify the onset of impacts, and to direct appropriate site management responses to address those impacts. The Project proponent would produce the results of any required monitoring activities to the appropriate state or federal agencies in a timely manner.

The Project proponent has designed the Project and the transmission line associated with the POI to minimize bird and bat collision mortality to the greatest extent practicable and has followed the siting recommendations provided in the USFWS Land-Based Wind Energy Guidelines (USFWS, 2012a). The turbines in modern projects are placed much farther apart than in older wind farms where higher numbers of avian mortality have been documented. The Project turbines would also be mounted on tubular towers (rather than lattice), which prevent perching by birds. In an effort to further reduce avian and bat impacts, electrical collection lines between the turbines

would generally be buried. The Project proponent would minimize lighting of the turbines and other infrastructure to the extent allowed by the FAA, and would follow specific design guidelines to reduce collision risk (e.g., using blinking lights with the longest permissible off cycle). To minimize or completely avoid impacts to the active bald eagle nest observed approximately one mile east of the north central Project boundary, the Project proponent has changed the Project layout by moving 4 turbines away from the nest and off of native grassland.

The Project proponent is consulting with the USFWS regarding the appropriate bird and bat conservation strategies for this Project, including the potential for additional pre-construction avian or bat surveys and post-construction monitoring and reporting to the agencies.

To avoid and minimize impacts to aquatic resources resulting from construction-related siltation and sedimentation, the Project proponent would implement an approved sediment and erosion control plan and SWPPP (as described in Section 2.4). In addition, the Project proponent would develop and implement a SPCC Plan to minimize the potential for unintended releases of petroleum and other hazardous chemicals during Project construction and operation (also as described in Section 2.4).

2.6 Land Use

The proposed Project is located in Grant and Roberts Counties, both of which are in northeast South Dakota, approximately 30 miles north of Watertown and 25 miles west of Milbank. This section focuses on the land use within the Project area.

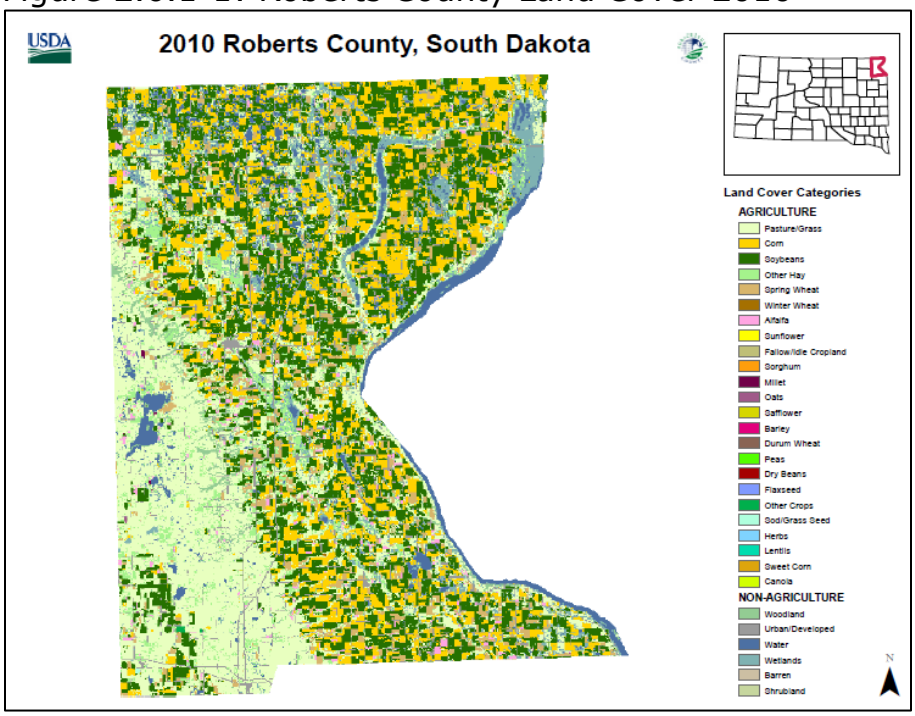
2.6.1 Existing Conditions

The Project encompasses approximately 13,700 acres in Grant and Roberts Counties, along the Coteau des Prairies, south of the Town of Summit, South Dakota. The Project area is comprised of predominantly rural residential and agricultural land (cropland and grazing pasture). Interstate 29 runs north-south through the middle of the Project area. The majority of the Project lies on private land inside the Sisseton-Wahpeton Oyate Reservation, which is not governed by the Tribal Planning Council. There is a SDGFP Game Production Area abutting the Project area to the east.

The Project turbines would be located completely within Grant County, which has a population density of 12 people per square mile. The Project Proponent would not site the Project within any city limit and would site all turbines a minimum of 1,400 feet from occupied residences.

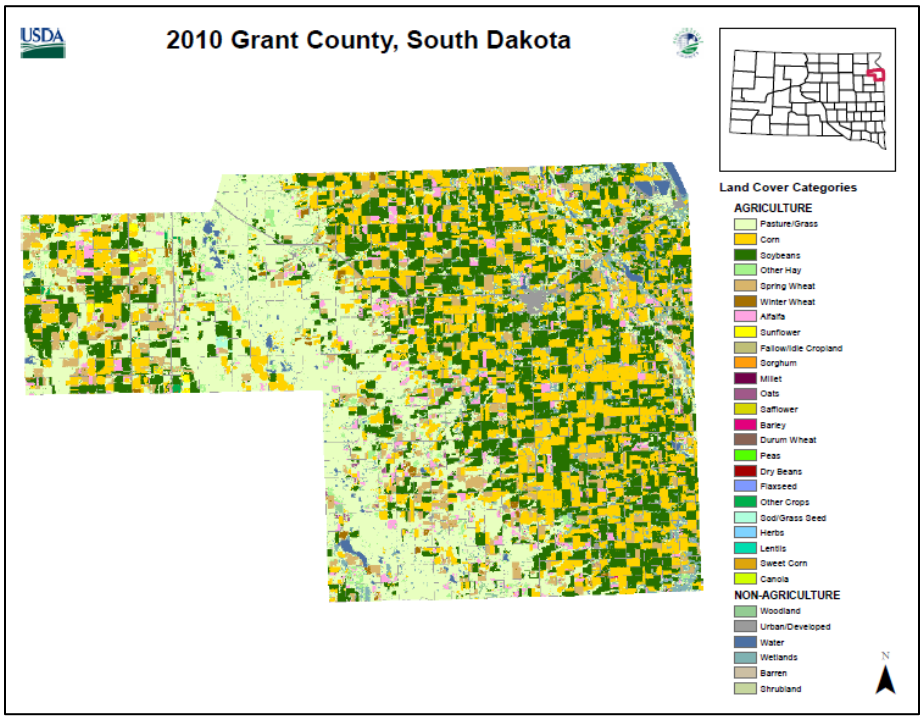
The Project area is predominantly rural land owned by private individuals. The majority of the land in Grant and Roberts Counties is agricultural, with most of that land being utilized for the cultivation of corn and soybeans or pastureland.

Figure 2.6.1-1: Roberts County Land Cover 2010



(NASS 2008)

Figure 2.6.1-2: Grant County Land Cover 2010



(NASS 2008)

Grant County has enacted a wind turbine siting ordinance, which requires:

- Distance from existing off-site residences, businesses, churches, and buildings owned and maintained by a governmental entity shall be at least 1,000 feet. Distance from on-site or lessor's residence shall be at least 500 feet.
- Distance from centerline of public roads shall be at least 500 feet or 110 percent of the height of the wind turbines, whichever distance is greater, measured from the ground surface to the tip of the blade when in a fully vertical position.
- Distance from any property line shall be at least 500 feet or 110 percent of the height of the wind turbine, whichever distance is greater, measured from the ground surface to the tip of the blade when in a fully vertical position unless wind easement has been obtained from adjoining property owner.
- Exception: The Board of Adjustment may allow setback distances to be less than the established distances identified above~~,~~ if the adjoining landowners agree to a lesser setback distance. If approved, such agreement is to be recorded and filed with the Register of Deeds.

At the time of drafting this EA, Roberts County is working on a draft wind ordinance that is not currently available for public review.

Recreational uses in Grant and Roberts Counties are primarily hunting, fishing, birding, snowmobiling, and camping. A birding trail is located outside of the Project area at the Reyelts/O'Farrell Wildlife Protection Area. Although the Project would be located on private agricultural land, the Project area is likely to be used for hunting purposes, whether or not landowners have given their express permission for this recreational use. Countyline Campgrounds is located in the Town of Summit at the northern border of the Project. SDGFP's eastern snowmobile map shows a trail area approximately eight miles from the Project area. No trails are shown within the Project area.

2.6.2 Potential Impacts of the Alternatives

During construction, up to 146.55 acres of agricultural land may be temporarily impacted by the Project construction and activities may temporarily interfere with planting, cultivation, harvesting, or animal husbandry activities at discrete locations in the Project area at certain times. Because the Project would be built primarily on private agricultural land, the Project proponent would work closely with contracted landowners to ensure that temporary agricultural land use disturbance due to construction is minimized to the greatest extent possible. Any unavoidable temporary construction related loss of business opportunity to agricultural landowners who are participating in the Project is typically addressed contractually between the Project proponent and landowner prior to the start of construction.

During operation, the Project would have little impact on agricultural uses. The Project would permanently impact only 17.54 acres of agricultural land, all of which is under lease contract with farmers who have negotiated acceptable terms. The Project proponent designed the Project to allow for the continued productive agricultural use of the surrounding land. In fact, it has been postulated that the development of wind farms helps to keep land in agricultural use because once a wind farm becomes operational, the most compatible land use for the surrounding landscape will remain agricultural until the wind farm is decommissioned (DOE 2011).

The POI is located 4.5 miles north of the Project area and the Project proponent would build an electric transmission line to connect the Project with the POI. By siting the proposed transmission line parallel to an existing transmission line, the Project proponent has minimized the potential for potential impacts on agricultural uses. Only 11.17 acres of agricultural land (cropland, hayland and pasture) would be temporarily impacted by the

transmission line, and there would be no permanent impacts. Further, by employing the conservation measures from the draft UGP Wind PEIS, the Project proponent would reduce any impacts associated with the POI location to less than significant levels.

Recreational vehicle (RV) campsites and motels may experience increased use by construction workers seeking temporary accommodations during Project construction, particularly on weekdays, which could displace recreational users. The Project proponent does not anticipate any impacts to RV campsite and motel usage during operation.

Some host communities report an increase in tourism after wind farms are built. In addition to curious individual local tourists, it is not unusual for other communities considering wind development to organize bus trips for landowners to visit operational wind farms.

The Project proponent does not anticipate any impacts to hunting within the Project area during the construction or operation of the Project. During operations, the small amount of land that is set aside for Project facilities is on private property and would not have any significant effect on the amount of land available for hunting in the vicinity. Further, construction and operations staff would always employ appropriate personal protective equipment while on the Project site, which would make them highly visible and keep them safe during hunting season.

Because there are no recorded snowmobile trails in the Project area, the Project proponent does not anticipate any impacts to snowmobiling.

The No Action Alternative would have no direct impact on agricultural or recreational land uses. The potential positive impacts on long term tourism in the Project area would not occur if the No Action Alternative were selected. However, selection of the No Action Alternative could potentially cause the Project proponent to reconsider the previously rejected interconnection alternative at the Big Stone Substation in Big Stone, South Dakota, which would require the construction of a 30-mile electric transmission line. Constructing this new transmission line could result in greater impacts to land use.

2.6.3 Proposed Conservation Measures

The Project proponent has followed the Grant County wind ordinance in creating the Project layout. The Project proponent also consulted with governmental agencies, tribes, property owners, and other stakeholders early in the planning process to identify potentially significant land use conflicts in order to avoid locating turbines in areas of unique or important

recreation, wildlife, or visual resources. Whenever feasible, the Project proponent sited the Project on already altered landscapes. In addition, the Project layout consolidates infrastructure wherever possible to maximize efficient use of the land and minimize impacts. The proposed POI makes the best use of existing transmission and market access while using existing facilities to the greatest extent possible.

Agricultural Uses

The Project proponent would coordinate construction activities with landowners to minimize interference with farming or livestock operations. Issues that would need to be addressed could include installation of gates and cattle guards where access roads cross existing fence lines, access control, signing of open range areas, traffic management (e.g., vehicle speed management), and location of livestock water sources.

Additionally, the draft PEIS indicates the following conservation measures for agricultural lands:

- Construction debris should be removed from the site.
- Excess concrete (excluding belowground portions of decommissioned turbine foundations intentionally left in place) should not be buried or left in active agricultural areas.
- Vehicles should be washed outside of active agricultural areas to minimize the possibility of the spread of noxious weeds.
- Topsoil should be stripped from any agricultural area used for traffic or vehicle parking—segregating topsoil from excavated rock and subsoil—and replaced during restoration activities.
- Drainage problems caused by construction should be corrected to prevent damage to agricultural fields.
- Following completion of construction and during decommissioning, subsoil should be decompacted.

2.7 Socioeconomic and Environmental Justice

This section of the EA describes the socioeconomic and environmental justice status of Grant and Roberts Counties, the Town of Summit, and Summit School District 54-6. It describes the anticipated socioeconomic and environmental justice impacts of the proposed Project and the No Action Alternative. Because the anticipated socioeconomic impacts of the Project are generally positive, the Project proponent is not proposing any conservation measures.

2.7.1 Existing Conditions

2.7.1.1 Socioeconomics

Employment

According to the U.S. Census Bureau, 2008-2012 American Community Survey, the majority of Grant County's workforce was associated with: educational services and health care, retail trade, and agriculture, forestry, fishing, hunting, and mining. In Roberts County the majority of the workforce was associated with: educational services, health care and social assistance, retail trade, and agriculture, forestry, fishing, hunting, and mining (U.S. Census Bureau FactFinder).

The January 2014 unemployment rate for Grant County was 6.3 percent and 6.6 percent for Roberts County.

Table 2.7.1-1: Unemployment rates for 2011 and 2012

	2011	**2012**
Grant County	5.3	4.9
Roberts County	6.9	6.0
South Dakota	4.7	4.2

Source: U.S. Department of Labor (DOL)

Personal Income

From 2008-2012 the median household income was $46,273 in Grant County and $42,893 in Roberts County.

Table 2.7.1-2: Personal Income

	Grant County	**Roberts County**	**South Dakota**
Median household income, 2008-2012	$46,273	$42,893	$49,091

Source: U.S. Census Bureau Quick Facts

Local Tax Revenue

In South Dakota, sales tax is collected at the city and town level rather than at the county level. The Town of Summit has a sales tax rate of 2 percent. In 2012 sales tax revenue was $93,128 and in 2011 it was $89,189. The majority of the Town's sales tax revenue comes from the Coffee Cup Fuel Stop. Overall annual revenue for Grant County in 2012 was $5,741,451.24. Overall annual revenue for Roberts County in 2012 was $3,401,227.04. Overall annual revenue for the Town of Summit in 2012 was $303,158 and $296,348 in 2011. Overall annual revenue for Summit School District 54-6 in 2012 was $1,612,768.92.

The Project proponent would pay an annual tax of 2 percent on its gross receipts from the wind farm. Gross receipts are calculated based on the wind farm's production of electricity in kWh multiplied by a base rate. The base rate for 2013 was $0.0537. The Project proponent would also pay an annual tax equal to $3.00 per kWh of nameplate capacity of the wind farm. The Project would be eligible for a partial rebate of the gross receipts tax (but not the nameplate capacity tax) based on the cost of its transmission lines and wind farm collector system.

Table 2.7.1-3: Tax Valuations 2012

	Grant County	**Roberts County**
Ag Real Valuation	$384,965,622	$425,441,752
Owner Occupied Valuation	$158,171,681	$127,151,752
Other Valuations	$77,965,365	$74,869,680
Total Real Valuation	$621,102,668	$627,463,18

Source: South Dakota Department of Revenue (2012)

Population

The 2012 population of Grant County was 7,259 and the 2012 population of Roberts County was 10,303. Population growth between 2010 and 2012 grew 1.5 percent in Roberts County, while dropping -1.3 percent in Grant County. In 2012 the population of the Town of Summit was 292. The median age in Grant County is 45.1 and 39.5 in Roberts County.

Table 2.7.1-4: Population

	2010	**2012**	**Population % change**
Grant County	7,356	7,259	-1.3%
Roberts County	10,149	10,303	1.5%
South Dakota	814,180	833,354	2.4%

Source: U.S. Census Bureau FactFinder

Recreation

The proposed Project area is located entirely on private land and does not encompass any land set aside for recreational purposes.

Grant and Roberts Counties have numerous creeks and watercourses flowing throughout their regions. Hunting, camping, fishing and snowmobiling provide the greatest recreational opportunities due to the area's rural nature and abundant water sources. County Line Campground, a privately operated

RV park, with cabins and tent areas, is located just south of Summit, South Dakota. In the larger region, Waubay National Wildlife Refuge, Enemy Swim Lake, and Bitter Lake are located over 15 miles west of the Project area. Hartford Beach State Park and Big Stone National Wildlife Refuge are located over 20 miles east of the Project area. A SDGFP Game Production Area abuts the Project area to the east. There are numerous lands owned by USFWS in the area. Both the state and federal areas are open to public hunting.

Seasonal activities in Grant County include the annual Farley Fest, which has traditional country fair activities, held each summer at Lake Farley Park in Milbank, South Dakota, which is located over 15 miles from the Project area. Milbank also hosts a Train Festival annually in August. Summit, South Dakota is known for its intense fog, which residents celebrate during Fog Fest.

2.7.1.2 Environmental Justice

The goal of environmental justice is to ensure the fair treatment and meaningful involvement of all people with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people, including a racial, ethnic, or socioeconomic group, should bear a disproportionate share of potentially adverse human health and environmental effects of a federal agency action, operation, or program. Meaningful involvement means that affected populations have the opportunity to participate in the decision process and their concerns are considered.

Executive Order 12898 was signed by President Clinton in 1994 and orders federal agencies to identify and address "disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low income populations in the United States" (EPA 1994). The analysis of potential environmental justice issues associated with the proposed Project followed guidelines described in the CEQ's Environmental Justice Guidance under NEPA (CEQ 1997). The analysis method has three parts: (1) the geographic distribution of low-income and minority populations in the affected area is described; (2) an assessment of whether the impacts of construction and operation of the Project would produce impacts that are high and adverse is conducted; and (3) if impacts are high and adverse, a determination is made as to whether these impacts would disproportionately impact low-income or minority populations.

The majority of Grant County residents, 97.4 percent of the population, are Caucasian. Although the majority of residents in Roberts County are also Caucasian, 35.9 percent of the population is Native American. From 2008 –

2012 the percentage of residents that lived below the poverty level was 13.8 percent in Grant County and 20.0 percent in Roberts County.

Table 2.7.1.2-1: Minority Populations by Percentage

	Grant County	**Roberts County**	**South Dakota**
White alone	97.4%	60.4%	86.2%
Black or African American alone	0.4%	0.2%	1.7%
Hispanic or Latino	2.5%	1.6%	3.1%
American Indian and Alaska Native	0.8%	35.9%	8.9%
Asian	0.4%	0.3%	1.1%
Two or more races	0.9%	3.1%	2.1%

Source: U.S. Census Bureau Quick Facts

Table 2.7.1.2-2: Poverty Level

	Grant County	**Roberts County**	**South Dakota**
Persons below poverty level, percent, 2008-2012	13.8%	20.0%	13.8%

Source: U.S. Census Bureau Quick Facts

2.7.2 Potential Impacts of the Alternatives

Development, construction and operation of the proposed Project in Grant and Roberts Counties would produce direct and indirect socioeconomic and environmental justice impacts. These impacts are generally positive or neutral.

Revenue generation from wind energy development falls into several general categories: direct income to taxing entities, direct income to Project participants, employment opportunities during construction and operation, and increased spending in the Project area during all phases of Project development, construction and operation.

The Project is anticipated to create up to 300 construction-related jobs at the peak of construction. Although a national wind energy construction

contractor would likely be chosen to construct the Project, hiring of construction crews would occur in the Project region to the greatest extent possible. During construction, there would also be the opportunity for local businesses to share in the economic benefits of the Project. Transportation companies, vehicle and equipment rental companies, fuel supply companies, aggregate and materials supply companies, and heavy equipment repair and maintenance companies are among those companies that often participate directly in in Project construction. Local packaging and postal services, gas stations, retail outlets, lodging facilities, restaurants, bars, and grocery stores would also experience economic benefits during construction.

The proposed Project is expected to create 5 to 10 permanent jobs during operation. In addition, the presence of a wind energy facility sometimes increases local tourism and ancillary economic benefits to local businesses that support tourism, such as gas stations, restaurants and lodging facilities.

In summary, the proposed Project, based on a per-MW estimate, would result in a total capital investment of $155 million (including the cost of turbines). The Project proponent anticipates that it would spend approximately $33 million locally during construction. In addition, The Project proponent anticipates making $500,000 per year in landowner payments and $700,000 per year in property and other taxes. Further, wind farms help landowners to maintain their agricultural property by providing an additional contribution to the taxes that keep communities rural.

The proposed Project would have at most a very limited impact on hunting, fishing, snowmobiling and camping, the most common recreational activities in the proposed Project area. This is due to the fact that the Project is located entirely on private property.

Property value concern is a common worry for residents at proposed wind farms. A 2013 study performed by the DOE's Lawrence Berkeley National Laboratory called "Spatial Hedonic Analysis of the Effects of Wind Energy Facilities on Surrounding Property Values in the United States" stated:

> We collected data from more than 50,000 home sales among 27 counties in nine states. These homes were within 10 miles of 67 different wind facilities, and 1,198 sales were within 1 mile of a turbine—many more than previous studies have collected. The data span the periods well before announcement of the wind facilities to well after their construction… we find no statistical evidence that home values near turbines were affected in the post-construction or post-announcement/pre-construction periods.

> Previous research on potentially analogous disamenities (e.g., high-voltage transmission lines, roads) suggests that the property-value effect of wind turbines is likely to be small, on average, if it is present at all (Berkeley).

If the No Action Alternative is chosen, the positive socioeconomic impacts associated with the Project may not occur because all other alternative interconnection options had been previously rejected by the Project proponent.

With regard to environmental justice, the Project's socioeconomic benefits are positive, so any impacts to minority or disadvantaged communities would likely improve the local standard of living. There is a very small minority and economically disadvantaged population in Grant County, where the largest portion of the proposed Project occurs. The Project would not disproportionately impact these populations in Grant County because the Project is primarily located on agricultural land. The Project transmission occurs in Roberts County, where there are higher minority and economically disadvantaged populations. The proposed transmission corridor would run parallel to the existing Western Summit to Watertown 115 kV transmission line and does not disproportionately impact those populations within Roberts County. The Project proponent would make lease agreements with private landowners in Robert's County, which would add to the local economic development benefit of the project.

2.7.3 Proposed Conservation Measures

Because there are no negative socioeconomic or environmental justice impacts associated with the proposed Project, the Project Proponent is not proposing any conservation measures.

2.8 Visual Resources

2.8.1 Existing Conditions

This section evaluates the existing visual setting in the vicinity of the proposed Project. The evaluation included areas within and adjacent to the Project area from which a person may be able to observe changes to the visual landscape resulting from development of the Project. The analysis presented in this section is supplemented by an Assessment of Project Visual Character and Visibility, prepared by Haley & Aldrich, Inc. and a Shadow Flicker Study prepared by Stantec.

Visual sensitivity is dependent on viewer attitudes, the types of activities in which people are engaged when viewing the Project, and the distance from which the Project would be seen. Overall, higher degrees of visual sensitivity are correlated with areas where people live, are engaged in recreational outdoor pursuits, or participate in scenic or pleasure driving. Lesser degrees of viewer sensitivity are anticipated for people living further away, participating landowners, workers who construct or maintain the Project, or people who are just traveling through the area.

2.8.2 Potential Impacts of the Alternatives

The Project visual area of potential effect (APE) is located in a rural, agricultural setting of generally open rolling grasslands interspersed with glacial lakes and streams. A high density of larger glacial lakes is located along the eastern Project boundary on the edge of the plateau. Vegetation in the APE is dominated by active agricultural land (pasture and active crop fields). Open fields are often interspersed with and bordered by hedgerows and small woodlots primarily used as screening around residential buildings. The Project APE lacks large forested areas. Deciduous forest is restricted to riparian and wetland areas.

The visual characteristics of the proposed Project area consist primarily of rural agricultural land with farming, livestock grazing, and related agricultural operations dominating the land use. The visual resources of the area are neither unique to the region nor entirely natural. Currently, no distinctive landscape features exist in the Project area that would require specific protection from visual impairment. Existing views are primarily agricultural activity and undeveloped land, along with transportation corridors within the Project APE that include a network of rural roads and larger roadways such as Interstate 29/US Highway 81 that intersect the Project APE in a north-south direction, and US Highway 12 which crosses the northern Project APE boundary in an east-west direction. An important commercial rail corridor (non-commuter line), the Burlington Northern Santa Fe Railroad, also crosses the northern portion of the APE parallel to US Route 12.

The majority of the Project APE is comprised of cropland or pasture and herbaceous rangeland. One area of moderate density residential development is the Town of Summit located in the northern portion of the APE. According to the 2010 census, the Town of Summit is a small town consisting of mainly residential and commercial properties with a population of 288 people within the 0.56 square mile municipal boundary. Overall population density within the APE is very low, averaging 2.5 people per square mile outside of the Town of Summit, and 3.7 people per square mile (including the Town of Summit).

Topography within the APE is not distinctive, as the Project sits on a plateau surrounded by lower flatlands in the distance. Although the APE is scattered with streams and lakes, no significant change in topography is attributable to these features. Additionally, none of the features within the APE are classified as scenic resources. Only a handful of wooded areas are present as small isolated pockets of vegetation. Although the Project area is relatively undeveloped, buildings such as silos and grain elevators can be seen in the typical landscape, along with the Town of Summit near the northern Project boundary. Additionally, there are no federal or state parks within the APE, nor does the APE contain any highly distinctive or important landscape features or unique viewsheds.

The APE is located on the Lake Traverse Indian Reservation, historically and currently inhabited by the Sisseton-Wahpeton Oyate, a branch of the Santee Dakota group of Native Americans. Western consulted with the Sisseton Wahpeton Oyate THPO and the tribal governments listed in Section 3.3 below to determine the cultural resource study area.

A review of the Sisseton Wahpeton Oyate website and the Oyate Tourism website indicates there are no historically or culturally sensitive tribal visual resources within the APE. The Project proponent reviewed the National Register of Historic Places and the South Dakota State Historical Preservation Society (SHPO) Cultural Resource Geographic Research Information Display websites for the presence of culturally sensitive resources. There are no historic places on the National Register within the APE, however two buildings within the Town of Summit which were reviewed by the state SHPO as eligible for National Register listing, the Summit Water Tower and First State Bank.

The POI is located 4.5 miles north of the Project area and the Project proponent would build an electric transmission line to connect the Project with the POI. By siting the proposed transmission line parallel to an existing transmission line, the proponent has avoided new visual impacts. Additionally, by employing the conservation measures from the draft UGP Wind PEIS, any impacts associated with the POI location would be reduced.

The No Action Alternative would have no direct impact on visual resources. However, selection of the No Action Alternative could potentially cause the Project proponent to reconsider the previously rejected interconnection alternative at the Big Stone Substation in Big Stone, South Dakota, which would require the construction of a 30-mile electric transmission line. Constructing this new transmission line could result in greater impacts to visual resources.

2.8.3 Proposed Conservation Measures

The Project proponent has limited conservation measures available for the operating Project. Wind turbines are very tall structures typically located in open fields at the highest locally available elevations. However, the Project proponent has selected conservation measures for the Project, as applicable, from the draft UGP PEIS. The greatest potential for visual impacts associated with wind energy facilities and associated electricity transmission systems would occur as a result of decisions made during the siting and design of the projects. In many cases, the Project proponent may avoid or substantially reduce the visual impacts associated with these facilities with careful project siting.

The Project proponent used geographical information system tools and visual impact simulations to conduct visual analyses (including mapping), analyzing the visual characteristics of landscapes, visualizing the potential impacts of project siting and design. The visual analyses have provided data that would be critical for identifying constraints and opportunities for siting projects to minimize visual impacts. The Project proponent has also sited wind turbines to minimize shadow flicker effects on nearby residences, as calculated using appropriate siting software and procedures.

The Project proponent has utilized site planning to locate turbines away from visually sensitive receptors and minimize site disturbance, including tree clearing and grading. Prior to finalization of the Project design, the Project proponent would explore, as practicable, opportunities for additional micro-siting or realignment of facilities that could reduce potential visual impacts.

During construction, the Project proponent would minimize the visual impacts associated with working construction equipment by adhering to a construction sequencing plan that minimizes impacts on local roads and residences. The Project proponent would develop and implement a dust control plan, which would minimize off-site visual impacts associated with construction activities. As described in the impacts discussion, any unavoidable construction-related visual impacts would be short term.

Following completion of construction, the Project proponent would perform site restoration activities. Restoration activities would include removal of excess road material from Project access roads, restoration of agricultural fields, and revegetating disturbed sites through seeding and mulching. These actions would assure that, to the greatest extent possible, the Project area is returned to its preconstruction condition and that long-term visual impacts are minimized.

2.9 Acoustics

Noise is generally defined as unwanted or excessive sound. Some land uses are considered more sensitive to intrusive noise than others due to the type of activities typically involved at the receptor location. According to the draft UGP Wind PEIS, any pressure variation that the human ear can detect is considered sound; noise is unwanted sound. Sound can be characterized in terms of amplitude (perceived as loudness), frequency (perceived as pitch), and time pattern.

The Grant County Zoning Ordinance requires that noise level originating from turbines shall not exceed 50 dBA at the perimeter of the principal and accessory structures of existing off-site residences, businesses, and buildings owned and/or maintained by a governmental entity. The Project proponent would also employ appropriate environmental noise criteria such as the guidelines provided by the U.S. Environmental Protection Agency (EPA).

2.9.1 Existing Conditions

The Project area would generally be characterized as a rural agricultural land use area sparsely populated with residences and farms. The Project proponent expects existing ambient sound levels to be relatively low, although sound levels may be sporadically elevated in localized areas due to roadway noise or periods of human activity. Sources of background noise to rural residents and occasional visitors to the area are primarily related to agricultural activity and vehicular traffic on Interstate Highway 29, County Highway 12, and low-traffic local roads such as 146th Street, 148th Street, and 455th Avenue. Rail traffic noise is also prominent in the areas adjacent to the railroad located in the northern extent of the Project area (south of County Road 12). Potential noise receptors in the vicinity of proposed facilities include scattered rural residences, the closest of which is approximately 1,400 feet from a proposed turbine location.

Background sound levels would vary both spatially and temporally depending on proximity to area sound sources, roadways and natural sounds. Principal contributors to the existing acoustic environment likely include motor vehicle traffic, mobile farming equipment, farming activities such as plowing and irrigation, all-terrain vehicles, local roadways, rail movements, periodic aircraft flyovers, and natural sounds.

2.9.2 Potential Impacts of the Alternatives

Construction of wind power projects requires the operation of heavy equipment and construction vehicles for various activities including

construction of access roads, excavation and pouring of foundations, the installation of buried and above ground electrical interconnects, and the erection of turbine components. Construction activity would generate traffic having potential noise effects, such as trucks travelling to and from the site on public roads.

Most construction activities would occur during the day, when noise is tolerated due to the masking effect of background noise. Nighttime noise levels would drop to the background levels of the Project area. In general, construction activities for wind energy development would disturb smaller areas than those at other industrial facilities, and would persist for a short period. However, the periods of noise at any given residence in the Project area would likely only occur during brief periods for a few days as turbine construction activities would move elsewhere within the overall Project area as turbine sites are completed. Therefore, the potential noise and vibration impacts of construction activities would be local and temporary in nature, and would not be substantially louder than everyday noise sources such as farm equipment and nearby traffic. The Project proponent would make all reasonable efforts to minimize the impact of noise resulting from construction activities.

During operation, the primary noise sources would be the wind turbines, the transformer and switchgear from the substation, as well as motorized travel within the Project area for O&M of the facility. The sources of sounds emitted from operating wind turbines can be divided into two categories: 1) mechanical sounds from the interaction of turbine components; and 2) aerodynamic sounds produced by the flow of air over the blades. Aerodynamic sound is typically the largest component of wind turbine acoustic emissions, and is generally characterized as a "swishing" or "whooshing" sound.

Maintenance activities involving periodic site visits to wind turbines, transmission lines, substations, and auxiliary structures would involve light- or medium-duty vehicle traffic with relatively low noise levels. The Project proponent anticipates infrequent but noisy activities, such as road maintenance work with heavy equipment or repair or replacement of old or inoperative wind turbines or auxiliary equipment. However, the anticipated level of noise impacts from maintenance activities would be far lower than that from construction activities. Overall, the noise levels of continuous site operation would be much lower than the noise levels associated with short-term construction activities.

The Project proponente retained Stantec to conduct a noise analysis for the proposed Project. Stantec performed the analysis to assess the potential sound levels that may be experienced at local residences (receptors) within

the Project area. Santec predicted the potential impact of noise on receptors within the Project area using a software program that considers the source sound power level from the wind turbines, along with the positions of the turbines and receptors within the area of impact. Santec identified a total of 202 potential receptors and included them within the analysis. Santec conservatively calculated the sound levels by using the maximum sound power level in a worst-case scenario. Results of the analysis indicate that the Project would cause minimal sound impact on receptors within the Project area. Santec expects noise levels at all receptors within the Project area to comply with the Grant County Zoning regulation maximum noise level of 50 dBA at inhabited structures. (Stantec, 2014).

The types and levels of decommissioning activities would be similar to (but shorter in duration) than those associated with construction. Thus, the noise levels would be similar to or less than those for construction activities. Similar to the construction period, most decommissioning activities would occur during the day, when people are more tolerant of noise due to the masking effect of background noise. Nighttime noise levels would drop to the background levels of a rural environment because decommissioning activities would cease at night. Like construction activities, relative to wind turbine operation, decommissioning activities would last for a short period of time and the potential noise impacts would be local and temporary in nature.

The No Action Alternative would have no direct noise impacts. However, selection of the No Action Alternative could potentially cause the Project proponent to reconsider the previously rejected interconnection alternative at the Big Stone Substation in Big Stone, South Dakota, which would require the construction of a 30-mile electric transmission line. Constructing this new transmission line could result in greater impacts to temporary construction-related noise.

2.9.3 Proposed Conservation Measures

All Project activities would comply with applicable laws, ordinances, regulations, and standards. The Grant County Zoning Ordinance requires that noise level originating from turbines shall not exceed 50 dBA at the perimeter of the principal and accessory structures of existing off-site residences, businesses, and buildings owned and/or maintained by a governmental entity.

The Project proponent and the contractors would implement best management practices for sound abatement during construction, including use of appropriate mufflers and limiting hours of construction. Stationary construction equipment (e.g., compressors or generators) would be located as far as practical from nearby sensitive receptors. In addition, the Project

proponent would notify landowners in advance of construction sound impacts and provide them with a complaint resolution procedure to assure that any complaints regarding construction sound are adequately addressed would also be put in place.

The Project proponent has sited the proposed turbines in accordance with all applicable local ordinances. Although the Project proponent does not anticipate that any impacts related to operational noise would be significant, the Project proponent would employ measures to minimize and mitigate operational related noise. The Project proponent and contractors would maintain turbines as necessary to keep them in good condition throughout the duration of the Project.

2.10 Transportation

This section considers the potential impacts the Project could have upon roadways, airfields, and railways within and immediately adjacent to the Project area.

2.10.1 Existing Conditions

The Project area is served by a network of state, county, and local roadways. Existing roads in the vicinity of the Project area range from two-lane highways with paved shoulders to seasonally maintained gravel roads. Interstate 29 is a north-south highway that bisects the Project area, and would likely be utilized for delivery of Project components to the Project area. The Project proponent would use county and local roads for delivery of components and equipment to the actual sites of Project components within the larger Project area.

The former Chicago Milwaukee St. Paul & Pacific railroad runs parallel to Highway 12, which traverses from northwest to southeast. The railroad is currently operated by the Burlington Northern Santa Fe Railroad.

Three airports were noted during a desktop analysis in the vicinity of the Project, including:

- Milbank Municipal Airport, located approximately 22 nautical miles to the east of the Project footprint and operated by the City of Milbank.
- Sisseton Municipal Airport, a publicly-owned airfield located approximately 30 nautical miles north of the Project area.
- A small landing strip located in Grant County, just south of the county line on the eastern portion of the Project area. A review of FAA-listed airports did not identify this landing strip.

In order to assess the existing traffic and road conditions within the Project area, the Project proponent would conduct a transportation study prior to final design to evaluate roadway safety, traffic capacity, structure inventory, and roadway geometry. The study would include a site visit to evaluate the anticipated delivery path(s) to the construction site, lateral clearances, vertical clearances, intersecting roadway control, speed limits, posted truck size and weight restrictions, major roadway intersection configurations, and primary and alternate route selections. Engineers would drive, measure and survey each potential delivery route and to identify any areas of concern, as well as bridges, culverts, and areas of poor road conditions. This would also include consultation with the State Department of Transportation and the local municipalities.

2.10.2 Potential Impacts of the Alternatives

The majority of transportation operations would involve material and equipment being moved to the site during the construction phase. The types and amounts of material and equipment required for construction of the Project would depend on site characteristics as well as the design selected. The following discussion provides a general overview of the expected transportation requirements during development, focusing on the unique considerations posed by the wind turbines, turbine towers, and rigging equipment necessary to erect them.

In general, the heavy equipment and materials needed for site access, site preparation, foundation construction, and construction of transmission lines are typical of construction projects and do not pose unique transportation considerations. Typically, flatbed combination trucks would move the equipment to the Project site and would remain on site through the duration of construction activities.

Transportation logistics have become a major consideration for wind energy development projects; the trend is toward larger rotors and taller turbine towers and the associated equipment needed to erect them. Depending on the design, some of the turbine components may be extremely long (e.g., blades) or heavy (e.g., the nacelle). The size and weight of these components would dictate the specifications for site access roads for required rights of way, turning radii, and fortified culverts or bridges. The Project proponent estimates that each wind turbine generator would require between 5 and 15 truck shipments of components, some of which could involve specialized trucks unique to the wind energy industry that are oversized or overweight. Congestion on local roadways should not be extremely worsened by construction traffic as existing traffic volumes are so low.

The construction of the 4.5 mile transmission line would have negligible transportation and traffic impacts because it would occur along an existing transmission corridor, off the existing road ROW. In addition, by employing the conservation measures from the draft UGP Wind PEIS, the Project proponent would reduce any impacts associated with the POI location.

Once the Project is commissioned and operational, Project staff traffic will likely be concentrated around the O&M facility. Some of these personnel will need to visit certain turbine locations and return to this facility. Each turbine typically requires routine maintenance visits once every three months, but certain turbines or other Project improvements could require periods of more frequent service visits. Such service visits typically involve one to two pick-up trucks. The Project proponent does not expect operation of the Project to result in any traffic issues in the Project area because there would be only a minor increase in traffic.

With some exceptions, transportation activities during site decommissioning would be similar to those during site development and construction. Heavy equipment and cranes would be required for dismantling turbines and towers, breaking up tower foundations, and regrading and recontouring the site to the original grade. With the possible exception of a main crane, the Project proponent does not expect any oversized and/or overweight shipments during decommissioning activities because the major turbine components can be disassembled, segmented, or size-reduced prior to shipment.

The Project proponent does not contemplate any impacts to the Burlington Northern Santa Fe Railroad railway by current Project plans.

The FAA has determined that no impacts to the aviation system or the three airports listed above would occur as a result of the Project. The FAA has issued a determination of no effect/hazard for each of the proposed turbine locations. Turbines would be lit according to FAA requirements to ensure aviation safety.

There would be no direct negative impacts on the transportation system associated with the No Action Alternative. However, if the Project is not built, any associated public road safety improvements that could be required for the delivery of Project requirements would also not be made. In addition, selection of the No Action Alternative could potentially cause the Project proponent to reconsider the previously rejected interconnection alternative at the Big Stone Substation in Big Stone, South Dakota, which would require the construction of a 30-mile electric transmission line. Constructing this new transmission line could result in greater temporary construction impacts to transportation.

2.10.3 Proposed Conservation Measures

The Project proponent would work with the appropriate state and local authorities to address road access, safety, and traffic issues during final Project planning. It is possible that local public roads would require improvements to safely accommodate the larger, heavier vehicles associated with wind energy construction, such as widening or improving intersections. The Project proponent would be responsible for making any required safety improvements. The Project proponent would also be responsible for ensuring that the quality of local roadways after construction is at least the same as it was before construction began.

The United States Department of Transportation Federal Highway Administration and the South Dakota Department of Transportation have unique rules, regulations, and oversized permit requirements. This system requires transporters to evaluate the type of shipment being planned, its origin, and destination. Demonstrating to permit officials that all possible means have been assessed or used to either minimize travel distances or select appropriate bypass routes is critical in obtaining permits. Typically, the transport company develops detailed transportation plans based on specific object sizes, weights, origin, destination, and unique handling requirements. The final transportation plan is developed after alternative approaches have been evaluated, costs refined, and adjustments have been made to comply with unique permit requirements.

Overweight permits are usually issued with specific dates during which transport is prohibited. These dates are state-specific but tend to eliminate periods during the spring when frozen ground is thawing. Over-dimension permits are likely to have travel time limits in congested areas, limiting movement to non-rush-hour periods. The construction company hired to build the proposed Project would obtain any necessary permits for transporting equipment.

2.11 Public Safety and Communications

This section of the EA discusses whether the development of the Project could have negative impacts upon public safety or the functioning of communications technology in the Project area.

2.11.1 Existing Conditions

The proposed Project is located near Summit, South Dakota, with a population of 288 people (U.S. Census Bureau FactFinder). The nearest fire department and ambulance service is located in downtown Summit,

approximately one mile to the north of the Project area. The closest hospital to the Project is 23 miles away.

The Project proponent would meet with the Summit Volunteer Fire Department to discuss potential fire and safety hazards associated with the Project.

Table 2.11.1-1: Local Fire, Police and Medical Services

Fire and Police Protection Services	**Approximate Distance from Project (miles)**
Summit Volunteer Fire Department	1
Ortley Volunteer Fire Department	10
Corona Fire Department	20
Webster Fire Department	25
Milbank Volunteer Fire Department	25
Sisseton Fire Hall	30
Milbank Police Headquarters	25
Webster City Police Department	25
Sisseton City Police Department	30
Watertown Police Department	30
Medical Services	
Summit Volunteer Fire Dept. Ambulance Service	1
Milbank Area Hospital	23
Coteau Des Prairies Hospital	30
Prairie Lakes Hospital (Watertown, SD)	30

Another important aspect of public safety is the security of the communications system. Microwave bands that may be affected by the installation of wind turbine facilities operate over a wide frequency range (900 MHz – 23 GHz). These systems are the telecommunication backbone of the country, providing long-distance and local telephone service, backhaul for cellular and personal communication services, data interconnects for mainframe computers and the Internet, network controls for utilities and railroads, and various video services.

A 406 foot cell tower is located in the town of Summit at 45655 140th St. There is also a 190 foot communication tower in Watertown, a city located approximately 30 miles south of the proposed Project area.

2.11.2 Potential Impacts of the Alternatives

The Project proponent has noted the potential impacts for to public safety and communications, as applicable, from the draft UGP Wind PEIS. The

following is a synopsis of the health and safety discussion in that document. Two topics that were discussed in the DPEIS public Safety Section, Shadow Flicker and Sound, have been addressed in Sections 2.8 Visual Resources and 2.9 Acoustic Resources, respectively.

Physical Hazards: Although rare, there is the potential for physical hazards to occur during the construction and operation of wind projects. These impacts are best mitigated by adhering to appropriate setbacks from infrastructure and homes.

- Blade or tower failure;
- Ice shed; and
- Fire.

Occupational Hazards: Many of the occupational hazards associated with the construction and operation of wind energy projects are similar to those of the heavy construction and electric power industries (i.e., working at heights, exposure to weather extremes including temperature extremes and high winds, working around energized systems, working around lifting equipment and large moving vehicles, and working in proximity to rotating/spinning equipment).

Electric and Magnetic Fields: Electric and magnetic fields may exist within the substation and switchyard of the Project and along the transmission line that connects the facility to the grid. Portions of the Project where such fields may exist are generally not accessible to the public. Adequate physical barriers preventing access to hazardous areas by unauthorized individuals can be expected to keep exposures of the general public to well below applicable maximum permissible exposure.

Electromagnetic Interference to Communications: Wind turbines have the potential to interfere with electromagnetic signals that make up a large part of modern communication networks (Burton et al. 2001). Electromagnetic interference with other electromagnetic transmissions can occur when a large wind turbine is placed between a radio, television, or microwave transmitter and receiver (Manwell et al. 2002).

The Project proponent had a microwave study conducted by Comsearch. This study focused on the potential impact of wind turbines on licensed, proposed and applied non-federal government microwave systems. This type of study determines the Worst Case Fresnel Zone (WCFZ) boundaries for each path. The WCFZ is a swath along the microwave path where wind turbines could obstruct the path. The study identified six microwave paths intersecting the Project area. Comsearch calculated and mapped the Fresnel Zones for these microwave paths to assess the potential impact from the

turbines. Comsearch considered a total of 46 turbines in the analysis (although only 41 are currently proposed), each with a blade diameter of 354 feet and turbine hub height of 262.5 feet. Of those turbines, Comsearch found that none would potentially obstruct the microwave systems in the area.

Hazardous Materials/Waste: The Project would generate limited quantities of both solid and hazardous waste during the construction, operation, and decommissioning of the proposed Project. Because the Project proponent would employ appropriate waste handling and disposal measures there should be little to no impact to the environment.

Potential Impacts of Accidents, Sabotage, and Terrorism: The Project proponent is responsible for ensuring the operability and reliability of their systems. To do so, they must evaluate the potential risks from all credible events, including natural disasters (earthquakes, storms, etc.) as well as mechanical failure, human error, sabotage, cyber-attack, or deliberate destructive acts, recognizing intrinsic system vulnerabilities, the realistic potential for each threat, and the potential consequences. The Project proponent does not anticipate that the proposed Project would be at any unusual risk for accidents or acts of sabotage or terrorism.

The No Action Alternative would have no direct public safety or communication system impacts. However, selection of the No Action Alternative could potentially cause the Project proponent to reconsider the previously rejected interconnection alternative at the Big Stone Substation in Big Stone, South Dakota, which would require the construction of a 30-mile electric transmission line. Constructing this new transmission line could result in greater temporary construction related impacts to public safety and communication systems.

2.11.3 Proposed Conservation Measures

The Project proponent has drawn conservation measures for Project impacts upon public safety and communications, as appropriate, from the draft UGP Wind PEIS.

The following conservation measures to protect wind energy facility and transmission line workers are applicable during all phases associated with the Project.

- Work at the Project would be in compliance with applicable federal and state occupational safety and health standards (e.g., the Occupational Health and Safety Administrations [OSHA's] Occupational Health and Safety Standards, CFR Parts 1910 and 1926, respectively).

- The Project proponent would conduct a safety assessment to describe potential safety issues during construction and operation and create a plan to mitigate them.
- The Project proponent would develop a health and safety program to protect workers during site characterization, construction, operation, and decommissioning of a wind energy project, as described in the draft PEIS.
- Design for all electrical systems on the Project would meet all applicable safety standards (e.g., the National Electrical Safety Code) and comply with the interconnection requirements of the transmission system operator.
- In the event of an accidental release of hazardous substances to the environment, the Project proponent would document the event, including a root cause analysis, a description of appropriate corrective actions taken, and a characterization of the resulting environmental or health and safety impacts. Documentation of the event should be provided to permitting agencies and other appropriate federal and state agencies within 30 days, as required.

The following conservation measures for the protection of public health and safety would be applicable during all phases associated the proposed Project:

- The Project proponent has complied with the setback requirements in the Grant County Ordinance in designing the Project layout.
- The Project proponent would develop a traffic management plan for the site access roads to control hazards that could result from increased truck traffic (most likely during construction or decommissioning), ensuring that traffic flow would not be adversely affected and that specific issues of concern (e.g., the locations of school bus routes and stops) are identified and addressed.
- The Project proponent would use proper signage and/or engineered barriers (e.g., fencing) to limit access to electrically energized equipment and conductors in order to prevent access to electrical hazards by unauthorized individuals or wildlife.
- The Project proponent has designed the Project to comply with FAA regulations, including lighting requirements, and to avoid potential safety issues associated with proximity to airports, military bases or training areas, or landing strips and has received confirmation from the FAA that the wind farm will not impact aviation safety.
- The Project proponent would work with the local fire and emergency services to develop a fire management and protection plan.
- The Project proponent would work with appropriate agencies (e.g., DOE and TSA) to address critical infrastructure and key resource

vulnerabilities at wind energy facilities, and to minimize and plan for potential risks from natural events, sabotage, and terrorism.

2.12 Cultural Resources

Cultural resources include archaeological, historic, and architectural sites or structures, or places that are significant in understanding the history of the United States or North America, and may include definite locations (sites or places) of traditional cultural or religious importance to specified social or cultural groups, such as Native American tribes ("traditional cultural properties"). Cultural resources can be either man-made or natural physical features associated with human activity and, in most cases, are unique, fragile, and nonrenewable. Cultural resources that meet the eligibility criteria for listing on the National Register of Historic Places (NRHP) are termed "historic properties" under the NHPA.

2.12.1 Existing Conditions

The Project area has not been listed in the online National Register database (as of a search conducted July 12, 2011). The South Dakota State Historic Preservation Office (SHPO) is the state agency for historic preservation. They maintain an atlas of historical designations within the state of South Dakota. The SHPO identified one historical designation, the Burlington Northern Santa Fe Railroad bridge, in the Project area.

The majority of the Project area is located on land that was formerly part of the Sisseton-Whapeton Indian Reservation. All of the land has been deeded to local farmers, but additional research is required to ascertain the presence or absence of native artifacts, burial grounds, sites of ancient habitation and other pertinent resources.

Metcalf Archeological Consultants, Inc. (MAC) conducted a Class I file search of the site and manuscript files at the SHPO office. The search area included the APE and the surrounding one-mile radius. The APE is any area where temporary or permanent impacts may occur during construction of the Project. The search identified 47 cultural resources that have been recorded in the APE, consisting of 40 architectural structures and cemeteries, six historic sites, and one prehistoric site. The historic Chicago, Milwaukee, St. Paul, and Pacific Railroad has been deemed eligible for inclusion on the NRHP. Two architectural structures located in the Town of Summit are located outside of the APE. MAC identified two sites, one structure and one unrecorded cemetery, during the files search that have not been evaluated for inclusion by NRHP; these sites should be avoided during Project construction (MAC, 2014).

2.12.2 Potential Impacts of the Alternatives

Construction has the greatest potential to impact cultural resources due to ground-disturbing activities, vegetation removal, and increased access to remote locations. Due to the weight and length of wind turbine components, the grade of access routes must be kept to a minimum. Maintaining minimal grades can require extensive grading, thus increasing the potential for impacts on cultural resources due to ground disturbance.

The creation of access roads also provides people with easier access to previously remote areas. Since one of the greatest threats to archaeological sites is from looting, increased access often leads to greater opportunities for looting to take place. However, since the Project would be located on private lands, the Project proponent anticipates that access levels by the general public will not change following development and therefore the overall effect of increased access on archeological sites within the Project area would be minimal. Although archaeological material is protected on public or state lands, archaeological sites and associated artifacts on private land are the property of the landowner.

The Project proponent would site project elements to avoid and minimize potential impacts. The Project proponent would avoid effects on cultural resources by consulting with Native Americans that have ancestral ties to the Project area and would conduct cultural resource surveys in the Project area to identify areas requiring protection. The Project proponent would consider all identified cultural resources prior finalizing the locations of Project infrastructure and beginning construction activities. As the construction of the access roads and wind turbines would not require demolition or other adverse impacts to historic and architectural resources, there would be no construction related impact on architectural resources.

The POI is located 4.5 miles north of the Project area and an electric transmission line would be built to connect the Project with the POI. By siting the proposed transmission line parallel to an existing transmission line, the Project proponent would reduce ground disturbance and thereby minimize the potential for impacts to cultural resources and limit new visual impacts. In addition, by employing the conservation measures from the draft UGP Wind PEIS, the Project Proponent would reduce any impacts associated with the POI location .

Once the Project proponent constructs the proposed Project, no substantial earth-disturbing activities associated with operation and maintenance of the Project would occur. Therefore, Project operation would not have an adverse effect on archeological resources. Impacts associated with operation would primarily come from the looting of sites by workers or the public, although

erosion of disturbed areas, if not properly controlled, could also result in ongoing effects on some cultural resources.

It is likely that the proposed wind turbines would be visible from at least some of the 47 cultural resource sites identified in the MAC report. Studies conducted thus far have included an assessment of potential visual impacts on cultural and Native American resources. The Project's potential effect on a given historic property would be a change (resulting from the introduction of wind turbines) in the property's visual setting, if turbines are visible when the historic property is viewed from a publicly accessible vantage point. The potential effect resulting from the introduction of wind turbines into the visual setting for any significant property is dependent on a number of factors including the number of visible turbines, distance, visual dominance, orientation of views, viewer context and activity, and the types and density of modern features in the existing view (such as silos, buildings, overhead electrical transmission lines, cellular towers, highways, development, etc.). Visual setting may or may not be an important factor contributing to a given property's historical significance. MAP does not identify scenic views and association with the landscape as contributing to the significance of any of the historic resources in the APE.

It is important to note that because MAC does not consider the screening provided by buildings and trees, as well as characteristics of the proposed turbines that influence visibility (color, narrow profile, distance from viewer, etc.), in the viewshed analyses, being within the viewshed does not necessarily equate to actual Project visibility. Visual screening provided by existing buildings, yard trees, silos, and other objects likely limit views of the Project from some areas where viewshed mapping suggests the Project is potentially visible, especially within the Town of Summit.

The Project proponent expects very few impacts on cultural resources from decommissioning. Again, the majority of impacts would be associated with new ground disturbance during construction. Ground disturbance during decommissioning would be confined primarily to areas that were originally disturbed during construction. If new work areas were needed in areas that had not previously been disturbed, there would be a potential for impacts on additional cultural resources. Removal of structures would be necessary, but the Project proponent does not expect previously undisturbed areas to be affected.

The No Action Alternative would have no direct impact on cultural resources. However, selection of the No Action Alternative could potentially cause the Project proponent to reconsider the previously rejected interconnection alternative at the Big Stone Substation in Big Stone, South Dakota, which would require the construction of a 30-mile electric transmission line.

Constructing this new transmission line could result in greater impacts to cultural resources due to increased temporary ground disturbance associated with transmission line construction.

2.12.3 Proposed Conservation Measures

The Project proponent has identified conservation measures for potential impacts upon cultural resources resulting from the construction and operation of the Project, as applicable, from the draft UGP Wind PEIS and tailored them specifically for the specifics of this Project and its unique characteristics.

Consultation is necessary to establish whether the Project is likely to disturb traditional cultural properties, affect access rights to particular locations, disrupt traditional cultural practices, or visually impact areas important to the tribe(s). Consultation is required under the NHPA. Western consulted with Sisseton Wahpeton Oyate THPO and the tribal governments listed in Section 3.3 below to determine the cultural resource study area. The cultural resource study parameters are as follows:

1. All project disturbances east of Interstate 29 would be surveyed.
2. All project areas west of Interstate 29 that have not been disturbed by agriculture (grasslands, pasture, etc.) would be surveyed.
3. All project disturbances in the north half of Section 5, the north half of Section 8, and the NE ¼ of Section 29 would be surveyed.
4. Once the Level 1 search has been completed, aerial photographs or high resolution satellite images should be utilized to search for historic farmstead features within the entire APE west of Interstate 29. Identified site Locations west of Interstate 29 that do not fall under points 2 and 3 above would be investigated.

Western and the Project proponent held a nation-to-nation Section 106 consultation meeting on February 11, 2014 at the Dakota Magic Casino. Discussion centered on construction impacts within the Project area. Construction impacts to lands that were already being used for crop cultivation were of less concern than impacts to lands used for pasture or grassland and wetland areas. Tribal representatives at the meeting noted that South Shore (south of the Project area, along the Coteau) and the northern side of Summit Lake (northeast of the Project footprint) were areas they believe have the greatest potential for cultural and archaeological resources.

The Project proponent and Western would implement the following mitigation measures to address potential impacts on cultural resources:

- The presence of archaeological sites and historic properties in the APE would be determined based on a records search of recorded sites and properties in the area and an archaeological survey.

- Archaeological sites and historic properties present in locations that would be affected by Project activities would be reviewed to determine whether they meet the criteria of eligibility for listing on the NRHP. Cultural resources listed on or eligible for listing on the NRHP are considered "significant" resources. The Project proponent would avoid these resources with siting of Project components.

- Cultural and Native American resources discovered during construction would immediately be brought to the attention of Western. Work would be immediately halted in the vicinity of the find to avoid further disturbance to the resources while they are being evaluated and appropriate mitigation plans are being developed. An Unanticipated Discovery Plan would be prepared.

- If human remains are found, work would cease immediately in the vicinity of the find. The appropriate law enforcement officials and Western would then be contacted. No material would be handled or removed from the find location. Once it is determined that the remains belong to an archaeological site, the South Dakota SHPO would be contacted to determine how the remains should be addressed. An Unanticipated Discovery Plan would be prepared.

- Significant cultural and Native American resources can be affected by soil erosion. The Project would employ all appropriate and necessary erosion and sedimentation controls to prevent damage to cultural and Native American resources.

2.13 Cumulative Impacts

Cumulative impact, as defined by the CEQ, "results from the incremental impact of [an] action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or nonfederal) or person undertakes such other actions."

This analysis presents the potential cumulative impacts associated with the proposed Project, taking into account existing and potential future wind development in the region as well as possible construction actions taking place in Grant and Roberts Counties that may occur at the same time as construction of the Project. The goal of the cumulative impacts analysis is to identify potentially significant impacts early in the planning process to improve decisions and move toward more sustainable development.

Past and Present Wind Development in the Region

There are no existing wind energy facilities in Grant and Roberts County. There are 8 operating wind farms within a 100 mile radius of the Project.

Table 2.13-1: Existing wind farms within a 100 mile radius of the Project

Project Name	**Approx. Distance from Project (miles)**	**Location**	**Project Capacity (MW)**
Day County Wind Farm	40	South Dakota	99
Buffalo Ridge Wind Farm I and II	60	South Dakota and Minnesota	300
MinnDakota Wind Farm	80	South Dakota and Minnesota	150
Lakota Ridge Wind Farm	90	Minnesota	11
Shaokatan Hills Wind Farm	90	Minnesota	12
Lake Benton 1 Wind Farm	95	Minnesota	107
Marshall Wind Farm	100	Minnesota	18.7

Reasonably Foreseeable Future Wind Development in the Region

There is only one known proposed wind farm within a 100 mile radius of the Project, the Northern Wind LLC wind farm located in Wilmot, South Dakota. This Project is approximately 20 miles from the proposed Project.

Other Potential Development in Grant and Roberts Counties

Major construction projects in the vicinity of the Project being constructed at the same time may potentially affect the same resources (such as transportation routes) at approximately the same time as the Project.

The Project proponent contacted Grant and Roberts Counties to determine whether any major construction projects coincident with the Project area or general vicinity were planned for 2015, the intended year of construction for the proposed Project. There was only one project mentioned, a transmission project currently under development in Grant County called Big Stone South to Ellendale. The proposed transmission line is located a few miles south of the Project area and construction of that transmission line may occur sometime between 2016 and 2019. It does not appear that the proposed

transmission line would likely be in construction at the same time as the Project.

Cumulative Impacts Summary

The Project proponent expects the proposed Project to have a positive impact on socioeconomics and air quality in the Project area and no significant impacts to any other area of the affected environment. This is in part due to the careful planning and deliberate siting process employed for the Project, but it is also due to the adoption of the conservation measures recommended in the draft UGP Wind PEIS.

As noted in the draft PEIS, if the Project proponent follows the conservation measures, wind energy is unlikely to have substantial negative cumulative impacts to any category of the affected environment. Wind energy development in the vicinity of the Project area, combined with past, present, and reasonably foreseeable future actions, may affect all resources in the UGP Region to some degree; however, over the long term, the most significant potential impacts would be to ecological and visual resources, which the Project proponent may avoid or reduc by employing the conservation measures in the draft PEIS. Adverse incremental impacts associated with Project construction activities would be localized and short in duration (for the construction period) and therefore would not likely substantially contribute to cumulative impacts in the region.

3. AGENCIES CONTACTED/CONSULTED

3.1 Federal Agencies

The following United States federal agencies were contacted regarding the EA or the studies supporting the EA or Project design:

- US Army Corps of Engineers;
- US Department of Agriculture (Farm Service Agency and Rural Utilities Service);
- US Department of Energy Federal Energy Regulatory Commission;
- US Department of Homeland Security Federal Energy Management Agency;
- US Department of Transportation Federal Aviation Administration;
- US Department of Transportation Highway Administration;
- US Environmental Protection Agency;
- US Fish and Wildlife Service (Ecological Services and Refuges); and
- US Geological Survey.

3.2 State and Local Agencies

The following state and local agencies were contacted regarding the EA or the studies supporting the EA or Project design:

- South Dakota Department of Environment and Natural Resources;
- South Dakota Department of Transportation;
- South Dakota Game, Fish and Parks;
- South Dakota Historic Preservation Office;
- Grant County;
- Roberts County; and
- Town of Summit.

3.3 Native American Tribes and Associated Bodies

Western initiated Section 106 consultation for the Project with the letter dated January 15, 2014 the following Tribal governments:

- Upper Sioux Indian Community;
- Prairie Island Indian Community;
- Lower Sioux Indian Community;
- Spirit Lake Tribal Council;
- Sisseton-Wahpeton Oyate;
- Flandreau Santee Sioux Executive Committee;
- Yankton Sioux Tribe;
- Santee Sioux Tribe of Nebraska;
- Rosebud Sioux Tribe of Indians;
- Crow Creek Sioux Tribe;
- Cheyenne River Sioux Tribe;
- Lower Brule Tribe;
- Standing Rock Sioux Tribe;
- Fort Peck Assiniboine and Sioux Tribes;
- Sac and Fox Nation (Oklahoma);
- Sac and Fox Nation of Missouri;
- Sac and Fox Nation of the Mississippi; and
- Oglala Sioux Tribe.

Western and the Project proponent held a Section 106 tribal consultation meeting on February 11th, 2014 at the Dakota Magic Casino in Hankinson, North Dakota. Western invited all of the Tribal governments listed above. The following Tribes participated in the meeting:

- Sisseton Wahpeton Oyate;
- Prairie Island Indian Community; and
- Fort Peck Tribes.

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United States Fish and Wildlife Service – Cooperating Agency		
Name/Title	**Education**	**Role**
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SummitWind Farm, LLC. – Project Proponent		
Name/Title	**Education**	**Role**
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Name/Title	**Education/Experience**	**Role**
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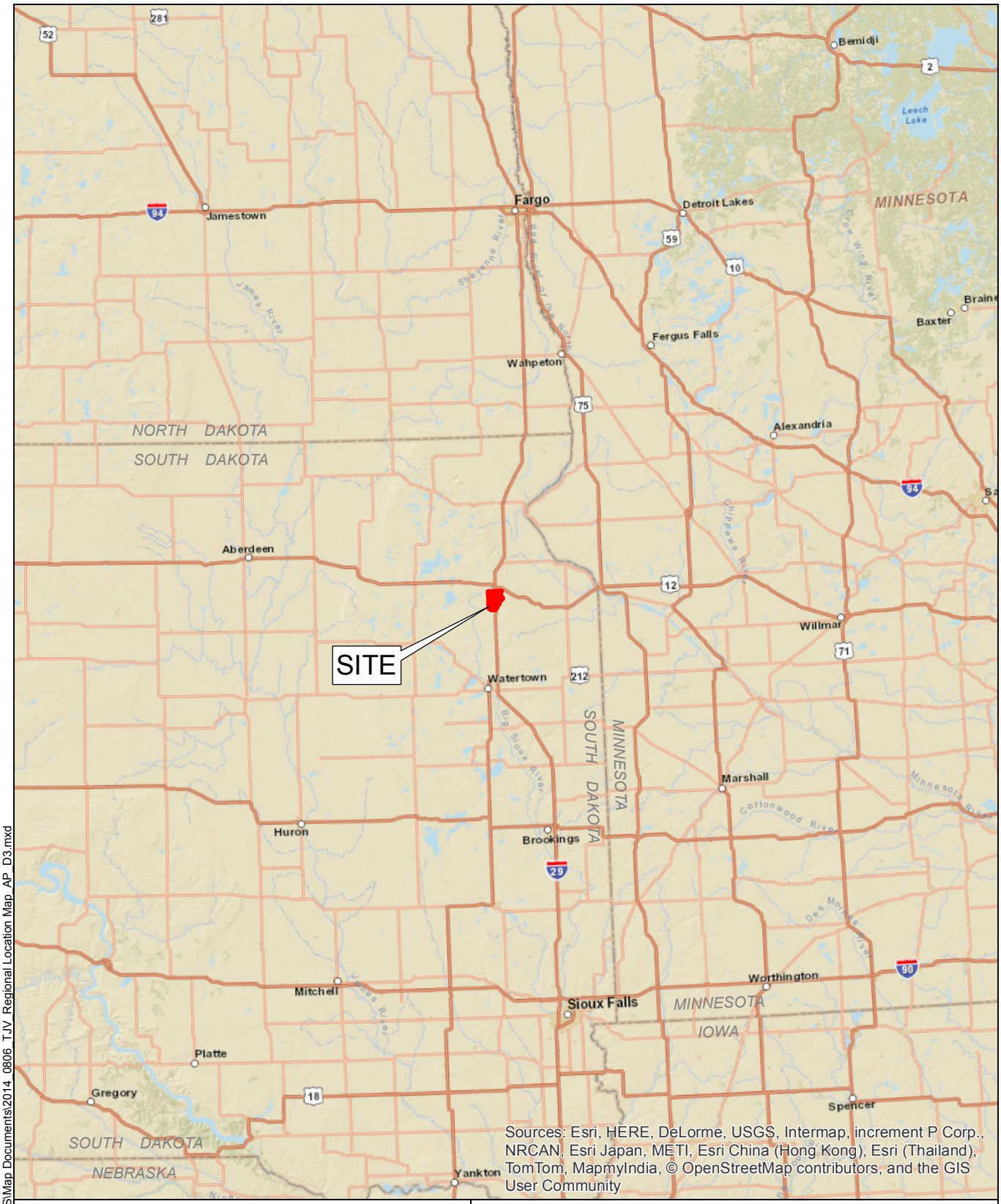
Lisa Telesca, CHMM Assistant Project Manager	B.S., Geologic Sciences	Geology and Soils

6. LIST OF TABLES

7. LIST OF FIGURES

8. LIST OF APPENDICES

FIGURES



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SITE COORDINATES:
45° 15' 57.5" N, 97° 3' 15.9" W

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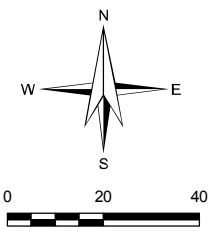
SUMMIT, SOUTH DAKOTA AND
STILL LAKE NE, SOUTH DAKOTA



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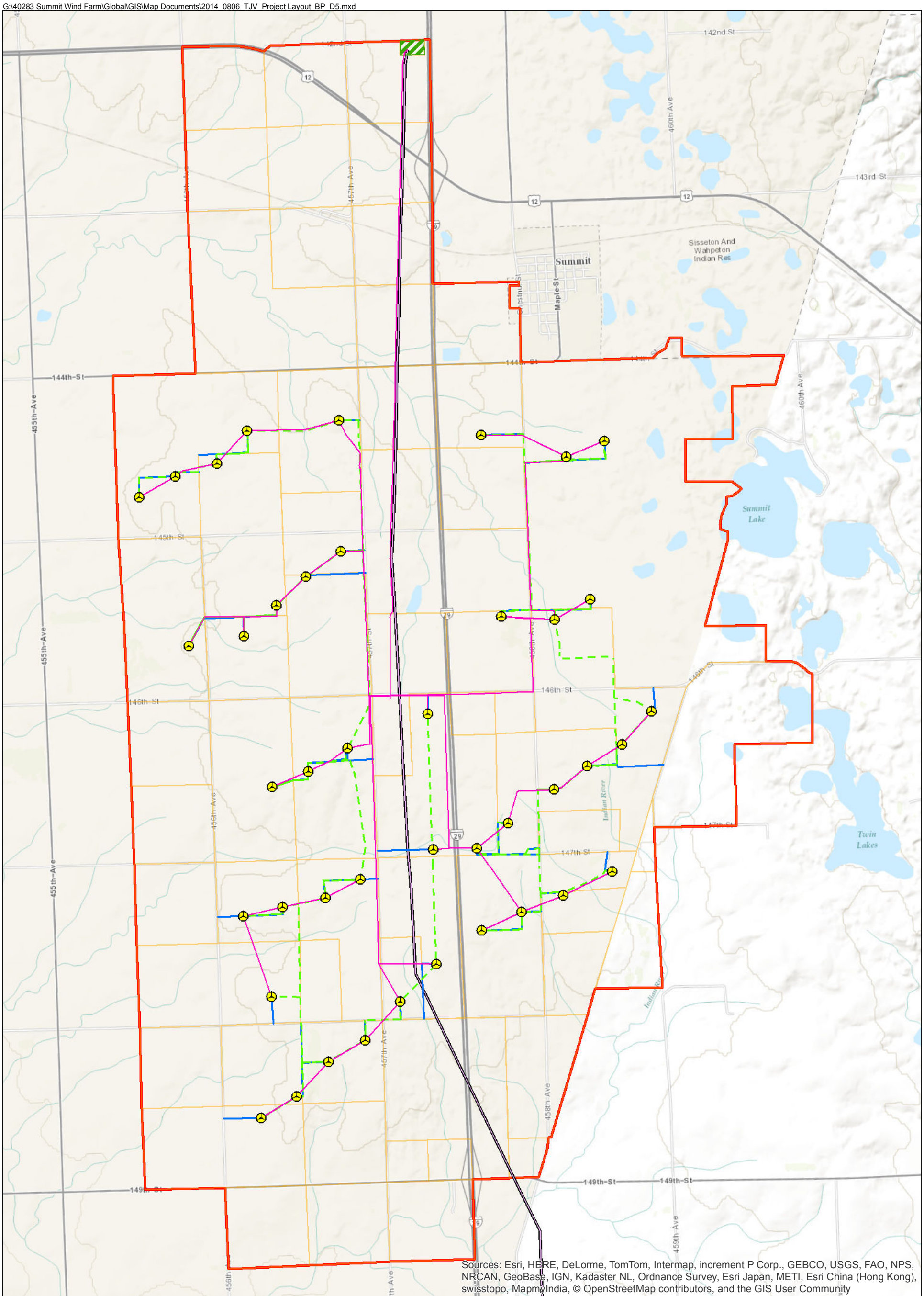
SUMMITWIND FARM LLC
ROBERTS AND GRANT COUNTIES
SOUTH DAKOTA

REGIONAL LOCATION MAP

SCALE: AS SHOWN
AUGUST 2014

FIGURE 1.1-1

G:\40283 Summit Wind Farm\Global\GIS\Map Documents\2014_0806_TJV_Project Layout_BP_D5.mxd



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

LEGEND

- PROJECT BOUNDARY
- PROJECT PARCELS
- TURBINE
- ALTERNATIVE POINT OF INTERCONNECTION
- COLLECTORS
- CRANE WALKS
- ACCESS ROADS
- EXISTING SUMMIT - WATERTOWN 115kV TRANSMISSION LINE

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SCALE IN FEET

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SUMMITWIND FARM
SUMMITWIND FARM, LLC
GRANT COUNTY, SOUTH DAKOTA

PROPOSED PROJECT LAYOUT

SCALE: AS SHOWN
AUGUST 2014

FIGURE 1.2-1

APPENDIX A

Scoping Meeting Summary

APPENDIX B

Agency Correspondence and Public Comments